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





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.

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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 ashy silt loam, Narcisse silt loam, Endoaquolls and Fluvaquents, Phoebe ashy 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 (SRSM) 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/ft²)
P-1 (TP-3)	1 – 3	SW-SM	10.8	2.84 x 10 ⁻⁴
P-2 (TP-8)	1.5 - 3.5	SM	12.5	8.36 x 10 ⁻⁴
P-3 (TP-19)	1 – 3	GW	3.0	1.21 x 10 ⁻³
P-4 (TP-22)	2 – 4	ML	64.0	1.29 x 10 ⁻⁴
P-9 (TP-28)	2 – 4	SM	47.0	6.93 x 10 ⁻⁵

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		ded Drywell Rate (cfs)
111	(Icci)	Classification	Filles	(cm/s)	Type A	Type B
TP-3	10 – 12	SP	3.5	6.1 x 10 ⁻²	0.3	1.0
TP-4	10 - 12	GW	4.4	4.1 x 10 ⁻²	0.3	0.8
TP-8	10 – 12	GW	3.6	5.9 x 10 ⁻²	0.3	1.0
TP-9	8 – 10	GW	2.1	1.7 x 10 ⁻¹	0.3	1.0
TP-11	10 – 12	SP	2.3	1.5 x 10 ⁻¹	0.3	1.0
TP-13	10 – 12	SP	2.2	1.6 x 10 ⁻¹	0.3	1.0
TP-17	10 – 12	SW	2.9	9.0 x 10 ⁻²	0.3	1.0
TP-19	10 – 12	SP	1.6	2.5 x 10 ⁻¹	0.3	1.0
TP-29	10 - 12	SP	2.3	1.5 x 10 ⁻¹	0.3	1.0
TP-30	14 – 15	SP	4.3	4.3 x 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 ²)	Safety Factor
P-1 (TP-3)	1-3	SW-SM	10.8	1.13 x 10 ⁻⁴	2.5
P-2 (TP-8)	1.5 - 3.5	SM	12.5	3.34 x 10 ⁻⁴	2.5
P-3 (TP-19)	1 – 3	GW	3.0	1.10 x 10 ⁻³	1.1
P-4 (TP-22)	2 – 4	ML	64.0	5.16 x 10 ⁻⁵	2.5
P-2 (TP-28)	2 – 4	SM	47.0	2.77 x 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.

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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



FIGURE 1





Site Location Map
Project No. 2013-026
Painted Hills Golf Course
4403 South Dishman-Mica
Road

Spokane County, WA

December 30, 2013

FIGURE 2

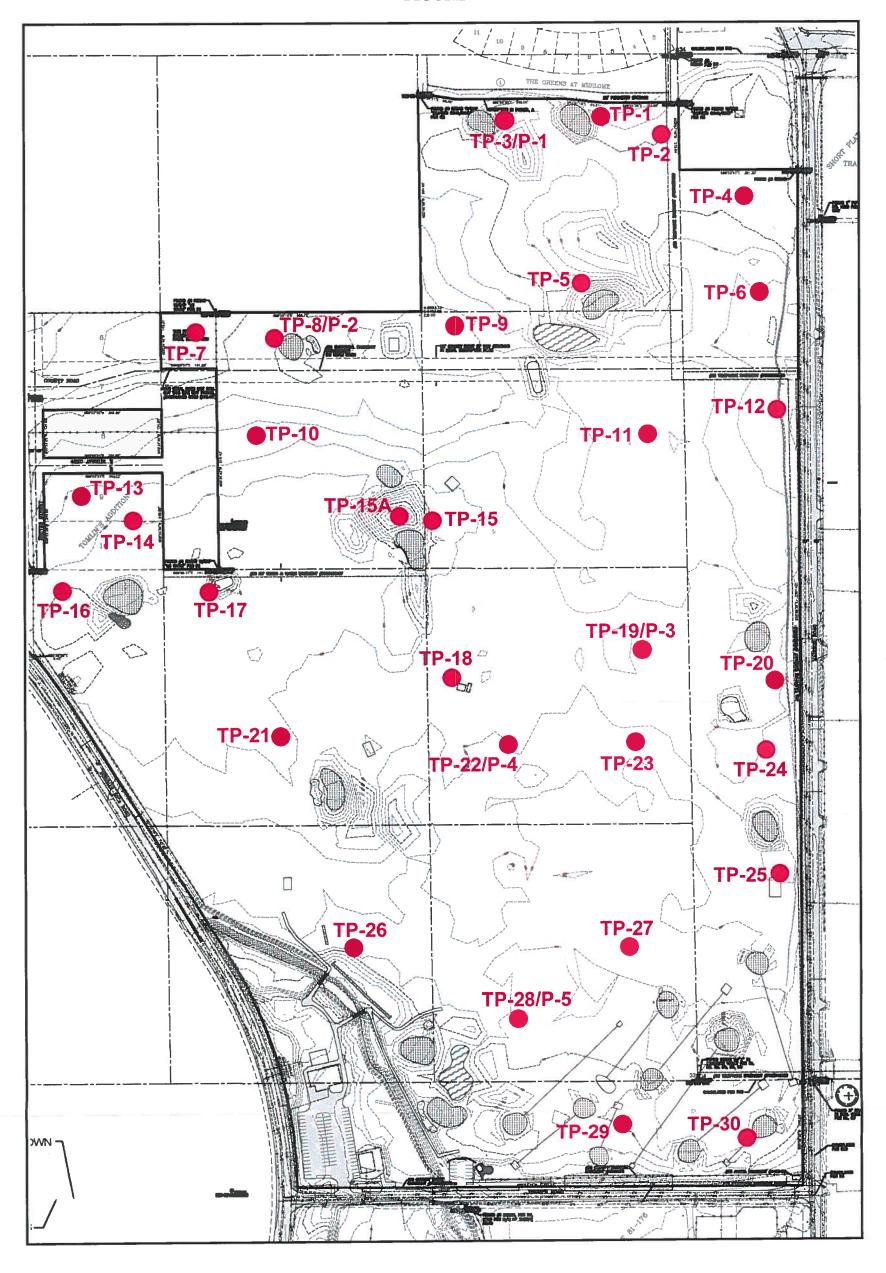




NRCS Map Project No. 2013-026 Painted Hills Golf Course 4403 South Dishman-Mica Road Spokane County, WA

December 30, 2013

FIGURE 3



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

IPEC

Inland Pacific Engineering Company Geotechnical Engineering and Consulting

TP-1 PROJECT: **BORING:** 2013-026 Preliminary Geotechnical Evaluation, Phase I LOCATION: See Attached Test Pit Painted Hills Golf Course Property **Location Map** 4403 South Dishman-Mica Road Spokane Valley, WA DATE: 12/2/13 SCALE: 1"=31 **ASTM** DEPTH D2487 WL ELEV. **DESCRIPTION OF MATERIALS** TESTS OR NOTES 0.0 SYMBOL 2007.4 SILT, with roots, dark brown, moist. ML 1.0 (Topsoil) 2006.4 SILT WITH SAND, tan, moist. (Alluvium) ML 2003.4 4.0 POORLY GRADED SAND WITH SILT AND GRAVEL, medium to coarse grained, a trace of Cobbles, SP-SM brown, moist. (Glacial Outwash) 2000.9 6.5 POORLY GRADED SAND WITH GRAVEL, coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash) SP 15.0 1992.4 End of Test Pit Groundwater not encountered Test pit immediately backfilled.

IPEC

Inland Pacific Engineering Company Geotechnical Engineering and Consulting

PROJECT: **BORING:** 2013-026 TP-2 LOCATION: Preliminary Geotechnical Evaluation, Phase I See Attached Test Pit Painted Hills Golf Course Property Location Map 4403 South Dishman-Mica Road Spokane Valley, WA 12/2/13 DATE: SCALE: 1"=31 **ASTM** DEPTH D2487 **DESCRIPTION OF MATERIALS** WL ELEV. TESTS OR NOTES SYMBOL 2004.9 0.0 SILT, with roots, dark brown, moist. ML (Topsoil) 2003.4 1.5 SILT WITH SAND, tan, moist. (Alluvium) ML 1998.4 6.5 SILTY CLAYEY GRAVEL WITH SAND, fine grained, brown, moist to wet. (Glacial Outwash) GC-GM 12.0 1992.9 POORLY GRADED SAND WITH GRAVEL, medium to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash) SP 1989.9 15.0 **End of Test Pit** Groundwater not encountered Test pit immediately backfilled.



Inland Pacific Engineering Company Geotechnical Engineering and Consulting

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



Inland Pacific Engineering Company Geotechnical Engineering and Consulting

PROJECT: **BORING:** 2013-026 TP-4 LOCATION: Preliminary Geotechnical Evaluation, Phase I See Attached Test Pit Painted Hills Golf Course Property Location Map 4403 South Dishman-Mica Road Spokane Valley, WA DATE: 12/2/13 SCALE: 1"=3" **ASTM** DEPTH D2487 ELEV. **DESCRIPTION OF MATERIALS** WL TESTS OR NOTES SYMBOL 2005.1 0.0 SILTY CLAY, with roots, dark brown to black, moist to wet. CL-ML 2004.1 1.0 (Topsoil) SILT WITH SAND, tan, moist. (Alluvium) ML 4.0 2001.1 SILTY GRAVEL WITH SAND, fine to coarse grained, a trace of Cobbles, brown, moist. GM (Glacial Outwash) 1999.1 6.0 WELL GRADED GRAVEL WITH SAND, fine to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash) GW 1990.1 15.0 End of Test Pit Groundwater not encountered Test pit immediately backfilled.



Inland Pacific Engineering Company Geotechnical Engineering and Consulting

PROJECT: **BORING:** TP-5 2013-026 Preliminary Geotechnical Evaluation, Phase I LOCATION: See Attached Test Pit Painted Hills Golf Course Property Location Map 4403 South Dishman-Mica Road Spokane Valley, WA 12/2/13 DATE: SCALE: 1"=3" **ASTM** DEPTH D2487 ELEV. **DESCRIPTION OF MATERIALS** WL TESTS OR NOTES 2004.6 0.0 SYMBOL SILTY SAND, fine to medium grained, a trace of Gravel, with SM 2003.6 1.0 roots, dark brown, moist to wet. (Topsoil) GM 2002.6 2.0 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.



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 BORING: TP-6

LOCATION: See Attached Test Pit

			th Dishman-Mica Road	Location Map				
			Valley, WA	DATE:	12/2/1	13 ISCA	LE:	1"=3'
ELEV. 2006.4		ASTM D2487 SYMBOL		DATE.	WL			NOTES
2004.4		SM	SILTY SAND, fine to medium grained, a trace of Grav roots, dark brown , moist. (Topsoil)	el, with			,	
2002.4		GM	SILTY GRAVEL WITH SAND, fine to coarse grained, a Cobbles, light brown to brown, moist. (Glacial Outwash)	trace of				
		SP	POORLY GRADED SAND WITH GRAVEL, medium to of grained, a trace of Cobbles, brown, moist. (Glacial Outwash)	coarse				
1991.4	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

BORING: TP-7

LOCATION: See Attached Test Pit

	S	pokane	Valley, WA	DATE:	12/2/1	3 SCALE	: 1"=3'
ELEV. 2010.4		ASTM D2487 SYMBOL			WL	TESTS OF	R NOTES
2009.4	1.0	SM	SILTY SAND, fine to medium grained, a trace of Gravroots, dark brown, moist to wet. (Topsoil)	el, with			
2008.4	2.0	SM	SILTY SAND, fine to medium grained, a trace of Grav brown, moist. (Glacial Outwash)	/el,			
2004.4	6.0	GM	SILTY GRAVEL WITH SAND, fine to coarse grained, a Cobbles, brown, moist. (Glacial Outwash)	trace of			
		GP	POORLY GRADED GRAVEL WITH SAND, fine to coars grained, a trace of Cobbles, brown, moist. (Glacial Outwash)	e			
1995.4	15.0		End of Test Pit				
			Groundwater not encountered				:
			Test pit immediately backfilled.				



Inland Pacific Engineering Company Geotechnical Engineering and Consulting

PROJECT: **BORING:** TP-8 2013-026 Preliminary Geotechnical Evaluation, Phase I LOCATION: See Attached Test Pit Painted Hills Golf Course Property **Location Map** 4403 South Dishman-Mica Road Spokane Valley, WA 12/2/13 DATE: SCALE: 1"=3' ASTM DEPTH D2487 ELEV. **DESCRIPTION OF MATERIALS** WL TESTS OR NOTES 2009.9 0.0 SYMBOL SILTY SAND WITH GRAVEL, fine to coarse grained, with SM roots, dark brown, moist to wet. 2008.4 1.5 (Topsoil) SILTY SAND WITH GRAVEL, fine to coarse grained, brown, moist to wet. (Glacial Outwash) SM 2004.9 5.0 WELL GRADED GRAVEL WITH SAND, fine to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash) GW 15.0 1994.9 End of Test Pit Groundwater not encountered Test pit immediately backfilled.



Inland Pacific Engineering Company Geotechnical Engineering and Consulting

PROJECT: 2013-026

Preliminary Geotechnical Evaluation, Phase I

Painted Hills Golf Course Property

BORING: TP-9

LOCATION: See Attached Test Pit

			ith Dishman-Mica Road	Location Map				
			Valley MA		1 - 1 - 1			
	_			DATE:	12/2/1	13 SC /	ALE:	1"=3'
ELEV. 2008.3		ASTM D2487 SYMBOL			WL	TESTS	OR	NOTES
2006.8		SM	SILTY SAND, fine to medium grained, a trace of Grav with roots, dark brown , moist. (Topsoil) POORLY GRADED GRAVEL WITH SILT AND SAND, fine					
2005.3	3.0	GP-GM	coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)	е то				
		GW	WELL GRADED GRAVEL WITH SAND, fine to coarse ga trace of Cobbles, brown, moist. (Glacial Outwash)	rained,				
1993.9	15.0		End of Test Pit				<u> </u>	
			Groundwater not encountered					
			Test pit immediately backfilled.					



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 BORING: LOCATION: TP-10

See Attached Test Pit

	4	403 Sou	th Dishman-Mica Road	Location wap					
	S	pokane	Valley, WA	DATE:	12/2/	13	ISCA	LE:	1"=3'
ELEV. 2006.3		ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS		WL				NOTES
2005.3		SM	SILTY SAND, fine to medium grained, a trace of Gravwith roots, dark brown, moist. (Topsoil)	el,					
		SM	SILTY SAND WITH GRAVEL, fine to coarse grained, a of Cobbles, brown, moist. (Glacial Outwash)	trace					
2001.8	4.5								
		SP	POORLY GRADED SAND WITH GRAVEL, medium to c grained, a trace of Cobbles, brown, moist. (Glacial Outwash)	coarse					
1993.9	13.0		End of Test Pit						
			Groundwater not encountered						
			Test pit immediately backfilled.						
		:							



Inland Pacific Engineering Company Geotechnical Engineering and Consulting

PROJECT: 2013-026 **BORING: TP-11** Preliminary Geotechnical Evaluation, Phase I LOCATION: See Attached Test Pit Painted Hills Golf Course Property Location Map 4403 South Dishman-Mica Road Spokane Valley, WA 12/2/13 DATE: SCALE: 1"=3' **ASTM** DEPTH D2487 ELEV. **DESCRIPTION OF MATERIALS** WL TESTS OR NOTES 2007.4 SYMBOL 0.0 SILTY SAND, medium to coarse grained, a trace of Gravel, 2006.9 0.5 SM with roots, dark brown, moist to wet. (Topsoil) SILTY SAND WITH GRAVEL, fine to coarse grained, brown, SM moist to wet. (Glacial Outwash) 2003.4 4.0 POORLY GRADED SAND WITH GRAVEL, medium to coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash) SP 1992.4 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 BORING: LOCATION: TP-12

See Attached Test Pit

			th Dishman-Mica Road	Location wap				
			Valley, WA	DATE:	12/2/1	13 50	\I F·	1"=3'
		ASTM		DATE:	+2/2/	-5 50/	\LL.	1 -2
ELEV.	DEPTH	D2487	DESCRIPTION OF MATERIALS		WL	TESTS	OR	NOTES
2005.1		SYMBOL						
			CLAYEY SAND, fine to medium grained, a trace of Gr	ravel,				
		SC	with roots, dark brown , wet.					
2003.6	1.5		(Topsoil)					
			SILTY GRAVEL WITH SAND, fine to coarse grained, w					
			Cobbles, a trace of Boulders, light brown to dark bromoist.	own,	1 1			
		GM	(Glacial Outwash)					ľ
			(Glacial Gutwash)					l
2000.6	4.5				1			
			POORLY GRADED GRAVEL WITH SILT AND SAND, fin	e to				
			coarse grained, a trace of Cobbles, brown, moist. (Glacial Outwash)					İ
			(Glacial Outwasii)		1 1			
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		GP-GM						
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1990.1	15.0				+			
	1		End of Test Pit					
			Groundwater not encountered					
			orodinawater not encountered					
			Test pit immediately backfilled.					
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PROJECT: 2013-026

Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property

BORING: LOCATION: **TP-13**

See Attached Test Pit

	4	403 Sou	th Dishman-Mica Road	Location Map					
			Valley, WA	DATE.	17/7/	12	Icca	I.E.	411 21
			-	DATE:	12/2/	13	12CA	LE:	1"=3'
ELEV.	DEPTH	ASTM D2487	DESCRIPTION OF MATERIALS		$ _{WL} $	7	FSTS	OR	NOTES
2006.8		SYMBOL			''-			J.1	
2000.0			SILTY SAND, fine to medium grained, a trace of Grav	/el,					
		SM	with roots, dark brown, moist to wet.						
2005.3	1.5		(Topsoil)						_
			SILTY GRAVEL WITH SAND, fine to coarse grained, a	trace					
			of Cobbles, light brown, moist.						
		GM	(Glacial Outwash)						
2001.8	5.0								
i			POORLY GRADED SAND WITH GRAVEL, medium to c	oarse					
			grained, light brown, moist.						
			(Glacial Outwash)						
		1			1				
1		65							
		SP							
	240								
						_			
	45.0								
1991.8	15.0				1				
			End of Test Pit						
	1		Groundwater not encountered						
			- Groundwater not encountered						
			Test pit immediately backfilled.						
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						1			
	L	1				<u> </u>			



Inland Pacific Engineering Company Geotechnical Engineering and Consulting

PROJECT: 2013-026

Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property

BORING: LOCATION: **TP-14**

See Attached Test Pit Location Map

			th Dishman-Mica Road	Location Map				١
	S	pokane	Valley, WA	DATE:	12/2/:	13	SCALE:	1"=3'
ELEV.		ASTM D2487	DESCRIPTION OF MATERIALS	DAIL.	WL	<u> </u>		NOTES
2005.9	0.0	SYMBOL	SILTY SAND, fine to medium grained, a trace of Grav	(0)				
2004.4	1.5	SM	with roots, dark brown , moist to wet. (Topsoil)	, ei,				
		GM	SILTY GRAVEL WITH SAND, fine to coarse grained, a of Cobbles, light brown, moist. (Glacial Outwash)	trace				
1999.9	6.0							
		SP	POORLY GRADED SAND WITH GRAVEL, medium to o grained, a trace of Cobbles, brown, moist. (Glacial Outwash)	oarse				
1990.9	15.0		End of Tart Dit		-			
			End of Test Pit Groundwater not encountered Test pit immediately backfilled.					

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 BORING: LOCATION: TP-15

See Attached Test Pit

	4	403 Sou	th Dishman-Mica Road	Location Map				
			Valley, WA	DATE:	12/2/:	13 SC	ΔIF·	1"=3'
ELEV.		ASTM D2487		DAIL.	WL			NOTES
2005.1	0.0	SYMBOL FILL	Silty Clayey Sand, fine to medium grained, a trace of with roots, dark brown to black, wet.	f Gravel,				_
2002.1	3.0							
1998.1		SC	CLAYEY SAND WITH GRAVEL, fine to medium graine brown, wet. (Glacial Outwash)	d,				
1338.1	7.0	SP	POORLY GRADED SAND WITH GRAVEL, medium to o grained, a trace of Cobbles, brown, moist. (Glacial Outwash)	coarse				
1990.1	15.0		End of Total Dia		-			
			End of Test Pit Groundwater not encountered Test pit immediately backfilled.					



Inland Pacific Engineering Company Geotechnical Engineering and Consulting

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

IPEC

Inland Pacific Engineering Company Geotechnical Engineering and Consulting

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

Inland Pacific Engineering Company Geotechnical Engineering and Consulting

PROJECT: 2013-026

Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property

BORING: LOCATION: **TP-17**

See Attached Test Pit

			th Dishman-Mica Road			Location	ocation iviap			
	S		Valley, WA	DATE:	12/2/	13 SC/	ALE:	1"=3'		
ELEV. 2005.4		ASTM D2487 SYMBOL			WL	TESTS	OR	NOTES		
2004.4		FILL	Silty Sand, fine to medium grained, a trace of Grave with roots, dark brown to black, wet.	l,						
1000 4	6.0	SM	SILTY SAND, fine to medium grained, a trace of Grav brown, moist to wet. (Alluvium)	el,						
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.							

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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 BORING: LOCATION: TP-18

See Attached Test Pit

			th Dishman-Mica Road			20	cocacion wap			
	S	pokane	Valley, WA	DATE:	12/2/	13	SCA	LE:	1"=3'	
ELEV. 2006.1		ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS		WL				NOTES	
2005.1		SM	SILTY SAND, fine to medium grained, with roots, black, moist to wet. (Topsoil)							
		SM	SILTY SAND, fine to medium grained, a trace of Grav brown, moist. (Alluvium)	el, light						
2002.1	4.0									
1001.1	15.0	SP	POORLY GRADED SAND WITH GRAVEL, medium to c grained, brown, moist. (Glacial Outwash)	oarse						
1991.1	15.0		End of Test Pit							
			Groundwater not encountered							
			Test pit immediately backfilled.					5		

IPEC

Inland Pacific Engineering Company Geotechnical Engineering and Consulting

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



Inland Pacific Engineering Company Geotechnical Engineering and Consulting

Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA ELEV. DEPTH 2006.9 0.0 SYMBOL 2005.9 1.0 ML SILT, with roots, dark brown, moist. (Topsoil) SILT WITH SAND, tan, moist. (Alluvium) ML 2000.9 6.0 LEAN CLAY, brown, wet. (Alluvium)	DATE:		See Attached Location Ma	p 1"=3'
ELEV. DEPTH 0.0 SYMBOL 2005.9 1.0 ML SILT, with roots, dark brown, moist. (Topsoil) SILT WITH SAND, tan, moist. (Alluvium) ML 2000.9 6.0 LEAN CLAY, brown, wet. (Alluvium)	DATE:			
ELEV. DEPTH D2487 O.0 SYMBOL 2005.9 1.0 ML SILT, with roots, dark brown, moist. (Topsoil) SILT WITH SAND, tan, moist. (Alluvium) ML 2000.9 6.0 LEAN CLAY, brown, wet. (Alluvium)		WL	TESTS OR	NOTES
2005.9 1.0 ML SILT, with roots, dark brown, moist. (Topsoil) SILT WITH SAND, tan, moist. (Alluvium) ML 2000.9 6.0 LEAN CLAY, brown, wet. (Alluvium)				
ML 2000.9 6.0 LEAN CLAY, brown, wet. (Alluvium)				
LEAN CLAY, brown, wet. (Alluvium)		:		
(Alluvium)				
1991.9 15.0 End of Test Pit				
Test pit immediately backfilled.				



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 BORING: LOCATION: **TP-21**See Attached Test Pit

			th Dishman-Mica Road						
	S	pokane '	Valley, WA	DATE:	12/3/	13	CALE:	1"=3'	
ELEV.	DEPTH 0.0	ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS		WL			NOTES	
2006.4			SILTY SAND, fine to medium grained, with roots, dar brown, moist. (Topsoil)	⁻ k					
	2.0	SC-SM	SILTY CLAYEY SAND, fine grained, brown, moist to v (Alluvium)	vet.					
1999.4	7.0								
1997.4		SP	POORLY GRADED SAND WITH GRAVEL, medium to o grained, brown, moist. (Glacial Outwash)	coarse					
1997.4		SP-SM	POORLY GRADED SAND WITH SILT, fine grained, bromoist. (Glacial Outwash)	own,					
		SP	POORLY GRADED SAND WITH GRAVEL, medium to o grained, brown, moist. (Glacial Outwash)	coarse					
1991.4	15.0		End of Test Pit					·-··- <u>-</u>	
			Groundwater not encountered Test pit immediately backfilled.						



Inland Pacific Engineering Company Geotechnical Engineering and Consulting

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



Inland Pacific Engineering Company Geotechnical Engineering and Consulting

PROJE		013-026		BORING	:	TP-	23			
			ry Geotechnical Evaluation, Phase I Iills Golf Course Property	OCATIO	ON:	See Attached Test Pit				
			th Dishman-Mica Road			Location Map				
	S	pokane	Valley, WA	DATE:	12/3/2	SCALE:	1"=3'			
ELEV. 2007.9		ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS		WL	TESTS OR	NOTES			
2007.5	0.0		SILTY CLAYEY SAND, fine to medium grained, with roots, black, moist to wet. (Topsoil)							
2004.9	3.0									
			SANDY LEAN CLAY, brown , wet.							
			(Alluvium)							
							İ			
		CL								
		CL								
1004 4	42.5									
1994.4	13.5		POORLY GRADED SAND WITH SILT AND GRAVEL, med	dium to	$\mid - \mid$					
		SP-SM	coarse grained, brown, moist.	aiuiii to						
1992.9	15.0		(Glacial Outwash)		7					
			End of Test Pit							
			Groundwater not encountered							
			Test pit immediately backfilled.							
		i								
*										



Inland Pacific Engineering Company Geotechnical Engineering and Consulting

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



Inland Pacific Engineering Company Geotechnical Engineering and Consulting

PROJE	CT: 2	013-026		BORING	10 - 11 - 1 - 1 - 12		TP-	id Consulting		
	P 4	ainted F 403 Sou	ry Geotechnical Evaluation, Phase I fills Golf Course Property th Dishman-Mica Road	LOCATI	ON: See Attached Test Location Map		Test Pit			
	S		Valley, WA	DATE:	12/3/1	3 SCA	LE:	1"=3'		
ELEV. 2007.6		ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS		WL	TESTS	OR	NOTES		
2006.6		FILL	Silty Sand, fine to medium grained, with roots, dar brown to brown, moist.	K						
2005.1	2.5	CL-ML	(Topsoil) SILTY CLAY, with roots, black, moist-wet. (Buried Topsoil)					<u></u>		
		CL	(Alluvium)							
1992.6	15.0		End of Test Pit							
			Groundwater not encountered							
			Test pit immediately backfilled.							



Inland Pacific Engineering Company Geotechnical Engineering and Consulting

PROJE		013-026		BORING	3:	TP-26	7 7 7 7 7 7 7 7
Painted I 4403 Sou			rry Geotechnical Evaluation, Phase I Hills Golf Course Property Ith Dishman-Mica Road Valley, WA	LOCATI		See Attached Tes Location Map	:
			valley, vvA	DATE:	12/3/:	13 SCALE: 1'	'=3'
ELEV. 2008.8		ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS		WL	TESTS OR NO	OTES
2006.8	2.0		SILTY SAND, fine to medium grained, with roots, black, moist to wet. (Topsoil)				
		CL	SANDY LEAN CLAY, brown, wet. (Alluvium)				
2000.3	8.5	SC	CLAYEY SAND, fine grained, with seams and layers Clay and Poorly Graded Sand, brown, wet. (Alluvium)	of Lean			4
1993.8	15.0		End of Test Pit Groundwater not encountered Test pit immediately backfilled.				



Inland Pacific Engineering Company Geotechnical Engineering and Consulting

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



Inland Pacific Engineering Company Geotechnical Engineering and Consulting

								nd Consulting
PROJE		013-026		BORING			TP-	28
Preliminary Geotechnical Evaluation, Phase I Painted Hills Golf Course Property 4403 South Dishman-Mica Road Spokane Valley, WA			lills Golf Course Property th Dishman-Mica Road	LOCATION: See Attach Location N				
			valley, vvA	DATE:	12/3/1	L3 SCA	LE:	1"=3'
ELEV. 2009.1		ASTM D2487 SYMBOL	DESCRIPTION OF MATERIALS		WL	TESTS	OR	NOTES
2007.1	2.0	SM	SILTY SAND, fine to medium grained, with roots, black, moist to wet. (Topsoil)				-	
1999.1	10.0	SM	SILTY SAND, fine to medium grained, brown, moist (Alluvium) CLAYEY SAND, fine to medium grained, brown, wet (Alluvium)					
1994.1	15.0	SC						
1774.1	25.0		End of Test Pit		+ +			
			Groundwater not encountered Test pit immediately backfilled.					

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Inland Pacific Engineering Company Geotechnical Engineering and Consulting

PROJE			BORING	i:	TP-29	
			ary Geotechnical Evaluation, Phase I	LOCATION	ON:	See Attached Test Pit
			Hills Golf Course Property Ith Dishman-Mica Road			Location Map
			Valloy MA	DATE:	12/3/:	13 SCALE: 1"=3'
		ASTM		57112.		
ELEV. 2009.9		D2487 SYMBOL			WL	TESTS OR NOTES
2003.3	0.0	31141801	SANDY LEAN CLAY, with roots, black, wet.			
		CL	(Topsoil)			,
2007.9	2.0					
			SANDY LEAN CLAY, brown, wet.			
			(Alluvium)			
		CL				
2003.9	6.0		SILTY SAND, fine to medium grained, brown, wet.			
			(Alluvium)			
		SM				
2000.9	9.0		DOODLY CRADED SAND, modium grained brown m	nist		
			POORLY GRADED SAND, medium grained, brown, m (Glacial Outwash)	oist.		
		SP				
		35				
1994.9	15.0					
			End of Test Pit			
			Groundwater not encountered			
	1	i	Test pit immediately backfilled.			
			rest pit inimediately backlined.			
	L					<u> </u>



Inland Pacific Engineering Company Geotechnical Engineering and Consulting

PROJE	CT: 2	013-026		BORING	11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	TP	2-30
	P P 4	relimina ainted H 403 Sou	ry Geotechnical Evaluation, Phase I Iills Golf Course Property th Dishman-Mica Road Valley, WA	LOCATI		See Attache Location Ma	ed Test Pit
ELEV.	DEPTH	ASTM D2487	DESCRIPTION OF MATERIALS	DAIL	WL	TESTS O	
2008.6 2008.1	0.0	SYMBOL ML	SANDY SILT, with roots, dark brown, moist to wet.				
		CL-ML	(Topsoil) SANDY SILTY CLAY, brown, moist to wet. (Alluvium)				
2004.1	4.5						
		SM	SILTY SAND, fine to medium grained, with seams ar 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, bi moist. (Glacial Outwash)	own,			
1993.6	15.0		End of Test Pit		-		
			Groundwater not encountered				
			Test pit immediately backfilled.				

REL	ATIVE DENSITY OR COM	NSISTENCY 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-Dense	11 - 30	Medium	6 - 8			
Dense	31 - 50	Rather Stiff	9 - 12			
Delise	31 - 30	CONSISTENCY Very Soft Soft Rather Soft Medium	13 - 16			
Vami Danca	> 50	Very Stiff	17 - 30			
Very Dense	> 30	Hard	> 30			

	USCS SOIL CLASSIFICATION							
	MAJOR DIVISIONS				IPTIONS			
Coarse-	Gravel and	Gravel	GW	Well Graded Grave	el			
Grained	Gravelly Soils	(with little or no fines)	GP	Poorly Graded Gra	ivel			
Soils	<50% coarse fraction	Gravel	GM	Silty Gravel				
	passes #4 sieve	(with >12% fines)	GC	Clayey Gravel				
<50%	Sandy and	Sand	SW	Well Graded Sand				
passes #200	Sandy Soils	(with little or no fines)	SP	Poorly Graded Sar	nd			
sieve	>50% coarse fraction	Sand	SM	Silty Sand				
	passes #4 sieve	(with >12% fines)	SC	Clayey Sand				
Fine-			ML	Silt				
Grained	Silt and Clay		CL	Lean Clay				
Soils	Liquid Limit < 50		OL	Organic Silt and C	lay (low plasticity)			
>50%			MH	Inorganic Silt				
passes #200	Salt and Clay		CH	Fat Clay				
sieve	Liquid Limit > 50		ОН	Organic Clay and S	ilt (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					

	MA	JOR DIVISIO	NS WITH	GRAIN S	IZE		
		SIE	EVE SIZE				
	12"	3" 3/	4" 4	4 1	0 4	0 2	000
		GRAIN S	SIZE (INC	HES)			
	12	3 0.	.75 0.	.19 0.	079 0.	.0171 0	0.0029
Boulders	Cobbles	Gra	vel		Sand		Silt and Clay
Doulders	Cobbles	Coarse	Fine	Coarse	Medium	Fine	Silt and Clay



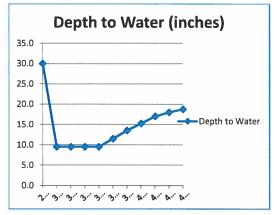
Test Pit Permeability Test Results

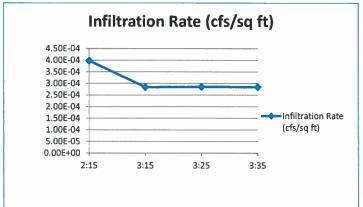
Project Name:	Painted Hills Golf Course	Preliminary			Test Date:	12/18/20	13
Project Number:	2013-026			Tes	st Location:	P-1 (TP-	3)
Client:	NAI Black				Depth:	1' - 3'	
Average Test Pit Dime	nsions: Length (ft): 6.	00 V	Vidth (ft):	2.63		Depth (ft):	2

Time	Elapsed Time (seconds)	Depth to Water (inches)	Flow Meter Reading (ft ³)	Volume of Water (ft ³)	Flow Rate (cfs)	Infiltration Rate (cfs/ft ²)
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	ŀ			
4:00	300	15.3				
4:05	300	17.0				
4:10	300	18.0			}	
4:15	300	18.8		ĺ		[

Effec

Average Infiltration Rate: 2.84E-0





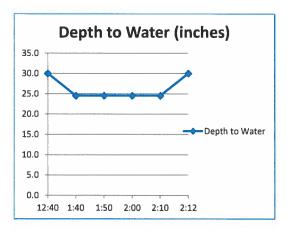


Test Pit Permeability Test Results

Project Name: _	Painted Hills Golf Course Preliminary		Test Date:	12/18/2013
Project Number:	2013-026	<u></u>	Test Location:	P-2 (TP-8)
Client:	NAI Black	_	Depth:	1,5' - 3.5'
Average Test Pit Dim	nensions: Length (ft): 5.75	Width (ft):	2.63	Depth (ft): 2

Time	Elapsed Time (seconds)	Depth to Water (inches)	Flow Meter Reading (ft ³)	Volume of Water (ft ³)	Flow Rate (cfs)	Infiltration Rate (cfs/ft²)
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		ļ		
						-

Effec



Infiltration Rate (cfs/sq ft)

1.00E-03
9.50E-04
9.00E-04
8.50E-04
8.00E-04
7.50E-04
12:40
1:40
1:50
2:00

8.36E-04

Average Infiltration Rate:



24 12

Test Pit Permeability Test Results

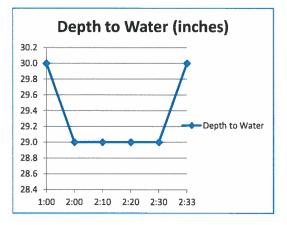
Project Name:l	Painted Hills Golf Co	ourse Prelimi	inary			Test Date:	12/18/20)13	
Project Number:	2013-0	26			7	est Location:	P-3 (TP-	19)	
Client:	NAI BI	ack				Depth:	1' - 3'	ē	
Average Test Pit Dimen	sions: Length (ft):	5.50	v	Vidth (ft):	2.63		Depth (ft):	2	

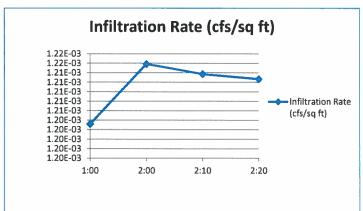
Time	Elapsed Time (seconds)	Depth to Water (inches)	Flow Meter Reading (ft ³)	Volume of Water (ft ³)	Flow Rate (cfs)	Infiltration Rate (cfs/ft ²)
1:00	0	30.0	246.55			
2:00	3600	29.0	314.95	68.40	1.90E-02	1.20E-03
2:10	600	29.0	326.47	11.52	1.92E-02	1.22E-03
2:20	600	29.0	337.97	11.50	1.92E-02	1.21E-03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

Effec

Average Infiltration Rate: 1.2









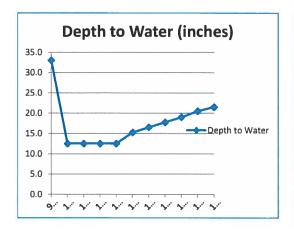
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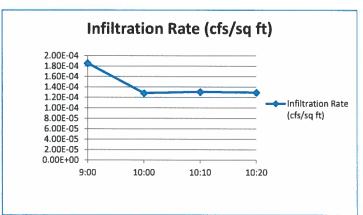
Test Pit Permeability Test Results

Project Name: _	Painted Hills Golf Co	ourse Preliminar	<u>y</u>	T	'est Date: _	12/18/201	13	
Project Number: _	2013-0	26		Test I	Location: _	P-4 (TP-2	2)	
Client:	NAI BI	ack			Depth:	2' - 4'		
verage Test Pit Dimensions: Length (ft): 5.75			Width (ft)	2.50		Denth (ft):	2	_

Time	Elapsed Time (seconds)	Depth to Water (inches)	Flow Meter Reading (ft ³)	Volume of Water (ft ³)	Flow Rate (cfs)	Infiltration Rate (cfs/ft ²)
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





1.29E-04

Average Infiltration Rate:



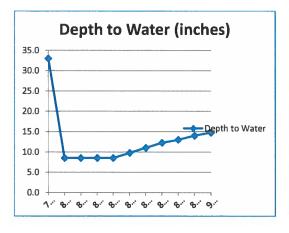
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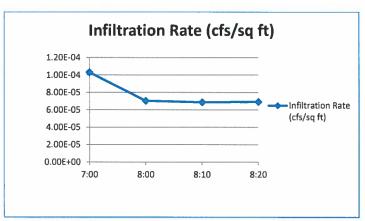
Test Pit Permeability Test Results

Project Name: _	Painted Hills Golf Co	urse Preliminary			Γest Date: _	12/18/201	13	
Project Number:	2013-0	26		Test	Location:	P-5 (TP-2	28)	
Client:	NAI Bl	ack			Depth:	2' - 4'		
verage Test Pit Din	nensions: Length (ft):	7 50	Width (ft):	2 54		Depth (ft):	2	

Time	Elapsed Time (seconds)	Depth to Water (inches)	Flow Meter Reading (ft ³)	Volume of Water (ft ³)	Flow Rate (cfs)	Infiltration Rate (cfs/ft²)
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





6.93E-05

Average Infiltration Rate:

GN Northern 722 N. 16th Avenue, Suite 31 Yakima, WA 98902 Telephone: 509-248-9798 Fax: 509-248-4220

GRAIN SIZE DISTRIBUTION

· 4 4 p ·

PROJECT NAME Painted Hills Golf Course CLIENT IPEC PROJECT NUMBER **PROJECT LOCATION** U.S. SIEVE OPENING IN INCHES 6 4 3 2 1.5 1 3/4 1/23/8 3 U.S. SIEVE NUMBERS 810 14 16 20 30 40 50 60 100 140 200 HYDROMETER 4 6 100 Ø 95 90 85 80 75 70 65 PERCENT FINER BY WEIGHT 60 55 50 45 40 35 30 25 20 15 10 5

GRAIN SIZE IN MILLIMETERS

CORRIES	GRA	VEL		SAND		SUTORCIAV
COBBLES	coarse	fine	coarse	medium	fine	SILT OR CLAT

E.GPJ	PERCENT FINER BY \	55					-		\mathbb{H}	\downarrow				+		$\dagger \dagger$						\parallel								_	
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BLICK			005	DI EC		GRA	VE	L							SA	٩NI	D								SILT OR CLAY					1	
C'USERSIPUBLICIDOCUMENTSIBENTLEY/GINTPROJECTSIS13-XXX PAINTED HILLS GOLF COURSE. GPJ			COE	BLES	С	oarse		fine		C	oars	se	r	med	liun	n			fine	,				•	SILI	Or	(U	LAI			
SI	ВС	RE	HOLE	DEP							(Cla	ssif	fica	tio	n								1	LL	Р	L	F	P	Сс	Cu
89		TP-3		10'-1				ORL												•				_						1.46	5.83
/13 11		TP-		12	1_			ELL											<u> </u>		<u>. </u>			-						2.10	6.83
- 2	▲ TP-8 10'-12' WELL-G ★ TP-9 8'-10' WELL-G																<u> </u>		<u> </u>			-						1.15	10.47		
눤																						-						1.02 1.18	14.44 5.33		
LAB	BOREHOLE DEPTH D100 D6) 060				D3			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	D1			_	Gr	ave	el le	_ %:	Sand	1	-	 %S	ilt	<u> </u>	Clay		
STD US LAB		TP-3		10'-1		37.5	1		.58		+		2.29		+		0.7		\dashv		37		-		8.0			,,,,		3.5	J.G.y
- GINT S	▼ TP-4 12' 37.5 5.8				.87	1		;	3.25	56			3.0	36			59	.1		3	4.9					4.4					
S L	▲ TP-8 10'-12' 37.5 6.90			5_	5 2.284 0.659 49.8			.8		43.5						3.6															
- []-	* TP-9 8'-10' 37.5 9.9								2.63				0.6				48				8.2	B.2		2.1							
SR.	® ○ TP-11 10'-12'				37.5		4.765			2	2.24	14		0.895 40.1		57.6		2.3													

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GRAIN SIZE DISTRIBUTION

CLIENT IPEC

JS LAB.

GINT STD I

SRAIN SIZE *

 \square

0

BOREHOLE

TP-13

TP-17

TP-19

TP-22

TP-27

DEPTH

10'-12'

10'-12'

10'-12'

10'-12'

9'-10'

D100

37.5

37.5

37.5

19

4.75

D60

3.71

4.103

4.556

2.817

0.214

D30

1.97

1.723

1.872

1.354

D10

0.817

0.571

0.774

%Gravel

28.2

31.4

35.4

13.3

0.0

%Sand

69.6

62.3

59.8

74.4

64.0

%Silt

%Clay

2.2

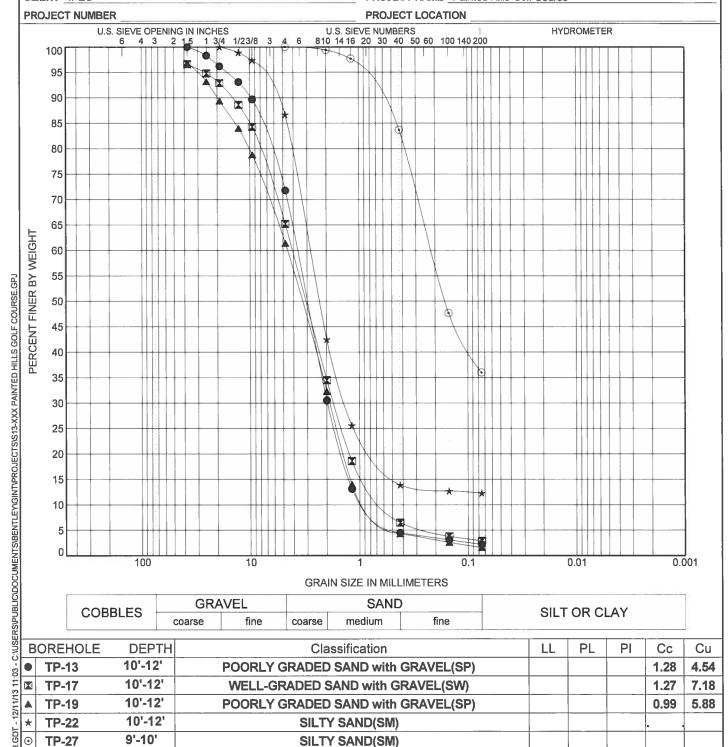
2.9

1.6

12.3

36.0

PROJECT NAME Painted Hills Golf Course



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GN Northern 722 N. 16th Avenue, Suite 31 Yakima, WA 98902

GRAIN SIZE DISTRIBUTION

Telephone: 509-248-9798 Fax: 509-248-4220

14'-15'

2

0.927

0.515

0.205

87.9

4.3

▼ TP-30

GINT

GRAIN

CLIENT IPEC PROJECT NAME Painted Hills Golf Course PROJECT NUMBER PROJECT LOCATION U.S. SIEVE OPENING IN INCHES ING IN INCHES | 2 1.5 | 1 3/4 1/23/8 | 3 U.S. SIEVE NUMBERS HYDROMETER 810 14 16 20 30 40 50 60 100 140 200 6 100[95 90 85 80 75 × 70 65 PERCENT FINER BY WEIGHT 60 55 C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\G\INT\PROJECTS\S13-XXX PAINTED HILLS GOLF COURSE.GPJ 50 45 40 35 30 25 20 15 10 5 0 100 10 0.1 0.01 0.001 **GRAIN SIZE IN MILLIMETERS GRAVEL** SAND COBBLES SILT OR CLAY coarse fine coarse medium **BOREHOLE DEPTH** LL PL Classification Сс Cu TP-29 10'-12' POORLY GRADED SAND(SP) 5.04 1.10 12/11/13 11:03 14'-15' × **TP-30** POORLY GRADED SAND(SP) 1.39 4.52 STD US LAB.GDT **BOREHOLE** DEPTH D100 D60 D30 D10 %Gravel %Sand %Silt %Clay 10'-12' **TP-29** 4.75 1.407 0.656 0.279 0.0 97.7 2.3

GN Northern Inc. 11115 E. Montgomery, Suite C Spokane Valley, WA, 99206 Telephone: (509) 248-9798 Fax: (509) 248-4220

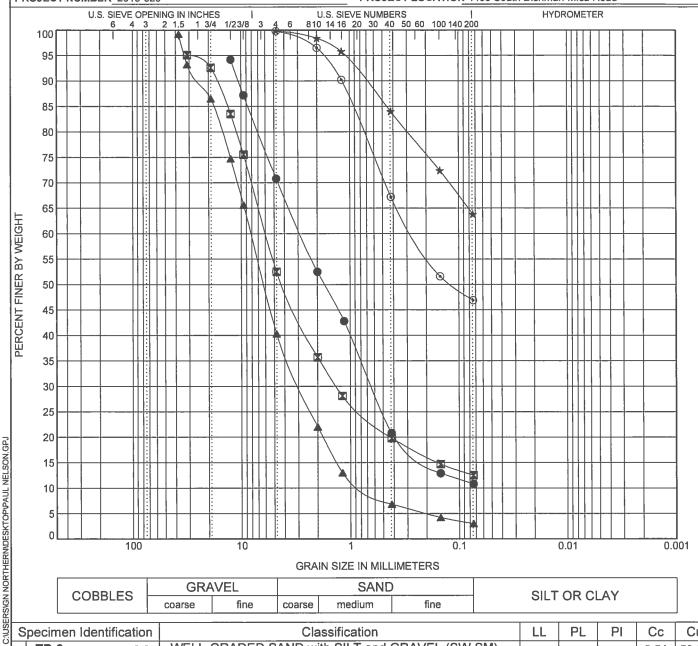
GRAIN SIZE DISTRIBUTION

CLIENT IPEC

PROJECT NAME Painted Hills Golf Course

PROJECT NUMBER 2013-026

PROJECT LOCATION 4403 South Dishman-Mica Road



GRAIN SIZE IN MILLIMETERS

CORRIES	GRA	VEL		SAND		SUTOPCIAV
COBBLES	coarse	fine	coarse	medium	fine	SILT OR CLAY

۴L															
C:\USER	S	pecimen	Identification		·	Classificati	on		LL	PL	PI	Сс	Cu		
5-0	•	TP-3	2.0	WELL-GR	ADED SAN	O with SILT	L (SW-SM)				2.51	50.34			
12/30/13 12:42 - (X	TP-8	2.0		SILTY SA	AND (SM)	ΞL								
130/1	lack	TP-19	2.0	WE	LL-GRADE	D GRAVEI				1.46	11.34				
][*	TP-22	3.0		SA	NDY SILT									
STD US LAB.GDT -	⊚	TP-28	3.0		SIL										
<u>\$</u> [S	pecimen	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				
<u>=</u> [X	TP-8	2.0	31.25	5.963	1.355		42.6	39.9			12.5			
9		TP-19	2.0	37.5	37.5 8.153 2.922 0.719 58.9 37.2 3.0										
BRAIN SIZE - GINT S	*	TP-22	3.0	4.76				0.0	35.9			64.0			
3KA	⊚	TP-28	3.0												