

CONTACT INFORMATION

PREPARER INFORMATION

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CLIENT INFORMATION

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SITE ADDRESS: 0 JACKSON ROAD
CHEHALIS, WASHINGTON
SECTION 03 TOWNSHIP 13N RANGE 02W PT LT 8 SE RD BLK 1
RICHARDT'S RPLT BLK 4-6 PARCVIA ADD PRCL B BL-09-148
335384

PARCEL: 010799001000

GPS LOCATION: 46.641138 -122.926586 (DD)

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SITE VISIT AND EVALUATION

AARON FULLER
FULLER DESIGNS
645 SE PROSPECT STREET
CHEHALIS, WA 98532

**RE: JACKSON VILLAS LANDSLIDE HAZARD SITE VISIT
0 JACKSON ROAD CHEHALIS, WASHINGTON
SECTION 03 TOWNSHIP 13N RANGE 02W PT LT 8 SE RD BLK 1
RICHARDT'S RPLT BLK 4-6 PARCUVIA ADD PRCL B BL-09-148
335384**

**PARCEL: 010799001000
JULY 26, 2021**

Dear Aaron Fuller:

This report is a follow-up to the initial site visit report of November 24, 2020. All American Geotechnical, Inc (AAG) was commissioned by Aaron Fuller (client) in November, 2020, to do a site visit to determine the geology and landslide potential for the above parcel. This is in reference to a proposed development of multiple family dwellings on the parcel. The site visit was done by Curtis D Cushman, L.G., L.E.G., on November 13, 2020. The client was not on site. The day was rainy.

A pitting program to determine the nature of underlying soils in select locations was undertaken on July 13, 2021. The day was sunny and Curtis D Cushman L.E.G. and Blaise Jelinek E.I.T. both of AAG were on site. Excavation was done by Jason Alvis in a SANY S4650C backhoe excavator. The client was on site at the end of the pitting program. The program will be described below.

SITE

The parcel is an imperfect rectangle, long to the northeast-southwest. A square section of the southernmost corner is omitted from the rectangle as it is not part of the parcel. This forms a blunt panhandle on the parcel's southwestern side which faces Jackson Highway. The northwest side is along Kennicott Road and the northeast side is along Hosanna Lane. The parcel looks like Nebraska.

The parcel slopes down to the southwest with the steepest area near the center of approximately 16%. The edges of the roads commonly drop off steeply near the parcels southern end, less so to the north. The lower land is locally designated wetlands.

SITE GEOLOGY

The parcel is overall mapped (Lewis County GIS and confirmed on the Centralia 100:000 Quadrangle) as being a "mass wasting deposit(s), mostly landslide" (Qls). This is a general description and is not site-specific. These deposits are common in the Centralia-Chehalis region where they are commonly associated with erosion of the Qlh Logan Hill Formation sediments at the end of the last glacial epoch.

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Allen Fiksdal, in *Slope Stability of the Centralia-Chehalis Area Lewis County, Washington* (OF Report 78-2, 1978), mapped these features as **Ols** - Old Landslides. He wrote: "...these areas are not generally observed to be unstable, but because of the nature of subsurface materials, low density development is recommended. Engineering studies should be required if natural slopes are over 30 percent." No such slopes were observed.

Site observation indicated various lithologies, dominantly sand and silt with minor gravel present as well. According to the client, the area of soil lining Hosanna Lane contains fill to a depth of 10 feet at least, including rubble, organic refuse, and concrete. This fill blankets much of the upper part of the parcel but to a lesser amount than at the northern property line.

Along this area and looking into the higher banks of material and the overall surface, there was no evidence of faulting, failure, or cracking on a large scale. There is abundant vegetation, so some features may be obscure. However, overall, there is no evidence of movement or downslope displacement.

Liquefaction is **Low to Moderate**, and the site class is **D** which is **Stiff Soil**.

At the time of the pitting program, much of the upper part of the parcel had been scraped revealing the soil underneath. The above description remains valid including the presence of fill which includes concrete and, piping, some rebar, etc.

SITE HYDROLOGY

There was no ponding seen on the upper part of the property during the rain at the time of the first visit, but light sheet water flow was entering the parcel from the slope descending from Hosanna Lane. There is a wetlands delineated in the center of the property.

SITE SOILS

The USDA WSS maps most of the site as *Galvin silt loam, 0 to 8 percent slopes*.

89—Galvin silt loam, 0 to 8 percent slopes

Map Unit Setting

- *National map unit symbol:* 2hht
- *Elevation:* 100 to 1,770 feet
- *Mean annual precipitation:* 40 to 70 inches
- *Mean annual air temperature:* 52 degrees F
- *Frost-free period:* 150 to 200 days

Map Unit Composition

- *Galvin and similar soils:* 85 percent
- *Minor components:* 15 percent

Description of Galvin

Setting

- *Landform:* Alluvial fans
- *Parent material:* Alluvium derived from sandstone and shale

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Typical profile

- H1 - 0 to 14 inches: silt loam
- H2 - 14 to 41 inches: silty clay loam
- H3 - 41 to 60 inches: silty clay

This corresponds in part, but same sandy material was seen. However, as there is fill on site, coarser sediments as well as concrete rubble and other fill materials are to be expected.

SITE VEGETATION

The site has been cleared to grass and scrub with the exception of isolated trees scattered on-site with some fringing trees and shrubs. The upper part has been mostly cleared as noted above. Fringing vegetation and growth along the property line to the southeast was mostly intact. The upper part of the lot was cleared of most of the vegetation at the time of the pitting program.

PITTING

A total of six pits were dug and are described below. Please see site map after the text.

Pit 1

0-12" Brown sand. At 12" some concretion clots seen

12" – 6' Possibly ML as grain size is very fine. Grey layers are present and concretions with hematite mottling are present. Sample #1. The test results from MTC Labs indicates this is a sandy silt, with silt/clay (-200 sieve) fraction at 61.5% passing. Field tests indicate this is dominantly silt.

6' – 8' Picking up clay in grey material. There is silt/clay deposition to 8' T.D. Sample #2 is from this interval. This was classified as **MH** – *Elastic silt with sand*. While silt and sand dominate, there is a potential that there is a clay fraction of 38.8%. Plasticity index was 23.2%. Liquid limit was 55.8%. This sample has likely a large fraction of clay.

Pit 2

0 – 18" Dry dusty grey silty sand/sandy silt. First mottling seen at 18".

2' Material is clumping and excavating out in "plates." Composition appears silt-dominated.

2 ½' More mottling in greyer material – silt but minor clay present.

6' Heavily mottled – into richer clay layer w/manganese staining.

8' T.D. in material similar to same depth in Pit 1

Pit 3

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0 – 5' Dry sandy silt

5' Takes on a clayey aspect as part of grey material with mottling

7' T.D. "Plates" of clay/mottled material sheen of water on surface of "plate."

Pit 4

0 to 3' or 4' Silty sand with gravel. Dark brown. Likely fill.

5' Still the same but with small concretions. Looks like the native as seen in the top of Pits 1 to 3.

6' – 7' Manganese in deposits. No clay yet except in minor "blobs."

T.D. 8' Native silt/sand with clay. Abundant manganese stain.

Pit 5

Soil is mixed with concrete and brick

T.D. 2 ½' Heavy concrete chunks in soil. No further progress.

Pit 6

0 – 4' Apparent sand/silt dominant fill.

4' Brown fine-grained native material

6' – 8' Sample #3. (Misabeled Pit 2 by MTC). This sample is again a MH – *Sandy elastic silt*. The silt/clay fraction was -67.7%. Clays were only found to be 9.7% with the Plastic Index of 12%. The liquid limit was. 34.9%. This is a silt.

Note that buried turf was found at 5' or 6'. Appears surface was pushed over and buried under a layer of import fill. (?)

The results of the tests of sample #1, #2, and #3 indicate this site is typical of the Logan Hill weathered "rind" and landslides derived from this material. It is a silt/clay mix with sand present all in different proportions. The expectation from field work and lab analysis is that the material is dominantly silt.

SITE WORK

Any material that is clearly fill may be built on if it is removed to a solid base and developed with structural fill. Fill must be disposed of in a manner in accord with local regulations. The native material is too fine-grained to be used as structural fill for buildings, but it is suitable for landscaping and non-structural backfill.

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Although the material is predominantly silt, the classification considers it elastic silt and there is the possibility of substantial clay present. Firm silts and stiff clays can easily be developed at 1500 psf but wetting conditions can be critical in this case. The slope of the parcel, while not considered liable to deep-seated failure, is subject to creep and possible low-angle failure especially with applied loads. On the multiplex unit, keying of load-bearing slabs is recommended, and the spread footings should be designed to insure movement is resisted on the downslope side.

In these fine grained-materials, fabric would be advised for placement between the road subgrade and the engineered surface. There is no guarantee that if the road is to be paved that there shall be no infiltration into that area. If the design appears that water may enter and flow downslope, saturating the subgrade, then fabric is recommended to prevent the removal of fines and the subsequent settlement of the road.

Fabric is not considered necessary "beneath buildings." Adequate drainage and sufficiently designed footings in the fine-grained material are sufficient to prevent infiltration and settlement. A vapor barrier, however, is recommended beneath all slabs. This should be upon a gravel pad or as determined by the Engineer of Record.

CONCLUSIONS

The material, in general would allow a bearing strength of 1500 lbs/ft².

Lateral pressures are:

Phi angle	34
ko	0.440807
ka	0.28271492
kp	3.537132037

Based on the results of the site visits, pitting, and an extensive literature search, the parcel does not appear to pose a deep-seated landslide hazard. This determination is subject to change if, in construction, a glide plane develops or there is mass wasting. Such an eventuality is not considered likely. Shallow creep is, however, possible and, due to the nature of these soils, moisture control shall be very important.

REPORT LIMITATIONS AND GUIDELINES FOR USE

We have prepared this report for the exclusive use of Fuller Designs and their authorized agents for the proposed building location in Lewis County, Washington. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty or other conditions, expressed or implied, should be understood.

READ THESE PROVISIONS CLOSELY

Some clients, design professionals, and contractors may not recognize that the geoscience practices (geotechnical engineering or geology) are far less exact than other engineering and natural science

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disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. All American Geotechnical includes these explanatory “limitations” provisions in our reports to help reduce such risks.

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, geotechnical engineering or geologic reporting does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

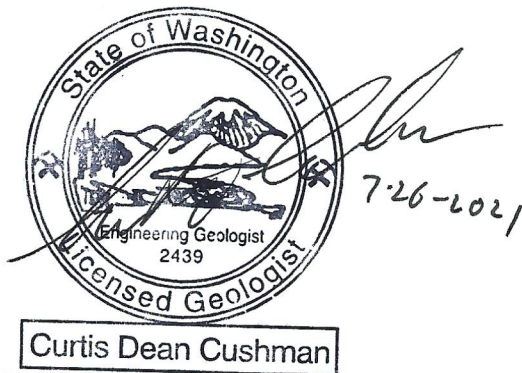
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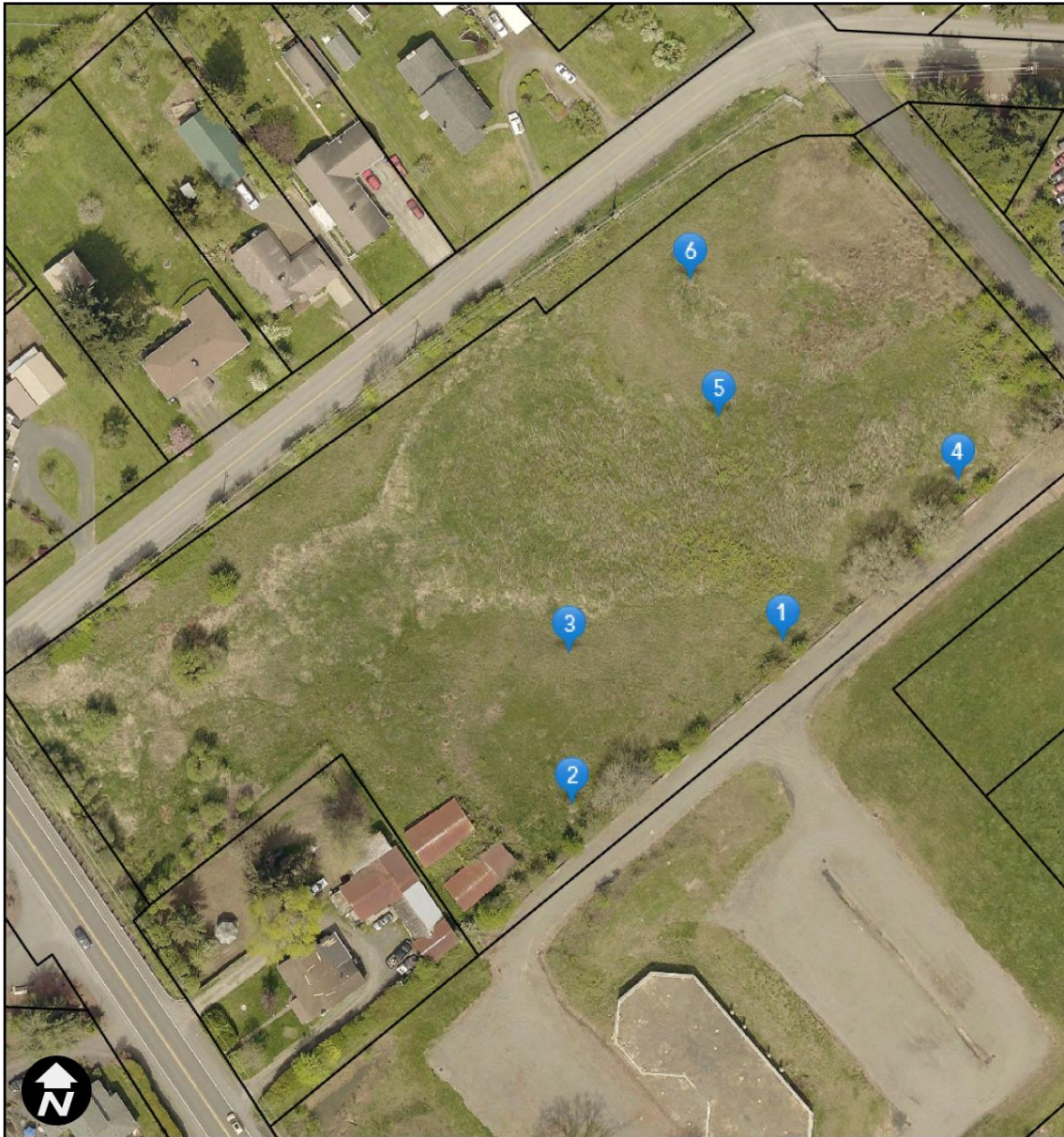
Respectfully Submitted,
GEOTECHNICAL TESTING LABORATORY

Curtis D. Cushman, L.G., L.E.G.
Senior Engineering Geologist

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SAMPLING LOCATIONS

7-13-2021 program pit locations



7/15/2021, 8:44:05 PM

1:1,128

 Parcels

0 50 100 200 ft
NAD 1983 StatePlane Washington South FIPS 4602 Feet




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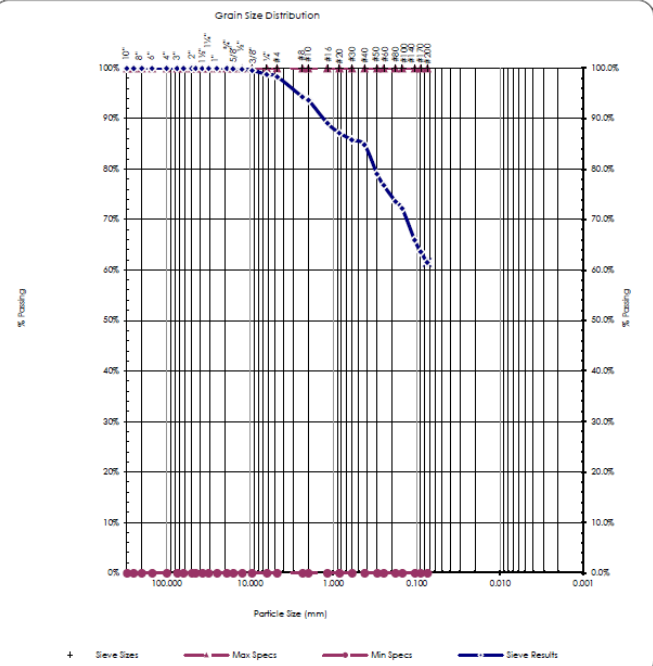
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LABORATORY RESULTS

SIEVE REPORT -- PIT 1 @ 6-FT BGS

Project: Q.C. All American Geotechnical - 2021 Project #: 21S031 Client: All American Geotechnical, Inc. Source: Jackson Pit-1 @ 6 ft, sample #1 Sample#: B21-1067		Date Received: 13-Jul-21 Sampled By: Client Date Tested: 16-Jul-21 Tested By: C. Kriss		Visual Soils Classification Silt with Sand Sample Color: brown		 ACCREDITED Certificate #: 1366.01	
ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281							
Specifications No Specs Sample Meets Specs ? N/A		D ₍₅₎ = 0.006 mm D ₍₁₀₎ = 0.012 mm D ₍₁₅₎ = 0.018 mm D ₍₃₀₎ = 0.037 mm D ₍₅₀₎ = 0.061 mm D ₍₆₀₎ = 0.073 mm D ₍₉₀₎ = 1.343 mm Dust Ratio = 66/91		% Gravel = 1.7% % Sand = 36.8% % Silt & Clay = 61.5% Liquid Limit = n/a Plasticity Index = n/a Sand Equivalent = n/a Fracture % , 1 Face = n/a Fracture % , 2+ Faces = n/a		Coeff. of Curvature, C _c = 1.50 Coeff. of Uniformity, C _u = 6.00 Fineness Modulus = 0.82 Plastic Limit = n/a Moisture %, as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =	
ASTM C136, ASTM D6913, ASTM C117							
Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min		
US	Metric						
12.00"	300.00	100%	100%	100.0%	0.0%		
10.00"	250.00	100%	100%	100.0%	0.0%		
8.00"	200.00	100%	100%	100.0%	0.0%		
6.00"	150.00	100%	100%	100.0%	0.0%		
4.00"	100.00	100%	100%	100.0%	0.0%		
3.00"	75.00	100%	100%	100.0%	0.0%		
2.50"	63.00	100%	100%	100.0%	0.0%		
2.00"	50.00	100%	100%	100.0%	0.0%		
1.75"	45.00	100%	100%	100.0%	0.0%		
1.50"	37.50	100%	100%	100.0%	0.0%		
1.25"	31.50	100%	100%	100.0%	0.0%		
1.00"	25.00	100%	100%	100.0%	0.0%		
3/4"	19.00	100%	100%	100.0%	0.0%		
5/8"	16.00	100%	100%	100.0%	0.0%		
1/2"	12.50	100%	100%	100.0%	0.0%		
3/8"	9.50	100%	100%	100.0%	0.0%		
1/4"	6.30	98%	99%	100.0%	0.0%		
#4	4.75	98%	98%	100.0%	0.0%		
#8	2.36	94%	94%	100.0%	0.0%		
#10	2.00	94%	94%	100.0%	0.0%		
#16	1.18	89%	89%	100.0%	0.0%		
#20	0.850	87%	87%	100.0%	0.0%		
#30	0.600	86%	86%	100.0%	0.0%		
#40	0.425	85%	85%	100.0%	0.0%		
#50	0.300	79%	79%	100.0%	0.0%		
#60	0.250	77%	77%	100.0%	0.0%		
#80	0.180	74%	74%	100.0%	0.0%		
#100	0.150	72%	72%	100.0%	0.0%		
#140	0.106	66%	66%	100.0%	0.0%		
#170	0.090	64%	64%	100.0%	0.0%		
#200	0.075	61.5%	61.5%	100.0%	0.0%		



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Comments: _____

Reviewed by: Meghan Blodgett-Carrillo



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SIEVE REPORT -- PIT 1 @ 8-FT BGS

Project: Q.C. All American Geotechnical - 2021 Project #: 21S031 Client: All American Geotechnical, Inc. Source: Jackson Pit-1 @ 8 ft, sample #2 Sample#: B21-1068	Date Received: 13-Jul-21 Sampled By: Client Date Tested: 16-Jul-21 Tested By: C. Kriss	Unified Soils Classification System MH, Elastic Silt with Sand Sample Color: brown																																																																																																																																																																																																	
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Specifications No Specs Sample Meets Specs ? N/A	D ₍₅₎ = 0.000 mm % Gravel = 0.0% D ₍₁₀₎ = 0.000 mm % Sand = 19.4% D ₍₁₅₎ = 0.001 mm % Silt & Clay = 80.6% D ₍₃₀₎ = 0.001 mm Liquid Limit = 55.8% D ₍₅₀₎ = 0.035 mm Plasticity Index = 23.2% D ₍₆₀₎ = 0.048 mm Sand Equivalent = n/a D ₍₈₀₎ = 0.181 mm Fracture % , 1 Face = n/a Dust Ratio = 9/11 Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C _c = 0.07 Coeff. of Uniformity, C _u = 120.53 Fineness Modulus = 0.19 Plastic Limit = 32.6% Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =																																																																																																																																																																																																	
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Comments:

Reviewed by: Meghan Blodgett-Carrillo



ALL AMERICAN GEOTECHNICAL, INC.

HYDROMETER REPORT -- PIT 1 @ 8-FT BGS

Project: Q.C. All American Geotechnical - 2021 Project #: 21S031 Client : All American Geotechnical, Inc. Source: Jackson Pit-1 @ 8 ft, sample #2 Sample#: B21-1068	Date Received: 13-Jul-21 Sampled By: Client Date Tested: 16-Jul-21 Tested By: C. Kriss	Unified Soils Classification System MH, Elastic Silt with Sand Sample Color brown																																																																																	
ASTM D422, HYDROMETER ANALYSIS		ASTM C136																																																																																	
Assumed Sp Gr : 2.70 Sample Weight: 50.10 grams Hydrosopic Moist.: 7.75% Adj. Sample Wgt : 46.50 grams		Sieve Analysis Grain Size Distribution																																																																																	
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Comments: _____


Reviewed by: _____

Meghan Blodgett-Carrillo





ALL AMERICAN GEOTECHNICAL, INC.

HYDROMETER REPORT -- PIT 2 @ 6-FT BGS

Project: Q.C. All American Geotechnical - 2021 Project #: 21S031 Client : All American Geotechnical, Inc. Source: Jackson Pit-2 @ 6 ft, sample #3 Sample#: B21-1069	Date Received: 13-Jul-21 Sampled By: Client Date Tested: 16-Jul-21 Tested By: C. Kriss	Unified Soils Classification System MH, Sandy Elastic Silt Sample Color gray-brown																																																																																																											
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All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

Comments: _____

Reviewed by: _____

 Meghan Blodgett-Carrillo



CONTACT INFORMATION

PREPARER INFORMATION

AAG PROJECT NUMBER: AAG21-092

CONTACT: CURTIS D. CUSHMAN

ADDRESS: 8947 BUTTONWOOD LANE NE
OLYMPIA, WASHINGTON 98516

TELEPHONE: (360) 491-5155

CELL: (360) 481-6677

EMAIL ADDRESS: CURTIS.CUSHMAN@COMCAST.NET

CLIENT INFORMATION

CLIENT: FULLER DESIGNS

TELEPHONE: (360) 880-4927

BILLING ADDRESS: 1101 KRESKY VENUE
CHEHALIS, WASHINGTON 98531

SITE ADDRESS: 0 JACKSON ROAD
CHEHALIS, WASHINGTON
SECTION 03 TOWNSHIP 13N RANGE 02W PT LT 8 SE RD BLK 1
RICHARDT'S RPLT BLK 4-6 PARCUVIA ADD PRCL B BL-09-148
335384

PARCEL: 010799001000

GPS LOCATION: 46.641138 -122.926586 (DD)

ALL AMERICAN GEOTECHNICAL, INC.

ADDENDUM

**FULLER DESIGNS
645 SE PROSPECT STREET
CHEHALIS, WA 98532**

**RE: JACKSON VILLAS LANDSLIDE HAZARD SITE VISIT
0 JACKSON ROAD CHEHALIS, WASHINGTON
SECTION 03 TOWNSHIP 13N RANGE 02W PT LT 8 SE RD BLK 1
RICHARDT'S RPLT BLK 4-6 PARCUVIA ADD PRCL B BL-09-148
335384**

**PARCEL: 010799001000
SEPTEMBER 8, 2021**

Dear Fuller Designs:

It has been indicated to All American Geotechnical, Inc (AAG) that certain questions have been brought up about the report of AAG dated August 14, 2021. This addendum is to extend and clarify those areas which may be considered needing amending by a competent professional.

The report of August 14, 2021 was to address the requirement that sub-surface information was to be done in order to get an idea of the extent of fill and the shallow soils and mass-wasting deposits underlying the area.

The overview approach to the geology is done in areas such as this to give the developer and engineer an idea of the deposits and derived soils prior to construction. The most recent report of AAG relied on 6 pits to give this overview. As it was clear from Pits 4, 5, and 6, the known presence of fill was verified in the northernmost part of the parcel, which fill extends down from Hosanna Lane. In Pits 4 and 6 fill was found, and in Pit 5 the fill was so massive it could not be penetrated with the excavator. Fine grained sediments were found at depth in Pits 4 and 6 and profiles of the subsurface are also included in the text for Pits 1 and 2 as well as Pit 4. These last three were considered the most important locations in this initial survey as the multiplex has been proposed to extend along the property line where these tests were taken. To that end, Pit 1 was sampled and tested by MTC. It was found to be ML on top of MH. These are silts.

To qualify out the rest of the northern area planned for residential development, Pit 6 was tested. Once through the fill, which may be as much as 6 feet in thickness, the deeper material was tested by MTC and this proved to be an Elastic silt (MH).

From page 4 of the report:

In pitting, we found there to be silts on top of elastic silts. There is possibly some clay content in the latter...A major difference in the two, despite some similarities, is that clays are chemically altered minerals with characteristics different from silts. Clays are plastic, and silts are elastic. The difference is that silts do not change volume when under pressure whereas clays plastically deform and swell when hydrated.

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The soil class is D.

MTC labs are fully accredited and any questions as to techniques used and the validity of the tests should be addressed to them.

Bearing strength is above 2200 lbs/ft² as detailed on page 21 of the report.

It is not the purview of the engineering geologist to make specific recommendations as to type of materials to be used for geofabric. The findings here were exploratory and not for engineering although the soil profiles are certainly good for engineering purposes. Construction on fill is site-specific as the material is so varied and the degree of compaction is unknown even where the material is seen.

Similarly, at this level of investigation, site specific recommendations for construction are not to be expected and design elements such as the design of keying is the responsibility of the site engineer, or the Engineer of Record. Such elements may be included in the construction plans, but as these have not be finalized, there is little possibility of having such information on them at this time.

The concept of a geotechnical observer on site for certain phases of construction is not unique to this project and may be done at the request of the responsible jurisdiction agencies and/or the site manager.

RECOMMENDATIONS FOR SITE PREPARATION

All areas to be excavated should be cleared of deleterious matter including any debris, duff, and vegetation. Any soils material that is excavated may be stockpiled and later used for erosion control and/or landscaping. Surficial material unsuitable for these tasks should be removed from the project site. No foundation elements shall be constructed on “untested” fill material.

The material immediately on site may not be suitable for structural fill due to the silty nature of the material. Where placement of fill material is required, the exposed subgrade areas should be compacted to a firm and unyielding surface prior to placement of any fill. Over-excavation in any building area should be backfilled with structural fill, compacted to the density requirements described in the “Structural Fill” section of this report.

If structural fill is needed, we recommend that a member of our staff evaluate the exposed subgrade conditions

RECOMMENDATIONS FOR STRUCTURAL FILL

All fill material should be placed as structural fill. In general, the structural fill should be placed in horizontal lifts of 8 inches to allow adequate and uniform compaction of each lift. Fill should be compacted to at least 95 percent of MDD (maximum dry density) as determined in accordance with ASTM D-1557 to grade.

The final appropriate lift thickness will depend on the fill characteristics and compaction equipment used. We recommend that a field representative evaluate the appropriate lift thickness during construction.

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Material placed for structural fill should be free of debris, organic matter, trash, and cobbles greater than 6 inches in diameter. The moisture content of the fill material should be adjusted for proper compaction.

RECOMMENDATIONS FOR SUITABILITY OF ONSITE SOILS AS FILL

Onsite soils may be considered for use as structural fill only if industry standards are satisfied. Fill material requirements are found on page 9-26 to 9-30 of the WSDOT Standard Specifications 2010. In general, a native soil (sand, silt, and gravel) encountered on a site must have less than 10 percent fines (material passing the US No. 200 sieve) to be suitable for use as structural fill. To qualify, a soil must be tested in a geotechnical laboratory for gradation. On-site materials do not appear to be acceptable as structural fill. Testing of specific samples would be required.

For your convenience the pitting results are repeated here.

PITTING

A total of six pits were dug and are described below. Please see site map after the text.

Pit 1

0-12" Brown sand. At 12" some concretion clots seen

12" – 6' Possibly ML as grain size is very fine. Grey layers are present and concretions with hematite mottling are present. Sample #1. The test results from MTC Labs indicates this is a sandy silt, with silt/clay (-200 sieve) fraction at 61.5% passing. Field tests indicate this is dominantly silt.

6' – 8' Picking up clay in grey material. There is silt/clay deposition to 8' T.D. Sample #2 is from this interval. This was classified as **MH** – *Elastic silt with sand*. While silt and sand dominate, there is a potential that there is a clay fraction of 38.8%. Plasticity index was 23.2%. Liquid limit was 55.8%. This sample has likely a large fraction of clay.

Pit 2

0 – 18" Dry dusty grey silty sand/sandy silt. First mottling seen at 18".

2' Material is clumping and excavating out in "plates." Composition appears silt-dominated.

2 ½' More mottling in greyer material – silt but minor clay present.

6' Heavily mottled – into richer clay layer w/manganese staining.

8' T.D. in material similar to same depth in Pit 1

Pit 3

0 – 5' Dry sandy silt

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5' Takes on a clayey aspect as part of grey material with mottling

7' T.D. "Plates" of clay/mottled material sheen of water on surface of "plate."

Pit 4

0 to 3' or 4' Silty sand with gravel. Dark brown. Likely fill.

5' Still the same but with small concretions. Looks like the native as seen in the top of Pits 1 to 3.

6' – 7' Manganese in deposits. No clay yet except in minor "blobs."

T.D. 8' Native silt/sand with clay. Abundant manganese stain.

Pit 5

Soil is mixed with concrete and brick

T.D. 2 ½' Heavy concrete chunks in soil. No further progress.

Pit 6

0 – 4' Apparent sand/silt dominant fill.

4' Brown fine-grained native material

6' – 8' Sample #3. (Mislabelled Pit 2 by MTC). This sample is again a MH – *Sandy elastic silt*. The silt/clay fraction was -67.7%. Clays were only found to be 9.7% with the Plastic Index of 12%. The liquid limit was. 34.9%. This is a silt.

Please see Conclusions and References in the original report.

REPORT LIMITATIONS AND GUIDELINES FOR USE

We have prepared this report for the exclusive use of Fuller Designs and their authorized agents for the proposed building location in Lewis County, Washington. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. No warranty or other conditions, expressed or implied, should be understood.

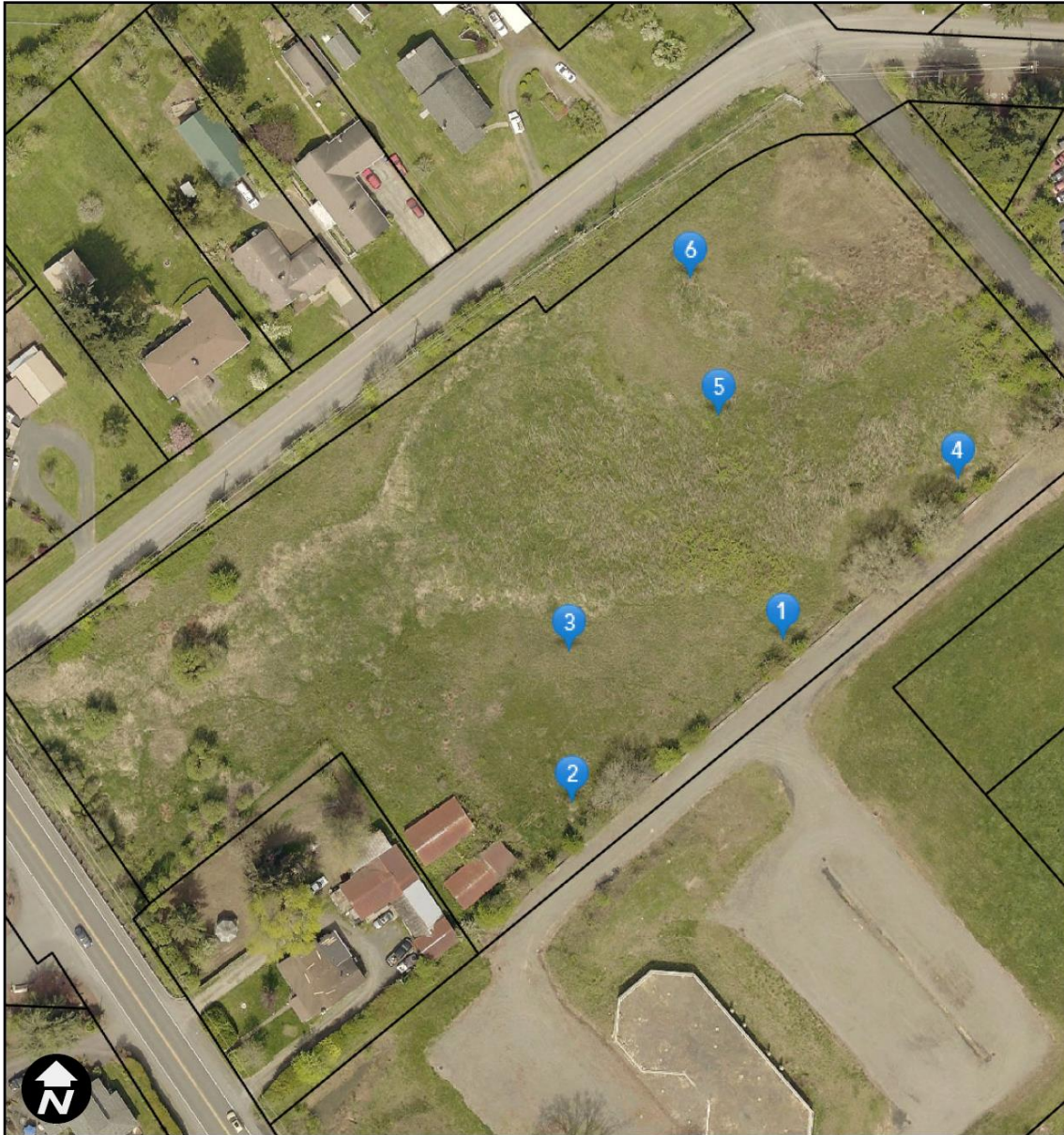
READ THESE PROVISIONS CLOSELY

Some clients, design professionals, and contractors may not recognize that the geoscience practices (geotechnical engineering or geology) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to

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SAMPLING LOCATIONS

7-13-2021 program pit locations



7/15/2021, 8:44:05 PM

1:1,128

□ Parcels

0 50 100 200 ft
NAD 1983 StatePlane Washington South FIPS 4602 Feet



Lewis County does not guarantee the accuracy of the information shown on this map and is not responsible for any use or misuse by others regarding this material. It is provided for general informational purposes only. This map does not meet legal, engineering, or survey standards. Please practice due diligence and consult with licensed experts before making decisions.

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AAG21-092

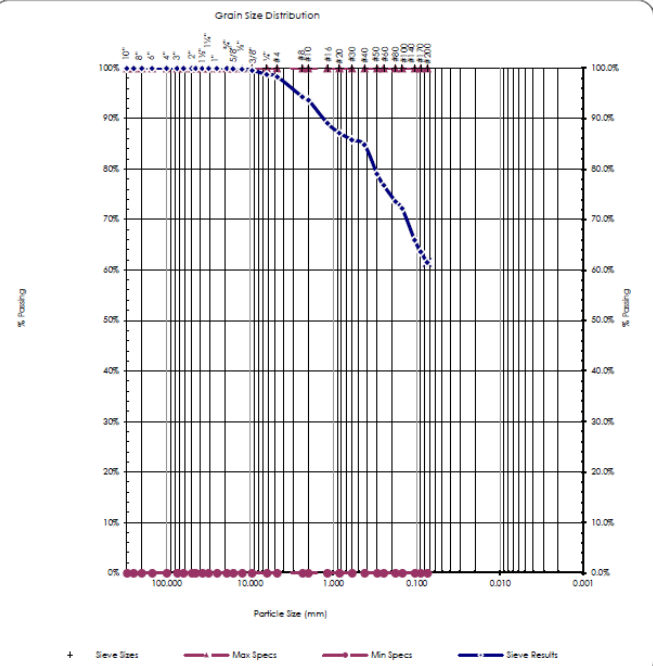
8947 Buttonwood Lane NE, Olympia, WA 98516
Phone #: (360) 491-5155 Cell #: (360) 481-6677

ALL AMERICAN GEOTECHNICAL, INC.

LABORATORY RESULTS

SIEVE REPORT -- PIT 1 @ 6-FT BGS

Project: Q.C. All American Geotechnical - 2021 Project #: 21S031 Client: All American Geotechnical, Inc. Source: Jackson Pit-1 @ 6 ft, sample #1 Sample#: B21-1067		Date Received: 13-Jul-21 Sampled By: Client Date Tested: 16-Jul-21 Tested By: C. Kriss		Visual Soils Classification Silt with Sand Sample Color: brown		 ACCREDITED Certificate #: 1366.01	
ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281							
Specifications No Specs Sample Meets Specs ? N/A		D ₍₅₎ = 0.006 mm D ₍₁₀₎ = 0.012 mm D ₍₁₅₎ = 0.018 mm D ₍₃₀₎ = 0.037 mm D ₍₅₀₎ = 0.061 mm D ₍₆₀₎ = 0.073 mm D ₍₉₀₎ = 1.343 mm Dust Ratio = 66/91		% Gravel = 1.7% % Sand = 36.8% % Silt & Clay = 61.5% Liquid Limit = n/a Plasticity Index = n/a Sand Equivalent = n/a Fracture %, 1 Face = n/a Fracture %, 2+ Faces = n/a		Coeff. of Curvature, C _c = 1.50 Coeff. of Uniformity, C _u = 6.00 Fineness Modulus = 0.82 Plastic Limit = n/a Moisture %, as sampled = n/a Req'd Sand Equivalent = Req'd Fracture %, 1 Face = Req'd Fracture %, 2+ Faces =	
ASTM C136, ASTM D6913, ASTM C117							
Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min		
US	Metric						
12.00"	300.00		100%	100.0%	0.0%		
10.00"	250.00		100%	100.0%	0.0%		
8.00"	200.00		100%	100.0%	0.0%		
6.00"	150.00		100%	100.0%	0.0%		
4.00"	100.00		100%	100.0%	0.0%		
3.00"	75.00		100%	100.0%	0.0%		
2.50"	63.00		100%	100.0%	0.0%		
2.00"	50.00	100%	100%	100.0%	0.0%		
1.75"	45.00		100%	100.0%	0.0%		
1.50"	37.50		100%	100.0%	0.0%		
1.25"	31.50		100%	100.0%	0.0%		
1.00"	25.00	100%	100%	100.0%	0.0%		
3/4"	19.00	100%	100%	100.0%	0.0%		
5/8"	16.00		100%	100.0%	0.0%		
1/2"	12.50	100%	100%	100.0%	0.0%		
3/8"	9.50	100%	100%	100.0%	0.0%		
1/4"	6.30		99%	100.0%	0.0%		
#4	4.75	98%	98%	100.0%	0.0%		
#8	2.36		94%	100.0%	0.0%		
#10	2.00	94%	94%	100.0%	0.0%		
#16	1.18		89%	100.0%	0.0%		
#20	0.850		87%	100.0%	0.0%		
#30	0.600		86%	100.0%	0.0%		
#40	0.425	85%	85%	100.0%	0.0%		
#50	0.300		79%	100.0%	0.0%		
#60	0.250		77%	100.0%	0.0%		
#80	0.180		74%	100.0%	0.0%		
#100	0.150	72%	72%	100.0%	0.0%		
#140	0.106		66%	100.0%	0.0%		
#170	0.090		64%	100.0%	0.0%		
#200	0.075	61.5%	61.5%	100.0%	0.0%		



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 All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.


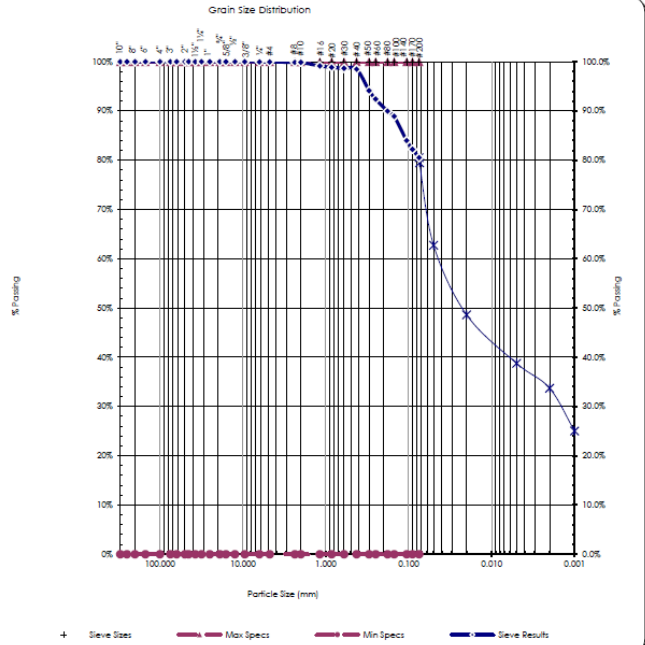
Comments: _____

Reviewed by: Meghan Blodgett-Carrillo



ALL AMERICAN GEOTECHNICAL, INC.

SIEVE REPORT -- PIT 1 @ 8-FT BGS

Project: Q.C. All American Geotechnical - 2021 Project #: 21S031 Client: All American Geotechnical, Inc. Source: Jackson Pit-1 @ 8 ft, sample #2 Sample#: B21-1068	Date Received: 13-Jul-21 Sampled By: Client Date Tested: 16-Jul-21 Tested By: C. Kriss	Unified Soils Classification System MH, Elastic Silt with Sand Sample Color: brown																																																																																																																																																																																																	
ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281																																																																																																																																																																																																			
Specifications No Specs Sample Meets Specs ? N/A	D ₍₅₎ = 0.000 mm D ₍₁₀₎ = 0.000 mm D ₍₁₅₎ = 0.001 mm D ₍₃₀₎ = 0.001 mm D ₍₅₀₎ = 0.035 mm D ₍₆₀₎ = 0.048 mm D ₍₉₀₎ = 0.181 mm Dust Ratio = 9/11	% Gravel = 0.0% % Sand = 19.4% % Silt & Clay = 80.6% Liquid Limit = 55.8% Plasticity Index = 23.2% Sand Equivalent = n/a Fracture % , 1 Face = n/a Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C _c = 0.07 Coeff. of Uniformity, C _u = 120.53 Fineness Modulus = 0.19 Plastic Limit = 32.6% Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =																																																																																																																																																																																																
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<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Sieve Size</th> <th rowspan="2">Actual Cumulative Percent Passing</th> <th rowspan="2">Interpolated Cumulative Percent Passing</th> <th rowspan="2">Specs Max</th> <th rowspan="2">Specs Min</th> </tr> <tr> <th>US</th> <th>Metric</th> </tr> </thead> <tbody> <tr><td>12.00"</td><td>300.00</td><td></td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>10.00"</td><td>250.00</td><td></td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>8.00"</td><td>200.00</td><td></td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>6.00"</td><td>150.00</td><td></td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>4.00"</td><td>100.00</td><td></td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>3.00"</td><td>75.00</td><td></td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>2.50"</td><td>63.00</td><td></td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>2.00"</td><td>50.00</td><td>100%</td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>1.75"</td><td>45.00</td><td></td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>1.50"</td><td>37.50</td><td></td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>1.25"</td><td>31.50</td><td></td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>1.00"</td><td>25.00</td><td>100%</td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>3/4"</td><td>19.00</td><td>100%</td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>5/8"</td><td>16.00</td><td></td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>1/2"</td><td>12.50</td><td>100%</td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>3/8"</td><td>9.50</td><td>100%</td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>1/4"</td><td>6.30</td><td></td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>#4</td><td>4.75</td><td>100%</td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>#8</td><td>2.36</td><td></td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>#10</td><td>2.00</td><td>100%</td><td>100%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>#16</td><td>1.18</td><td></td><td>99%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>#20</td><td>0.850</td><td></td><td>99%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>#30</td><td>0.600</td><td></td><td>99%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>#40</td><td>0.425</td><td>98%</td><td>98%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>#50</td><td>0.300</td><td></td><td>94%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>#60</td><td>0.250</td><td></td><td>92%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>#80</td><td>0.180</td><td></td><td>90%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>#100</td><td>0.150</td><td>89%</td><td>89%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>#140</td><td>0.106</td><td></td><td>84%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>#170</td><td>0.090</td><td></td><td>82%</td><td>100.0%</td><td>0.0%</td></tr> <tr><td>#200</td><td>0.075</td><td>80.6%</td><td>80.6%</td><td>100.0%</td><td>0.0%</td></tr> </tbody> </table>	Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min	US	Metric	12.00"	300.00		100%	100.0%	0.0%	10.00"	250.00		100%	100.0%	0.0%	8.00"	200.00		100%	100.0%	0.0%	6.00"	150.00		100%	100.0%	0.0%	4.00"	100.00		100%	100.0%	0.0%	3.00"	75.00		100%	100.0%	0.0%	2.50"	63.00		100%	100.0%	0.0%	2.00"	50.00	100%	100%	100.0%	0.0%	1.75"	45.00		100%	100.0%	0.0%	1.50"	37.50		100%	100.0%	0.0%	1.25"	31.50		100%	100.0%	0.0%	1.00"	25.00	100%	100%	100.0%	0.0%	3/4"	19.00	100%	100%	100.0%	0.0%	5/8"	16.00		100%	100.0%	0.0%	1/2"	12.50	100%	100%	100.0%	0.0%	3/8"	9.50	100%	100%	100.0%	0.0%	1/4"	6.30		100%	100.0%	0.0%	#4	4.75	100%	100%	100.0%	0.0%	#8	2.36		100%	100.0%	0.0%	#10	2.00	100%	100%	100.0%	0.0%	#16	1.18		99%	100.0%	0.0%	#20	0.850		99%	100.0%	0.0%	#30	0.600		99%	100.0%	0.0%	#40	0.425	98%	98%	100.0%	0.0%	#50	0.300		94%	100.0%	0.0%	#60	0.250		92%	100.0%	0.0%	#80	0.180		90%	100.0%	0.0%	#100	0.150	89%	89%	100.0%	0.0%	#140	0.106		84%	100.0%	0.0%	#170	0.090		82%	100.0%	0.0%	#200	0.075	80.6%	80.6%	100.0%	0.0%	
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Comments:

Reviewed by: Meghan Blodgett-Carrillo



