Analytical Resources, Incorporated
Analytical Chemists and Consultants

25 August 2021

Cindy Fields
Anchor QEA, LLC
1201 3rd Ave, Suite 2600
Seattle, WA 98101

RE: Lower Duwamish AOC4

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
21G0204	N/A

Susan Dunnihoo

Digitally signed by Susan Dunnihoo
Date: 2021.08.25 13:51:01 -07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclosed Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Susan Dunnihoo, Director, Client Services

Cert# 100006-012

21G0204

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CHAIN-OF-CUSTODY/TEST REQUEST FORM

Archive

№ 3958

Project/Client Name: Duwamish AOC4
Project Number: 180067-02.02
Contact Name: Amara Vanderwort
Sampled By: Windward

Ship to: ARI
Attn: Sue Dunnihoo
Shipper: Courier
Form filled out by: Nicolas Eckhardt

Shipping Date: 7/14/21
Airbill Number:
Turnaround requested: STD

Sample Collection Date (m/d/y)	Time	Sample Identification	Volume of Sample / # of Containers	Matrix	Test(s) Requested (check test(s) required): Archive							Comments / Instructions [Jar tag number(s)]
7/14/2021	0729	LDW21-IT622D	4	Sediment	X							
	0729	LDW21-IT622F	4		X							
	0839	LDW21-IT660A	4		X							
		LDW21-IT660C	4		X							
		LDW21-IT660D	4		X							
		LDW21-IT660E	4		X							
		LDW21-IT660F	4		X							
		LDW21-IT660-GS1	1		X							
	0839	LDW21-IT660-GS2	1		X							
	0740	LDW21-IT682	7		X							
	0740	LDW21-IT682-GS1	1		X							
7/14/21	1003	LDW21-IT588A	3 ~~4~~ NE	Sediment	X							
		Total Number of Containers	41 ~~38~~ NE	Purchase Order / Statement of Work # CLF-05 2021-ARI								

1) Released by:	1) Rec'd by:	2) Released by:	2) Rec'd by:
Print name: Kate McPeek	Jacob Hatter	Print name:	
Signature:	Company: ARI	Signature:	Company:
Company: Windward		Company:	
Date/Time: 7/14/21 1730	Date/Time: 07/14/2021 1730	Date/Time:	Date/Time:

* Distribution: White copies accompany shipment; yellow retained by consignor.

Windward environmental LLC
200 1st Ave W, Suite 500
Seattle, WA 98119
206.378.1364

To be completed by Laboratory upon sample receipt:

Date of receipt::	Laboratory W.O. #:
Condition upon receipt:	Time of receipt:
Cooler temperature:	Received by:

2 of 3 21G0204

CHAIN-OF-CUSTODY/TEST REQUEST FORM

Archive

№ 3956

Project/Client Name: Duwamish AOC4
Project Number: 180067-02.02
Contact Name: Amara Vanderwort
Sampled By: Windward

Ship to: ARI
Attn: Sue Punnihoo
Shipper: Courier
Form filled out by: Nicolas Eckhardt

Shipping Date: 7/14/21
Airbill Number: —
Turnaround requested: STD

Sample Collection Date (m/d/y)	Time	Sample Identification	Volume of Sample / # of Containers	Matrix	Test(s) Requested (check test(s) required): Archive							Comments / Instructions [Jar tag number(s)]
7/14/21	1003	LDW21-IT 588 D	3 ~~4~~ NE	Sediment	X							
		LDW21-IT 588 F	3 ~~4~~ NE		X							
	1003	LDW21-IT 588-GS1	1		X							
	1118	LDW21-IT 585A	3		X							
	↓	LDW21-IT 585 D	3		X							
	1118	LDW21-IT 585 F	3		X							
	1025	LDW21-IT 681	3		X							
	1400	LDW21-SC 571D	3		X							
	1400	LDW21-SC571-GS1	1		X							
	1448	LDW21-SC 568A	3		X							
	↓	LDW21-SC 568 D	3		X							
7/14/21	1448	LDW21-SC 568 F	3		X							
		Total Number of Containers	32	Purchase Order / Statement of Work # CLF-052021-ARI								

1) Released by:	1) Rec'd by:	2) Released by:	2) Rec'd by:
Print name: Kate McCook	Sue Punnihoo	Print name:	
Signature: [signature]	Company: ARI	Signature:	Company:
Company: Windward		Company:	
Date/Time: 7/14/21 1730	Date/Time: 07/14/2021 1730	Date/Time:	Date/Time:

* Distribution: White copies accompany shipment; yellow retained by consignor.

Windward environmental LLC
200 1st Ave W, Suite 500
Seattle, WA 98119
206.378.1364

To be completed by Laboratory upon sample receipt:

Date of receipt::	Laboratory W.O. #:
Condition upon receipt:	Time of receipt:
Cooler temperature:	Received by:

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CHAIN-OF-CUSTODY/TEST REQUEST FORM

Archive

№ 3194

Project/Client Name: Duwamish AOCH
Project Number: 180067-02.02
Contact Name: Amara Vanderwort
Sampled By: Windward

Ship to: ARI
Attn: Sue Dominhoo
Shipper: Courier
Form filled out by: Nicolas Eckhardt

Shipping Date: 7/14/21
Airbill Number: —
Turnaround requested: STD

Sample Collection Date (m/d/y)	Time	Sample Identification	Volume of Sample / # of Containers	Matrix	Test(s) Requested (check test(s) required): Archive							Comments / Instructions [Jar tag number(s)]
7/14/21	1448	LDW21-SC568-GS1	1	Sediment	X							
		Total Number of Containers	1									

Purchase Order / Statement of Work # CLF-052021-ARI

1) Released by:	1) Rec'd by:	2) Released by:	2) Rec'd by:
Print name: Kate McCleck	Sandra Walter	Print name:	
Signature:	Company: ARI	Signature:	Company:
Company: Windward		Company:	
Date/Time: 7/14/21 1730	Date/Time: 07/14/2021 1730	Date/Time:	Date/Time:

* Distribution: White copies accompany shipment; yellow retained by consignor.

Windward environmental LLC

200 1st Ave W, Suite 500
Seattle, WA 98119

206.378.1364

To be completed by Laboratory upon sample receipt:

Date of receipt::	Laboratory W.O. #:
Condition upon receipt:	Time of receipt:
Cooler temperature:	Received by:

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Anchor QEA, LLC	Project:	Lower Duwamish AOC4	
1201 3rd Ave, Suite 2600	Project Number:	180067-02.02	**Reported:**
Seattle, WA 98101	Project Manager:	Cindy Fields	08/25/2021 13:39

ANALYTICAL REPORT FOR SAMPLES

Laboratory ID	Sample ID	Matrix	Date Sampled	Date Received
21G0204-01	LDW21-IT622D	Solid	07/14/21 07:29	07/14/21 17:30
21G0204-02	LDW21-IT622F	Solid	07/14/21 07:29	07/14/21 17:30
21G0204-03	LDW21-IT660A	Solid	07/14/21 08:39	07/14/21 17:30
21G0204-04	LDW21-IT660C	Solid	07/14/21 08:39	07/14/21 17:30
21G0204-05	LDW21-IT660D	Solid	07/14/21 08:39	07/14/21 17:30
21G0204-06	LDW21-IT660E	Solid	07/14/21 08:39	07/14/21 17:30
21G0204-07	LDW21-IT660F	Solid	07/14/21 08:39	07/14/21 17:30
21G0204-08	LDW21-IT660-GS1	Solid	07/14/21 08:39	07/14/21 17:30
21G0204-09	LDW21-IT660-GS2	Solid	07/14/21 08:39	07/14/21 17:30
21G0204-10	LDW21-IT682	Solid	07/14/21 07:40	07/14/21 17:30
21G0204-11	LDW21-IT682-GS1	Solid	07/14/21 07:40	07/14/21 17:30
21G0204-12	LDW21-IT588A	Solid	07/14/21 10:03	07/14/21 17:30
21G0204-13	LDW21-IT588D	Solid	07/14/21 10:03	07/14/21 17:30
21G0204-14	LDW21-IT588F	Solid	07/14/21 10:03	07/14/21 17:30
21G0204-15	LDW21-IT588-GS1	Solid	07/14/21 10:03	07/14/21 17:30
21G0204-16	LDW21-IT585A	Solid	07/14/21 11:18	07/14/21 17:30
21G0204-17	LDW21-IT585D	Solid	07/14/21 11:18	07/14/21 17:30
21G0204-18	LDW21-IT585F	Solid	07/14/21 11:18	07/14/21 17:30
21G0204-19	LDW21-IT681	Solid	07/14/21 10:25	07/14/21 17:30
21G0204-20	LDW21-SC571D	Solid	07/14/21 14:00	07/14/21 17:30
21G0204-21	LDW21-SC571-GS1	Solid	07/14/21 14:00	07/14/21 17:30
21G0204-22	LDW21-SC568A	Solid	07/14/21 14:48	07/14/21 17:30
21G0204-23	LDW21-SC568D	Solid	07/14/21 14:48	07/14/21 17:30
21G0204-24	LDW21-SC568F	Solid	07/14/21 14:48	07/14/21 17:30
21G0204-25	LDW21-SC568-GS1	Solid	07/14/21 14:48	07/14/21 17:30

Anchor QEA, LLC	Project: Lower Duwamish AOC4	
1201 3rd Ave, Suite 2600	Project Number: 180067-02.02	**Reported:**
Seattle WA, 98101	Project Manager: Cindy Fields	25-Aug-2021 13:39

Case Narrative

Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Work Order: 21G0204

Sample receipt

Samples as listed on the preceding page were received 14-Jul-2021 17:30 under ARI work order 21G0204, with all samples on hold. For details regarding sample receipt, please refer to the Cooler Receipt Form.

On July 28, 2021, sample LDW21-IT682-GS1 was activate for grainsize analysis.

Grainsize

The samples were submitted to Materials Testing & Consulting, Inc. (MTC) Burlington for grainsize analysis. The MTC report is included here in its entirety.

QUALIFIERS AND NOTES

Qualifier	Definition
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Windward / Archer

Project Name: Lone Duwamish ACCY

COC No(s): 3958, 3956, 3194 NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 21G0204

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc.)	YES	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1807 4.2 1.9 ___ ___ ___ ___

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: DOO 5206

Cooler Accepted by: [signature] Date: 07/14/2021 Time: 1730

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____			
Was sufficient ice used (if appropriate)?	NA	YES	NO
How were bottles sealed in plastic bags?	Individually	Grouped	Not
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ...	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO
Date VOC Trip Blank was made at ARI	NA	_____	

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: SC Date: 7/19/21 Time: 1519 Labels checked by: SC

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:

Client:	Analytical Resources, Inc.	**Date:**	July 30, 2021
Address:	4611 S. 134th Place, Suite 240	**Project:**	Q.C. - Duwamish AOC4 190067-02.02
	Tukwila, WA 98168	**Project #:**	21B218-02
Attn:	Susan Dunnihoo	**Sample #:**	B21-1146-1153
Revised on:		**Date sampled:**	July 13, 2021

As requested MTC, Inc. has performed the following test(s) on the sample referenced above. The testing was performed in accordance with current applicable AASHTO or ASTM standards as indicated below. The results obtained in our laboratory were as follows below or on the attached pages:

	Test(s) Performed:	Test Results		Test(s) Performed:	Test Results
X	Sieve Analysis	Please See Attached Reports		Sulfate Soundness	
	Proctor			Bulk Density & Voids	
	Sand Equivalent			WSDOT Degradation	
	Fracture Count			LA Abrasion	
	Moisture Content				
	Specific Gravity, Coarse				
	Specific Gravity, Fine				
X	Hydrometer Analysis	Please See Attached Reports			
	Atterberg Limits				

If you have any questions concerning the test results, the procedures used, or if we can be of any further assistance please call on us at the number below.

Respectfully Submitted,
Meghan Blodgett-Carrillo
WABO Supervising Laboratory Technician

MATERIALS TESTING & CONSULTING, INC.

Sieve Report

Project: Q.C. - Duwamish AOC4 190067-02.02
Project #: 21B218-02
Client: Analytical Resources, Inc.
Source: LDW21-SS613, 21G0141-03A Trip #1
Sample#: B21-1146

Date Received: 20-Jul-21
Sampled By: Client
Date Tested: 26-Jul-21
Tested By: C. Kriss

Unified Soil Classification System, ASTM-2487
SM, Silty Sand with Gravel
Sample Color:
brown

ACCREDITED
Certificate #: 1366.01

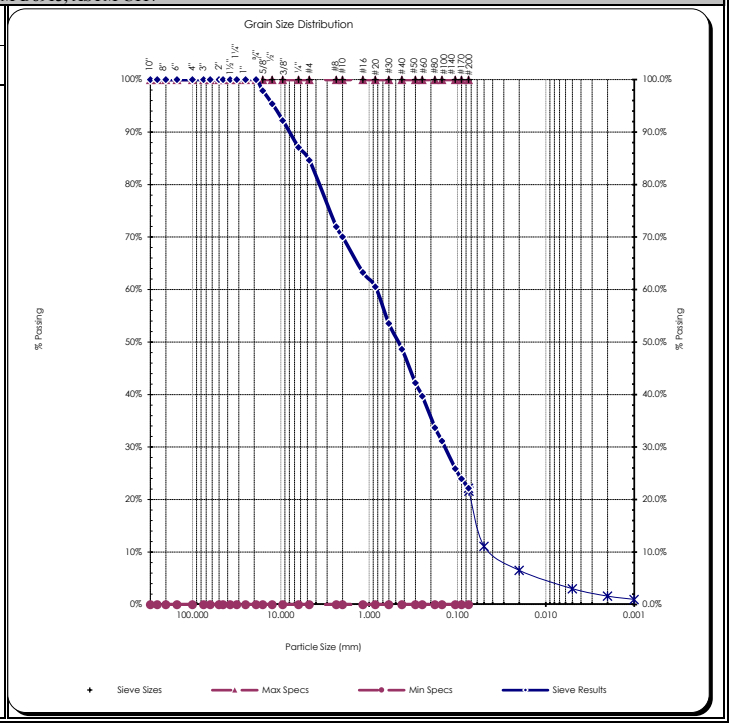
ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281

Specifications
No Specs
Sample Meets Specs ? N/A

$D_{(5)}$ = 0.009	mm	% Gravel = 15.4%	Coeff. of Curvature, C_C = 0.43
$D_{(10)}$ = 0.055	mm	% Sand = 62.5%	Coeff. of Uniformity, C_U = 15.18
$D_{(15)}$ = 0.063	mm	% Silt & Clay = 22.2%	Fineness Modulus = 2.61
$D_{(30)}$ = 0.140	mm	Liquid Limit = n/a	Plastic Limit = n/a
$D_{(50)}$ = 0.474	mm	Plasticity Index = n/a	Moisture %, as sampled = n/a
$D_{(60)}$ = 0.831	mm	Sand Equivalent = n/a	Req'd Sand Equivalent =
$D_{(90)}$ = 8.107	mm	Fracture %, 1 Face = n/a	Req'd Fracture %, 1 Face =
Dust Ratio = 26/57		Fracture %, 2+ Faces = n/a	Req'd Fracture %, 2+ Faces =

ASTM C136, ASTM D6913, ASTM C117

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
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		98%	100.0%	0.0%
1/2"	12.50	95%	95%	100.0%	0.0%
3/8"	9.50	92%	92%	100.0%	0.0%
1/4"	6.30		87%	100.0%	0.0%
#4	4.75	85%	85%	100.0%	0.0%
#8	2.36		72%	100.0%	0.0%
#10	2.00	70%	70%	100.0%	0.0%
#16	1.18		63%	100.0%	0.0%
#20	0.850	61%	61%	100.0%	0.0%
#30	0.600		54%	100.0%	0.0%
#40	0.425	49%	49%	100.0%	0.0%
#50	0.300		42%	100.0%	0.0%
#60	0.250	40%	40%	100.0%	0.0%
#80	0.180		34%	100.0%	0.0%
#100	0.150	31%	31%	100.0%	0.0%
#140	0.106		26%	100.0%	0.0%
#170	0.090		24%	100.0%	0.0%
#200	0.075	22.2%	22.2%	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

MATERIALS TESTING & CONSULTING, INC.

Hydrometer Report

Project:	Q.C. - Duwamish AOC4 190067-02.0	**Date Received:**	20-Jul-21
Project #:	21B218-02	**Sampled By:**	Client
Client :	Analytical Resources, Inc.	**Date Tested:**	26-Jul-21
Source:	LDW21-SS613, 21G0141-03A Trip #1	**Tested By:**	C. Kriss
Sample#:	B21-1146		

Unified Soil Classification System, ASTM-2487
SM, Silty Sand with Gravel
Sample Color
brown

ASTM D422, HYDROMETER ANALYSIS

Assumed Sp Gr :	2.65	
Sample Weight:	50.03	grams
Hydroscopic Moist.:	1.04%	
Adj. Sample Wgt :	49.52	grams

ACCREDITED
Certificate #: 1366.01

Hydrometer Reading Minutes	Corrected Reading	Percent Passing	Soils Particle Diameter
2	5.5	7.8%	0.0380 mm
5	5	7.1%	0.0240 mm
15	4	5.7%	0.0139 mm
30	4	5.7%	0.0098 mm
60	3	4.2%	0.0070 mm
250	1.5	2.1%	0.0035 mm
1440	1	1.4%	0.0014 mm

% Gravel:	15.4%	**Liquid Limit:**	n/a
% Sand:	62.5%	**Plastic Limit:**	n/a
% Silt:	19.1%	**Plasticity Index:**	n/a
% Clay:	3.0%		

ASTM C136

Sieve Analysis
Grain Size Distribution

Sieve Size	Percent Passing	Soils Particle Diameter
3.0"	100%	75.000 mm
2.0"	100%	50.000 mm
1.5"	100%	37.500 mm
1.25"	100%	31.500 mm
1.0"	100%	25.000 mm
3/4"	100%	19.000 mm
5/8"	98%	16.000 mm
1/2"	95%	12.500 mm
3/8"	92%	9.500 mm
1/4"	87%	6.300 mm
#4	85%	4.750 mm
#10	70%	2.000 mm
#20	61%	0.850 mm
#40	49%	0.425 mm
#100	31%	0.150 mm
#200	22.2%	0.075 mm
Silts	21.8%	0.074 mm
	12.5%	0.050 mm
	6.5%	0.020 mm
Clays	3.0%	0.005 mm
	1.6%	0.002 mm
Colloids	1.0%	0.001 mm

USDA Soil Textural Classification

	Particle Size
% Sand:	2.0 - 0.05 mm
% Silt:	0.05 - 0.002 mm
% Clay:	< 0.002 mm

USDA Soil Textural Classification
Loamy Sand

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: _____

MATERIALS TESTING & CONSULTING, INC.

Sieve Report

Project: Q.C. - Duwamish AOC4 - 190067-02.02
Project #: 21B218-02
Client: Analytical Resources, Inc.
Source: LDW21-SS613, 21G0141-03A Trip #2
Sample#: B21-1147

Date Received: 20-Jul-21
Sampled By: Client
Date Tested: 26-Jul-21
Tested By: C. Kriss

Unified Soil Classification System, ASTM-2487
SM, Silty Sand with Gravel
Sample Color:
brown

ACCREDITED
Certificate #: 1366.01

ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281

Specifications
No Specs
Sample Meets Specs ? N/A

$D_{(5)}$ =	0.040	mm	% Gravel =	32.0%	Coeff. of Curvature, C_C = 0.39
$D_{(10)}$ =	0.054	mm	% Sand =	50.2%	Coeff. of Uniformity, C_U = 51.63
$D_{(15)}$ =	0.068	mm	% Silt & Clay =	17.8%	Fineness Modulus = 3.45
$D_{(30)}$ =	0.243	mm	Liquid Limit =	n/a	Plastic Limit = n/a
$D_{(50)}$ =	1.179	mm	Plasticity Index =	n/a	Moisture %, as sampled = n/a
$D_{(60)}$ =	2.787	mm	Sand Equivalent =	n/a	Req'd Sand Equivalent =
$D_{(90)}$ =	11.862	mm	Fracture %, 1 Face =	n/a	Req'd Fracture %, 1 Face =
Dust Ratio =	29/61		Fracture %, 2+ Faces =	n/a	Req'd Fracture %, 2+ Faces =

ASTM C136, ASTM D6913, ASTM C117

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
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		97%	100.0%	0.0%
1/2"	12.50	93%	93%	100.0%	0.0%
3/8"	9.50	81%	81%	100.0%	0.0%
1/4"	6.30		72%	100.0%	0.0%
#4	4.75	68%	68%	100.0%	0.0%
#8	2.36		58%	100.0%	0.0%
#10	2.00	57%	57%	100.0%	0.0%
#16	1.18		50%	100.0%	0.0%
#20	0.850	47%	47%	100.0%	0.0%
#30	0.600		41%	100.0%	0.0%
#40	0.425	37%	37%	100.0%	0.0%
#50	0.300		32%	100.0%	0.0%
#60	0.250	30%	30%	100.0%	0.0%
#80	0.180		26%	100.0%	0.0%
#100	0.150	24%	24%	100.0%	0.0%
#140	0.106		20%	100.0%	0.0%
#170	0.090		19%	100.0%	0.0%
#200	0.075	17.8%	17.8%	100.0%	0.0%

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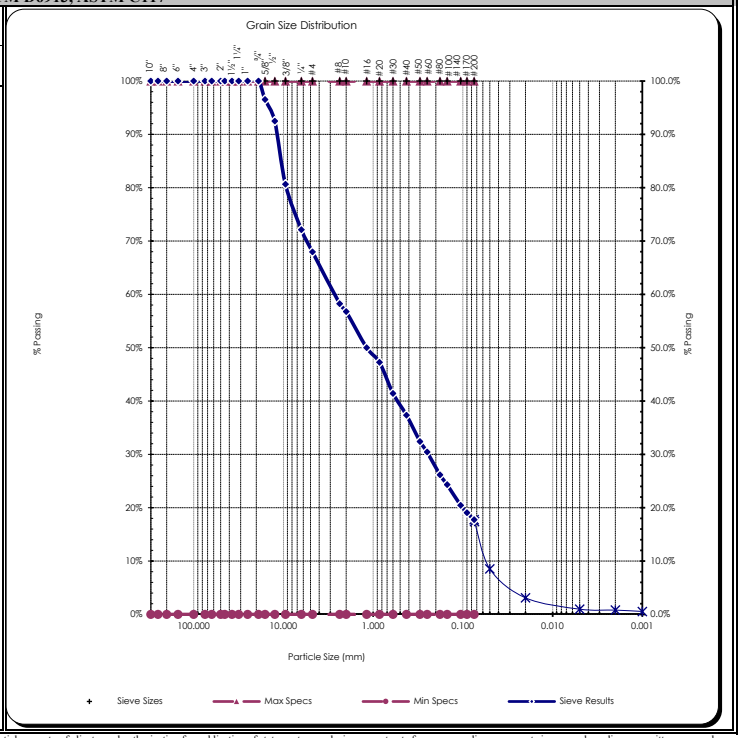

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Comments:

Reviewed by:
Meghan Blodgett-Carrillo

MATERIALS TESTING & CONSULTING, INC.

Hydrometer Report

Project:	Q.C. - Duwamish AOC4 - 190067-02.02	**Date Received:**	20-Jul-21
Project #:	21B218-02	**Sampled By:**	Client
Client :	Analytical Resources, Inc.	**Date Tested:**	26-Jul-21
Source:	LDW21-SS613, 21G0141-03A Trip #2	**Tested By:**	C. Kriss
Sample#:	B21-1147		

Unified Soil Classification System, ASTM-2487
SM, Silty Sand with Gravel
Sample Color
brown

ASTM D422, HYDROMETER ANALYSIS

Assumed Sp Gr :	2.65	
Sample Weight:	69.79	grams
Hydroscopic Moist.:	0.87%	
Adj. Sample Wgt :	69.19	grams

ACCREDITED
Certificate #: 1366.01

Hydrometer Reading Minutes	Corrected Reading	Percent Passing	Soils Particle Diameter
2	5	4.1%	0.0380 mm
5	4	3.3%	0.0241 mm
15	3.5	2.9%	0.0140 mm
30	3	2.5%	0.0099 mm
60	1.5	1.2%	0.0071 mm
250	1	0.8%	0.0035 mm
1440	1	0.8%	0.0014 mm

% Gravel:	32.0%	**Liquid Limit:**	n/a
% Sand:	50.2%	**Plastic Limit:**	n/a
% Silt:	16.8%	**Plasticity Index:**	n/a
% Clay:	1.0%		

ASTM C136

Sieve Analysis
Grain Size Distribution

Sieve Size	Percent Passing	Soils Particle Diameter
3.0"	100%	75.000 mm
2.0"	100%	50.000 mm
1.5"	100%	37.500 mm
1.25"	100%	31.500 mm
1.0"	100%	25.000 mm
3/4"	100%	19.000 mm
5/8"	97%	16.000 mm
1/2"	93%	12.500 mm
3/8"	81%	9.500 mm
1/4"	72%	6.300 mm
#4	68%	4.750 mm
#10	57%	2.000 mm
#20	47%	0.850 mm
#40	37%	0.425 mm
#100	24%	0.150 mm
#200	17.8%	0.075 mm
Silts	17.4%	0.074 mm
	8.5%	0.050 mm
	3.1%	0.020 mm
Clays	1.0%	0.005 mm
	0.8%	0.002 mm
Colloids	0.6%	0.001 mm

USDA Soil Textural Classification

	Particle Size
% Sand:	2.0 - 0.05 mm
% Silt:	0.05 - 0.002 mm
% Clay:	< 0.002 mm

USDA Soil Textural Classification
Loamy Sand

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Comments:

Reviewed by: Meghan Blodgett-Carrillo

MATERIALS TESTING & CONSULTING, INC.

Sieve Report

Project: Q.C. - Duwamish AOC4 - 190067-02.02
Project #: 21B218-02
Client: Analytical Resources, Inc.
Source: LDW21-SS613, 21G0141-03A Trip #3
Sample#: B21-1148

Date Received: 20-Jul-21
Sampled By: Client
Date Tested: 26-Jul-21
Tested By: C. Kriss

Unified Soil Classification System, ASTM-2487
SM, Silty Sand with Gravel
Sample Color:
brown

ACCREDITED
Certificate #: 1366.01

ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281

Specifications
No Specs
Sample Meets Specs ? N/A

$D_{(5)}$ =	0.040	mm	% Gravel =	16.3%	Coeff. of Curvature, C_C = 0.57
$D_{(10)}$ =	0.048	mm	% Sand =	57.9%	Coeff. of Uniformity, C_U = 8.81
$D_{(15)}$ =	0.057	mm	% Silt & Clay =	25.8%	Fineness Modulus = 2.36
$D_{(30)}$ =	0.108	mm	Liquid Limit =	n/a	Plastic Limit = n/a
$D_{(50)}$ =	0.286	mm	Plasticity Index =	n/a	Moisture %, as sampled = n/a
$D_{(60)}$ =	0.424	mm	Sand Equivalent =	n/a	Req'd Sand Equivalent =
$D_{(90)}$ =	7.871	mm	Fracture %, 1 Face =	n/a	Req'd Fracture %, 1 Face =
Dust Ratio =	3/7		Fracture %, 2+ Faces =	n/a	Req'd Fracture %, 2+ Faces =

ASTM C136, ASTM D6913, ASTM C117

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
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		99%	100.0%	0.0%
1/2"	12.50	97%	97%	100.0%	0.0%
3/8"	9.50	93%	93%	100.0%	0.0%
1/4"	6.30		87%	100.0%	0.0%
#4	4.75	84%	84%	100.0%	0.0%
#8	2.36		71%	100.0%	0.0%
#10	2.00	69%	69%	100.0%	0.0%
#16	1.18		68%	100.0%	0.0%
#20	0.850	67%	67%	100.0%	0.0%
#30	0.600		63%	100.0%	0.0%
#40	0.425	60%	60%	100.0%	0.0%
#50	0.300		51%	100.0%	0.0%
#60	0.250	47%	47%	100.0%	0.0%
#80	0.180		39%	100.0%	0.0%
#100	0.150	35%	35%	100.0%	0.0%
#140	0.106		30%	100.0%	0.0%
#170	0.090		28%	100.0%	0.0%
#200	0.075	25.8%	25.8%	100.0%	0.0%

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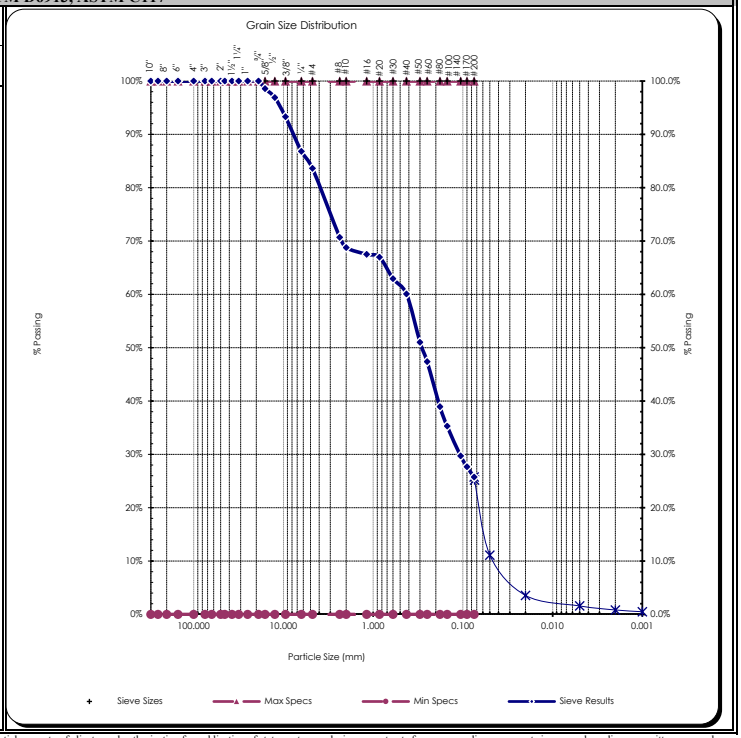

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Comments:

Reviewed by:
Meghan Blodgett-Carrillo

MATERIALS TESTING & CONSULTING, INC.

Hydrometer Report

Project:	Q.C. - Duwamish AOC4 - 190067-02.02	**Date Received:**	20-Jul-21
Project #:	21B218-02	**Sampled By:**	Client
Client :	Analytical Resources, Inc.	**Date Tested:**	26-Jul-21
Source:	LDW21-SS613, 21G0141-03A Trip #3	**Tested By:**	C. Kriss
Sample#:	B21-1148		

Unified Soil Classification System, ASTM-2487
SM, Silty Sand with Gravel
Sample Color
brown

ASTM D422, HYDROMETER ANALYSIS

Assumed Sp Gr :	2.65	
Sample Weight:	93.54	grams
Hydroscopic Moist.:	1.18%	
Adj. Sample Wgt :	92.45	grams

ACCREDITED
Certificate #: 1366.01

Hydrometer Reading Minutes	Corrected Reading	Percent Passing	Soils Particle Diameter
2	5.5	4.1%	0.0380 mm
5	5	3.7%	0.0240 mm
15	4.5	3.3%	0.0139 mm
30	4	3.0%	0.0098 mm
60	3	2.2%	0.0070 mm
250	1.5	1.1%	0.0035 mm
1440	1	0.7%	0.0014 mm

% Gravel:	16.3%	**Liquid Limit:**	n/a
% Sand:	57.9%	**Plastic Limit:**	n/a
% Silt:	24.2%	**Plasticity Index:**	n/a
% Clay:	1.6%		

ASTM C136

Sieve Analysis
Grain Size Distribution

Sieve Size	Percent Passing	Soils Particle Diameter
3.0"	100%	75.000 mm
2.0"	100%	50.000 mm
1.5"	100%	37.500 mm
1.25"	100%	31.500 mm
1.0"	100%	25.000 mm
3/4"	100%	19.000 mm
5/8"	99%	16.000 mm
1/2"	97%	12.500 mm
3/8"	93%	9.500 mm
1/4"	87%	6.300 mm
#4	84%	4.750 mm
#10	69%	2.000 mm
#20	67%	0.850 mm
#40	60%	0.425 mm
#100	35%	0.150 mm
#200	25.8%	0.075 mm
Silts	25.2%	0.074 mm
	11.1%	0.050 mm
	3.6%	0.020 mm
Clays	1.6%	0.005 mm
	0.8%	0.002 mm
Colloids	0.5%	0.001 mm

USDA Soil Textural Classification

	Particle Size
% Sand:	2.0 - 0.05 mm
% Silt:	0.05 - 0.002 mm
% Clay:	< 0.002 mm

USDA Soil Textural Classification
Loamy Sand

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Comments:

Reviewed by: Meghan Blodgett-Carrillo

MATERIALS TESTING & CONSULTING, INC.

Sieve Report

Project: Q.C. - Duwamish AOC4 - 190067-02.02
Project #: 21B218-02
Client: Analytical Resources, Inc.
Source: LDW21-SS682, 21G0141-01A
Sample#: B21-1149

Date Received: 20-Jul-21
Sampled By: Client
Date Tested: 26-Jul-21
Tested By: C. Kriss

Unified Soil Classification System, ASTM-2487
SM, Silty Sand
Sample Color:
brown

ACCREDITED
Certificate #: 1366.01

ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281

Specifications
No Specs
Sample Meets Specs ? N/A

$D_{(5)}$ = 0.040	mm	% Gravel = 13.6%	Coeff. of Curvature, C_C = 0.36
$D_{(10)}$ = 0.046	mm	% Sand = 52.6%	Coeff. of Uniformity, C_U = 6.37
$D_{(15)}$ = 0.052	mm	% Silt & Clay = 33.8%	Fineness Modulus = 1.79
$D_{(30)}$ = 0.070	mm	Liquid Limit = n/a	Plastic Limit = n/a
$D_{(50)}$ = 0.190	mm	Plasticity Index = n/a	Moisture %, as sampled = n/a
$D_{(60)}$ = 0.295	mm	Sand Equivalent = n/a	Req'd Sand Equivalent =
$D_{(90)}$ = 7.022	mm	Fracture %, 1 Face = n/a	Req'd Fracture %, 1 Face =
Dust Ratio = 43/88		Fracture %, 2+ Faces = n/a	Req'd Fracture %, 2+ Faces =

ASTM C136, ASTM D6913, ASTM C117

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
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		99%	100.0%	0.0%
1/2"	12.50	98%	98%	100.0%	0.0%
3/8"	9.50	94%	94%	100.0%	0.0%
1/4"	6.30		89%	100.0%	0.0%
#4	4.75	86%	86%	100.0%	0.0%
#8	2.36		83%	100.0%	0.0%
#10	2.00	82%	82%	100.0%	0.0%
#16	1.18		80%	100.0%	0.0%
#20	0.850	79%	79%	100.0%	0.0%
#30	0.600		73%	100.0%	0.0%
#40	0.425	69%	69%	100.0%	0.0%
#50	0.300		60%	100.0%	0.0%
#60	0.250	57%	57%	100.0%	0.0%
#80	0.180		49%	100.0%	0.0%
#100	0.150	45%	45%	100.0%	0.0%
#140	0.106		39%	100.0%	0.0%
#170	0.090		36%	100.0%	0.0%
#200	0.075	33.8%	33.8%	100.0%	0.0%

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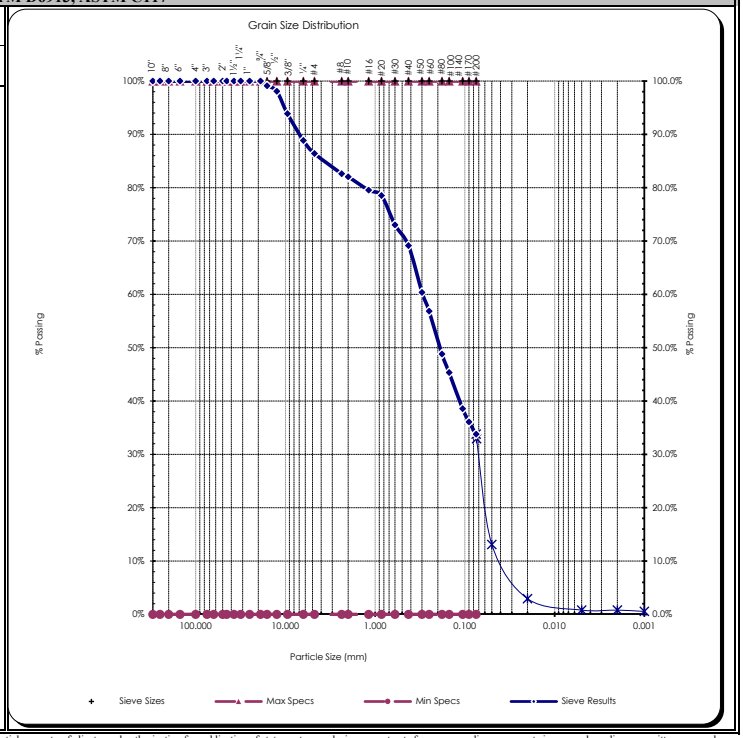

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Comments:

Reviewed by:
Meghan Blodgett-Carrillo

MATERIALS TESTING & CONSULTING, INC.

Hydrometer Report

Project:	Q.C. - Duwamish AOC4 - 190067-02.02	**Date Received:**	20-Jul-21
Project #:	21B218-02	**Sampled By:**	Client
Client :	Analytical Resources, Inc.	**Date Tested:**	26-Jul-21
Source:	LDW21-SS682, 21G0141-01A	**Tested By:**	C. Kriss
Sample#:	B21-1149		

Unified Soil Classification System, ASTM-2487
SM, Silty Sand
Sample Color
brown

ASTM D422, HYDROMETER ANALYSIS

Assumed Sp Gr :	2.65	
Sample Weight:	100.04	grams
Hydroscopic Moist.:	0.30%	
Adj. Sample Wgt :	99.74	grams

ACCREDITED
Certificate #: 1366.01

Hydrometer Reading Minutes	Corrected Reading	Percent Passing	Soils Particle Diameter
2	4	3.3%	0.0381 mm
5	4	3.3%	0.0241 mm
15	3	2.5%	0.0140 mm
30	2	1.6%	0.0100 mm
60	1	0.8%	0.0071 mm
250	1	0.8%	0.0035 mm
1440	1	0.8%	0.0014 mm

% Gravel:	13.6%	**Liquid Limit:**	n/a
% Sand:	52.6%	**Plastic Limit:**	n/a
% Silt:	33.0%	**Plasticity Index:**	n/a
% Clay:	0.8%		

ASTM C136

Sieve Analysis
Grain Size Distribution

Sieve Size	Percent Passing	Soils Particle Diameter
3.0"	100%	75.000 mm
2.0"	100%	50.000 mm
1.5"	100%	37.500 mm
1.25"	100%	31.500 mm
1.0"	100%	25.000 mm
3/4"	100%	19.000 mm
5/8"	99%	16.000 mm
1/2"	98%	12.500 mm
3/8"	94%	9.500 mm
1/4"	89%	6.300 mm
#4	86%	4.750 mm
#10	82%	2.000 mm
#20	79%	0.850 mm
#40	69%	0.425 mm
#100	45%	0.150 mm
#200	33.8%	0.075 mm
Silts	33.0%	0.074 mm
	13.1%	0.050 mm
	3.0%	0.020 mm
Clays	0.8%	0.005 mm
	0.8%	0.002 mm
Colloids	0.6%	0.001 mm

USDA Soil Textural Classification

	Particle Size
% Sand:	2.0 - 0.05 mm
% Silt:	0.05 - 0.002 mm
% Clay:	< 0.002 mm

USDA Soil Textural Classification
Loamy Sand

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Comments:

Reviewed by: Meghan Blodgett-Carrillo

MATERIALS TESTING & CONSULTING, INC.

Sieve Report

Project: Q.C. - Duwamish AOC4 - 190067-02.02
Project #: 21B218-02
Client: Analytical Resources, Inc.
Source: LDW21-SS685, 21G0141-02A
Sample#: B21-1150

Date Received: 20-Jul-21
Sampled By: Client
Date Tested: 26-Jul-21
Tested By: C. Kriss

Unified Soil Classification System, ASTM-2487
SM, Silty Sand
Sample Color:
brown

ACCREDITED
Certificate #: 1366.01

ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281

Specifications
No Specs
Sample Meets Specs ? N/A

$D_{(5)}$ = 0.012	mm	% Gravel = 4.2%	Coeff. of Curvature, C_C = 0.51
$D_{(10)}$ = 0.042	mm	% Sand = 54.0%	Coeff. of Uniformity, C_U = 4.37
$D_{(15)}$ = 0.047	mm	% Silt & Clay = 41.8%	Fineness Modulus = 1.10
$D_{(30)}$ = 0.063	mm	Liquid Limit = n/a	Plastic Limit = n/a
$D_{(50)}$ = 0.118	mm	Plasticity Index = n/a	Moisture %, as sampled = n/a
$D_{(60)}$ = 0.183	mm	Sand Equivalent = n/a	Req'd Sand Equivalent =
$D_{(90)}$ = 0.931	mm	Fracture %, 1 Face = n/a	Req'd Fracture %, 1 Face =
Dust Ratio = 25/48		Fracture %, 2+ Faces = n/a	Req'd Fracture %, 2+ Faces =

ASTM C136, ASTM D6913, ASTM C117

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
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	98%	98%	100.0%	0.0%
1/4"	6.30		97%	100.0%	0.0%
#4	4.75	96%	96%	100.0%	0.0%
#8	2.36		93%	100.0%	0.0%
#10	2.00	93%	93%	100.0%	0.0%
#16	1.18		91%	100.0%	0.0%
#20	0.850	90%	90%	100.0%	0.0%
#30	0.600		84%	100.0%	0.0%
#40	0.425	80%	80%	100.0%	0.0%
#50	0.300		72%	100.0%	0.0%
#60	0.250	68%	68%	100.0%	0.0%
#80	0.180		60%	100.0%	0.0%
#100	0.150	56%	56%	100.0%	0.0%
#140	0.106		48%	100.0%	0.0%
#170	0.090		45%	100.0%	0.0%
#200	0.075	41.8%	41.8%	100.0%	0.0%

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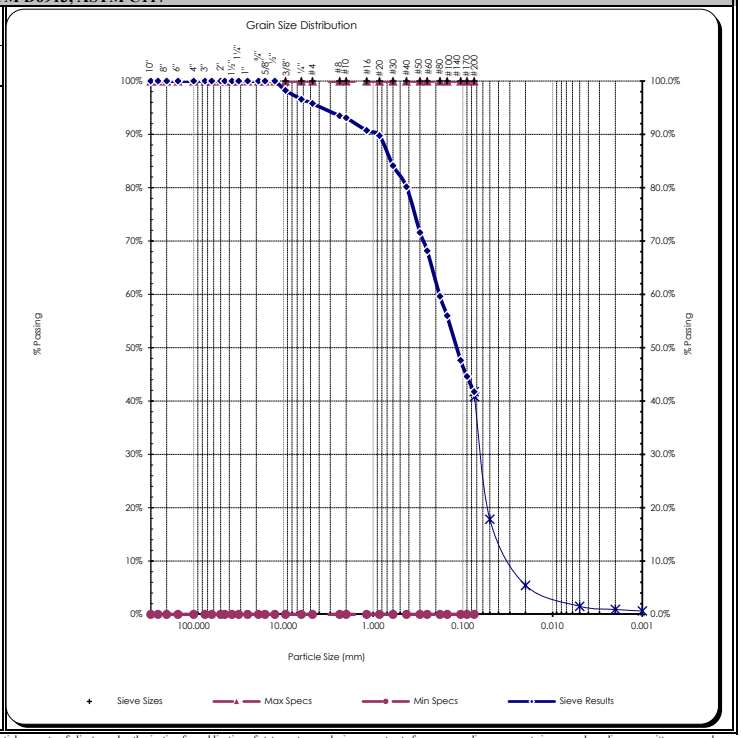

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Comments:

Reviewed by:
Meghan Blodgett-Carrillo

MATERIALS TESTING & CONSULTING, INC.

Hydrometer Report

Project:	Q.C. - Duwamish AOC4 - 190067-02.02	**Date Received:**	20-Jul-21
Project #:	21B218-02	**Sampled By:**	Client
Client :	Analytical Resources, Inc.	**Date Tested:**	26-Jul-21
Source:	LDW21-SS685, 21G0141-02A	**Tested By:**	C. Kriss
Sample#:	B21-1150		

Unified Soil Classification System, ASTM-2487
SM, Silty Sand
Sample Color
brown

ASTM D422, HYDROMETER ANALYSIS

Assumed Sp Gr :	2.65	
Sample Weight:	100.07	grams
Hydroscopic Moist.:	1.08%	
Adj. Sample Wgt :	99.00	grams

ACCREDITED
Certificate #: 1366.01

Hydrometer Reading Minutes	Corrected Reading	Percent Passing	Soils Particle Diameter
2	6.5	6.1%	0.0378 mm
5	6	5.6%	0.0239 mm
15	5.5	5.2%	0.0139 mm
30	5	4.7%	0.0098 mm
60	2.5	2.4%	0.0070 mm
250	1	0.9%	0.0035 mm
1440	1	0.9%	0.0014 mm

% Gravel:	4.2%	**Liquid Limit:**	n/a
% Sand:	54.0%	**Plastic Limit:**	n/a
% Silt:	40.2%	**Plasticity Index:**	n/a
% Clay:	1.5%		

ASTM C136

Sieve Analysis
Grain Size Distribution

Sieve Size	Percent Passing	Soils Particle Diameter
3.0"	100%	75.000 mm
2.0"	100%	50.000 mm
1.5"	100%	37.500 mm
1.25"	100%	31.500 mm
1.0"	100%	25.000 mm
3/4"	100%	19.000 mm
5/8"	100%	16.000 mm
1/2"	100%	12.500 mm
3/8"	98%	9.500 mm
1/4"	97%	6.300 mm
#4	96%	4.750 mm
#10	93%	2.000 mm
#20	90%	0.850 mm
#40	80%	0.425 mm
#100	56%	0.150 mm
#200	41.8%	0.075 mm
Silts	40.8%	0.074 mm
	17.8%	0.050 mm
	5.5%	0.020 mm
Clays	1.5%	0.005 mm
	0.9%	0.002 mm
Colloids	0.7%	0.001 mm

USDA Soil Textural Classification

	Particle Size
% Sand:	2.0 - 0.05 mm
% Silt:	0.05 - 0.002 mm
% Clay:	< 0.002 mm

USDA Soil Textural Classification
Loamy Sand

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

MATERIALS TESTING & CONSULTING, INC.

Sieve Report

Project: Q.C. - Duwamish AOC4 - 190067-02.02
Project #: 21B218-02
Client: Analytical Resources, Inc.
Source: LDW21-IT682, 21G0204-11A
Sample#: B21-1151

Date Received: 20-Jul-21
Sampled By: Client
Date Tested: 26-Jul-21
Tested By: C. Kriss

Unified Soil Classification System, ASTM-2487
SM, Silty Sand
Sample Color:
brown

ACCREDITED
Certificate #: 1366.01

ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281

Specifications
No Specs
Sample Meets Specs ? N/A

$D_{(5)}$ = 0.007	mm	% Gravel = 3.4%	Coeff. of Curvature, C_C = 0.35
$D_{(10)}$ = 0.037	mm	% Sand = 62.8%	Coeff. of Uniformity, C_U = 9.96
$D_{(15)}$ = 0.045	mm	% Silt & Clay = 33.8%	Fineness Modulus = 1.57
$D_{(30)}$ = 0.069	mm	Liquid Limit = n/a	Plastic Limit = n/a
$D_{(50)}$ = 0.219	mm	Plasticity Index = n/a	Moisture %, as sampled = n/a
$D_{(60)}$ = 0.370	mm	Sand Equivalent = n/a	Req'd Sand Equivalent =
$D_{(90)}$ = 1.699	mm	Fracture %, 1 Face = n/a	Req'd Fracture %, 1 Face =
Dust Ratio = 47/88		Fracture %, 2+ Faces = n/a	Req'd Fracture %, 2+ Faces =

ASTM C136, ASTM D6913, ASTM C117

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
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	99%	99%	100.0%	0.0%
1/4"	6.30		98%	100.0%	0.0%
#4	4.75	97%	97%	100.0%	0.0%
#8	2.36		94%	100.0%	0.0%
#10	2.00	94%	94%	100.0%	0.0%
#16	1.18		83%	100.0%	0.0%
#20	0.850	79%	79%	100.0%	0.0%
#30	0.600		70%	100.0%	0.0%
#40	0.425	63%	63%	100.0%	0.0%
#50	0.300		56%	100.0%	0.0%
#60	0.250	53%	53%	100.0%	0.0%
#80	0.180		47%	100.0%	0.0%
#100	0.150	44%	44%	100.0%	0.0%
#140	0.106		38%	100.0%	0.0%
#170	0.090		36%	100.0%	0.0%
#200	0.075	33.8%	33.8%	100.0%	0.0%

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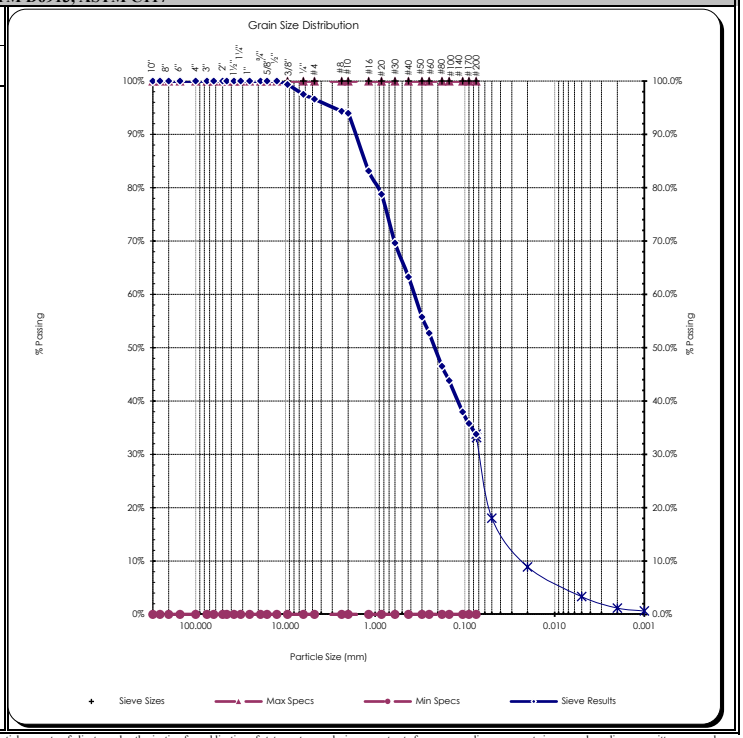

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Comments:

Reviewed by:
Meghan Blodgett-Carrillo

MATERIALS TESTING & CONSULTING, INC.

Hydrometer Report

Project:	Q.C. - Duwamish AOC4 - 190067-02.02	**Date Received:**	20-Jul-21
Project #:	21B218-02	**Sampled By:**	Client
Client :	Analytical Resources, Inc.	**Date Tested:**	26-Jul-21
Source:	LDW21-IT682, 21G0204-11A	**Tested By:**	C. Kriss
Sample#:	B21-1151		

Unified Soil Classification System, ASTM-2487
SM, Silty Sand
Sample Color
brown

ASTM D422, HYDROMETER ANALYSIS

Assumed Sp Gr :	2.65	
Sample Weight:	100.05	grams
Hydroscopic Moist.:	0.36%	
Adj. Sample Wgt :	99.69	grams

ACCREDITED
Certificate #: 1366.01

Hydrometer Reading Minutes	Corrected Reading	Percent Passing	Soils Particle Diameter
2	10.5	9.9%	0.0370 mm
5	10	9.4%	0.0234 mm
15	8.5	8.0%	0.0137 mm
30	7	6.6%	0.0097 mm
60	5.5	5.2%	0.0069 mm
250	2	1.9%	0.0035 mm
1440	1	0.9%	0.0014 mm

% Gravel:	3.4%	**Liquid Limit:**	n/a
% Sand:	62.8%	**Plastic Limit:**	n/a
% Silt:	30.5%	**Plasticity Index:**	n/a
% Clay:	3.4%		

ASTM C136

Sieve Analysis
Grain Size Distribution

Sieve Size	Percent Passing	Soils Particle Diameter
3.0"	100%	75.000 mm
2.0"	100%	50.000 mm
1.5"	100%	37.500 mm
1.25"	100%	31.500 mm
1.0"	100%	25.000 mm
3/4"	100%	19.000 mm
5/8"	100%	16.000 mm
1/2"	100%	12.500 mm
3/8"	99%	9.500 mm
1/4"	98%	6.300 mm
#4	97%	4.750 mm
#10	94%	2.000 mm
#20	79%	0.850 mm
#40	63%	0.425 mm
#100	44%	0.150 mm
#200	33.8%	0.075 mm
Silts	33.2%	0.074 mm
	18.1%	0.050 mm
	8.9%	0.020 mm
Clays	3.4%	0.005 mm
	1.2%	0.002 mm
Colloids	0.7%	0.001 mm

USDA Soil Textural Classification

	Particle Size
% Sand:	2.0 - 0.05 mm
% Silt:	0.05 - 0.002 mm
% Clay:	< 0.002 mm

USDA Soil Textural Classification
Loamy Sand

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Comments:

Reviewed by: Meghan Blodgett-Carrillo

MATERIALS TESTING & CONSULTING, INC.

Sieve Report

Project: Q.C. - Duwamish AOC4 - 190067-02.02
Project #: 21B218-02
Client: Analytical Resources, Inc.
Source: LDW21-SS688, 21G0199-13A
Sample#: B21-1152

Date Received: 20-Jul-21
Sampled By: Client
Date Tested: 26-Jul-21
Tested By: C. Kriss

Unified Soil Classification System, ASTM-2487
SM, Silty 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	% Gravel = 8.8%	Coeff. of Curvature, C_C = 0.64
$D_{(10)}$ = 0.022	mm	% Sand = 52.1%	Coeff. of Uniformity, C_U = 12.19
$D_{(15)}$ = 0.041	mm	% Silt & Clay = 39.2%	Fineness Modulus = 1.71
$D_{(30)}$ = 0.062	mm	Liquid Limit = n/a	Plastic Limit = n/a
$D_{(50)}$ = 0.161	mm	Plasticity Index = n/a	Moisture %, as sampled = n/a
$D_{(60)}$ = 0.271	mm	Sand Equivalent = n/a	Req'd Sand Equivalent =
$D_{(90)}$ = 4.459	mm	Fracture %, 1 Face = n/a	Req'd Fracture %, 1 Face =
Dust Ratio = 25/44		Fracture %, 2+ Faces = n/a	Req'd Fracture %, 2+ Faces =

ASTM C136, ASTM D6913, ASTM C117

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
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		99%	100.0%	0.0%
1/2"	12.50	98%	98%	100.0%	0.0%
3/8"	9.50	97%	97%	100.0%	0.0%
1/4"	6.30		93%	100.0%	0.0%
#4	4.75	91%	91%	100.0%	0.0%
#8	2.36		81%	100.0%	0.0%
#10	2.00	80%	80%	100.0%	0.0%
#16	1.18		77%	100.0%	0.0%
#20	0.850	76%	76%	100.0%	0.0%
#30	0.600		72%	100.0%	0.0%
#40	0.425	69%	69%	100.0%	0.0%
#50	0.300		62%	100.0%	0.0%
#60	0.250	59%	59%	100.0%	0.0%
#80	0.180		52%	100.0%	0.0%
#100	0.150	49%	49%	100.0%	0.0%
#140	0.106		43%	100.0%	0.0%
#170	0.090		41%	100.0%	0.0%
#200	0.075	39.2%	39.2%	100.0%	0.0%

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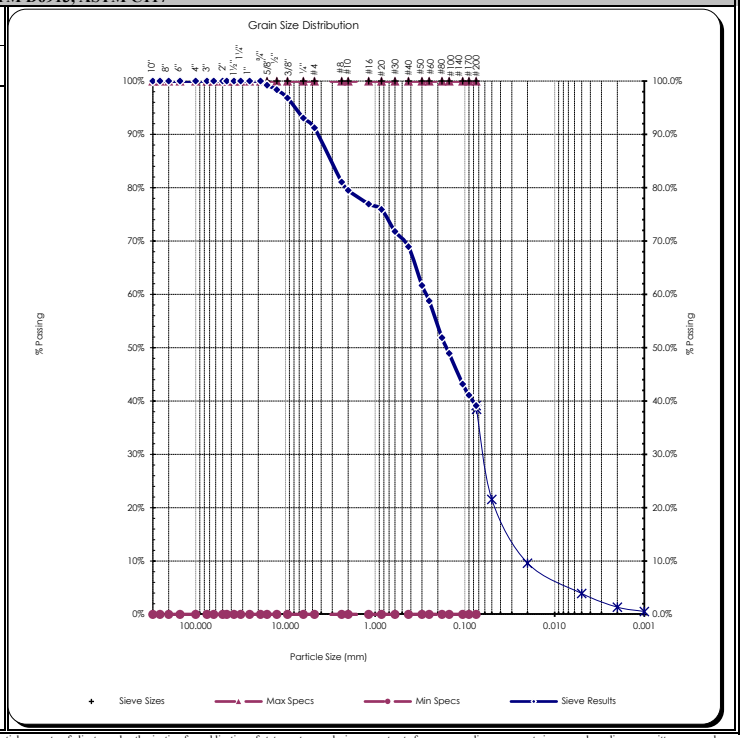

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Comments:

Reviewed by:
Meghan Blodgett-Carrillo

MATERIALS TESTING & CONSULTING, INC.

Hydrometer Report

Project:	Q.C. - Duwamish AOC4 - 190067-02.02	**Date Received:**	20-Jul-21
Project #:	21B218-02	**Sampled By:**	Client
Client :	Analytical Resources, Inc.	**Date Tested:**	26-Jul-21
Source:	LDW21-SS688, 21G0199-13A	**Tested By:**	C. Kriss
Sample#:	B21-1152		

Unified Soil Classification System, ASTM-2487
SM, Silty Sand
Sample Color
brown

ASTM D422, HYDROMETER ANALYSIS

Assumed Sp Gr :	2.65	
Sample Weight:	100.05	grams
Hydroscopic Moist.:	2.15%	
Adj. Sample Wgt :	97.94	grams

ACCREDITED
Certificate #: 1366.01

Hydrometer Reading Minutes	Corrected Reading	Percent Passing	Soils Particle Diameter
2	14.5	11.8%	0.0361 mm
5	12.5	10.1%	0.0231 mm
15	10.5	8.5%	0.0135 mm
30	9	7.3%	0.0096 mm
60	6.5	5.3%	0.0069 mm
250	3.5	2.8%	0.0034 mm
1440	1	0.8%	0.0014 mm

% Gravel:	8.8%	**Liquid Limit:**	n/a
% Sand:	52.1%	**Plastic Limit:**	n/a
% Silt:	35.2%	**Plasticity Index:**	n/a
% Clay:	3.9%		

ASTM C136

Sieve Analysis
Grain Size Distribution

Sieve Size	Percent Passing	Soils Particle Diameter
3.0"	100%	75.000 mm
2.0"	100%	50.000 mm
1.5"	100%	37.500 mm
1.25"	100%	31.500 mm
1.0"	100%	25.000 mm
3/4"	100%	19.000 mm
5/8"	99%	16.000 mm
1/2"	98%	12.500 mm
3/8"	97%	9.500 mm
1/4"	93%	6.300 mm
#4	91%	4.750 mm
#10	80%	2.000 mm
#20	76%	0.850 mm
#40	69%	0.425 mm
#100	49%	0.150 mm
#200	39.2%	0.075 mm
Silts	38.5%	0.074 mm
	21.6%	0.050 mm
	9.6%	0.020 mm
Clays	3.9%	0.005 mm
	1.4%	0.002 mm
Colloids	0.6%	0.001 mm

USDA Soil Textural Classification

	Particle Size
% Sand:	2.0 - 0.05 mm
% Silt:	0.05 - 0.002 mm
% Clay:	< 0.002 mm

USDA Soil Textural Classification
Loamy Sand

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Comments:

Reviewed by: Meghan Blodgett-Carrillo

MATERIALS TESTING & CONSULTING, INC.

Sieve Report

Project: Q.C. - Duwamish AOC4 - 190067-02.02
Project #: 21B218-02
Client: Analytical Resources, Inc.
Source: LDW21-SS689, 21G0199-12A
Sample#: B21-1153

Date Received: 20-Jul-21
Sampled By: Client
Date Tested: 26-Jul-21
Tested By: C. Kriss

Unified Soil Classification System, ASTM-2487
SM, Silty Sand
Sample Color:
brown

ACCREDITED
Certificate #: 1366.01

ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281

Specifications
No Specs
Sample Meets Specs ? N/A

$D_{(5)}$ = 0.015	mm	% Gravel = 8.2%	Coeff. of Curvature, C_C = 0.38
$D_{(10)}$ = 0.040	mm	% Sand = 60.5%	Coeff. of Uniformity, C_U = 9.03
$D_{(15)}$ = 0.048	mm	% Silt & Clay = 31.3%	Fineness Modulus = 1.79
$D_{(30)}$ = 0.073	mm	Liquid Limit = n/a	Plastic Limit = n/a
$D_{(50)}$ = 0.241	mm	Plasticity Index = n/a	Moisture %, as sampled = n/a
$D_{(60)}$ = 0.357	mm	Sand Equivalent = n/a	Req'd Sand Equivalent =
$D_{(90)}$ = 4.011	mm	Fracture %, 1 Face = n/a	Req'd Fracture %, 1 Face =
Dust Ratio = 10/21		Fracture %, 2+ Faces = n/a	Req'd Fracture %, 2+ Faces =

ASTM C136, ASTM D6913, ASTM C117

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
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		99%	100.0%	0.0%
1/2"	12.50	99%	99%	100.0%	0.0%
3/8"	9.50	98%	98%	100.0%	0.0%
1/4"	6.30		94%	100.0%	0.0%
#4	4.75	92%	92%	100.0%	0.0%
#8	2.36		86%	100.0%	0.0%
#10	2.00	85%	85%	100.0%	0.0%
#16	1.18		80%	100.0%	0.0%
#20	0.850	78%	78%	100.0%	0.0%
#30	0.600		71%	100.0%	0.0%
#40	0.425	66%	66%	100.0%	0.0%
#50	0.300		55%	100.0%	0.0%
#60	0.250	51%	51%	100.0%	0.0%
#80	0.180		43%	100.0%	0.0%
#100	0.150	40%	40%	100.0%	0.0%
#140	0.106		35%	100.0%	0.0%
#170	0.090		33%	100.0%	0.0%
#200	0.075	31.3%	31.3%	100.0%	0.0%

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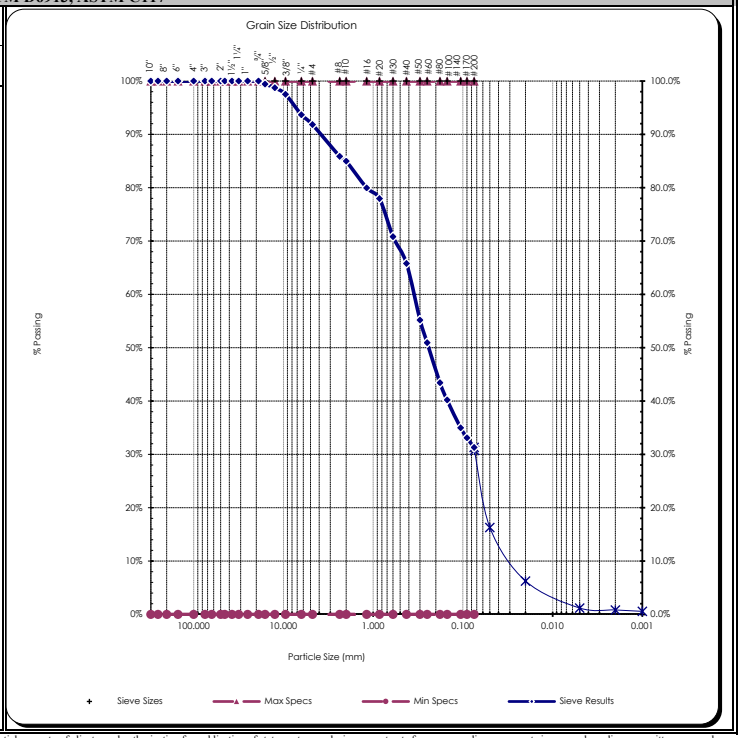

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Comments:

Reviewed by:
Meghan Blodgett-Carrillo

MATERIALS TESTING & CONSULTING, INC.

Hydrometer Report

Project:	Q.C. - Duwamish AOC4 - 190067-02.02	**Date Received:**	20-Jul-21
Project #:	21B218-02	**Sampled By:**	Client
Client :	Analytical Resources, Inc.	**Date Tested:**	26-Jul-21
Source:	LDW21-SS689, 21G0199-12A	**Tested By:**	C. Kriss
Sample#:	B21-1153		

Unified Soil Classification System, ASTM-2487
SM, Silty Sand
Sample Color
brown

ASTM D422, HYDROMETER ANALYSIS

Assumed Sp Gr :	2.65	
Sample Weight:	100.58	grams
Hydroscopic Moist.:	0.54%	
Adj. Sample Wgt :	100.04	grams

ACCREDITED
Certificate #: 1366.01

Hydrometer Reading Minutes	Corrected Reading	Percent Passing	Soils Particle Diameter
2	10	8.5%	0.0370 mm
5	8.5	7.2%	0.0236 mm
15	5.5	4.7%	0.0139 mm
30	4.5	3.8%	0.0098 mm
60	2	1.7%	0.0070 mm
250	1	0.8%	0.0035 mm
1440	1	0.8%	0.0014 mm

% Gravel:	8.2%	**Liquid Limit:**	n/a
% Sand:	60.5%	**Plastic Limit:**	n/a
% Silt:	30.1%	**Plasticity Index:**	n/a
% Clay:	1.2%		

ASTM C136

Sieve Analysis
Grain Size Distribution

Sieve Size	Percent Passing	Soils Particle Diameter
3.0"	100%	75.000 mm
2.0"	100%	50.000 mm
1.5"	100%	37.500 mm
1.25"	100%	31.500 mm
1.0"	100%	25.000 mm
3/4"	100%	19.000 mm
5/8"	99%	16.000 mm
1/2"	99%	12.500 mm
3/8"	98%	9.500 mm
1/4"	94%	6.300 mm
#4	92%	4.750 mm
#10	85%	2.000 mm
#20	78%	0.850 mm
#40	66%	0.425 mm
#100	40%	0.150 mm
#200	31.3%	0.075 mm
Silts	30.7%	0.074 mm
	16.3%	0.050 mm
	6.3%	0.020 mm
Clays	1.2%	0.005 mm
	0.8%	0.002 mm
Colloids	0.6%	0.001 mm

USDA Soil Textural Classification

	Particle Size
% Sand:	2.0 - 0.05 mm
% Silt:	0.05 - 0.002 mm
% Clay:	< 0.002 mm

USDA Soil Textural Classification
Loamy Sand

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Comments:

Reviewed by: Meghan Blodgett-Carrillo

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
ASTM D6913/D6913M-17

LDW21-IT682-GS1

Laboratory:	Materials Testing & Consulting, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0204-11	SDG:	21G0204
Sampled:	07/14/21 07:40	Prepared:	07/26/21 00:00	File ID:	
% Solids:	0.00	Preparation:	No Prep Geo	Analyzed:	
Batch:	B210726	Sequence:		Initial/Final:	/
Instrument:	MT&C			Calibration:	

CAS NO.	Analyte	Concentration (%)	Dilution Factor	MDL	MRL	Q
GS_<3IN	<3 Inches (percent passing)	100	1	0.1	0.1	
GS_<2IN	<2 Inches (percent passing)	100	1	0.1	0.1	
GS_<1.5IN	<1.5 Inches (percent passing)	100	1	0.1	0.1	
GS_<1.25IN	<1.25 Inches (percent passing)	100	1	0.1	0.1	
GS_<1IN	<1 Inches (percent passing)	100	1	0.1	0.1	
GS_<3/4IN	<3/4 Inches (percent passing)	100	1	0.1	0.1	
GS_<5/8IN	<5/8 Inches (percent passing)	100	1	0.1	0.1	
GS_<1/2IN	<1/2 Inches (percent passing)	100	1	0.1	0.1	
GS_<3/8IN	<3/8 Inches (percent passing)	99	1	0.1	0.1	
GS_<1/4IN	<1/4 Inches (percent passing)	98	1	0.1	0.1	
GS_<4750	<4750 microns (percent passing)	97	1	0.1	0.1	
GS_<2000	<2000 microns (percent passing)	94	1	0.1	0.1	
GC_<850	<850 microns (percent passing)	79	1	0.1	0.1	
GS_<400	<400 microns (percent passing)	63	1	0.1	0.1	
GC_<150	<150 microns (percent passing)	44	1	0.1	0.1	
GS_<75	<75 microns (percent passing)	33.8	1	0.1	0.1	
GS_<63	<63 Microns (percent passing)	33.2	1	0.1	0.1	
GS_<4	<4 microns (percent passing)	3.4	1	0.1	0.1	