Analytical Resources, Incorporated
Analytical Chemists and Consultants

8 September 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)
21G0141	N/A
21G0156	NA
21G0199	NA
21G0204	NA
21G0269	NA
21G0286	NA

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

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-Sept-2021 11:37

Case Narrative

Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Work Order: 21G0141, 21G0156, 21G0199, 21G0204, 21G0269, 21G0286

Sample receipt

Samples as listed on the preceding page were received over various work orders as listed on the cover page.

Grainsize

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

1 of 1 2160141

CHAIN-OF-CUSTODY/TEST REQUEST FORM

№ 3201

Project/Client Name: Duwamish AOCY
Project Number: 180067-02.02
Contact Name: Amara Vandervort
Sampled By: Windward

Ship to: ARI
Attn: Sue Dunnihoo
Shipper: Courier
Form filled out by: K. McPeek

Shipping Date: 7/13/21
Airbill Number: —
Turnaround requested: 2 weeks/STD

Sample Collection Date (m/d/y)	Time	Sample Identification	Volume of Sample / # of Containers	Matrix	PAHs	Archive	TOC/total solids	grain size	ammonia	sulfide	~~ACM~~ SMS SVOCs, metals, Hg	PCBs	Comments / Instructions [Jar tag number(s)]
					Test(s) Requested (check test(s) required)								A: archive
7/13/21	0740	LDW21-SS682	8	Sediment		X	X	A	A	A			2 wk TAT
	0905	LDW21-SS685	8		X	X	X	A	A	A			
	1040	LDW21-SS613	8			X	X	A	A	A	X	X	
	1210	LDW21-SS544	3			X	X					X	STD TAT
	1350	LDW21-SS700	3			X	X					X	+ benzoic acid, STD TAT
	1415	LDW21-SS705	3			X	X					X	STD TAT
	1455	LDW21-SS704	3			X	X					X	STD TAT
					7/13/21								
		Total Number of Containers	36	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 McPeek	Jacob Leather	Print name:	
Signature:	Company: ARI	Signature:	Company:
Company: Windward		Company:	
Date/Time: 7/13/21 1725	Date/Time: 07/13/2021 1725	Date/Time:	Date/Time:

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

To be completed by Laboratory upon sample receipt:

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

Wind Ward environmental LLC

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

206.378.1364

2120156

1 of 2

CHAIN-OF-CUSTODY/TEST REQUEST FORM

№ 3957

Project/Client Name: Duwamish AOC4
Project Number: 180067-02.02
Contact Name: Amara Vandervort
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	PCBs	TOC/TOTAL SOLIDS	D/F	Archive	PCB/CPAHs	Arsenic	PAHs, 1,2,4-trichlorobenzene	Mercury	Ammonia	Sulfides	Comments / Instructions [Jar tag number(s)]
7/14/2021	0729	LDW21-IT622A	4	Sediment	X	X	X	X							
	↓	LDW21-IT622B	4	↓	X	X	X	X							
	↓	LDW21-IT622C	4		X	X	X	X							
	0729	LDW21-IT622E	4		X	X	X	X							
	0839	LDW21-IT660B	4		X	X	X	X							
	1003	LDW21-IT588B	3 ~~4~~ NE			X		X	X	X					
	↓	LDW21-IT588C	3 ~~4~~ NE			X		X	X	X					
	1003	LDW21-IT588E	3 ~~4~~ NE			X		X	X	X					
	1118	LDW21-IT585B	3		X	X		X		X					
	↓	LDW21-IT585C	3		X	X		X		X					
	1118	LDW21-IT585E	3		X	X		X		X					
7/14/2021	0920	LDW21-IT685	7	↓	A	X		X			X	A	~~A~~	~~A~~	
		Total Number of Containers	45	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 McPeek		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.

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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:

21G0156

2 of 2

CHAIN-OF-CUSTODY/TEST REQUEST FORM

~~Toxicity~~ NE ~~Archive~~ NE

№ 3195

Project/Client Name: Duwamish AOC4
Project Number: 180067-02.02
Contact Name: Amara Vanderwart
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	Grain Size	PCBs	TOC/TOTAL SOLIDS	Archive	PAHs, 1,2,4-trichlorobenzene	Mercury	Ammonia	sulfides	Comments / Instructions [Jar tag number(s)]
7/14/2021	0920	LDW21-IT685-GS1	1	Sediment	X								
	1400	LDW21-SC571A	3			X	X	X					
		LDW21-SC571A-FD	3			X	X	X					
		LDW21-SC571B	3			X	X	X					
		LDW21-SC571C	3			X	X	X					
	1400	LDW21-SC571E	3			X	X	X					
	1448	LDW21-SC568B	3			X	X	X					
		LDW21-SC568C	3			X	X	X					
	1448	LDW21-SC568E-FD	3			X	X	X					
	1448	LDW21-SC568E	3			X	X	X					
	1130	LDW21-SC680	7			A	X	X	X	A	A	A	
7/14/2021	1130	LDW21-SC680-GS1	1	Sediment	X								
		Total Number of Containers	36	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 McPeek	Print name: Sue Dunnihoo	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.

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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:

2160199

1 of 2

CHAIN-OF-CUSTODY/TEST REQUEST FORM

Tier 1

№ 4137

Project/Client Name: Duwamish AOC4
Project Number: 180667-02.02
Contact Name: Amara Vanderwoft
Sampled By: Windward

Ship to: ARI
Attn: Sue Dunnihoo
Shipper: courier
Form filled out by: S. Replinger

Shipping Date: 7.16.2021
Airbill Number: —
Turnaround requested: std.

Sample Collection Date (m/d/y)	Time	Sample Identification	Volume of Sample / # of Containers	Matrix	PCBs	TOC/TS	Archive	Mercury	PAHs	Ammonia	Sulfides	Grain Size	Comments / Instructions [Jar tag number(s)]
7.16.2021	0738	LDW21-SS707	3	Sediment	x	x	x						
	0805	LDW21-SS706	3		x	x	x						
	0805	LDW21-SS706-FD	3		x	x	x						
	0831	LDW21-SS703	5		x	x	x	x					all chems w/ benthic RALs
	0855	LDW21-SS701	3		x	x	x						benzoic acid
	0947	LDW21-SS675	3		x	x	x						
	1112	LDW21-SS504	3		x	x	x						
	1127	LDW21-SS507	3		x	x	x	~~x~~ SR					~~metals~~ SR
	1140	LDW21-SS518	SR ~~3~~ 4		x	x	x	x					metals
	1150	LDW21-SS516	3		x	x	x						
	1320	LDW21-SS547	3		x	x	x						
	1410	LDW21-SS689	11		A	x	x		x	A	A	x	
		Total Number of Containers	47	Purchase Order / Statement of Work # CLF-052021-ARI									

1) Released by:	1) Rec'd by:	2) Released by:	2) Rec'd by:
Print name: Suzanne Replinger		Print name:	
Signature:	Company: ARI	Signature:	Company:
Company: Windward Env.		Company:	
Date/Time: 7.16.2021 1739	Date/Time: 7/16/21 1739	Date/Time:	Date/Time:

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

Windward environmental LLC

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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:

2160199

2 of 2

CHAIN-OF-CUSTODY/TEST REQUEST FORM

Tier 1

№ 4135

Project/Client Name: Duwamish AOC4
Project Number: 180667-02.02
Contact Name: Amara Vandervort
Sampled By: Windward

Ship to: ARI
Attn: Sue Dunnihoo
Shipper: courier
Form filled out by: S. Replinger

Shipping Date: 7.16.2021
Airbill Number: —
Turnaround requested: std

Sample Collection Date (m/d/y)	Time	Sample Identification	Volume of Sample / # of Containers	Matrix	PCBs	TOC/TS	Archive	PAHs	Ammonia	Sulfides	Grain Size		Comments / Instructions [Jar tag number(s)]
					Test(s) Requested (check test(s) required)								
7.16.2021	1510	LDW21-SS688	11	Sediment	A	X	X	A	A	A	X		
↓	1620	LDW21-SS503	3	↓	X	X	X						
		Total Number of Containers	14	Purchase Order / Statement of Work # CFL-052021-ARI									

1) Released by:	1) Rec'd by:	2) Released by:	2) Rec'd by:
Print name: Suzanne Replinger		Print name:	
Signature:	Company: ARI	Signature:	Company:
Company: Windward Env		Company:	
Date/Time: 7/16/2021 1739	Date/Time: 7/16/21 1739	Date/Time:	Date/Time:

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

To be completed by Laboratory upon sample receipt:

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

Windward environmental LLC

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Seattle, WA 98119

206.378.1364

21G0204

1 of 3

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 Haller	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.

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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 Vandervort
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)]
7/14/21	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 Dunnihoo	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
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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:

3 of 3 21G0204

CHAIN-OF-CUSTODY/TEST REQUEST FORM

Archive

№ 3194

Project/Client Name: Duwamish AOCH
Project Number: 180067-02.02
Contact Name: Amam 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.

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Seattle, WA 98119

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To be completed by Laboratory upon sample receipt:

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

1 of 1 216-0269

CHAIN-OF-CUSTODY/TEST REQUEST FORM

№ 4134

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

Ship to: ARI
Attn: Sue Dunihoo
Shipper: courier
Form filled out by: K. McPeek
Shipping Date: 7/21/21
Airbill Number: —
Turnaround requested: STD

Sample Collection Date (m/d/y)	Time	Sample Identification	Volume of Sample / # of Containers	Matrix	PCBs	PAHs	TOC / total solids	Metals	Archive	~~Gran~~ Sulfide + Ammonia	Grain size	Comments / Instructions [Jar tag number(s)]
					Test(s) Requested (check test(s) required)							A: archive
7/21/21	0920	LDW21-SS583	3	sediment	X		X	X	X			+ BBP + BEHP, Metals: As
	0930	-SS586	3		X		X	X	X			+ BBP + BEHP, Metals: As, Zn
	0950	-SS570	3		X		X		X			
	1005	-SS556	3		X		X		X			
	1015	-SS555	3		X		X		X			
	1015	-SS555FD	3		X		X		X			
	1035	-SS536	3		X		X		X			
	1230	-SS690	~~3~~ 7		A	X	X	A	X	A		+ Hg (A)
	1230	-SS690GS	1								X	
	1417	-SS575	4		X		X		X			+ Hg
	1440	-SS505	3		X		X		X			
	1455	-SS506	3		X		X		X			
		Total Number of Containers	39	Purchase Order / Statement of Work # CLF-OS2021-ARI								

1) Released by:	1) Rec'd by:	2) Released by:	2) Rec'd by:
Print name: Kate McPeek	Jacob Walter	Print name:	
Signature:	Company: ARI	Signature:	Company:
Company: Windward		Company:	
Date/Time: 7/21/21 1715	Date/Time: 07/21/2021 1715	Date/Time:	Date/Time:

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

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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:

Reply all Delete Junk Block ···

Fw: updates for AOC4 sample SS690

Version changes coming this summer to SW-846 8260 and 8270 analyses, see our recent post explaining the details.

"Don't wish it were easier. Wish you were better." - Jim Rohn

Before printing, think about ENVIRONMENTAL responsibility

From: Kate McPeek <katem@windwardenv.com>
Sent: Thursday, July 22, 2021 9:16 AM
To: Sue Dunnihoo <limsadm@arilabs.com>
Cc: Amara Vandervort <amarav@windwardenv.com>; Brandi Quinlisk <brandiq@windwardenv.com>; Suzanne Replinger <SuzanneR@windwardenv.com>
Subject: updates for AOC4 sample SS690

Hi Sue, 2160269

Yesterday we submitted AOC4 sample LDW21-SS690. A couple of changes to what was listed on the COC:

- This sample is on a 2 week TAT
- Sulfide and ammonia should be analyzed (not archived)

Thank you,
Kate

Kate McPeek
Direct: 206-812-5406
katem@windwardenv.com | www.windwardenv.com
200 1st Avenue West, Suite 500 | Seattle, WA 98119

Windward environmental LLC

Reply | Reply all | Forward

1 of 1 2160286

CHAIN-OF-CUSTODY/TEST REQUEST FORM

Tier 1

№ 4132

Project/Client Name: Duwamish AOCA
Project Number: 180067-02.02
Contact Name: Amara Vandervort
Sampled By: Windward

Ship to: ARI
Attn: Sue Dunnihoo
Shipper: courier
Form filled out by: S. Replinger

Shipping Date: 7.22.2021
Airbill Number: —
Turnaround requested: std.

Sample Collection Date (m/d/y)	Time	Sample Identification	Volume of Sample / # of Containers	Matrix	PCBs	TOC / total solids	Archive	PAHs	Metals	Sulfide + Ammonia	Grain Size	Comments / Instructions [Jar tag number(s)]
					Test(s) Requested (check test(s) required)							
7.22.2021	0645	LDW21-SS687	11	Sediment	A	x	x	x	A	x	x	extra volume for tox testing
	0750	LDW21-SS625	4		x	x	x		x			BBP, metals (As, Zn, Pb, Hg)
	0750	LDW21-IT625	3		x	x	x		x			Arsenic
	0810	LDW21-SS627	4		x	x	x		x			BBP, metals (As, Zn, Pb, Hg)
	1150	LDW21-SS646	4		x	x	x					BBP, dioxins / furans
		Total Number of Containers	26	Purchase Order / Statement of Work # CFL-052021-ARI								

1) Released by:	1) Rec'd by:	2) Released by:	2) Rec'd by:
Print name: Amorfiro	Print name: Sandhatt	Print name:	
Signature:	Company: ARI	Signature:	Company:
Company: ~~Windward~~ AOCA		Company:	
Date/Time: 7.22.2021 1730	Date/Time: 07/22/2021 1730	Date/Time:	Date/Time:

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

Wind Ward 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:

MATERIALS TESTING & CONSULTING, INC.

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 - July 16, 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

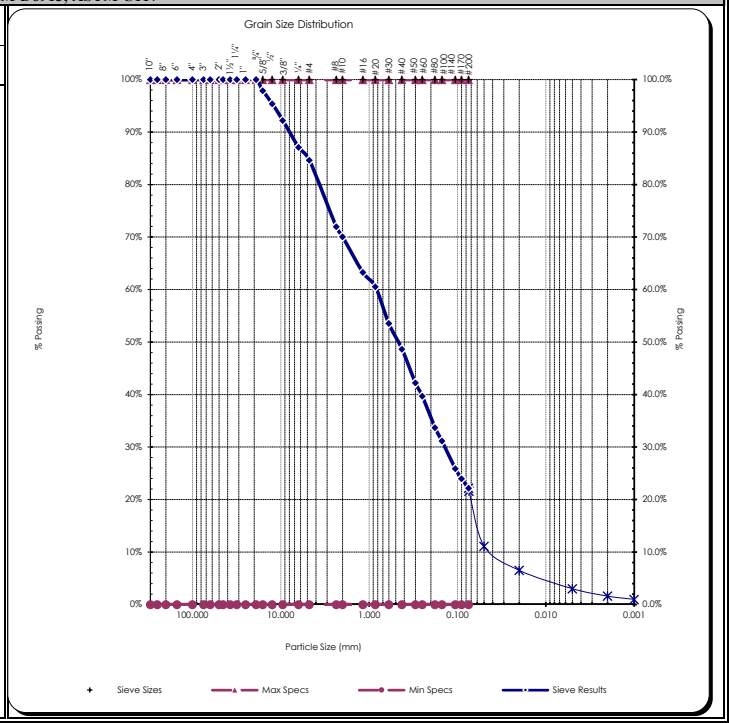
ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281

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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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

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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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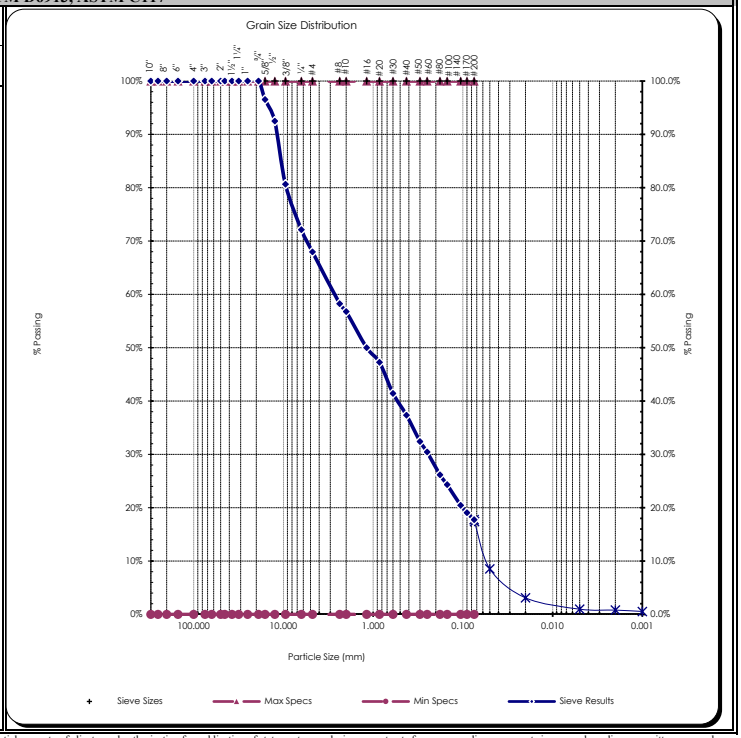

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Comments:

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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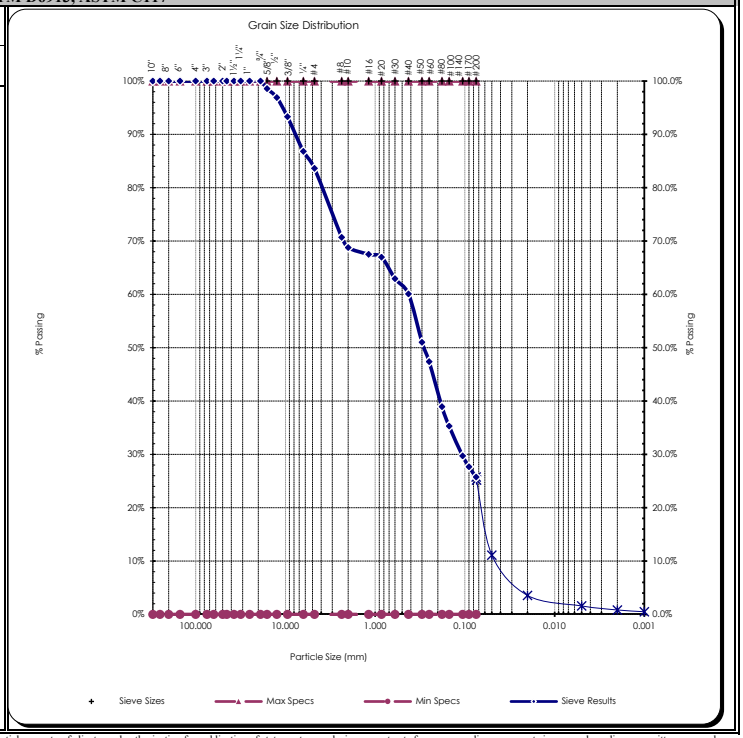

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Comments:

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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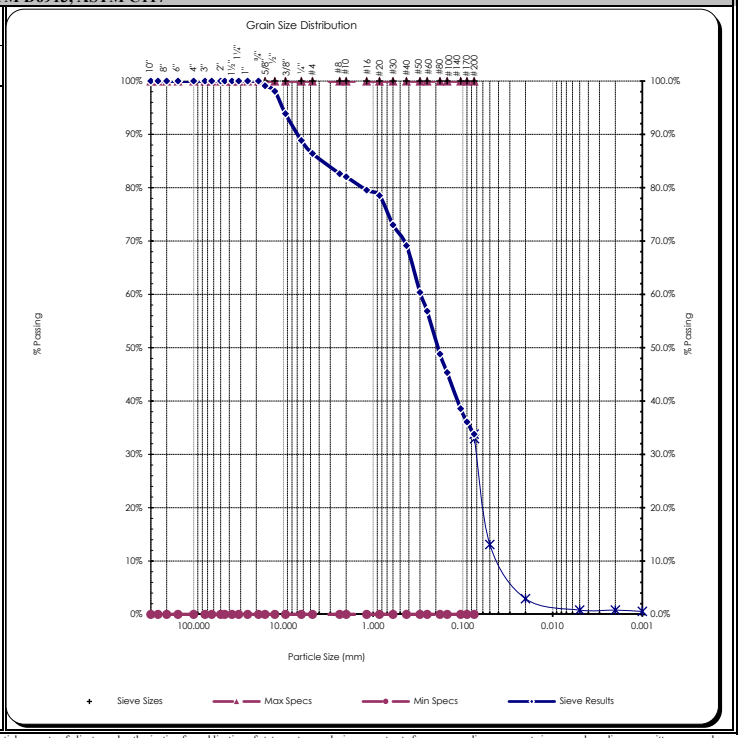

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Comments:

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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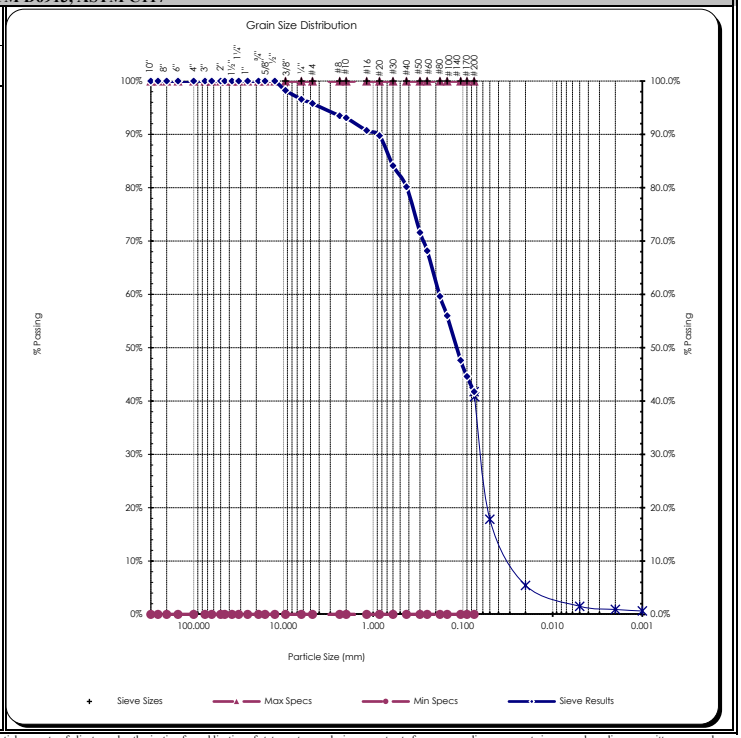

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Comments:

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

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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-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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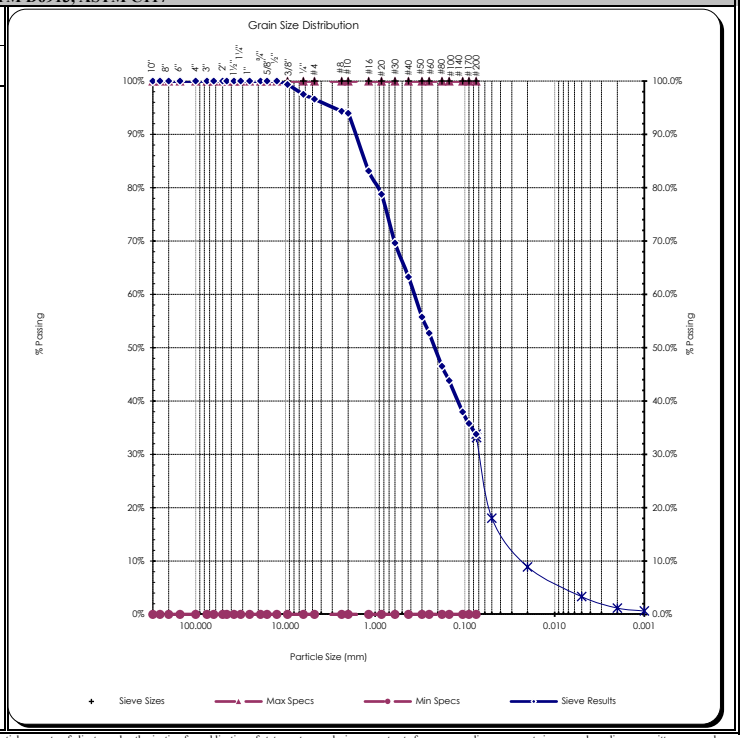

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Comments:

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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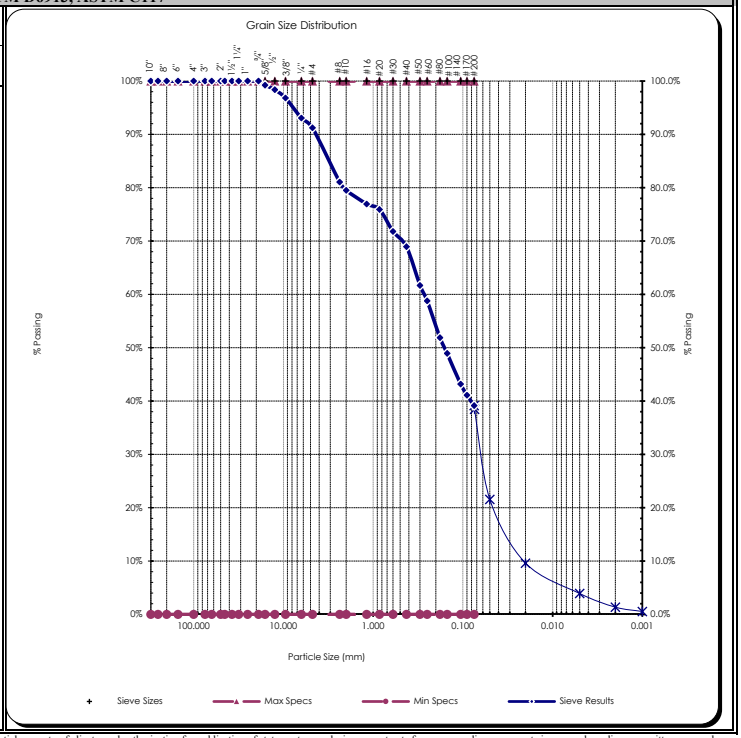

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Comments:

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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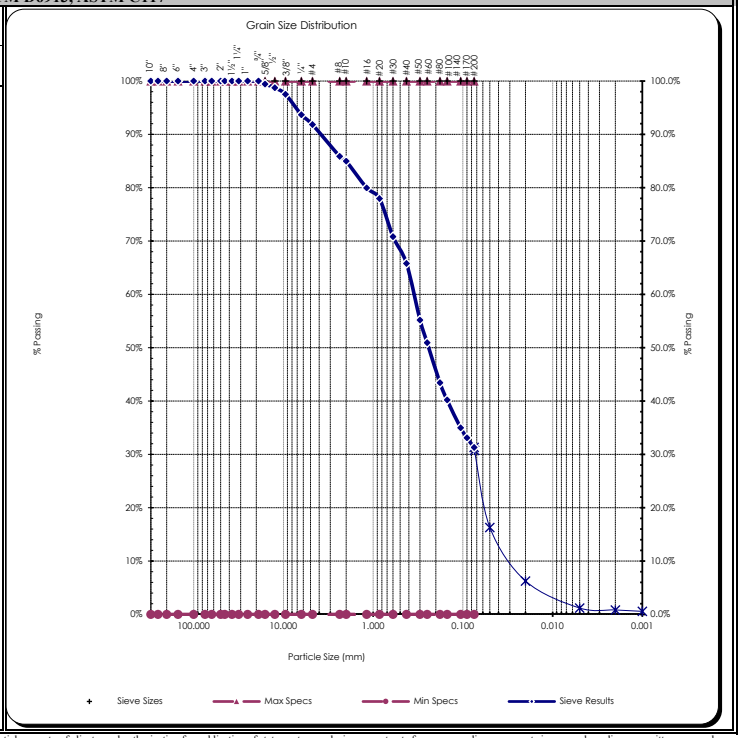

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Comments:

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

MATERIALS TESTING & CONSULTING, INC.

Client:	Analytical Resources, Inc.	**Date:**	August 3, 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 #:**	B21-1158-1163
Revised on:		**Date sampled:**	7-14-21 through 7-22-21

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-SC680, 21G0156-24A
Sample#: B21-1158

Date Received: 27-Jul-21
Sampled By: Client
Date Tested: 28-Jul-21
Tested By: C. Kriss

Unified Soil Classification System, ASTM-2487
SP, Poorly graded Sand
Sample Color:
brown

ACCREDITED
Certificate #: 1366.01

ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281

Specifications
No Specs
Sample Meets Specs ? N/A

$D_{(5)}$ =	0.200	mm	% Gravel =	0.9%	Coeff. of Curvature, C_C = 1.00
$D_{(10)}$ =	0.356	mm	% Sand =	94.9%	Coeff. of Uniformity, C_U = 2.80
$D_{(15)}$ =	0.445	mm	% Silt & Clay =	4.3%	Fineness Modulus = 2.98
$D_{(30)}$ =	0.597	mm	Liquid Limit =	n/a	Plastic Limit = n/a
$D_{(50)}$ =	0.799	mm	Plasticity Index =	n/a	Moisture %, as sampled = n/a
$D_{(60)}$ =	0.997	mm	Sand Equivalent =	n/a	Req'd Sand Equivalent =
$D_{(90)}$ =	1.882	mm	Fracture %, 1 Face =	n/a	Req'd Fracture %, 1 Face =
Dust Ratio =	18/55		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	100%	100%	100.0%	0.0%
1/4"	6.30		99%	100.0%	0.0%
#4	4.75	99%	99%	100.0%	0.0%
#8	2.36		95%	100.0%	0.0%
#10	2.00	94%	94%	100.0%	0.0%
#16	1.18		66%	100.0%	0.0%
#20	0.850	55%	55%	100.0%	0.0%
#30	0.600		30%	100.0%	0.0%
#40	0.425	13%	13%	100.0%	0.0%
#50	0.300		8%	100.0%	0.0%
#60	0.250	5%	5%	100.0%	0.0%
#80	0.180		5%	100.0%	0.0%
#100	0.150	5%	5%	100.0%	0.0%
#140	0.106		4%	100.0%	0.0%
#170	0.090		4%	100.0%	0.0%
#200	0.075	4.3%	4.3%	100.0%	0.0%

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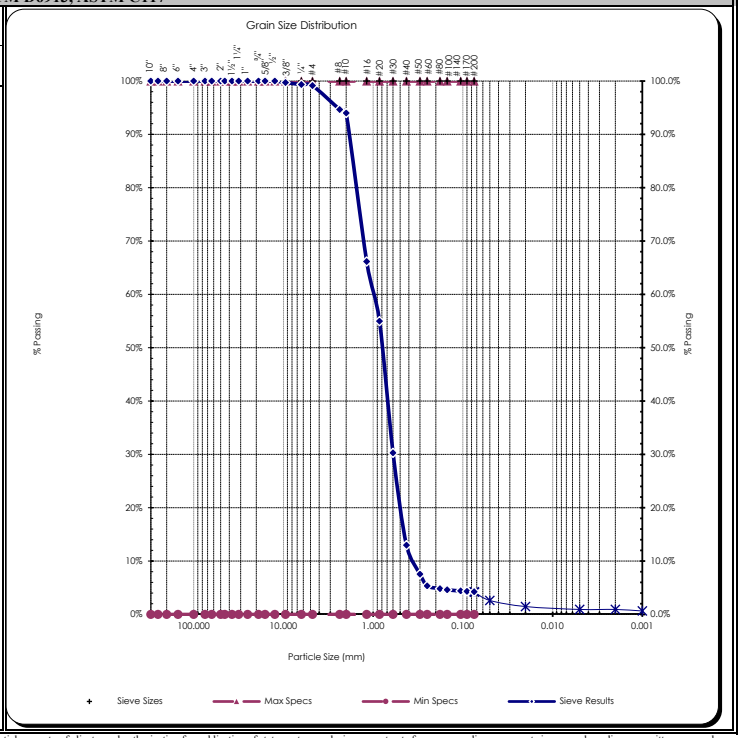

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Comments:

Reviewed by:
Meghan Blodgett-Carrillo

MATERIALS TESTING & CONSULTING, INC.

Hydrometer Report

Project:	Q.C. - Duwamish AOC4 - 190067-02.02	**Date Received:**	27-Jul-21
Project #:	21B218-02	**Sampled By:**	Client
Client :	Analytical Resources, Inc.	**Date Tested:**	28-Jul-21
Source:	LDW21-SC680, 21G0156-24A	**Tested By:**	C. Kriss
Sample#:	B21-1158		

Unified Soil Classification System, ASTM-2487
SP, Poorly graded Sand
Sample Color
brown

ASTM D422, HYDROMETER ANALYSIS

Assumed Sp Gr :	2.65	
Sample Weight:	100.01	grams
Hydroscopic Moist.:	0.64%	
Adj. Sample Wgt :	99.37	grams

ACCREDITED
Certificate #: 1366.01

Hydrometer Reading Minutes	Corrected Reading	Percent Passing	Soils Particle Diameter
2	2	1.9%	0.0386 mm
5	2	1.9%	0.0244 mm
15	1	0.9%	0.0141 mm
30	1	0.9%	0.0100 mm
60	1	0.9%	0.0071 mm
250	1	0.9%	0.0035 mm
1440	1	0.9%	0.0014 mm

% Gravel:	0.9%	**Liquid Limit:**	n/a
% Sand:	94.9%	**Plastic Limit:**	n/a
% Silt:	3.3%	**Plasticity Index:**	n/a
% Clay:	0.9%		

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"	100%	16.000 mm
1/2"	100%	12.500 mm
3/8"	100%	9.500 mm
1/4"	99%	6.300 mm
#4	99%	4.750 mm
#10	94%	2.000 mm
#20	55%	0.850 mm
#40	13%	0.425 mm
#100	5%	0.150 mm
#200	4.3%	0.075 mm
Silts	4.2%	0.074 mm
	2.6%	0.050 mm
	1.5%	0.020 mm
Clays	0.9%	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
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-IT685, 21G0156-13A
Sample#: B21-1159

Date Received: 27-Jul-21
Sampled By: Client
Date Tested: 28-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 =	4.2%	Coeff. of Curvature, C_C = 3.25
$D_{(10)}$ =	0.009	mm	% Sand =	67.6%	Coeff. of Uniformity, C_U = 26.99
$D_{(15)}$ =	0.023	mm	% Silt & Clay =	28.2%	Fineness Modulus = 1.28
$D_{(30)}$ =	0.084	mm	Liquid Limit =	n/a	Plastic Limit = n/a
$D_{(50)}$ =	0.188	mm	Plasticity Index =	n/a	Moisture %, as sampled = n/a
$D_{(60)}$ =	0.243	mm	Sand Equivalent =	n/a	Req'd Sand Equivalent =
$D_{(90)}$ =	0.836	mm	Fracture %, 1 Face =	n/a	Req'd Fracture %, 1 Face =
Dust Ratio =	6/17		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		67%	100.0%	0.0%
#60	0.250	61%	61%	100.0%	0.0%
#80	0.180		48%	100.0%	0.0%
#100	0.150	43%	43%	100.0%	0.0%
#140	0.106		34%	100.0%	0.0%
#170	0.090		31%	100.0%	0.0%
#200	0.075	28.2%	28.2%	100.0%	0.0%

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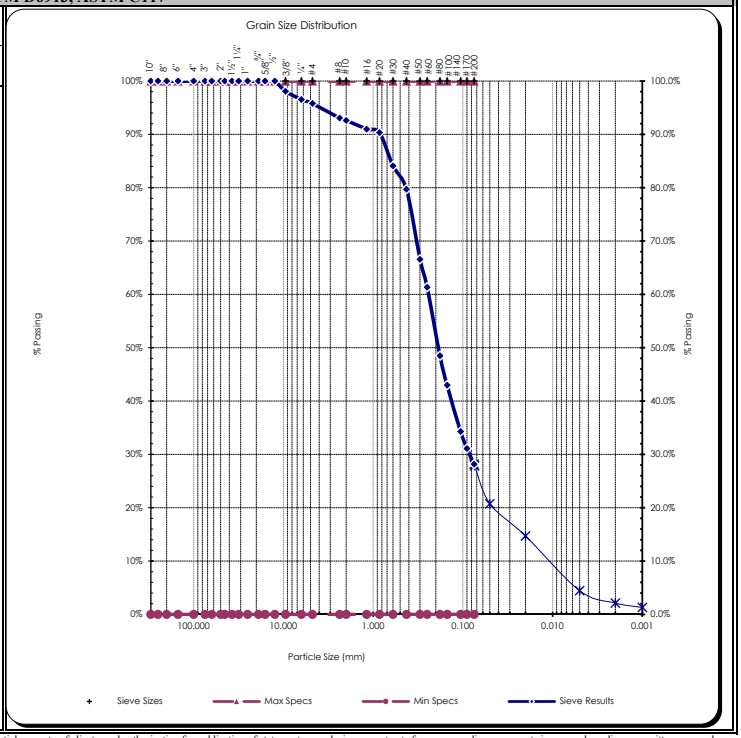

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Comments:

Reviewed by:
Meghan Blodgett-Carrillo

MATERIALS TESTING & CONSULTING, INC.

Hydrometer Report

Project:	Q.C. - Duwamish AOC4 - 190067-02.02	**Date Received:**	27-Jul-21
Project #:	21B218-02	**Sampled By:**	Client
Client :	Analytical Resources, Inc.	**Date Tested:**	28-Jul-21
Source:	LDW21-IT685, 21G0156-13A	**Tested By:**	C. Kriss
Sample#:	B21-1159		

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

ASTM D422, HYDROMETER ANALYSIS

Assumed Sp Gr :	2.65	
Sample Weight:	50.18	grams
Hydroscopic Moist.:	1.98%	
Adj. Sample Wgt :	49.21	grams

ACCREDITED
Certificate #: 1366.01

Hydrometer Reading Minutes	Corrected Reading	Percent Passing	Soils Particle Diameter
2	9	16.9%	0.0371 mm
5	8	15.1%	0.0236 mm
15	7.5	14.1%	0.0137 mm
30	6	11.3%	0.0097 mm
60	3.5	6.6%	0.0070 mm
250	1.5	2.8%	0.0035 mm
1440	1	1.9%	0.0014 mm

% Gravel:	4.2%	**Liquid Limit:**	n/a
% Sand:	67.6%	**Plastic Limit:**	n/a
% Silt:	23.7%	**Plasticity Index:**	n/a
% Clay:	4.5%		

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	43%	0.150 mm
#200	28.2%	0.075 mm
Silts	27.9%	0.074 mm
	20.8%	0.050 mm
	14.7%	0.020 mm
Clays	4.5%	0.005 mm
	2.1%	0.002 mm
Colloids	1.3%	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-SS687, 21G0286-01A
Sample#: B21-1160

Date Received: 27-Jul-21
Sampled By: Client
Date Tested: 28-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 = 7.5%	Coeff. of Curvature, C_C = 1.70
$D_{(10)}$ = 0.009	mm	% Sand = 46.0%	Coeff. of Uniformity, C_U = 21.76
$D_{(15)}$ = 0.039	mm	% Silt & Clay = 46.5%	Fineness Modulus = 1.36
$D_{(30)}$ = 0.056	mm	Liquid Limit = n/a	Plastic Limit = n/a
$D_{(50)}$ = 0.104	mm	Plasticity Index = n/a	Moisture %, as sampled = n/a
$D_{(60)}$ = 0.201	mm	Sand Equivalent = n/a	Req'd Sand Equivalent =
$D_{(90)}$ = 3.552	mm	Fracture %, 1 Face = n/a	Req'd Fracture %, 1 Face =
Dust Ratio = 13/21		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		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		94%	100.0%	0.0%
#4	4.75	93%	93%	100.0%	0.0%
#8	2.36		88%	100.0%	0.0%
#10	2.00	87%	87%	100.0%	0.0%
#16	1.18		84%	100.0%	0.0%
#20	0.850	83%	83%	100.0%	0.0%
#30	0.600		78%	100.0%	0.0%
#40	0.425	75%	75%	100.0%	0.0%
#50	0.300		67%	100.0%	0.0%
#60	0.250	64%	64%	100.0%	0.0%
#80	0.180		58%	100.0%	0.0%
#100	0.150	55%	55%	100.0%	0.0%
#140	0.106		50%	100.0%	0.0%
#170	0.090		48%	100.0%	0.0%
#200	0.075	46.5%	46.5%	100.0%	0.0%

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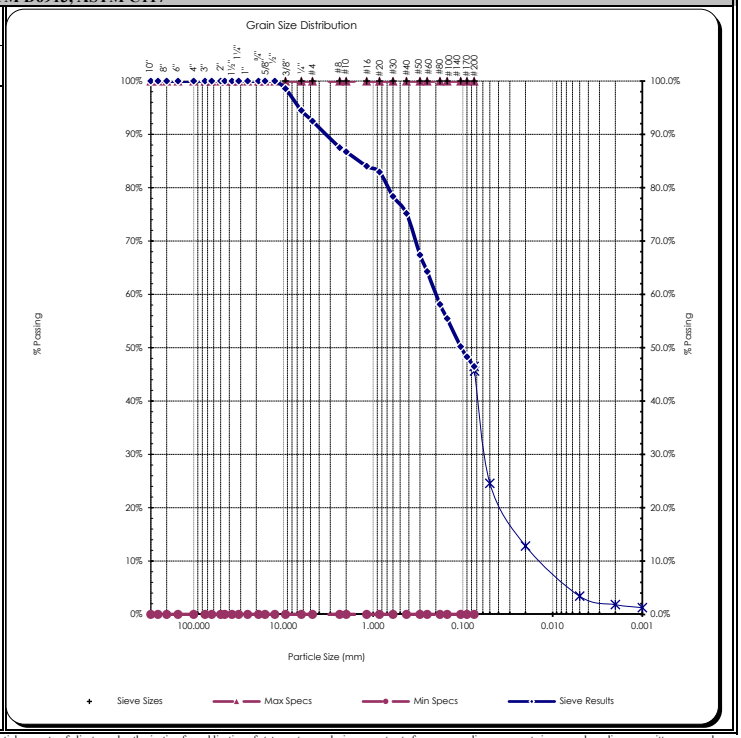

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Comments:

Reviewed by:
Meghan Blodgett-Carrillo

MATERIALS TESTING & CONSULTING, INC.

Hydrometer Report

Project:	Q.C. - Duwamish AOC4 - 190067-02.02	**Date Received:**	27-Jul-21
Project #:	21B218-02	**Sampled By:**	Client
Client :	Analytical Resources, Inc.	**Date Tested:**	28-Jul-21
Source:	LDW21-SS687, 21G0286-01A	**Tested By:**	C. Kriss
Sample#:	B21-1160		

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

ASTM D422, HYDROMETER ANALYSIS

Assumed Sp Gr :	2.65	
Sample Weight:	50.24	grams
Hydroscopic Moist.:	6.25%	
Adj. Sample Wgt :	47.28	grams

ACCREDITED
Certificate #: 1366.01

Hydrometer Reading Minutes	Corrected Reading	Percent Passing	Soils Particle Diameter
2	7.5	13.8%	0.0376 mm
5	7	12.8%	0.0238 mm
15	7	12.8%	0.0137 mm
30	6	11.0%	0.0097 mm
60	3	5.5%	0.0070 mm
250	1	1.8%	0.0035 mm
1440	1	1.8%	0.0014 mm

% Gravel:	7.5%	**Liquid Limit:**	n/a
% Sand:	46.0%	**Plastic Limit:**	n/a
% Silt:	43.1%	**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"	94%	6.300 mm
#4	93%	4.750 mm
#10	87%	2.000 mm
#20	83%	0.850 mm
#40	75%	0.425 mm
#100	55%	0.150 mm
#200	46.5%	0.075 mm
Silts	45.6%	0.074 mm
	24.6%	0.050 mm
	12.8%	0.020 mm
Clays	3.4%	0.005 mm
	1.8%	0.002 mm
Colloids	1.3%	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
Sandy Loam

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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-SS690, 21G0269-09A Triplicate #1
Sample#: B21-1161

Date Received: 27-Jul-21
Sampled By: Client
Date Tested: 28-Jul-21
Tested By: C. Kriss

Visual Identification
Sandy Silt
Sample Color:
brown

ACCREDITED
Certificate #: 1366.01

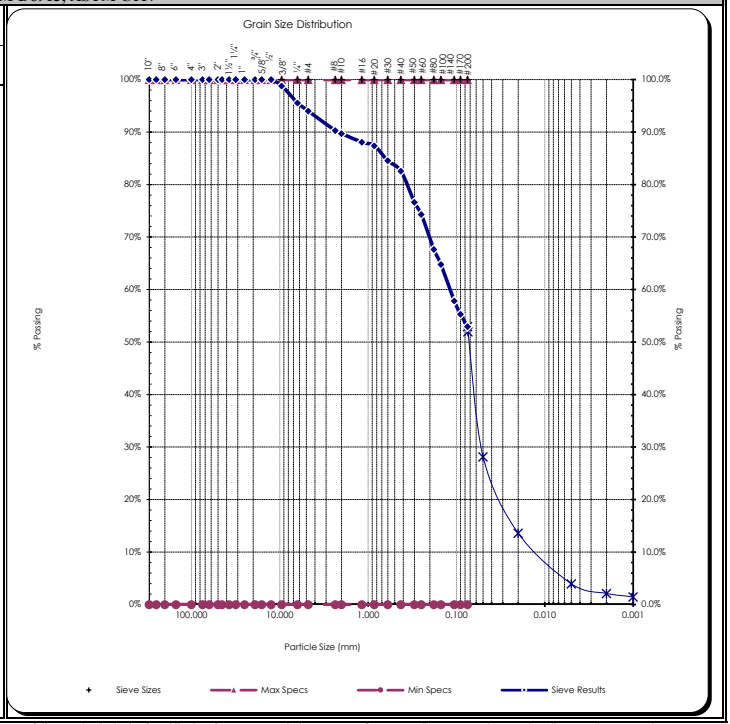
ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281

Specifications
No Specs
Sample Meets Specs ? N/A

$D_{(5)}$ = 0.006	mm	% Gravel = 6.0%	Coeff. of Curvature, C_C = 2.38
$D_{(10)}$ = 0.009	mm	% Sand = 41.1%	Coeff. of Uniformity, C_U = 12.69
$D_{(15)}$ = 0.026	mm	% Silt & Clay = 52.9%	Fineness Modulus = 1.03
$D_{(30)}$ = 0.052	mm	Liquid Limit = n/a	Plastic Limit = n/a
$D_{(50)}$ = 0.072	mm	Plasticity Index = n/a	Moisture %, as sampled = n/a
$D_{(60)}$ = 0.120	mm	Sand Equivalent = n/a	Req'd Sand Equivalent =
$D_{(90)}$ = 2.175	mm	Fracture %, 1 Face = n/a	Req'd Fracture %, 1 Face =
Dust Ratio = 59/92		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		96%	100.0%	0.0%
#4	4.75	94%	94%	100.0%	0.0%
#8	2.36		90%	100.0%	0.0%
#10	2.00	90%	90%	100.0%	0.0%
#16	1.18		88%	100.0%	0.0%
#20	0.850	87%	87%	100.0%	0.0%
#30	0.600		85%	100.0%	0.0%
#40	0.425	83%	83%	100.0%	0.0%
#50	0.300		77%	100.0%	0.0%
#60	0.250	74%	74%	100.0%	0.0%
#80	0.180		68%	100.0%	0.0%
#100	0.150	65%	65%	100.0%	0.0%
#140	0.106		58%	100.0%	0.0%
#170	0.090		55%	100.0%	0.0%
#200	0.075	52.9%	52.9%	100.0%	0.0%



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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:**	27-Jul-21
Project #:	21B218-02	**Sampled By:**	Client
Client :	Analytical Resources, Inc.	**Date Tested:**	28-Jul-21
Source:	LDW21-SS690, 21G0269-09A Triplicate #1	**Tested By:**	C. Kriss
Sample#:	B21-1161		

Visual Identification
Sandy Silt
Sample Color
brown

ASTM D422, HYDROMETER ANALYSIS

Assumed Sp Gr :	2.65	
Sample Weight:	50.08	grams
Hydroscopic Moist.:	18.00%	
Adj. Sample Wgt :	42.44	grams

ACCREDITED
Certificate #: 1366.01

Hydrometer Reading Minutes	Corrected Reading	Percent Passing	Soils Particle Diameter
2	7.5	15.9%	0.0376 mm
5	7	14.8%	0.0238 mm
15	5.5	11.6%	0.0139 mm
30	5	10.6%	0.0098 mm
60	3	6.3%	0.0070 mm
250	1	2.1%	0.0035 mm
1440	1	2.1%	0.0014 mm

% Gravel:	6.0%	**Liquid Limit:**	n/a
% Sand:	41.1%	**Plastic Limit:**	n/a
% Silt:	49.0%	**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"	100%	16.000 mm
1/2"	100%	12.500 mm
3/8"	99%	9.500 mm
1/4"	96%	6.300 mm
#4	94%	4.750 mm
#10	90%	2.000 mm
#20	87%	0.850 mm
#40	83%	0.425 mm
#100	65%	0.150 mm
#200	52.9%	0.075 mm
Silts	51.9%	0.074 mm
	28.1%	0.050 mm
	13.6%	0.020 mm
Clays	3.9%	0.005 mm
	2.1%	0.002 mm
Colloids	1.5%	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
Sandy Loam

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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-SS690, 21G0269-09A Triplicate #2
Sample#: B21-1162

Date Received: 27-Jul-21
Sampled By: Client
Date Tested: 28-Jul-21
Tested By: C. Kriss

Visual Identification
Sandy Silt
Sample Color:
brown

ACCREDITED
Certificate #: 1366.01

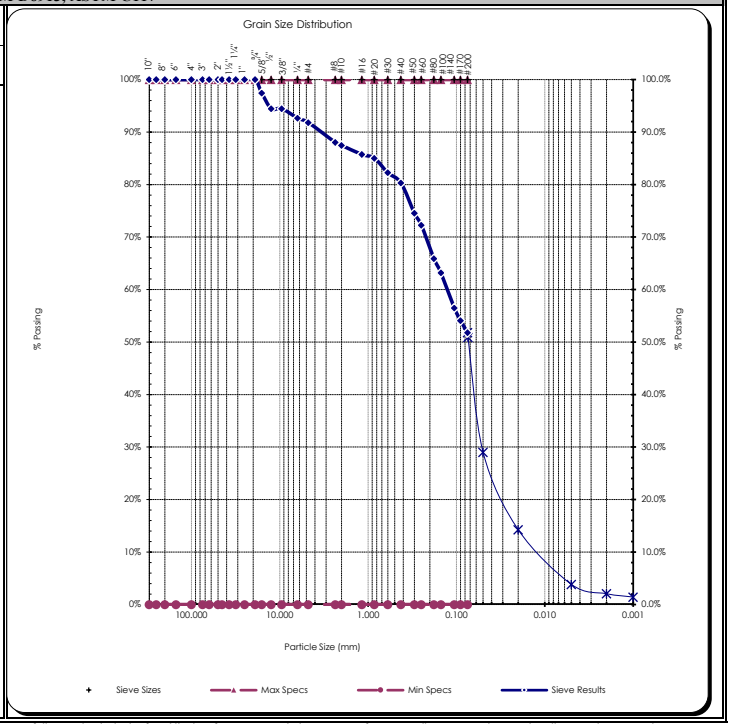
ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281

Specifications
No Specs
Sample Meets Specs ? N/A

$D_{(5)}$ = 0.006	mm	% Gravel = 8.2%	Coeff. of Curvature, C_C = 2.22
$D_{(10)}$ = 0.009	mm	% Sand = 40.0%	Coeff. of Uniformity, C_U = 14.19
$D_{(15)}$ = 0.022	mm	% Silt & Clay = 51.8%	Fineness Modulus = 1.20
$D_{(30)}$ = 0.051	mm	Liquid Limit = n/a	Plastic Limit = n/a
$D_{(50)}$ = 0.073	mm	Plasticity Index = n/a	Moisture %, as sampled = n/a
$D_{(60)}$ = 0.129	mm	Sand Equivalent = n/a	Req'd Sand Equivalent =
$D_{(90)}$ = 3.602	mm	Fracture %, 1 Face = n/a	Req'd Fracture %, 1 Face =
Dust Ratio = 20/31		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	94%	94%	100.0%	0.0%
3/8"	9.50	94%	94%	100.0%	0.0%
1/4"	6.30		93%	100.0%	0.0%
#4	4.75	92%	92%	100.0%	0.0%
#8	2.36		88%	100.0%	0.0%
#10	2.00	87%	87%	100.0%	0.0%
#16	1.18		86%	100.0%	0.0%
#20	0.850	85%	85%	100.0%	0.0%
#30	0.600		82%	100.0%	0.0%
#40	0.425	80%	80%	100.0%	0.0%
#50	0.300		75%	100.0%	0.0%
#60	0.250	72%	72%	100.0%	0.0%
#80	0.180		66%	100.0%	0.0%
#100	0.150	63%	63%	100.0%	0.0%
#140	0.106		57%	100.0%	0.0%
#170	0.090		54%	100.0%	0.0%
#200	0.075	51.8%	51.8%	100.0%	0.0%



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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:**	27-Jul-21
Project #:	21B218-02	**Sampled By:**	Client
Client :	Analytical Resources, Inc.	**Date Tested:**	28-Jul-21
Source:	LDW21-SS690, 21G0269-09A Triplicate #2	**Tested By:**	C. Kriss
Sample#:	B21-1162		

Visual Identification
Sandy Silt
Sample Color
brown

ASTM D422, HYDROMETER ANALYSIS

Assumed Sp Gr :	2.65	
Sample Weight:	50.05	grams
Hydroscopic Moist.:	17.65%	
Adj. Sample Wgt :	42.54	grams

ACCREDITED
Certificate #: 1366.01

Hydrometer Reading Minutes	Corrected Reading	Percent Passing	Soils Particle Diameter
2	8.5	17.5%	0.0374 mm
5	7.5	15.4%	0.0238 mm
15	6	12.3%	0.0138 mm
30	5.5	11.3%	0.0098 mm
60	3	6.2%	0.0070 mm
250	1	2.1%	0.0035 mm
1440	1	2.1%	0.0014 mm

% Gravel:	8.2%	**Liquid Limit:**	n/a
% Sand:	40.0%	**Plastic Limit:**	n/a
% Silt:	48.0%	**Plasticity Index:**	n/a
% Clay:	3.8%		

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"	97%	16.000 mm
1/2"	94%	12.500 mm
3/8"	94%	9.500 mm
1/4"	93%	6.300 mm
#4	92%	4.750 mm
#10	87%	2.000 mm
#20	85%	0.850 mm
#40	80%	0.425 mm
#100	63%	0.150 mm
#200	51.8%	0.075 mm
Silts	50.9%	0.074 mm
	29.0%	0.050 mm
	14.3%	0.020 mm
Clays	3.8%	0.005 mm
	2.1%	0.002 mm
Colloids	1.4%	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
Sandy Loam

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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-SS690, 21G0269-09A Triplicate #3
Sample#: B21-1163

Date Received: 27-Jul-21
Sampled By: Client
Date Tested: 28-Jul-21
Tested By: C. Kriss

Visual Identification
Sandy Silt
Sample Color:
brown

ACCREDITED
Certificate #: 1366.01

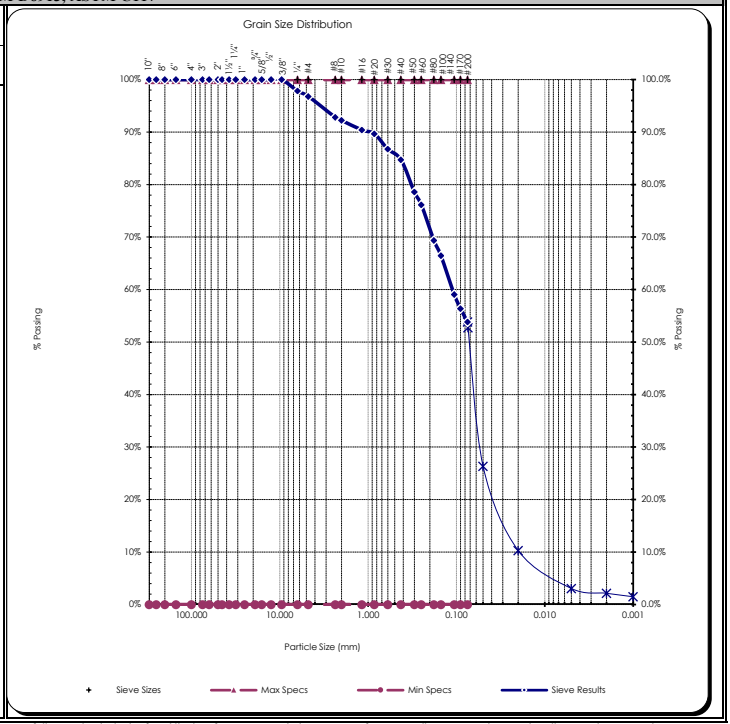
ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281

Specifications
No Specs
Sample Meets Specs ? N/A

$D_{(5)}$ = 0.008	mm	% Gravel = 3.2%	Coeff. of Curvature, C_C = 1.46
$D_{(10)}$ = 0.017	mm	% Sand = 43.0%	Coeff. of Uniformity, C_U = 6.41
$D_{(15)}$ = 0.040	mm	% Silt & Clay = 53.8%	Fineness Modulus = 0.88
$D_{(30)}$ = 0.053	mm	Liquid Limit = n/a	Plastic Limit = n/a
$D_{(50)}$ = 0.072	mm	Plasticity Index = n/a	Moisture %, as sampled = n/a
$D_{(60)}$ = 0.112	mm	Sand Equivalent = n/a	Req'd Sand Equivalent =
$D_{(90)}$ = 0.999	mm	Fracture %, 1 Face = n/a	Req'd Fracture %, 1 Face =
Dust Ratio = 61/96		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	100%	100%	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		93%	100.0%	0.0%
#10	2.00	92%	92%	100.0%	0.0%
#16	1.18		90%	100.0%	0.0%
#20	0.850	90%	90%	100.0%	0.0%
#30	0.600		87%	100.0%	0.0%
#40	0.425	85%	85%	100.0%	0.0%
#50	0.300		79%	100.0%	0.0%
#60	0.250	76%	76%	100.0%	0.0%
#80	0.180		69%	100.0%	0.0%
#100	0.150	66%	66%	100.0%	0.0%
#140	0.106		59%	100.0%	0.0%
#170	0.090		56%	100.0%	0.0%
#200	0.075	53.8%	53.8%	100.0%	0.0%



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Comments:

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MATERIALS TESTING & CONSULTING, INC.

Hydrometer Report

Project:	Q.C. - Duwamish AOC4 - 190067-02.02	**Date Received:**	27-Jul-21
Project #:	21B218-02	**Sampled By:**	Client
Client :	Analytical Resources, Inc.	**Date Tested:**	28-Jul-21
Source:	LDW21-SS690, 21G0269-09A Triplicate #3	**Tested By:**	C. Kriss
Sample#:	B21-1163		

Visual Identification
Sandy Silt
Sample Color
brown

ASTM D422, HYDROMETER ANALYSIS

Assumed Sp Gr :	2.65	
Sample Weight:	50.45	grams
Hydroscopic Moist.:	17.05%	
Adj. Sample Wgt :	43.10	grams

ACCREDITED
Certificate #: 1366.01

Hydrometer Reading Minutes	Corrected Reading	Percent Passing	Soils Particle Diameter
2	6	12.8%	0.0378 mm
5	5	10.7%	0.0240 mm
15	4.5	9.6%	0.0139 mm
30	3	6.4%	0.0099 mm
60	2	4.3%	0.0070 mm
250	1	2.1%	0.0035 mm
1440	1	2.1%	0.0014 mm

% Gravel:	3.2%	**Liquid Limit:**	n/a
% Sand:	43.0%	**Plastic Limit:**	n/a
% Silt:	50.8%	**Plasticity Index:**	n/a
% Clay:	3.1%		

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"	100%	9.500 mm
1/4"	98%	6.300 mm
#4	97%	4.750 mm
#10	92%	2.000 mm
#20	90%	0.850 mm
#40	85%	0.425 mm
#100	66%	0.150 mm
#200	53.8%	0.075 mm
Silts	52.7%	0.074 mm
	26.3%	0.050 mm
	10.3%	0.020 mm
Clays	3.1%	0.005 mm
	2.1%	0.002 mm
Colloids	1.5%	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

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