

GROUND

ENGINEERING

February 22, 2023

Subject: Laboratory Testing Services,
Allied Recycled Aggregates, Concrete
Aggregate Base

Job No. 23-1041

Mr. Gary Hansen
Allied Recycled Aggregates
P.O. Box 566
Commerce City, Colorado 80037

Dear Mr. Hansen,

A representative of Allied Recycled Aggregates delivered five buckets of recycled concrete materials to GROUND's Commerce City laboratory on February 10, 2023. As requested, the following tests were performed on the submitted sample. All tests were completed in general accordance with the listed standards:

- Atterberg Limits (AASHTO T89 and T90)
- Modified Proctor AASHTO T180, Method D)
- Sieve Analysis (ASTM C136 / AASHTO T27)
- R-Value (AASHTO T190 / CP-L 3101)
- Los Angeles Abrasion – Small Size (ASTM C131 / AASHTO T96)

A summary of the test results is provided herein as well as the individual test results. Based on these test results, the sample meets the specifications for CDOT Class 6 and Aurora Type 2 Aggregate Base Courses.

If you have any questions regarding this data, please do not hesitate to contact GROUND's Commerce City office.

GROUND Engineering Consultants, Inc.

Sincerely,

Evan Kuhn
Laboratory Supervisor

Brian H. Reck, P.G., C.E.G., P.E.

Ground ID: Soil14997
 Client Project: C6-2/10/2023
 Client Location: 4082
 Sample Received: February 10, 2023 Description: Recycled Concrete Aggregate Base

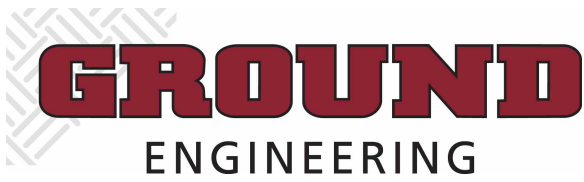
Sieve Analysis Summary:

Sieve	Cumulative Passing (%)	CDOT Class 6	Aurora Type 2
1 in	100	100	100
3/4 in	100	95-100	--
1/2 in	89	--	--
3/8 in	79	--	50-85
No.4	63	30-65	35-65
No. 8	52	25-55	--
No. 10	49	--	25-50
No. 16	41	--	--
No. 30	31	--	--
No. 40	26	--	15-30
No. 50	21	--	--
No. 100	13	--	--
No. 200	8.4	3-12	3-15

Summary of Atterberg Limits (Liquid Limit and Plasticity Index), Modified Proctor (Maximum Dry Density and Optimum Moisture), LA Abrasion (Loss by Abrasion), and R-Value Tests:

Test	Result	CDOT Class 6	Aurora Type 2
Liquid Limit	No Value	30 max.	25 max.
Plasticity Index	Non-plastic	6 max.	15 max.
Max. Dry Density (pcf)	117.3	--	--
Opt. Moisture (%)	12.4	--	--
Loss by Abrasion (%)	38	50 max.	45 max.
R-Value	80	--	78 min.

Individual test results are attached.



Client: Gary Hansen
Allied Recycled Aggregates
7901 Hwy 85
P.O. Box 566
Commerce City, CO 80037

Allied Recycled Aggregates Lab testing Services

Report Date: Feb 10, 2023

Work Order No.: 23-1041.SoilSampling.0001; ver:

Work Order Date: Feb 10, 2023

Reviewed by:

Soil/Aggregate Laboratory Summary

General Location: Proposed CDOT Class 6 Aggregate Base Course

Logged-in by: Evan Kuhn

Results apply only to the specific items and locations referenced and at the time of testing, observations or special inspections. Unless noted otherwise, samples were received in adequate condition. This report should not be reproduced, except in full, without the written permission of GROUND Engineering Consultants, Inc.

41 Inverness Drive East, Englewood, Colorado

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303-289-1989

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Allied Recycled Aggregates Lab testing Services

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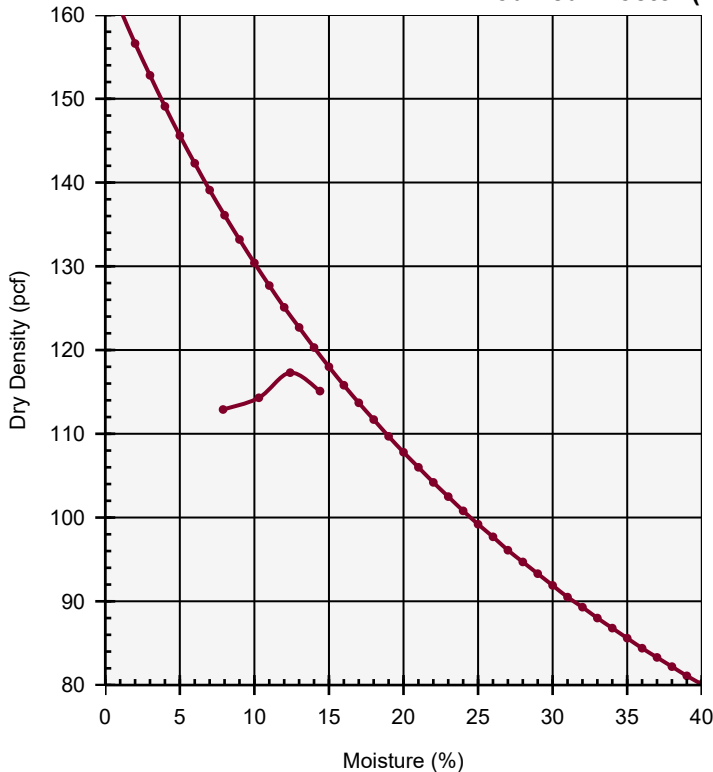
Soil/Aggregate Laboratory Summary

Sample No.: 1
Dropped Off By: Client *Sampling may not be in accordance with reported method.
Sampling Method: ASTM D75 / AASHTO T2 / CDOT CP30
Sample Location: Proposed CDOT Class 6 Aggregate Base Course
Lab ID: Soil14997

Atterberg Limits (AASHTO T89 & T90) and Classification (ASTM D2487 & AASHTO M145)

Method	Liquid Limit		Plastic Limit		Plasticity Index		Classification	
	Value	Spec.	Value	Spec.	Value	Spec.	USCS	AASHTO
Single Point	-	30 max.	NP	-	NP	6 max.	(SP-SM)g	A-1-a (0)

Modified Proctor (AASHTO T180)



Method	Preparation	Hammer
Method D	Moist Preparation	Manual

Maximum Dry Density (pcf)	Optimum Moisture (%)	Oversize Corrected	
		Maximum Dry Density (pcf)	Optimum Moisture (%)
117.3	12.4	-	-

Oversize Sieve: 3/4 in
Coarse Fraction (%): -
Fine Fraction (%): -
Coarse Specific Gravity: -
Coarse Absorption (%): -
Fine Specific Gravity: Estimated 2.65

No. 200 Wash (ASTM C117 / AASHTO T11)

Method	Passing No. 200 (%)	
	Value	Specified
Procedure A - Plain Water	7.4	3 - 12

Total Moisture Content (ASTM C566 / AASHTO T255)

Moisture Content (%)	Absorption (%)	Surface Moisture (%)
10.48	-	-

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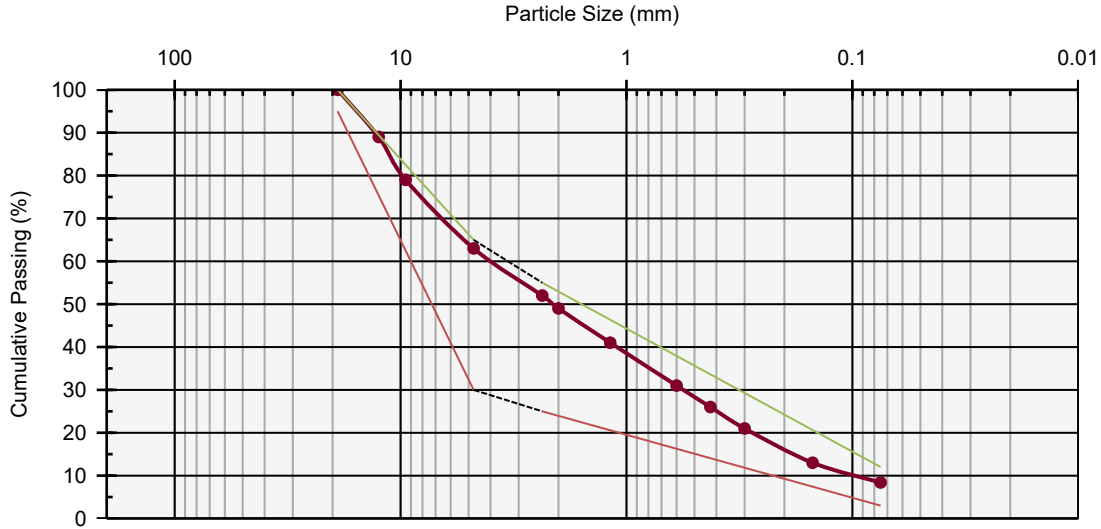
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Soil/Aggregate Laboratory Summary

Aggregate Gradation (ASTM C136 / AASHTO T27)



Coarse Gradation				Fine Gradation			
Sieve Size	Particle Size (mm)	Cumulative Passing (%)	Specified (%)	Sieve Size	Particle Size (mm)	Cumulative Passing (%)	Specified (%)
6 in	150	-	-	No. 4	4.75	63	30 - 65
5 in	125	-	-	No. 8	2.36	52	25 - 55
4 in	100	-	-	No. 10	2.00	49	-
3.5 in	90	-	-	No. 16	1.18	41	-
3 in	75	-	-	No. 20	0.85	-	-
2.5 in	63	-	-	No. 30	0.60	31	-
2 in	50	-	-	No. 40	0.425	26	-
1.5 in	37.5	-	-	No. 50	0.300	21	-
1 in	25.0	-	100 max.	No. 60	0.250	-	-
3/4 in	19.0	100	95 - 100	No. 80	0.180	-	-
1/2 in	12.5	89	-	No. 100	0.150	13	-
3/8 in	9.5	79	-	No. 140	0.090	-	-
No. 4	4.75	63	30 - 65	No. 200	0.075	8.4	3 - 12

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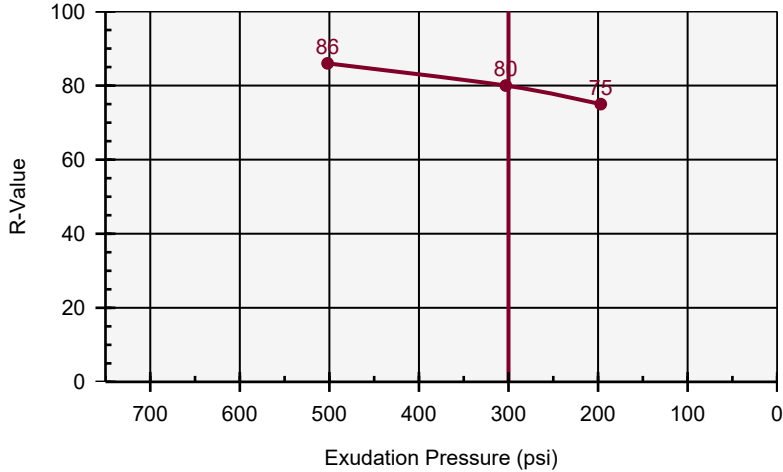
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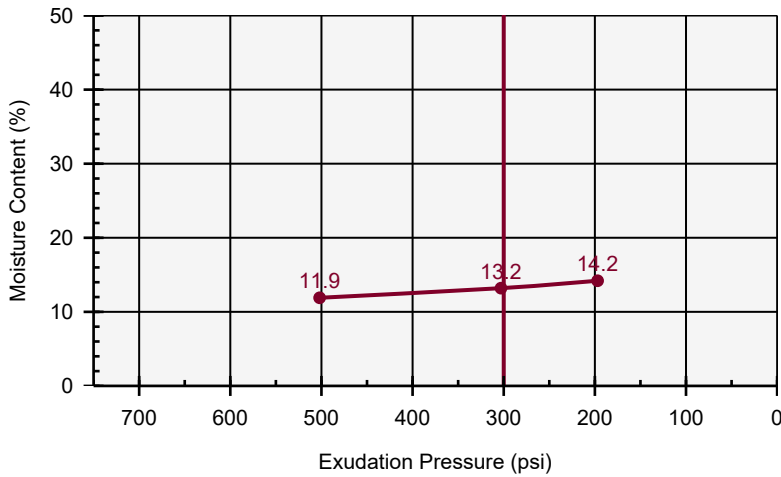
Soil/Aggregate Laboratory Summary

R-Value (CDOT CP-L 3101 / AASHTO T-190)



Test Point	Moisture (%)	Exudation Pressure (psi)	R-Value
1	11.9	502	86
2	13.2	303	80
3	14.2	197	75

R- Value at 300 psi Exudation Pressure	Spec.
80	78 min.



L.A. Abrasion - Small Size (ASTM C131 / AASHTO T96)

Nominal Maximum Size	Grading Used	Loss by Abrasion and Impact (%)	Specified Loss (%)
3/4 in	B	38	-

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