



Kumar & Associates, Inc.®
Geotechnical and Materials Engineers
and Environmental Scientists

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An Employee Owned Company

Office Locations: Denver (HQ), Parker, Colorado Springs, Fort Collins, Glenwood Springs, and Summit County, Colorado

April 9, 2025

Colorado Aggregate Recycling
Attn: Matt Bustamante
8900 Highway 93, Unit A
Golden, Colorado 80403

Subject: Laboratory Test Results, Class 6 Aggregate Base Course/Recycled Concrete,
2024 Colorado Aggregate Recycling, Colorado Springs Pit, Colorado

Project No. 25-1-226

Dear Mr. Bustamante:

Attached are the results of laboratory testing performed on a bulk sample of aggregate submitted to our Denver laboratory by a representative of Colorado Aggregate Recycling. The sample was assigned Kumar & Associates, Inc. (K+A) laboratory sample number 3932. We understand the sample was requested to be tested to evaluate the material's suitability to be classified as CDOT Class 6 aggregate base course (ABC). The sample originated from Colorado Aggregate Recycling's Colorado Springs Pit (South Yard). Laboratory testing was performed to determine the material classification parameters, including Atterberg Limits, gradation, and moisture-density relationships (modified Proctor). R-Value (Hveem-stabilometer) and Los Angeles Abrasion testing were also performed. The results of the testing are summarized in the attached Table and figures. The testing was performed in accordance with the applicable ASTM standard test procedures.

Based on the testing results, the submitted sample meets the gradation and Atterberg limit specifications for Class 6 ABC presented on Table 703-2 in the Colorado Department of Transportation's (CDOT) 2023 *Standard Specifications for Road and Bridge Construction*. The testing indicated the material had an R-value of 79 at an exudation pressure of 300 psi and a 40% loss as evaluated by the Los Angeles Abrasion test.

If you have questions or need further information, please call.

Sincerely,

KUMAR & ASSOCIATES, INC.

Justin Cupich, P.E.



JDC/lis
Attachments
cc: File



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TABLE 1
SUMMARY OF LABORATORY TEST RESULTS
SOUTH YARD

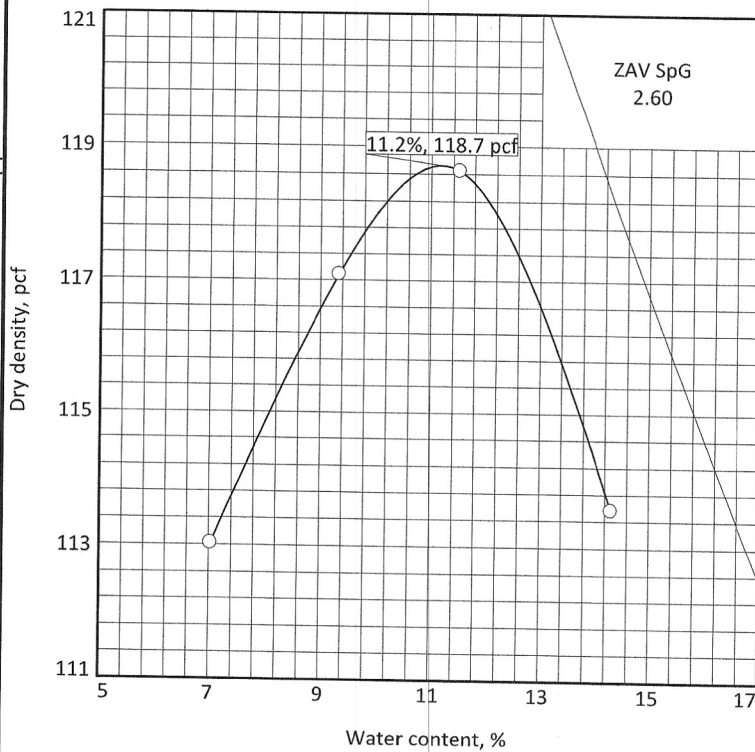
PROJECT NO.: 25-1-226
PROJECT NAME: 2025 COLORADO AGGREGATE RECYCLING LABORATORY TESTING
DATE RECEIVED: 2/28/2025

SAMPLE NO.	DATE TESTED	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE CONTENT (%)	GRADATION		PERCENT PASSING NO. 200 SIEVE	ATTERBERG LIMITS		R-VALUE @ 300 PSI	LOS ANGELES ABRASION (ASTM C-131)		SOIL OR BEDROCK TYPE
				GRAVEL (%)	SAND (%)		LIQUID LIMIT (%)	PLASTICITY INDEX (%)		GRADING	PERCENT LOSS (%)	
3932	3/3/25	118.7	11.2	50	45	5	NV	NP	79	B	40	WELL-GRADED GRAVEL WITH SILT AND SAND ABC CLASS 6 (RECYCLED CONCRETE)

These test results apply only to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of K & A, Inc.

COMPACTION TEST REPORT

Curve No. 3932



Preparation Method _____	
Rammer: Wt.	10 lb.
Drop	18 in.
Type _____ Manual _____	
Layers: No.	five
Blows per	56
Mold Size	0.075 cu. ft.
Test Performed on Material	
Passing	3/4 in.
Sieve	
%>3/4 in.	0
%<No.200	5.1
Atterberg (D 4318): LL	NV
PI	NP
NM (D 2216)	
Sp.G. (D 854)	2.6
USCS (D 2487)	GW-GM
AASHTO (M 145)	A-1-a
Date: Sampled	2/28/25
Received	2/28/25
Tested	3/17/25
Tested By	AS

COMPACTION TESTING DATA
ASTM D 1557-12 Method C Modified

	1	2	3	4	5	6
WM + WS	10595.0	10835.0	10981.0	10896.0		
WM	6474.0	6474.0	6474.0	6474.0		
WW + T #1	626.4	743.5	713.7	792.5		
WD + T #1	599.7	698.8	664.1	717.2		
TARE #1	220.2	220.1	233.4	191.1		
WW + T #2						
WD + T #2						
TARE #2						
MOIST.	7.0	9.3	11.5	14.3		
DRY DENS.	113.0	117.1	118.6	113.6		

SIEVE TEST RESULTS

Opening Size	% Passing	Specs.
1"	100	100
3/4"	100	95-100
1/2"	84	
3/8"	72	
#4	50	30-65
#8	38	25-55
#16	28	
#30	19	
#50	12	
#100	8	
#200	5.1	3-12

TEST RESULTS

Maximum dry density = 118.7 pcf

Optimum moisture = 11.2 %

Project No. 25-1-226 Client: Colorado Aggregate Recycling
Project: Colorado Aggregate Recycling - 2025 Various Laboratory Projects

Location: South Yard Sample Number: 3932

Kumar & Associates, Inc.

Material Description

well-graded gravel with silt and sand
ABC Class 6 (Recycled Concrete)

Remarks:

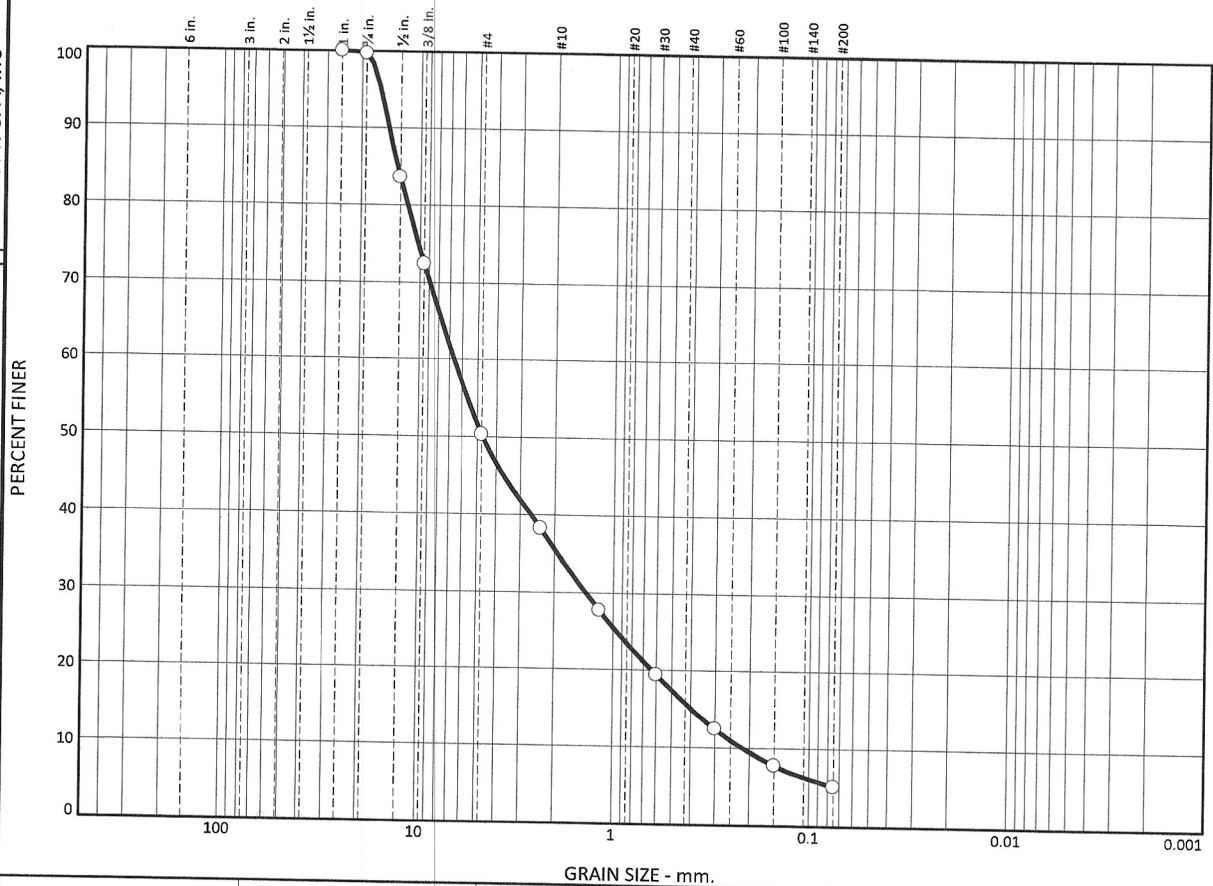
Checked by: JJM

Title: Lab Manager

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Particle Size Distribution Report

ASTM D422



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0	0	50	14	20	11	5	

Test Results (ASTM D422)				
Sieve Size or Diam. (mm.)	Finer (%)	Spec. * (%)	Out of Spec. (%)	Pct. of Fines
1"	100	100		
3/4"	100	95-100		
1/2"	84			
3/8"	72			
#4	50	30-65		76
#8	38	25-55		55
#16	28			39
#30	19			25
#50	12			15
#100	8			10
#200	5.1	3-12		

* CDOT - ABC Class 6

Material Description
well-graded gravel with silt and sand
ABC Class 6 (Recycled Concrete)

Atterberg Limits
PL= NP LL= NV PI= NP

Classification
USCS= GW-GM AASHTO= A-1-a

Test Remarks

Location: South Yard
Sample Number: 3932

Sample Date: 2/28/25

Kumar & Associates, Inc.

Denver, Colorado

Client: Colorado Aggregate Recycling

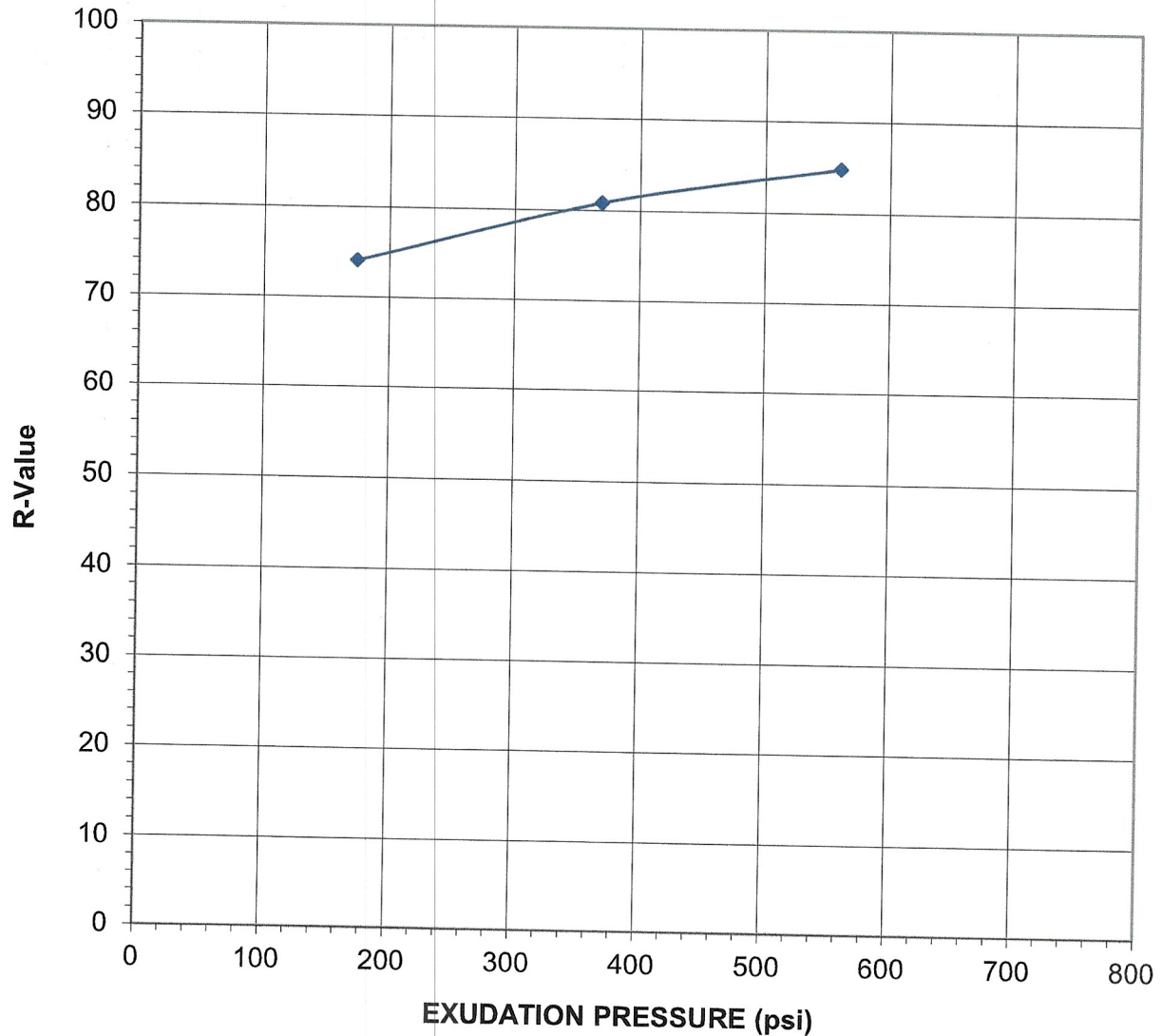
Project: Colorado Aggregate Recycling - 2025 Various Laboratory Projects

Project No: 25-1-226

Figure

R-VALUE

TEST SPECIMEN	1	2	3	4	R-VALUE (300 psi)
MOISTURE CONTENT (%)	13.0	13.8	14.7		79
DENSITY (pcf)	114.9	111.7	109.7		
EXPANSION PRESSURE (psi)	0.000	0.000	0.000		
EXUDATION PRESSURE (psi)	560	370	175		
R-VALUE	85	81	74		



SOIL TYPE: well-graded gravel with silt and sand - ABC Class 6 (Recycled Concrete)

LOCATION: South Yard

DATE SAMPLED: 2/28/25

DATE RECEIVED: 2/28/25

DATE TESTED: 3/3/25

GRAVEL: 50

SAND: 45

SILT AND CLAY: 5

LIQUID LIMIT: NV

PLASTICITY INDEX: NP

These test results apply to the samples which were tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar & Associates, Inc. R-value performed in accordance with ASTM D2844. Atterberg limits performed in accordance with ASTM D4318. Sieve analyses performed in accordance with ASTM D422, D1140

25-1-226

KUMAR & ASSOCIATES

HVEEM STABILOMETER TEST RESULTS

3932