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An Employee Owned Company

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

February 9, 2024

Revised: February 19, 2024

Colorado Aggregate Recycling Attn: Matt Bustamante 8900 Highway 93, Unite 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. 23-1-248

Dear Mr. Bustamante:

Attached are the results of laboratory testing performed on a bulk sample of recycled concrete material submitted to our Denver laboratory by a representative of Colorado Aggregate Recycling. The sample was assigned Kumar & Associates, Inc. (K+A) laboratory sample number 3201. 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. Laboratory testing was performed to determine the material classification parameters, including Atterberg Limits, gradation, and relationships (modified Proctor). R-Value (Hveem-stabilometer) and Los Angles Abrasion testing was also performed. The results of the testing are summarized in the attached Table and figures.

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) 2021 Standard Specifications for Road and Bridge Construction. The testing indicated the material had an R-value of 80 at an exudation pressure of 300 psi and a 40% loss as evaluated by the Los Angles Abrasion test.

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

Sincerely, KUMAR & ASSOCIATES, INC.

Justin Cupich, P.E.

JDC/mm Attachments cc: File





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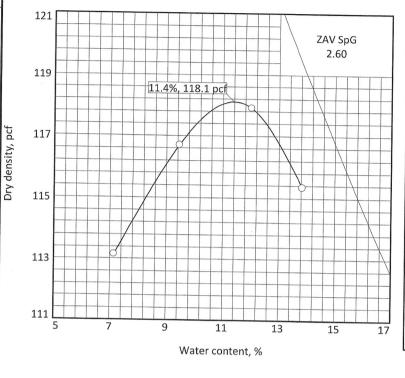
Office Locations: Denver (HQ), Parker, Colorado Springs, Fort Collins, Glenwood Springs and Summit County, Colorado

SUMMARY OF LABORATORY TEST RESULTS **COLORADO SPRINGS PIT** TABLE 1

PROJECT NO.: 23-1-248
PROJECT NAME: 2023 COLORADO AGGREGATE RECYCLING LABORATORY TESTING
DATE RECEIVED: 12/21/2023

		_	_	_
		SOIL OR BEDROCK TYPE	WELL-GRADED GRAVEL WITH SILT AND SAND (RECYCLED	CONCRETE
SARRACION	PERCENT	R	;	9
LOS ANGELE		GRAUME		20
	R-VALUE @	ann Lai	ć	3
SERG LIMITS	PLASTICITY INDEX	(4)	ş	MF
ATTERE	LIMIT		M	AM
PERCENT	PASSING No. 200 SIEVE		u	>
ATION	SAND (%)		43	2
GRAD	GRAVEL (%)		5	
OPTIMUM	MOISTURE CONTENT (%)		11.4	
	MAXIMUM DRY DENSITY (pcf)		118.1	
	DATE TESTED		1/9/24	
	SAMPLE NO.		3201	
	OPTIMUM GRADATION PERCENT ATTERBERG LIMITS	MAXIMUM GRADATION PERCENT ATTERBERG LIMITS LOS ANGELES ABRASION PASSING LIQUID LIQUID	MAXIMUM MOISTURE GRAVEL SAND NO. 200 LIMIT INDEX R-VALUE PRADING GRADING DATE TESTED (pcf) (%) (%) (%) (%) (%) 300 PSI	MAXIMUM MOISTURE CONTENT CONTENT (%) (%) (%) (%) (%) (%) (%) (%) (%) (%)

COMPACTION TEST REPORT

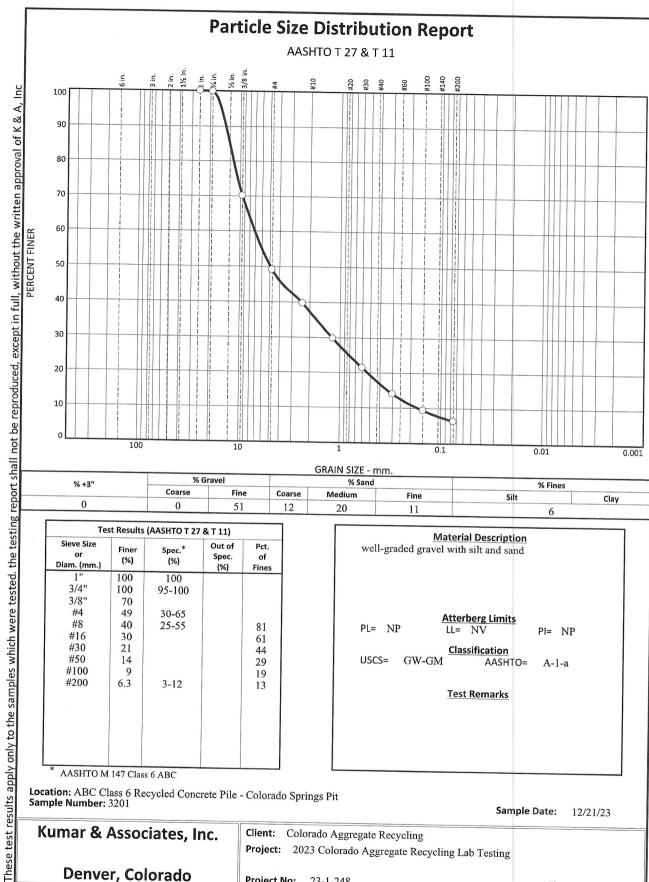


Preparation Method	10 10 10 10 10 10 10 10 10 10 10 10 10 1		
Rammer: Wt.	10 lb. Drop 18 in.		
Туре	Manual		
Layers: Nofi	ve Blows per 56		
Mold Size	0.075 cu. ft.		
Test Performed on I	Material		
Passing3/4			
%>3/4 in. (% <no.2006.3< td=""></no.2006.3<>		
Atterberg (D 4318):	LL NV PI NP		
NM (D 2216)	Sp.G. (D 854) 2.6		
USCS (D 2487)	GW-GM		
AASHTO (M 145)	A-1-a		
Date: Sampled	12/21/23		
Received	12/21/23		
Tested	1/9/24		
Tested By	DS		

SIEVE TEST RESULTS						
Opening Size	% Passing	Specs.				
1"	100	100				
3/4"	100	95-100				
3/8"	70					
#4	49	30-65				
#8	40	25-55				
#16	30					
#30	21					
#50	14					
#100	9					
#200	6.3	3-12				

Figure

								Curv	ve No. 320)1
< >	121									
×						ZAV	SnG			
7						2.6		Preparation Method		
20	119							Rammer: Wt.	10 lb. Drop	18 in.
מממ	2		11.49	%, 118.1 pcf				Туре	Man	ual
מ					*	++A+		Layers: No fir	ve Blows p	er 56
itte								Mold Size	0.075 cu.	ft.
×	Dry density, pcf				+++	++++		Test Performed on N	/aterial	
the	sity							Passing 3/4		
tio	den		+++/			A + A + A + A + A + A + A + A + A + A +				
vith	<u>}</u> 115						+	%>3/4 in0	% <no.2< th=""><th>00 6.3</th></no.2<>	00 6.3
			+ A $+$ $+$					Atterberg (D 4318):		
η tu								NM (D 2216)		
pt ii			4					USCS (D 2487)		
xce	113							AASHTO (M 145)		
d, e	1								12/21/	
nce								Received	12/21/	
rod	111 L	7						Tested	1/9/2	
rep	1	,	9	11	13	15	17	Tested By	DS	
þe				Water con	tent, %					
not										
lall										
t sh					TESTING DATA Nethod D Mod	ified		CIE	/F TEST DES	
oda		1	2	3	4	5	6	Opening Size	WE TEST RESULT % Passing	Specs.
g 75	WM + WS	10613.0	10835.0	10983.0	10957.0			1"	100	100
stin	WM	6478.0	6478.0	6478.0	6478.0			3/4"	100	95-100
e te	WW + T#1	1382.3	1538.1	1276.2	1376.4			3/8" #4	70 49	30-65
th.	WD + T #1	1304.8	1431.1	1159.9	1245.8			#8	40	25-55
ted	TARE #1	220.1	299.9	192.0	302.2			#16		
tes	WW + T #2				202.2			#30	30	
/ere	WD + T #2				302.2			#30 #50	30 21 14	
SI	100.172				302.2			#50 #100	21 14 9	2.12
ج	TARE #2				302.2			#50	21 14	3-12
vhich	TARE #2 MOIST.	7.1	9.5	12.0				#50 #100	21 14 9	3-12
es which	TARE #2 MOIST. DRY DENS.	7.1	9.5 116.7	12.0	13.8			#50 #100	21 14 9	3-12
mples which	TARE #2 MOIST. DRY DENS.			12.0				#50 #100	21 14 9	3-12
samples which	TARE #2 MOIST. DRY DENS.		116.7	117.9	13.8			#50 #100 #200	21 14 9 6.3	
the samples which	TARE #2 MOIST. DRY DENS.	113.1	116.7	117.9	13.8			#50 #100 #200	21 14 9	
y to the samples which	TARE #2 MOIST. DRY DENS.	dry densi	ty = 118.1	117.9	13.8			#50 #100 #200	21 14 9 6.3	tion
only to the samples which	TARE #2 MOIST. DRY DENS. Maximum Optimum	dry densi	ty = 118.1	117.9	13.8			#50 #100 #200 Mat well-graded	21 14 9 6.3	tion
ply only to the samples which	TARE #2 MOIST. DRY DENS. Maximum Optimum Project No.	dry densi	116.7 ty = 118.1 = 11.4 %	117.9 TEST RESUL	13.8 115.3	ecyclina		#50 #100 #200	21 14 9 6.3	tion
s apply only to the samples which	TARE #2 MOIST. DRY DENS. Maximum Optimum Project No. Project: 20	113.1 dry densi moisture = 23-1-248	116.7 ty = 118.1 = 11.4 % Client:	TEST RESUL' pcf Colorado	13.8 115.3	ecycling		#50 #100 #200 Mat well-graded	21 14 9 6.3	tion
sults apply only to the samples which	TARE #2 MOIST. DRY DENS. Maximum Optimum Project No. Project: 20	dry densi	116.7 ty = 118.1 = 11.4 % Client:	TEST RESUL' pcf Colorado	13.8 115.3	ecycling		#50 #100 #200 Mat well-graded	21 14 9 6.3	tion
t results apply only to the samples which	TARE #2 MOIST. DRY DENS. Maximum Optimum Project No. Project: 20	dry densi moisture = 23-1-248 023 Colorad	116.7 ty = 118.1 = 11.4 % Client: o Aggregate	TEST RESUL pcf Colorado . Recycling I	13.8 115.3 TS Aggregate R Lab Testing			#50 #100 #200 Mat well-graded Remarks:	21 14 9 6.3	tion silt and sand
test results apply only to the samples which	TARE #2 MOIST. DRY DENS. Maximum Optimum Project No. Project: 20 Cloc.: ABC	dry densi moisture = 23-1-248 023 Colorad	ty = 118.1 = 11.4 % Client: o Aggregate	TEST RESULT pcf Colorado Recycling I	13.8 115.3 TS Aggregate R Lab Testing			#50 #100 #200 Mat well-graded Remarks:	21 14 9 6.3 erial Descrip gravel with s	tion
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.8. A lac	TARE #2 MOIST. DRY DENS. Maximum Optimum Project No. Project: 20 Loc.: ABC	dry densi moisture = 23-1-248 023 Colorad	ty = 118.1 = 11.4 % Client: o Aggregate	TEST RESUL pcf Colorado . Recycling I	13.8 115.3 TS Aggregate R Lab Testing			#50 #100 #200 Mat well-graded Remarks:	21 14 9 6.3 erial Descrip gravel with s	tion silt and sand



Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)	Pct. of Fines
1" 3/4" 3/8"	100 100 70	100 95-100		
#4 #8 #16	49 40 30	30-65 25-55		81 61
#30 #50 #100	21 14 9			44 29 19
#200	6.3	3-12		13

Material Descript well-graded gravel with silt and sa	ion nd
PL= NP LL= NV Classification USCS= GW-GM AASHT Test Remarks	S PI= NP FO= A-1-a

* AASHTO M 147 Class 6 ABC

Location: ABC Class 6 Recycled Concrete Pile - Colorado Springs Pit **Sample Number:** 3201

Kumar & Associates, Inc.

Client: Colorado Aggregate Recycling

Project: 2023 Colorado Aggregate Recycling Lab Testing

Denver, Colorado

Project No: 23-1-248

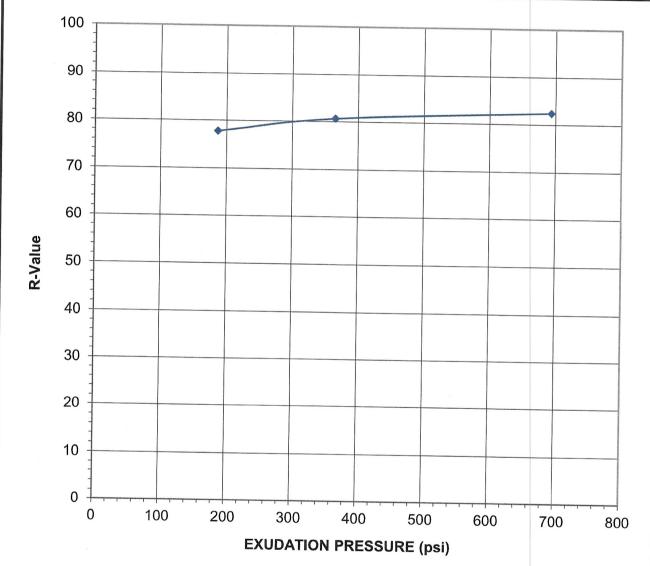
Figure

Sample Date: 12/21/23

Tested By: HS

Checked By: JJM

		R-VALUE	,		
TEST SPECIMEN	1	2	3	4	R-VALUE (300 psi)
MOISTURE CONTENT (%)	13.9	13.0	12.1		(300 psi)
DENSITY (pcf)	114.5	112.4	109.9		
EXPANSION PRESSURE (psi)	0.000	0.000	0.000		
EXUDATION PRESSURE (psi)	187	365	693		
R-VALUE	78	81	82		80



SOIL TYPE: Well-Graded Gravel with Silt and Sand

LOCATION: ABC Class 6 Recycled Concrete Pile - Colorado Springs Pit

DATE SAMPLED: 12/21/23

DATE RECEIVED: 12/21/23

DATE TESTED: 2/12/24

GRAVEL: 51

SAND: 43

SILT AND CLAY: 6

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. Sleve analyses performed in accordance with ASTM D4318. Sleve analyses performed in accordance with ASTM D422, D1140

23-1-248

KUMAR & ASSOCIATES

HVEEM STABILOMETER TEST RESULTS

3201