Aggregate Optimization Chart

Production	Gradation	Report
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PLANT :	#:	P-101					Contractor:			
Sample Date):	3/27/23			Concrete Grade:	DM, 4500HP				
Dates Test R	epresents:	3/28/2023	through	4/3/2023			MDOT No.:			
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution				•
6AA	71-47	Presque Isle	1400	8.56	2.62	48.3				
26A	71-47	Presque Isle	350	2.14	2.62	12.1				
2NS	63-115	Ray Rd	1150	6.95	2.65	39.7				é
		Total Wt	2900	17.66		100.0	< Verify this n	umber is 100%	•	S
Sieve		6AA	26	A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained		<u>Sup</u> 307
2"	1	100.0	100	0.0	100.0	100.0	0.0	0.0		Suit
1.5"	1	100.0	100).0	100.0	100.0	0.0	0.0		Farr
1"		97.5	100).0	100.0	98.8	1.2	1.2		
3/4"		78.7	100).0	100.0	89.7	9.1	10.3		
1/2"	31.5		96	.7	100.0	66.5	23.2	33.5		
3/8"		16.4	85.5		100.0	57.9	8.6	42.1	*Maximum %	Retained m
#4		3.1	19.0		97.6	42.5	15.4	57.5	*Any two adja	icent sieves
#8		1.8	4.9		80.1	33.2	9.3			00 and #200
#16	1.6 1.6		2.		63.6	26.3	6.9	73.7	*% Retained	must be at l
#30			2.		47.5	19.9	6.4	80.1	nom. max., #1	00 and #200
#50		1.5	2.		24.3	10.6	9.3	89.4	*% Retained	
#100		1.5	2.		5.3	3.1	7.5	96.9	a 2" max. size (nom. Max	
LBW		1.3	2.	-	0.9	1.2	1.9	98.8		
Production G	Gradation	O Batch Plant Gra	dations 💿 Aggi	regate Supplier (Gradations	Adjusted WF	Initial Product	on Sample (IPS	S)	_
Coarsene	ess Factor:	63	Work	ability Facto	or: 33	35.7	Coars	eness Factor:	62	
45							Work	ability Factor:	35	
	45, 44				JMF Zone		Sieve	Cumulative	%	Cumula
	,				31411 20110		Sieve	% Passing	Retained	% Reta
10		52, 41			_		2"	100.0	0.0	0.0
् ⁴⁰			57, 39	67, 3	75, 39		1.5"	100.0	0.0	0.0
e			!		,,		1"	100.0	0.0	0.0
1			■ 60, 3	Beroduction Gr	radation		3/4"	95.0	5.0	5.0
5 35			· !				1/2"	70.5	24.5	29.5
		52, 34		i			3/8"	60.0	10.5	40.0
l Fi	45, 33		57, 31		21.		#4	44.4	15.6	55.6
ig 30 -		_	01,01	676	9 , ' 31		#8	35.5	9.0	64.5
Vorkability Factor (%)	Operating Zone	·					#16	28.5	7.0	71.5
ļ Š	Boundary				75, 28		#30	21.5	7.0	78.5
								40.0		

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75



perior Materials, LLC 01 W. 10 Mile Rd. e 500 nington Hills, MI 48336

ust be above the 3/8" sieve. must equal 10% except max.,) sieves. east 4% for each sieve except max.,) sieves. east 8% for the 1" sieve when 1.5") aggregate is used.

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 $\textbf{Coarseness Factor (\%)}^{60}$

Coars	eness Factor:	62								
Work	ability Factor:	35								
Sieve	Cumulative	%	Cumulative							
Sleve	% Passing	Retained	% Retained							
2"	100.0	0.0	0.0							
1.5"	100.0	0.0	0.0							
1"	100.0	0.0	0.0							
3/4"	95.0	5.0	5.0							
1/2"	70.5	24.5	29.5							
3/8"	60.0	10.5	40.0							
#4	44.4	15.6	55.6							
#8	35.5	9.0	64.5							
#16	28.5	7.0	71.5							
#30	21.5	7.0	78.5							
#50	10.2	11.3	89.8							
#100	3.1	7.1	96.9							
LBW	1.3	1.8	98.7							

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ActionLimits Boundary = - - - - -

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Approved By:

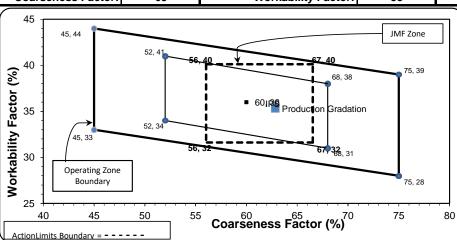
Aggregate Optimization Chart

PLANT #	#:	P-102					Contractor:			
Sample Date	:	3/27/23	-		Concrete Grade:	DM, 4500HP				-
Dates Test R	epresents:	3/28/2023	through	4/3/2023			MDOT No.:			
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution				
6AA	58-003	Stoneco	1500	8.94	2.69	50.8				
26A	58-003	Stoneco	300	1.79	2.69	10.2				
2NS	81-019	Pleasant Lake	1150	6.95	2.65	39.0				SUPE
		Total Wt	2950	17.68		100.0	< Verify this no	umber is 100%	-	MATE
Sieve		6AA	26	A	2NS	Cumulative % Passing	% Retained	Cumulative % Retained		<u>Superior N</u> 30701 W. 10
2"	,	100.0	100	0.0	100.0	100.0	0.0	0.0		Suite 500
1.5"		100.0	100	0.0	100.0	100.0	0.0	0.0		Farmington
1"		100.0	100	0.0	100.0	100.0	0.0	0.0		
3/4"		88.8	100	0.0	100.0	94.3	5.7	5.7		
1/2"		42.9	100.0		100.0	71.0	23.3	29.0		
3/8"		19.1	89.4		100.0	57.8	13.2	42.2	*Maximum %	Retained must be al
#4		1.5	11.9		96.8	39.7	18.1	60.3	*Any two adja	icent sieves must eq
#8		0.6	3.	9	82.4	32.8	6.9	67.2	nom. max., #1	00 and #200 sieves.
#16		0.6	2.	7	66.4	26.5	6.4	73.5	*% Retained	must be at least 4%
#30		0.5	2.	3	48.8	19.5	7.0	80.5	nom. max., #1	00 and #200 sieves.
#50		0.5	2.	1	23.5	9.6	9.9	90.4	*% Retained	must be at least 8%
#100		0.4	2.	0	6.5	2.9	6.7	97.1	a 2" max. size	(nom. Max. 1.5") age
LBW		0.3	1.		1.3	0.9	2.1	99.1		, , ,
Production G	iradation	O Batch Plant Gra	adations 💿 Agg	regate Supplier G	radations	Adjusted WF	Intial Production	on Sample (IPS	- 5)	_
Coarsene	ess Factor:	63	Work	ability Facto	r: 33	35.3	Coarse	eness Factor:	61	
45							Worka	ability Factor:	36	
	15, 44				JMF Zone		Sieve	Cumulative	%	Cumulative
	- ,						OICVC	% Passing	Retained	% Retained
		52, 41 56	40	67_40			2"	100.0	0.0	0.0
ত ⁴⁰				68, 3	75, 39		1.5"	100.0	0.0	0.0
<u>ျပီး</u>			i				1"	99.3	0.7	0.7
Factor (%)			■ 60µ 3 §	i			3/4"	89.2	10.1	10.8
5 35		l		Production Grade	ation		1/2"	70.7	18.5	29.3
ŭ]	\rightarrow	52, 34	÷.				3/8"	60.7	10.0	39.3



aterials, LLC Mile Rd. ills, MI 48336

ve the 3/8" sieve. 10% except max., each sieve except max., the 1" sieve when egate is used.



Coars	eness Factor:	61			
Work	ability Factor:	36			
Sieve	Cumulative	%	Cumulative		
	% Passing	Retained	% Retained		
2"	100.0	0.0	0.0		
1.5"	100.0	0.0	0.0		
1"	99.3	0.7	0.7		
3/4"	89.2	10.1	10.8		
1/2"	70.7	18.5	29.3		
3/8"	60.7	10.0	39.3		
#4	44.4	16.3	55.6		
#8	35.9	8.5	64.1		
#16	27.3	8.6	72.7		
#30	19.1	8.2	80.9		
#50	7.4	11.7	92.6		
#100	1.9	5.6	98.1		
LBW	0.7	1.2	99.3		

PREPARED BY: SM, LLC Technical Service

Approved By: Mart P. Ball

Aggregate Optimization Chart

PLANT :	#:	P-32					Contractor:				
Sample Date):	3/27/23	-		Concrete Grade:	DM, 4500HP					
Dates Test R	Represents:	3/28/2023	through	4/3/2023			MDOT No.:				
Agg. Class	Pit #	Source	Weight (SSD)	ft ³	Specific Gravity	% Contribution					
6AA	71-47	Presque Isle	1405	8.59	2.62	48.4					
26A	71-47	Presque Isle	350	2.14	2.62	12.0					
2NS	95-013	Smelter Bay	1150	6.95	2.65	39.6				SUP	ERIOR
		Total Wt	2905	17.69		100.0	< Verify this n	umber is 100%			ERIALS
Sieve		6AA	26	Α	2NS	Cumulative % Passing	% Retained	Cumulative % Retained			Materials, LLC 10 Mile Rd.
2"	1	00.0	100	0.0	100.0	100.0	0.0	0.0		Suite 500	
1.5"		00.0	100		100.0	100.0	0.0	0.0		Farmingto	n Hills, MI 48336
1"		96.3	100	0.0	100.0	98.2	1.8	1.8			
3/4"		76.1	100		100.0	88.4	9.8	11.6			
1/2"		33.1	95	.3	100.0	67.1	21.4	32.9			
3/8"		17.5	84	.4	100.0	58.2	8.9	41.8	*Maximum % Retained must be above the 3/8" siev		above the 3/8" sieve.
#4		3.5	17.3		96.5	42.0	16.2	58.0	*Any two adjacent sieves must equal 10% except m		
	#8 1.8		4.7		84.9	35.0	6.9	65.0	nom. max., #100 and #200 sieves.		
#16		1.7	2.		69.3	28.5	6.5	71.5			6 for each sieve except r
#30		1.6	1.		50.6	21.0	7.5	79.0	nom. max., #100 and #200 sieves.		
#50		1.6	1.		24.8	10.8	10.2	89.2			6 for the 1" sieve when
#100 LBW		1.5 1.2	1.		7.2	3.8 1.3	7.0 2.5	96.2 98.7	a 2" max. size	(nom. Max. 1.5") a	ggregate is used.
Production G	Gradation	Batch Plant Gra		o regate Supplier G		-	-	on Sample (IPS	5)		
	ess Factor:	64	Work	ability Facto	r: 35	37.5		eness Factor:	62		
		-					Workability Factor:		36	4	
45								Cumulative	%	Cumulative	
	45, 44				JMF Zone		Sieve	% Passing	Retained	% Retained	
1		52, 41	6 40	67.40			2"	100.0	0.0	0.0	
G ⁴⁰					75, 39		1.5"	100.0	0.0	0.0	
8			i	68, 3			1"	100.0	0.0	0.0	
Factor (%)			6 0, 3 B				3/4"	95.0	5.0	5.0	
5 35		Ţ	1 00,00				1/2"	72.3	22.8	27.7	
		52, 34	+	i			3/8"	60.4	11.8	39.6	
lit	45, 33				,		#4	42.6	17.8	57.4	
Workability			.,	67, 32 68, 3	31		#8 #16	36.0 29.5	6.6	64.0 70.5	
ž	Operating Zone						#16 #30	29.5	6.5 9.2	70.5 79.7	
₽ L	Boundary				75, 28		#30 #50	9.5	9.2	90.5	
> ₂₅							#100	3.4	6.1	96.6	
40	45	<u>50</u> 55	5 Coarseness	_657	0 75	80	LBW	1.3	2.1	98.7	
			Coarseness	-actor (%)				1			

PREPARED BY: SM, LLC Technical Service

Approved By: