ONLINE LEARNING

AGGREGATE BLENDING

Blending of stockpiles to achieve the required gradation

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Aggregate Blending

- Process to determine the *correct proportion* in blending 2 or more *aggregates stockpiles* with different grading to *obtain the required* grading specification
- Normally a single stockpile will not meet the required gradation
- Most practical "Trial and error" method guided by *reasoning* and *experience*

Aggregate Blending

Trial & Error Steps

1. Select *critical* sieves in blend
2. Determine *initial proportions* which will meet critical sieves
3. *Check* calculated blend against specification
4. *Adjust* as necessary (or repeat) to ensure blending meet the required gradation
5. Determine the new blended aggregate specific gravity

$$G_{sb} = \frac{P_1 + P_2 + \ldots . P_n}{\frac{P_1}{G_1} + \frac{P_2}{G_2} + \ldots . \frac{P_n}{G_n}}$$

Blending Steps…

6. Basic formula:

$$p = Aa + Bb + \ldots + Nn$$

p = the percent of material passing a given sieve for the combined stockpile A, B, … N

A, B, …N = the percent of material passing a given sieve for each stockpile A, B, … N

a, b,…n = proportions (in decimal fractions) of stockpile A, B, … N to be used in the blend,

$$a + b + \ldots + n = 1.00$$

Example

Material	Stockpile A G_s = 2.562		Stockpile B G_s = 2.589		Stockpile C G_s = 2.988		Blend	Target
% used	% pass	% blend	% pass	% blend	% pass	% blend	Total	
Sieve								
28 mm	100		100		100			100
20 mm	90		100		100			95-100
14 mm	55		91		100			65-85
10 mm	40		76		100			52-72
6.3 mm	25		58		100			39-55
3.35 mm	8		38		100			32-46
300µm	0		14		95			7-21
75µm	0		0		80			2-8

Calculation

At sieve 75μm: $5 = 0a + 0b + 80c$

$c = 0.06$

At sieve 300μm: $14 = 0a + 14b + 95c$

$14 = 0a + 14b + 95(0.06)$

$b = 0.59$

Remember: $a + b + \ldots + n = 1.00$

$a + 0.59 + 0.06 = 1.00$

$a = 0.35$

Example

Material	Stockpile A		Stockpile B		Stockpile C		Blend	Target
% used	% pass	% blend	% pass	% blend	% pass	% blend	Total	
Sieve		0.35		0.59		0.06	1.00	
28 mm	100	35	100	59	100	6	100	100
20 mm	90	31.5	100	59	100	6	96.5	95-100
14 mm	55	19.2	91	53.7	100	6	78.9	65-85
10 mm	40	14	76	44.8	100	6	64.8	52-72
6.3 mm	25	8.7	58	34.2	100	6	48.9	39-55
3.35 mm	8	2.8	38	22.4	100	6	31.2	32-46
300µm	0	0	14	8.3	95	5.7	14	7-21
75µm	0	0	0	0	80	4.8	4.8	2-8

Example

Material	Stockpile A		Stockpile B		Stockpile C		Blend	Target
% used	% pass	% blend	% pass	% blend	% pass	% blend	Total	
Sieve	~~0.35~~ 0.33			0.59	~~0.06~~ 0.08		1.00	
28 mm	100		100	59	100			100
20 mm	90		100	59	100			95-100
14 mm	55		91	53.7	100			65-85
10 mm	40		76	44.8	100			52-72
6.3 mm	25		58	34.2	100			39-55
3.35 mm	8		38	22.4	100			32-46
300µm	0		14	8.3	95			7-21
75µm	0		0	0	80			2-8

Calculation

Specific gravity of blended stockpile:

$$G_S = \frac{100}{\frac{33}{2.562} + \frac{59}{2.589} + \frac{8}{2.988}}$$

$$= 2.608$$

THANK YOU

e-mail your questions to:

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