BLENDING PROGRAMME - 0/2 LIME MORTAR SAND FOR SMOOTH FINE NORMAL FINISHING COATS - IMPROVEMENT TO NHLB BY ON SITE BLENDING OF F1FF

COMMENT:-

THE PRESENCE OF FINE SANDS (BELOW 125 MICRONS) IN A MIX WILL DEMAND MORE WATER DUE TO THE HIGHER SURFACE AREA OF THE GRAINS TO BE COATED. COMPARE THE SURFACE AREA OF A ONE TONNE BOULDER TO THE SURFACE AREA OF ONE TONNE OF SAND GRAINS TO VISUALISE THE DIFFERENCE. A HIGH WATER CONTENT IN A MORTAR REDUCES THE COMPRESSIVE AND FLEXURAL STRENGTH. HIGH MOISTURE WILL PROMOTE SHRINKAGE AND COULD LEAD TO DE-BONDING ESPECIALLY IN LIME MORTARS APPLIED TO LOW SUCTION AREAS. HIGH WATER CONTENT IN LIME MORTARS WILL LEAD TO LONGER SETTING TIMES, POSSIBLY LIME LEACHING AND MORE SENSITIVITY TO ADVERSE WEATHER CONDITIONS. WHERE FINER SANDS MUST BE USED, SUCH AS IN SMOOTH PLASTERS AND RENDERS, THE SAND SHOULD STILL BE WELL GRADED. THE STRUCTURAL SOUNDNESS OF A RENDER DEPENDS ON THE BONDING WITH THE BACKGROUND AND BETWEEN COATS.BONDING IS PARTLY DEPENDENT ON THE CAPILLARY SUCTION OF THE BACKGROUND OR THE PREVIOUS COAT. A PERCENTAGE OF FINER PARTICLES (10-20% BETWEEN 150 AND 75 MICRONS (IE 20% PASSING THE 300 SIEVE) AND 2% BELOW 75 MICRONS) WILL PROMOTE BONDING WITHOUT AFFECTING VAPOUR PERMEABILITY AND CAPILLARY SUCTION. PARTICULAR ATTENTION SHOULD THEN BE GIVEN TO CURING. IN ALL CASES BINDER QUANTITIES SHOULD BE CAREFULLY CONSIDERED IN RELATION TO THE PERFORMANCE REQUIRED AND THE COMPOSITION OF THE SAND. SANDS ARE MOSTLY RESPONSIBLE FOR THE VOID STRUCTURE OF LIME MORTARS AND CONSEQUENTLY FOR THE VAPOUR PERMEABILITY, SO VITAL FOR THE PERFORMANCE AGAINST ACCUMULATION OF CONDENSATION. MONOGRANULAR SANDS, (DEFINED AS HAVING A PARTICLE DISTRIBUTION OF MORE THAN TEN PERCENT OVER ONLY ONE OR TWO GRADES), WILL NOT ALLOW GOOD VAPOUR EXCHANGE, THEY WILL DIMINISH WORKABILITY OF LIME MORTARS AND THEREFORE INCREASE THE DANGER OF TOO MUCH WATER ADDITION IN ORDER TO ACHIEVE IT.IN MAKING NHL MORTARS WITH GOOD SAND, WORKABILITY SHOULD NOT BE ACHIEVED BY ADDING MORE WATER BUT BY ALLOWING A BIT MORE TIME FOR MIXING. IT IS ALSO ADVANTAGEOUS TO LET LIME MORTARS REST FOR A WHILE: THE WATER WILL SETTLE BETWEEN THE PARTICLES AND ALLOW BETTER HYDRATION OF THE FREE LIME CONTENT RESULTING IN A FATTER, MORE HOMOGENOUS AND WORKABLE MORTAR.

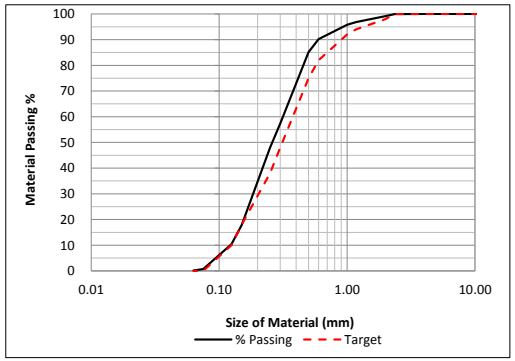
Sieve Size	% MAT. AS	% MAT. BS	% MAT. CS	% MAT. DS	% ARTE. AD	% ARTE. BD	% ARTE. CD	% ARTE. DD	A BLEND	B BLEND	C BLEND	D BLEND	PROP A	PROP B	PROP C	PROP D	BLEND % SAND	BLEND % NPDA ES	Sieve Size	TARGET SPEC FOR NHLB FINISHING COATS
14.000	100	100	100	100	0	0	0	0	0	100	0	20	0	0.00	0.00	0.00	0.00	100.0	14.000	100
10.000	100	100	100	100	0	0	0	0	0	100	0	20	0	0.00	0.00	0.00	0.00	100.0	10.000	100
8.000	100	100	100	100	0	0	0	0	0	100	0	20	0	0.00	0.00	0.00	0.00	100.0	8.000	100
6.300	100	100	100	100	0	0	0	0	0	100	0	20	0	0.00	0.00	0.00	0.00	100.0	6.300	100
5.000	100	100	100	100	0	0	0	0	0	100	0	20	0	0.00	0.00	0.00	0.00	100.0	5.000	100
4.000	100	100	99.4	100	0	0	0.6	0	0	100	0	20	0	0.00	0.00	0.00	0.00	100.0	4.000	100
2.800	100	99.9	94	100	0	0.1	5.4	0	0	100	0	20	0	0.08	0.00	0.00	0.08	99.9	2.800	100
2.360	100	99.9	88	100	0	0	6	0	0	100	0	20	0	0.00	0.00	0.00	0.00	99.9	2.360	100
2.000	100	99	82.1	100	0	0.9	5.9	0	0	100	0	20	0	0.75	0.00	0.00	0.75	99.2	2.000	98
1.180	99.9	96.2	62.9	100	0.1	2.8	19.2	0	0	100	0	20	0	2.33	0.00	0.00	2.33	96.8	1.180	94
1.000	99.8	94.9	56.8	100	0.1	1.3	6.1	0	0	100	0	20	0	1.08	0.00	0.00	1.08	95.8	1.000	92
0.600	98.8	88.2	43.3	100	1	6.7	13.5	0	0	100	0	20	0	5.58	0.00	0.00	5.58	90.2	0.600	82
0.500	97.6	82.2	39.1	100	1.2	6	4.2	0	0	100	0	20	0	5.00	0.00	0.00	5.00	85.2	0.500	75
0.300	80.9	48.9	29.8	99.8	16.7	33.3	9.3	0.2	0	100	0	20	0	27.75	0.00	0.03	27.78	57.4	0.300	48
0.250	67.5	37.7	26.6	99.2	13.4	11.2	3.2	0.6	0	100	0	20	0	9.33	0.00	0.10	9.43	48.0	0.250	38
0.150	7.7	8.6	3.2	64.3	59.8	29.1	23.4	34.9	0	100	0	20	0	24.25	0.00	5.82	30.07	17.9	0.150	18
0.125	1.7	4.1	0.8	41.8	6	4.5	2.4	22.5	0	100	0	20	0	3.75	0.00	3.75	7.50	10.4	0.125	10
0.075	0.1	0.2	0.2	3.2	1.6	3.9	0.6	38.6	0	100	0	20	0	3.25	0.00	6.43	9.68	0.7	0.075	0
0.063	0	0.1	0.2	0.5	0.1	0.1	0	2.7	0	100	0	20	0	0.08	0.00	0.45	0.53	0.2	0.063	0
0.000	0	0	0	0	0	0.1	0.2	0.5	0	100	0	20	0	0.08	0.00	0.08	0.17	0.0	0.000	0
Total					**100**	**100**	**100**	**100**					**0**	**83.33**	**0.00**	**16.67**	**100.0**			

THE BLENDED % PASSING IS THE RELEVANT OUTPUT WHICH IS PLOTTED ON THE CUMULATIVE LOGARITHMIC CHART BELOW AND MAY BE COMPARED WITH THE TARGET SPECIFICATION.

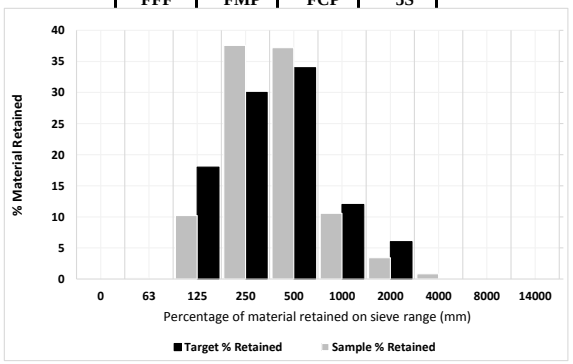
RECIPE:

		Tested	
A	FMP	14/05/14	0 kg
	0/1 LIME MORTAR SMOOTH FINE FINISHING COAT FMP		
B	FICB1-1000M	14/05/14	100 kg
	0/2 LIME MORTAR SMOOTH FINE FINISHING COAT FCB		
C	0/4 GREY CYE CSG BLM	20/06/13	0 kg
D	F1/FFF	07/05/14	20 kg
	0/0.25 FINE FILLER SAND		

SAMPLE PERCENTAGE RETAINED EXCEEDS 10% ON FOUR SIZE RANGES AS DEMONSTRATED ON THE BAR CHART THUS CREATING A WELL GRADED SAND FOR LIME MORTAR.



FFF	FMP	FCP	5S



BLENDING PROGRAMME

0/2 LIME MORTAR SAND FOR SMOOTH FINE NORMAL FINISHING COATS

IMPROVEMENT TO NHLB BY BLENDING F1FF

Ref: ZBP4.NHLB 02 FFF