VIVA FINES

Stallion Energy Pvt Ltd.'s Viva fines is, ultrafine material which makes durable concrete with higher compressive strength and low permeability having better finish. Blending with Portland cement, Viva Fines improve the properties of Concrete and Cement products. In concrete it improves durability, strength gain, workability, flow ability and reduces segregation.

BENEFITS:

- It provides a more uniform distribution and a greater volume of hydration products; as filler, it decreases the average size of pores in the cement paste. On using as an admixture, it can improve the properties of both fresh and hardened concrete. Used as a partial replacement for cement, it can substitute for energy-consuming cement without sacrifice of quality.

- It reduces 20% cost when mixed with high grade concrete in compare with other supplementary cementitious materials mixed concrete.

- It offers better compatibility with cement and chemical admixtures. Its physical /chemical structure on hydration improves the workability retention properties of fresh concrete for longer haul and pouring of concrete.

- Unlike other equivalent materials, this green material makes concrete more alkaline, which protects the reinforced steel and provides improved durability to the structure.

- As a result of in-built cementitious material it forms a dense structure and due to cement hydration it provides an increased secondary hydrated product, which results in improved strength at early and later stage.

- Has better particle packing, which results in improved rheology, resulting in improved flow ability to help concrete pump perform better.

- Has better particle size distribution, therefore, provides better workability, cohesiveness and superior volume stability (reduced shrinkage in concrete).

- Improves particle packing in the cementitious paste, reduces the bleed water and results in more homogenous concrete with reduced segregation.

- Has lime content of about 34% that, during hydration, helps retain higher alkalinity in pore solution, mitigating corrosion issue in concrete.

FEATURES:

- It provides toxic free working “environment friendly” and can replace chemical grouts.
- Higher durability
- It is economical
- The initial setting time in less than 2-3 hours.
- Final setting time < 6 hours
- Bulk density: 650-700 kg/m3
- Particle size distribution <12 microns: 90%

COST BENEFIT ANALYSIS FOR STANDARD MIX OF M60 WITH VIVA FINES

		MIX W/O VIVA FINES - A		MIX WITH VIVA FINES - B	
ITEM	RATE PER KG (RS)	CEMENT+SILICA FUMES+FA (RS)	COST/CUM (RS)	CEMENT+VIVA FINES+FA (RS)	COST/CUM (RS)
CEMENT	5	430	2150	430	2150
SILICAFUME	25	50	1250	0	0
VIVA FINES	25	0	0	50	1250
FLY ASH(FA)	1.5	80	120	80	120
ADMIXTURE	130	7.67	997.1	5.59	726.7
TOTAL (RS)			**4517.1**		**4246.7**

NET SAVINGS / CUM (A-B) = RS 4517.1 - 4246.7 = RS 270.4

MIX DESIGN ADOPTED FOR M60 GRADE OF CONCRETE

BASIC MATERIALS	W/O VIVA FINES	WITH VIVA FINES
CEMENT	430	430
SILICAFUMES	50	0
VIVA FINES	0	50
FLY ASH	80	50
WATER	159	140
AGG 20 MM	545	530
AGG 10 MM	365	360
MANUFACTURED SAND	175	170
NATURAL SAND	665	650
ADMIXTURE DOSES	1.30%	1.00%

RESULT OBTAINED M60 GRADE OF CONCRETE

ADMIXTURE DOSE	1.30%	1.00%
FRESH CONCRETE PROPERTIES: (WORKABILITY)		
INITIAL	COLLAPSE	COLLAPSE

30 MIN	COLLAPSE	240
60 MIN	200	220
90 MIN	180	200
120 MIN	160	180
HARDENDED CONCRETE PROPERTIES: (COMPRESSIVE STRENGTH)		
1 DAY	22.5	24.2
3 DAYS	36.5	38.3
7 DAYS	54.71	56.3
28 DAYS	68.77	70.69

COST BENEFIT ANALYSIS FOR A STANDARD MIX OF GRADE M80 WITH VIVA FINES

		MIX W/O VIVA FINES - A		MIX WITH VIVA FINES - B	
ITEM	RATE PER KG (RS)	CEMENT+SILICA FUMES+FA (RS)	COST/CUM (RS)	CEMENT+VIVA FINES+FA (RS)	COST/CUM (RS)
CEMENT	5	460	2300	460	2300
SILICAFUME	25	50	1250	0	0
VIVA FINES	25	0	0	50	1250
FLY ASH (FA)	1.5	80	120	80	120
ADMIXTURE	130	6.49	843.7	5.31	690.3
TOTAL (RS)			4513.7		4360.3

NET SAVINGS / CUM (A-B) = RS 4513.7 - 4360.3 = RS 153.4

MIX DESIGN ADOPTED FOR M80 GRADE OF CONCRETE

BASIC MATERIALS	W/O VIVA FINES	WITH VIVA FINES
CEMENT	460	460
SILICAFUMES	50	0
VIVA FINES	0	50
FLY ASH	80	80
WATER	145	145
AGG 20 MM	607	586
AGG 10 MM	518	502
NATURAL SAND	600	611
ADMIXTURE DOSES	1.10%	0.90%

RESULT OBTAINED M80 GRADE OF CONCRETE

ADMIXTURE DOSE	1.10%	0.90%
FRESH CONCRETE PROPERTIES: (WORKABILITY)		
INITIAL	COLLAPSE	COLLAPSE
30 MIN	COLLAPSE	COLLAPSE
60 MIN	150	165
90 MIN	130	140
120 MIN	100	110
180 MIN	90	100
HARDENDED CONCRETE PROPERTIES: (COMPRESSIVE STRENGTH)		
1 DAY	25	29
3 DAYS	45	49
7 DAYS	70	74
28 DAYS	83	88

TEST RESULTS – M50

PARAMETERS	SILICA FUMES	VIVA FINES
ADMIXTURE DOSAGE - %	0.7	0.4
INITIAL FLOW – MM	650	620
FLOW AFTER 30 MINUTES - MM	620	480
7 DAY STRENGTH – MPA	39.18	40.94
28 DAY STRENGTH – MPA	55.2	56.4
PARTICLE SIZE DISTRIBUTION	0.1 TO 1 MICRON	0.1 TO 12 MICRON

THE ADMIXTURE DOSAGE IN CASE OF VIVA FINES IS 40% LOWER AND WE AREVGETTING COMPARABLE RESULTS OF FLOW AS WELL AS STRENGTH. EVEN WITHVSAVINGS ON ADMIXTURE VIVA FINES CONCRETE IS GIVING DESIRED STRENGTHVAND WORKABLITY LEADING TO SAVINGS.

DESIGN PARAMETERS FOR 1M3 CONCRETE

M50 CONCRETE	WITH SILICA FUMES	WITH VIVA FINES
CEMENT IN KG	445	445
VIVA FINES/SILICA FUMES IN KG	41	41
ADMIXTURE DOSAGE IN LTR	3.40	2.2
FA IN KGS	764	764
CA1-10 MM	286	286
CA2-20 MM	638	638
WATER	170	160
W/C	0.35	0.33

ADMIXTURE WITH VIVA FINES SHOWS SAVING OF 1.2 LTS PER 1M3 IN FIELD CONDITIONS.