Appendices (A): Data sheet of Polypropylene Fiber (AdfIBE' III)

Appendices (B): Mix Design with British Standard

B.1 Mixes Proportions

Characteristic strength: specified **25** N/mm^2 at **28** days.

Proportion Defective percent 5%

Standard deviation: Fig 3 **8** N/mm^2

Margin C1 (K=1.64) 1.64*8 = 13.12 N/mm^2

Target mean strength C2 13.12+25 3 = 38 N/mm^2

Cement type Specified 42.5 (OPC)

Aggregate type coarse Uncrushed

Aggregate type: fine Uncrushed

Free-water/cement ratio Table 2 (Fig 4) = 0.55

Maximum free water ratio48 = 0.5 use it(less)

Slump Specified (30– 60 mm)

Maximum aggregate size Specified 20 mm

Free- water content Table 3 180 kg /m^3.

Cement content C3 180/ 0.50 = 360 Kg / m^3

Relative density of aggregate Known 2.6

Concrete density Fig 5 2380 Kg/m3

Total aggregate content C4 2380 – 180 – 360 = 1840 kg / m^3.

Grading of fine aggregate percentage passing 600μm sieve 51%

Proportion of fine aggregate Fig 6 36%

Fine aggregate content 0.30 * 1840 = 665 kg / m^3

Coarse aggregate content 1805 – 540 = 1175 kg / m^3

Quantities per m3:

Cement (kg)	Water (kg)	Fine aggregate (kg)	Coarse aggregate(kg)
360	**180**	**665**	**1175**

B.2 Tables and charts for mix design

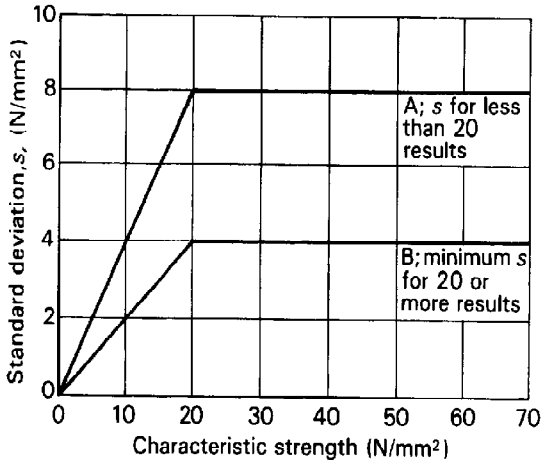

Figure 3
Relationship between standard deviation and characteristic strength

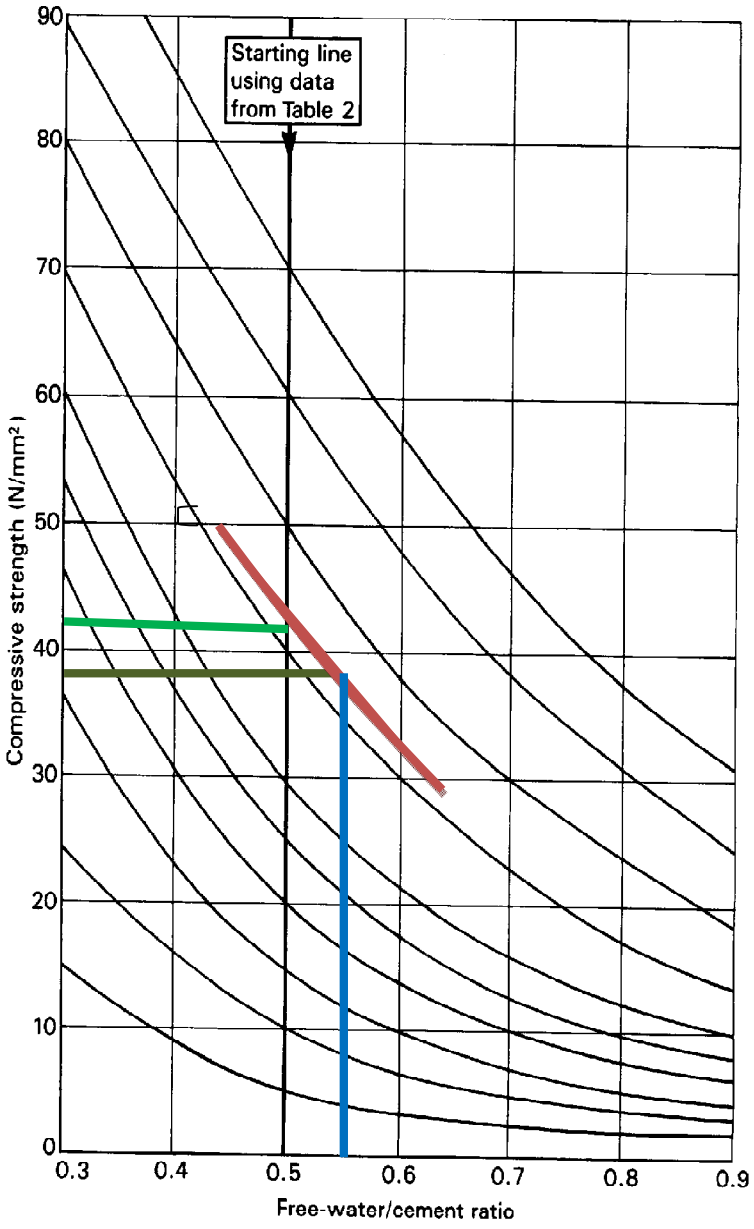

Figure 4
Relationship between compressive strength and free-water/cement ratio

Table 2 Approximate compressive strengths (N/mm^2) of concrete mixes made with a free-water/cement ratio of 0.5

Cement strength class	Type of coarse aggregate	Compressive strengths (N/mm^2) Age (days) 3	7	28	91
42.5	Uncrushed	22	30	42	49
	Crushed	27	36	49	56
52.5	Uncrushed	29	37	48	54
	Crushed	34	43	55	61

Throughout this publication concrete strength is expressed in the units N/mm^2.
$1\ N/mm^2 = 1\ MN/m^2 = 1\ MPa$. (N = newton; Pa = pascal.)

Table 3 Approximate free-water contents (kg/m^3) required to give various levels of workability

Slump (mm)		0–10	10–30	30–60	60–180
Vebe time (s)		>12	6–12	3–6	0–3
Maximum size of aggregate (mm)	Type of aggregate				
10	Uncrushed	150	180	205	225
	Crushed	180	205	230	250
20	Uncrushed	135	160	180	195
	Crushed	170	190	210	225
40	Uncrushed	115	140	160	175
	Crushed	155	175	190	205

Note: When coarse and fine aggregates of different types are used, the free-water content is estimated by the expression:

$$\tfrac{2}{3} W_f + \tfrac{1}{3} W_c$$

where W_f = free-water content appropriate to type of fine aggregate
and W_c = free-water content approporiate to type of coarse aggregate.

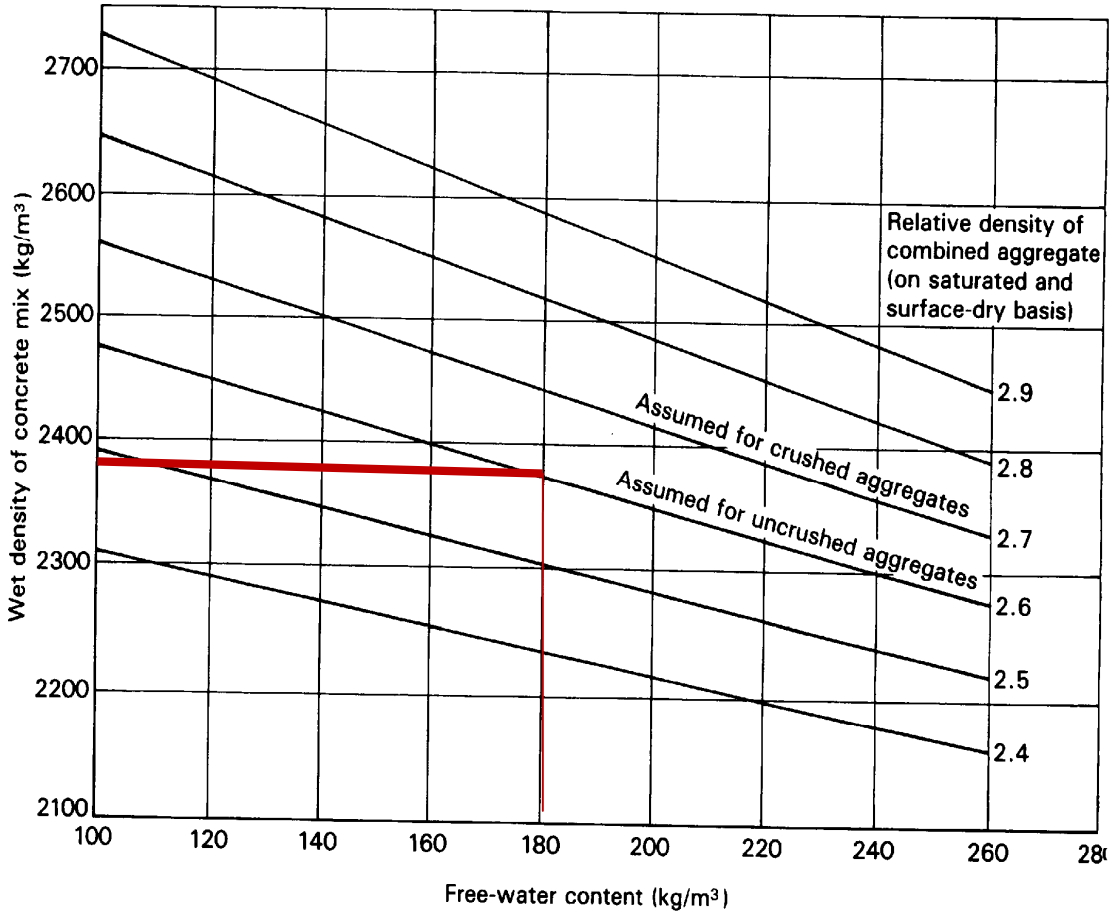

Figure 5 Estimated wet density of fully compacted concrete

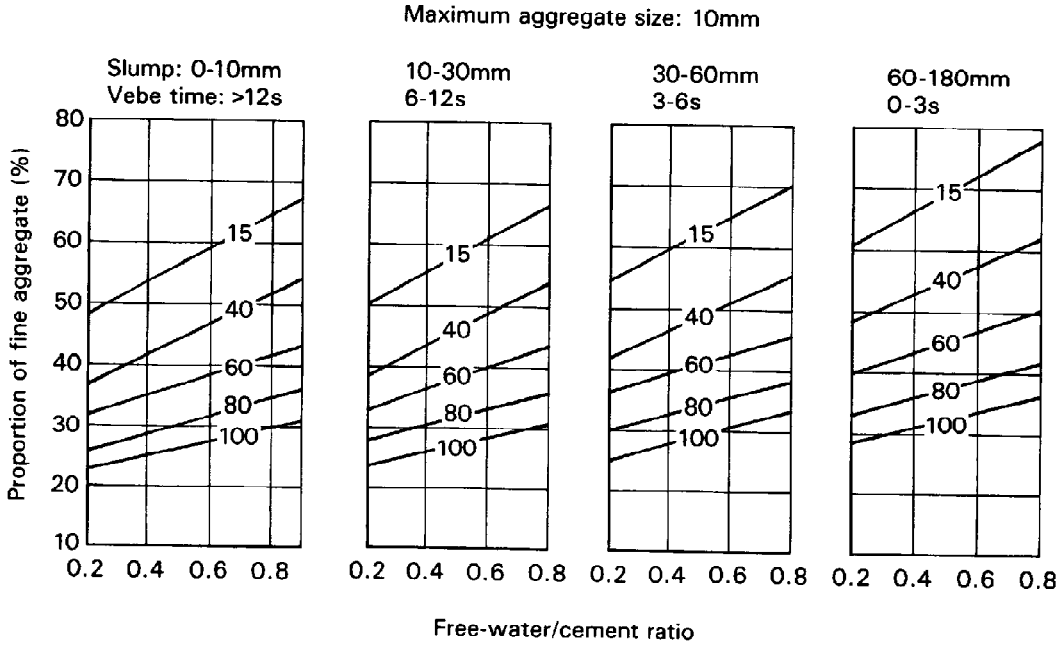

Figure 6 Recommended proportions of fine aggregate according to percentage passing a 600 μm sieve

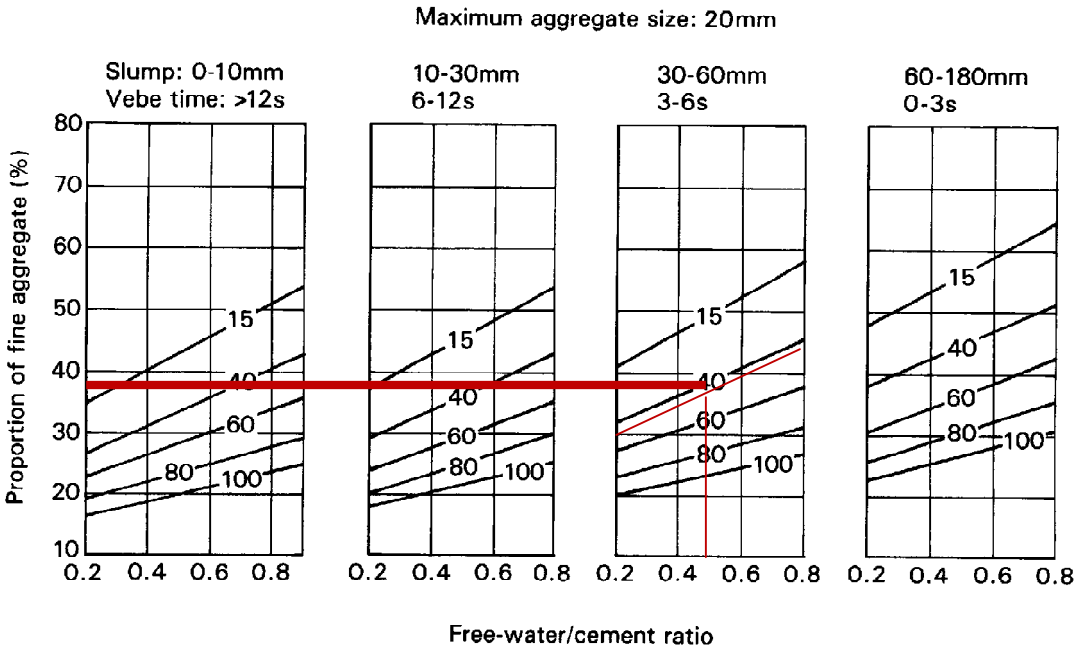

Figure 6 (continued)

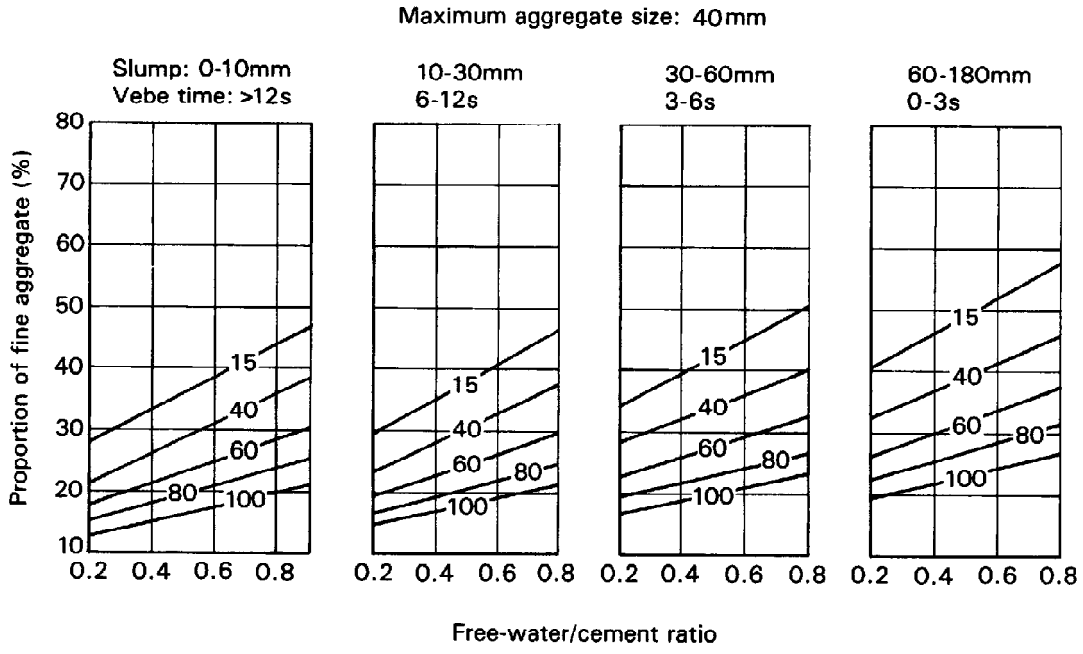

Figure 6 (continued)

Appendices (C):**Pictures fromLaboratoryTest**


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CONTROLS


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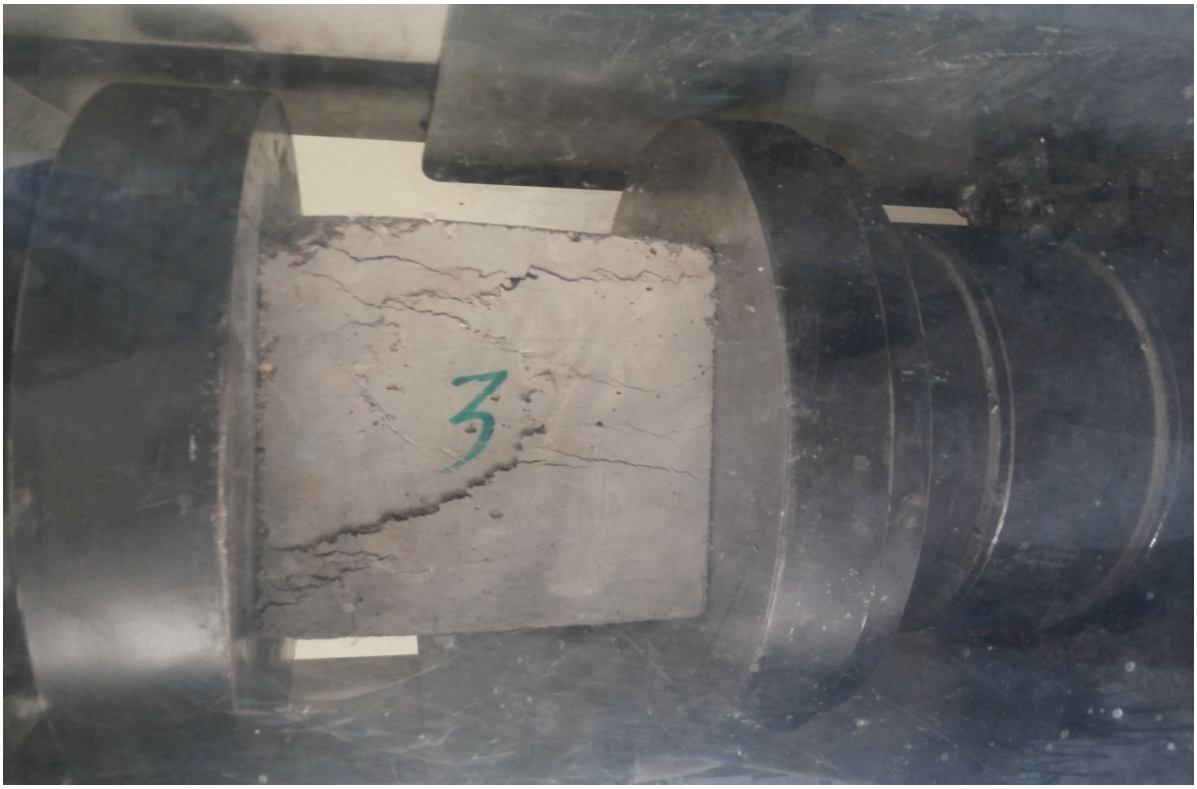
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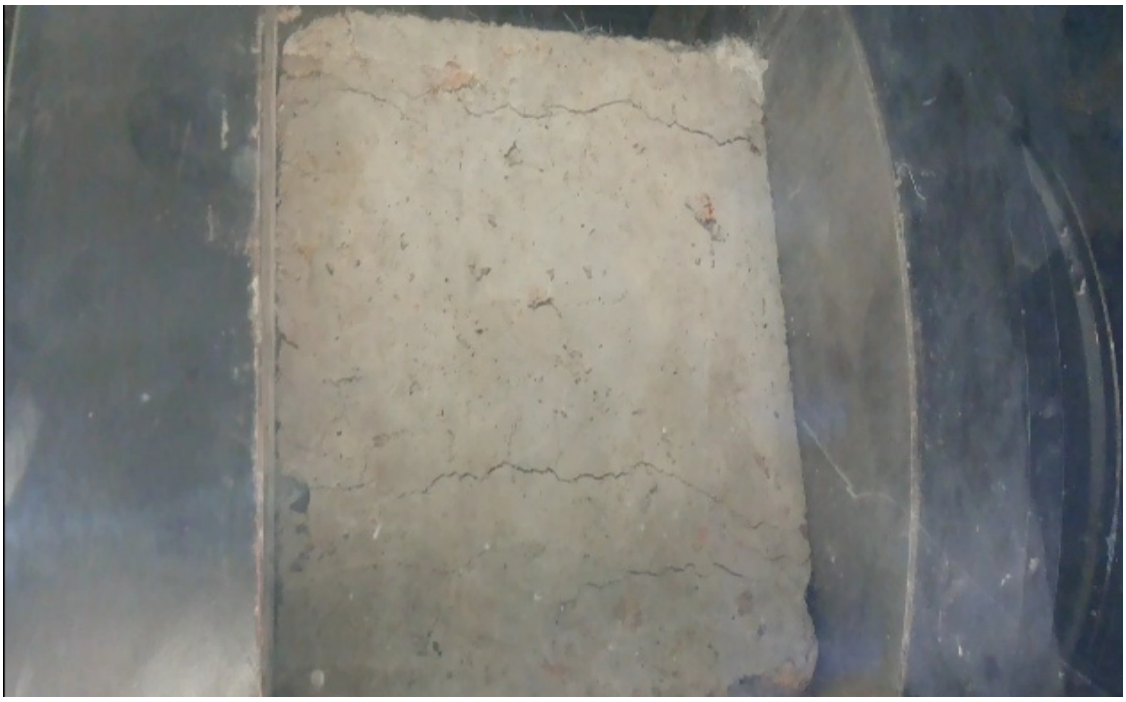


90bt


90bt


IMPACT TEST


SUDAN