

GRADE C70 SP CONCRETE (28days)

Table 4 Completed concrete mix design form for unrestricted design.

Serial No	Item	Reference or calculation	Values																								
1	1.1	Characteristic strength	Specified <u>70</u> N/mm ² at <u>28</u> days																								
			Proportion defective <u>5</u> %																								
	1.2	Standard deviation	Fig.3 <u>6</u> N/mm ² or no data <u> </u> N/mm ²																								
	1.3	Margin	C1 or Specified (k= <u>1.64</u>) <u>1.64</u> x <u>6</u> = <u>10</u> N/mm ²																								
	1.4	Target mean strength	C2 <u>70</u> + <u>10</u> = <u>80</u> N/mm ²																								
	1.5	Cement Type	Specified <u>OPC/SRPC/RHPC</u>																								
	1.6	Aggregate type: Coarse Aggregate type: Fine	<u>Crushed/Un-crushed</u> <u>Crushed/Un-crushed</u> Fly Ash + Silica Fume <u>25</u> %																								
	1.7	Free-water/cement ratio	Table2, Fig 4 <u>0.28</u>																								
	1.8	Maximum free water/cement ratio	Specified <u> </u> Use the lower value <u>0.28</u>																								
2	2.1	Slump or Vebe time	Specified Slump <u>1</u> <u>200</u> mm or Vebe time <u> </u> / <u> </u> s																								
	2.2	Maximum aggregate size	Specified <u>20</u> mm																								
	2.3	Free - water content	Table3 <u>160</u> kg/m ³																								
3	3.1	(Cement + Fly Ash) content	C3 <u>160</u> ÷ <u>0.28</u> = <u>571</u> kg/m ³																								
	3.2	Maximum cement content	Specified <u> </u> kg/m ³																								
	3.3	Minimum cement content	Specified <u> </u> kg/m ³ Fly Ash+Silica fume <u>143</u> kg/m ³																								
			use 3.1 if ≤ 3.2 use 3.3 if > 3.1 Cement <u>429</u> kg/m ³																								
	3.4	Modified free - water/cement ratio	<u> </u> / <u> </u>																								
4	4.1	Relative density of aggregate(SSD)	<u>2.8</u> known/assumed																								
	4.2	Concrete Density	Fig 5 <u>2470</u> kg/m ³																								
	4.3	Total aggregate content	C4 <u>2470</u> - <u>160</u> - <u>571</u> = <u>1739</u> kg/m ³																								
5	5.1	Grading of fine aggregate	Percentage passing 600µm sieve <u> </u> %																								
	5.2	Proportion of fine aggregate	Fig 6 <u>42</u> %																								
	5.3	Fine aggregate content	<u>1739</u> x <u>0.42</u> = <u>730</u> kg/m ³																								
	5.4	Coarse aggregate content	C5 <u>1739</u> - <u>730</u> = <u>1008</u> kg/m ³																								
<table border="1"> <thead> <tr> <th>Quantities</th> <th>Cement</th> <th>Fly Ash + Silica Fume</th> <th>Water</th> <th>Fine aggregate</th> <th>Coarse aggregate(kg)</th> </tr> <tr> <th></th> <th>(kg)</th> <th></th> <th>(kg or L)</th> <th>(kg)</th> <th>10mm 20mm 10mm</th> </tr> </thead> <tbody> <tr> <td>per m³ (to nearest 5kg)</td> <td><u>430</u></td> <td><u>140</u></td> <td><u>160</u></td> <td><u>730</u></td> <td><u>1010</u></td> </tr> <tr> <td>per trial mix of m³</td> <td><u>440</u></td> <td><u>130</u></td> <td><u> </u></td> <td><u> </u></td> <td><u> </u></td> </tr> </tbody> </table>				Quantities	Cement	Fly Ash + Silica Fume	Water	Fine aggregate	Coarse aggregate(kg)		(kg)		(kg or L)	(kg)	10mm 20mm 10mm	per m ³ (to nearest 5kg)	<u>430</u>	<u>140</u>	<u>160</u>	<u>730</u>	<u>1010</u>	per trial mix of m ³	<u>440</u>	<u>130</u>	<u> </u>	<u> </u>	<u> </u>
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Items in italics are optional limiting values that may be specified (see Section 7)

1N/mm² = 1MN/m² = Mpa (see footnote to Section 3)

PPC=Portland Pozzolana Cement; OPC = ordinary Portland cement; SRPC = sulphate resisting Portland cement

RHPC=rapid-hardening Portland cement; Relative density = specific gravity (see footnote to para 5.4)

SSD = based on a saturated surface- dry basic.

*add 5.7 Liters of Super Plasticiser - Hypercrete +M

*Add 40 Kg Silica fume + 100 kg Fly ash.

*Add 30 kg Silica fume + 100 kg Fly ash.