

GRADE C70 SP CONCRETE (28days)

Table 4 Completed concrete mix design form for unrestricted design.

Serial No	C70 SP- (OPC/TC/Hyp+M/200)			Reference or calculation	Values																								
Stage	Item																												
1	1.1	Characteristic strength	Specified	$\frac{70}{5} \text{ N/mm}^2 \text{ at } 28 \text{ days}$																									
	1.2	Standard deviation	Fig.3	$\frac{6}{\text{N/mm}^2 \text{ or no data}}$																									
	1.3	Margin	C1 or Specified	$(k=1.64) \times 1.64 \times 6 = 10$																									
				/																									
	1.4	Target mean strength	C2	$70 + 10 = 80$																									
	1.5	Cement Type	Specified	OPC/SRPC/RHPC																									
	1.6	Aggregate type: Coarse Aggregate type: Fine		Crushed/UnCrushed Crushed/UnCrushed	Fly Ash + Silica Fume 25 %																								
1.7	Free-water/cement ratio	Table2, Fig 4	0.28	Use the lower value	0.28																								
1.8	Maximum free water/cement ratio	Specified																											
2	2.1	Slump or Vebe time	Specified	Slump 1 200 mm or Vebe time / s																									
	2.2	Maximum aggregate size	Specified	20 mm																									
	2.3	Free - water content	Table3	160 kg/m ³																									
3	3.1	(Cement + Fly Ash) content	C3	$\frac{160}{0.28} = 571$	kg/m ³																								
	3.2	Maximum cement content	Specified	/	kg/m ³																								
	3.3	Minimum cement content	Specified		kg/m ³																								
				Fly Ash+Silica fume 143 kg/m ³																									
				Cement 429 kg/m ³																									
3.4	Modified free - water/cement ratio			/																									
4	4.1	Relative density of aggregate(SSD)		2.8 known/assumed																									
	4.2	Concrete Density	Fig 5	2470	kg/m ³																								
	4.3	Total aggregate content	C4	$2470 - 160 - 571 = 1739$	kg/m ³																								
5	5.1	Grading of fine aggregate	Percentage passing 600µm sieve		%																								
	5.2	Proportion of fine aggregate	Fig 6	42	%																								
	5.3	Fine aggregate content	C5	$\frac{1739}{1739} \times 0.42 = 730$	kg/m ³																								
	5.4	Coarse aggregate content		$1739 - 730 = 1008$	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> <td></td> <td>(kg)</td> <td></td> <td>(kg or L)</td> <td>(kg)</td> <td>10mm 20mm 10mm</td> </tr> </thead> <tbody> <tr> <td>per m³ (to nearest 5kg)</td> <td>430</td> <td>140</td> <td>160</td> <td>730</td> <td>1010</td> </tr> <tr> <td>per trial mix of m³</td> <td></td> <td></td> <td></td> <td></td> <td></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)	430	140	160	730	1010	per trial mix of m ³					
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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 basis.

***add 5.7 Liters of Super Plasticiser - Hypercrete +M**

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

