

GSTIN: 33AABFS9025Q1ZS



# S.K.V. Engineering Constructions

119/54-A, Amma Mandapam Road, Srirangam, Trichy - 620 006.

Ph: 0431-2433132, Mob: +91 94431 44132 , +91 95789 63440

Email: skvconstruct@yahoo.com Web : www.skvconstructions.com

Date: 01.09.2022

To

The Principal,  
Indra Ganesan College of Engineering,  
Manikandam,  
Trichy- 620 012

Dear Sir/Madam,

Sub: Enquiry Regarding consultancy work brochure – Concrete Mix Design  
M35Grade

We are in need of a Concrete Mix Design M35 Grade. We wish to avail your services.  
In this regard, send your cost estimation to favour the above mentioned work.

Dr. G. Balakrishnan, M.E., Ph.D.,  
Principal  
Indra Ganesan College of Engineering  
IG Valley, Madurai Main Road  
Manikandam, Trichy-620 012.

S.R.Sridhar  
Structural Engineering  
SKV Engineering Constructions

**Dr. V.S. Thangarasu** M.E.,M.B.A.,Ph.D.  
PRINCIPAL



# Indra Ganesan

## COLLEGE OF ENGINEERING

Madurai Main Road, (NH 45B), Manikandam, Trichirappalli- 620012

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

NAAC Accredited, 2(F) Status Institution by UGC



09.09.2022

To

S.K.V.Engineering Constructions  
119/54-A, Amma Mandapam Road  
Srirangam, Trichy-620006

Respect Sir/Madam,

**Sub:** Submission of consultancy work quotation- Reg.


Greetings from Indra Ganesan College of Engineering!!!

We thank you for considering our consultancy work brochure and we received your requirements about Concrete Mix Design M35 Grade. In this connection, we would like to inform you that the consultancy charges for the following test is furnished here.

S.NO	TYPE OF TEST	CHARGES FOR DRAWING (IN Rs.)	UNIT
1	Concrete Mix Design M35 Grade	20000	1
	<b>TOTAL</b>	<b>20000</b>	

We request you to kindly consider the above proposed consultancy charges and we are eagerly awaiting for your kind sanction of the consultancy work.

  
Project Investigator

  
Dr. G. Balakrishnan, M.E., Ph.D.,  
Principal  
Indra Ganesan College of Engineering  
IG Valley, Madurai Main Road  
Manikandam, Trichy-620 012.

  
9/9/22  
Dr. V. S. THANGARASU  
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Ph: 0431-2433132, Mob: +91 94431 44132 , +91 95789 63440

Email: skvconstruct@yahoo.com Web : www.skvconstructions.com

Date: 21.09.2022

To

The Principal,

Indra Ganesan College of Engineering,

Manikandam,

Trichy- 620 012

Dear Sir/Madam,

Subject: Enquiry Regarding consultancy work brochure - Concrete Mix Design  
M35Grade.

We granted the amount of Rs.20000/-, in response to your quotation dated on  
09.09.2022 for the successful delivery of the Concrete Mix Design M35.

Dr. G. Balakrishnan, M.E., Ph.D.  
Principal

Indra Ganesan College of Engineering  
IG Valley, Madurai Main Road,  
Manikandam, Trichy-620 012.

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## **CONSULTANCY PROJECT ENDOWMENT TEST REPORT**

### **CONCRETE MIX DESIGN**

**SUBMITTED**

**TO**

**S.K.V.Engineering Constructions**

**119/54-A, Amma Mandapam Road**

**Srirangam, Trichy-620006**

**Delivery Date: 21.10.2022**

**Dr. G. Balakrishnan, M.E., Ph.D.**  
Principal

Indra Ganesan College of Engineering

Manikandam, Trichy-620012

## CONSULTANCY TEST REPORT

Date of Casting: 21.09.2022

Date of Testing: 21.10.2022

### Test Conducted for Cement:

S.No	Name of the Test	Test Result	Range
1	Specific gravity of cement	3.13	3.10-3.15
2	Fineness of cement	338 m <sup>2</sup> / kg	240-300 m <sup>2</sup> / kg
3	Consistency test on cement	35%	25-30%
4	Setting time of cement	30-60 min	30-60 min

### Test Conducted for Fine Aggregate:


S.No	Name of the Test	Test Result	Range
1	Specific gravity of fine aggregate	2.68	2.5-2.9
2	Grading of fine aggregate	2.56	2.22-3.2
3	Water absorption test on fine aggregate	1%	1-3%

### Test Conducted for Coarse Aggregate:

S.No	Name of the Test	Test Result	Range
1	Specific gravity of coarse aggregate	2.79	2.5-2.9
2	Water absorption test on coarse aggregate	0.3%	0.5-2%
3	Elongation index	7%	5-10%
4	Flakiness index	2%	15-20%

### Admixture type:

Ground granulated blast-furnace slag (20%)

  
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### STIPULATION FOR PROPORTIONING:

- a) Grade designation : M35
- b) Type of cement : OPC 43 grade
- c) Type of mineral admixture : GGBS
- d) Maximum nominal size of aggregate : 20mm
- e) Minimum cement content : 320 kg/m<sup>3</sup>
- f) Maximum water cement ratio : 0.45
- g) Workability : 100mm
- h) Exposure condition : Severe
- i) Method of concrete placing : Pumping
- j). Degree of supervision : Good
- k) Type of aggregate : Crushed Angular aggregate
- l) Maximum cement(OPC) content : 450 kg/m<sup>3</sup>

#### 1. Target strength for mix proportioning (M 35 grade)

$$f'_{ck} = f'_{ck} + 1.65 s$$

From IS 10262:2009,  $s = 5 \text{ N/mm}^2$

$$\text{Target strength} = 35 + 1.65 \times 5$$
$$= 43.25 \text{ N/mm}^2$$

#### 2. Water cement ratio

From Table 5 of IS 456,

Max. Water- cement ratio = 0.45

Adopt water cement ratio = 0.40

$$0.40 < 0.45$$

Hence ok



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### 3. Water content

Max. water content for

$$\begin{aligned} 100 \text{ slump} &= 186 + 6/100 \times 186 \\ &= 197 \text{ liters} \end{aligned}$$

$$\begin{aligned} \text{Water content} &= 197 \times 0.71 \\ &= 140 \text{ liters} \end{aligned}$$

### 4. Cement and Calcium chloride content

$$\text{Water-cement ratio} = 0.40$$

$$\begin{aligned} \text{Cement content} &= 140/0.40 \\ &= 350 \text{ kg/ m}^3 \end{aligned}$$

$$\text{Min. cement content mild} = 320 \text{ kg/ m}^3$$

$$350 \text{ kg/ m}^3 > 320 \text{ kg/ m}^3$$

### 5. Volume of coarse and fine aggregate content

$$\begin{aligned} \text{The volume of coarse aggregate} &= 0.62 \times 0.9 \\ &= 0.56 \end{aligned}$$

$$\begin{aligned} \text{The volume of fine aggregate} &= 1 - 0.56 \\ &= 0.44 \end{aligned}$$

### 6. Mix calculation

$$\text{i. volume of concrete} = 1 \text{ m}^3$$

$$\begin{aligned} \text{ii. volume of cement} &= \text{mass of cement} / \text{specific gravity of cement} \times 1/1000 \\ &= 350/3.13 \times 1/1000 \\ &= 0.118 \text{ m}^3 \end{aligned}$$

$$\begin{aligned} \text{iii. volume of water} &= \text{mass of water} / \text{specific gravity of water} \times 1/1000 \\ &= 140/1 \times 1/1000 \\ &= 0.140 \text{ m}^3 \end{aligned}$$

$$\text{iv. Volume of chemical admixture} = \text{mass of chemical ad.} / \text{sp.gravity of chemical ad.} \times 1/1000$$



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$$= 7/1.145 \times 1/1000$$

$$= 0.006 \text{ m}^3$$

v. Volume of all in aggregate = (a- (b+c+a))

$$= 1- (0.1118+0.0140 + 0.006)$$

$$= 0.753 \text{ m}^3$$

vi. Mass of coarse aggregate = e x volume of coarse aggregate specific x 1000

$$= 0.743 \times 0.56 \times 2.74 \times 1000$$

$$= 1140\text{kg}$$

vii. Mass of fine aggregate = ex volume of fine aggregate x specific gravity of fine aggregate x1000

$$= 0.743 \times 0.44 \times 2.68 \times 1000$$

$$= 876.14 \text{ kg}$$

## MIX PROPORTIONS

Cement = 350 kg/ m<sup>3</sup>

GGBS = 6.5 kg/ m<sup>3</sup>

Water = 140 kg/ m<sup>3</sup>

Fine aggregate = 876.14 kg/ m<sup>3</sup>

Coarse aggregate = 1140 kg/ m<sup>3</sup>

Cement: Coarse Aggregate: Fine Aggregate = 1:1.41: 2.51

Water-cement ratio = 0.4

  
TEST CONDUCTED

  
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21.10.2022

### **UTILIZATION CERTIFICATE**

Certified that an amount of **Rs 20000/- (Twenty Thousand Only)** sanctioned during the year **2022-2023** in favor of civil engineering received from **S.K.V.Engineering Constructions** has been utilized for the project consultancy work titled **"Concrete Mix Design M35 Grade"**. The purpose for which it was sanctioned has been duly fulfilled and delivered as per the conditions of the grant.

  
Project Investigator

  
21/10/22  
Dr. V. S. THANGARASU  
PRINCIPAL

  
Dr. G. Balakrishnan, M.E., Ph.D.,  
Principal  
Indra Ganesan College of Engineering  
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