

VEE VEE CONSTRUCTIONS

DESIGNER AND BUILDERS

Er.B. ASHOK KUMAR B.E., MBA

MOBILE NO: 9791202260

Date: 02.01.2019

To


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


Dear Sir/Madam,

Subject: Enquiry Regarding consultancy work brochure – Concrete Mix Design M15

We should greatly thank you for sharing the Consultancy Work Brochure of Indra Ganesan College of Engineering. We are particularly required the Concrete Mix Design M15. Kindly provide information on the cost structure for the Concrete Mix Design M15.

For vee vee constructions


B. ASHOK KUMAR
Authorized Signature


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





13.08.2019

Trichy

To

VEE VEE Constructions
No.22, Bharathiyar Street,
Rms Colony, Edamalaipattipudur
Trichy-620012

Respected Sir,

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. 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 (IN Rs.)	UNIT
1	Concrete Mix Design M15	20000	1
	TOTAL	20000	

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. S. BHARATHI RAJA
PRINCIPAL

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

Indra Ganesan College of Engineering
IG Valley, Madurai

Madurai Main Road,
NH-45B, Manikandam
Tiruchirapalli – 620 012
Tamil Nadu, South India

Mobile : 85086 88845
Phone : 0431 2906565
Web : www.igceng.in
igceprincipal@gmail.com

VEE VEE CONSTRUCTIONS

DESIGNER AND BUILDERS

Er.B. ASHOK KUMAR B.E., MBA

MOBILE NO: 9791202260

Date: 05.09.2019

To

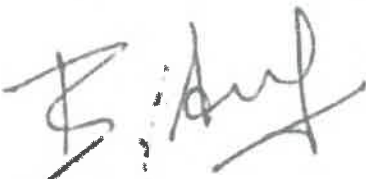
The Principal,
Indra Ganesan College of Engineering,
Manikandam,
Trichy, 620 012


Dear Sir/ Madam,

Subject: Sanctioned Amount - Cost Estimation for Concrete Mix Design M15

We have accepted the consultancy work on Concrete Mix Design M15. We are decided to grant a amount of **Rs.20000** and assure you that our team will be helpful in the entire required situation to complete the project.

For vee vee constructions


E. ASHOK KUMAR
Authorized Signature


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





Indra Ganesan

COLLEGE OF ENGINEERING
Madurai Main Road (NH-45B), Manikandam, Tiruchirapalli- 620 012
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

CONSULTANCY PROJECT ENDOWMENT REPORT

CONCRETE MIX DESIGN

SUBMITTED

TO

**No.22, Bharathiyar Street
Rms Colony, Edamalaipattipudur
Trichy-620012**

Delivery Date: 09.10.2019

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

CONSULTANCY TEST REPORT

Date of Casting: 05.09.2019

Date of Testing: 09.10.2019

Test conducted : CONCRETE MIX DESIGN M15

Test Conducted for Cement:

S.No	Name of the Test	Test Result	Range
1	Specific gravity of cement	3.15	3.10-3.15
2	Fineness of cement	380 m ² / kg	300-400 m ² / kg
3	Consistency test on cement	30%	25-30%
4	Setting time of cement	30-60 min	30-60 min

Test Conducted for Fine Aggregate:

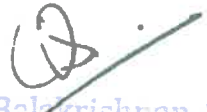
S.No	Name of the Test	Test Result	Range
1	Specific gravity of fine aggregate	2.74	2.5-2.9
2	Grading of fine aggregate	2.29	2.22-3.2
3	Water absorption test on fine aggregate	1%	1-3%

Test Conducted for Coarse Aggregate:

S.No	Name of the Test	Test Result	Range
1	Specific gravity of coarse aggregate	2.74	2.5-2.9
2	Water absorption test on coarse aggregate	0.6%	0.5-2%
3	Elongation index	9%	5-10%
4	Flakiness index	18%	15-20%

STIPULATION FOR PROPORTIONING:

- a) Grade designation : M15
- b) Type of cement : OPC 43 grade
- c) Type of mineral admixture : 1.5% of kaolinite
- d) Maximum nominal size of aggregate : 20mm
- e) Minimum cement content : 320 kg/m³
- f) Maximum water cement ratio : 0.45
- g) Workability : 100mm


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- h) Exposure condition : Moderate
 i) Method of concrete placing : Pumping
 j). Degree of supervision : Good
 k) Type of aggregate : Angular aggregate
 l) Maximum cement(OPC) content : 400 kg/m³

1. Target strength for mix proportioning (M 15 grade)

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

From IS 10262:2009, $s = 15 \text{ N/mm}^2$

$$\text{Target strength} = 15 + 1.65 \times 3.50$$

$$= 20.78 \text{ N/mm}^2$$

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

3. Water content


Max. water content for

85 slump = $186 + 4/100 \times 186$
 = 193.8 liters

Water content = 194×0.71
 = 137.74 liters

4. Cement and Calcium chloride content

Water-cement ratio = 0.40
 Cement content = $140/0.40$
 = 350 kg/ m³
 Min. cement content serve = 300 kg/ m³


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$$350 \text{ kg/ m}^3 > 300 \text{ kg/ m}^3$$

$$\begin{aligned} \text{Cementitious material content} &= 350 \times 1.10 \\ &= 385 \text{ kg/ m}^3 \end{aligned}$$

$$\text{Water content} = 193 \text{ liters}$$

$$\begin{aligned} \text{Water cement ratio} &= 193/385 \\ &= 0.501 \end{aligned}$$

kaolinite @ 1.5% of

$$\begin{aligned} \text{Total cementitious content} &= 385 \times 1.5/100 \\ &= 5.77 \text{ kg/ m}^3 \end{aligned}$$

$$\begin{aligned} \text{Cement (OPC)} &= 385 - 5.77 \\ &= 379.2 \text{ kg/ m}^3 \end{aligned}$$

Saving of cement while using

$$\begin{aligned} \text{Kaolinite} &= 350 - 379.2 \\ &= -29.2 \text{ kg/ m}^3 \end{aligned}$$

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

i. volume of concrete = 1 m^3

ii. volume of cement = $\frac{\text{mass of cement}}{\text{specific gravity of cement}} \times 1/1000$
 $= \frac{379.2 - 29.2}{1} \times 1/1000$
 $= -0.12 \text{ m}^3$

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

iv. Volume of chemical admixture = mass of chemical ad. / sp.gravity of chemical ad. x 1/1000
= 7/1.145 x 1/1000

= 0.007 m³

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

= 1- (0.12+0.002+0.140 + 0.007)

= 0.971 m³

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

= 0.971 x 0.44 x 2.61 x1000

= 1108.24 kg

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

= 0.971 x 0.44x 1.59 x 1000

= 679.25 kg

MIX PROPORTIONS

Cement = 485 kg/ m³

Water = 206 kg/ m³


Fine aggregate = 672 kg/ m³

Coarse aggregate = 11103 kg/ m³

Water-cement ratio = 0.364

Cement: Coarse aggregate: Fine aggregate = 1:1.61:2.63


TEST CONDUCTED


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

Principal

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


PRINCIPAL

Dr.S.BHARATHIRAJA



09.10.2019

Trichy

UTILIZATION CERTIFICATE

Certified that an amount of **Rs 20000/- (Twenty Thousand Only)** sanctioned during the year **2019-2020** in favor of civil engineering received from **VEE VEE Constructions** has been utilized for the recommended project consultancy work titled **"Concrete Mix Design"**. The purpose for which it was sanctioned has been duly fulfilled and delivered as per the conditions of the grant.

PROJECT INVESTIGATOR



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igceprincipal@gmail.com