

DATE: 02.03.2023

To

The Principal,  
Sri Bharathi Engineering College for Women,  
Kaikkurichi,  
Pudukkottai – 622 303.

Respected Sir /Madam,

We require a 'Tensile Strength Test on Steel Rod' for two brand steels (with sizes of 10mm-4 nos. and 12mm-1 no.). To satisfy our needs, kindly give us your budget for the consulting project mentioned above.

Hon / Sir /  
Kindly do the needful  
02/03/23

Thanks and regards,

For M.R. Construction & Promoters

R. ~~Arum~~ 02/03/2023  
Managing Partner.

  
Dr. S. THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.





# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)  
Pudukkottai - Aranthangi Road,  
Kaikkurichi, Pudukkottai - 622 303.

Date : 03.03.2023.

To

MR Constructions & Promoters  
No. 66/3, Abraham Pandithar nagar  
5th street  
Thanjavur - 613001

Respected Sir,

**Sub :** Submission of Consultancy Work quotation – Reg.

Greetings from Sri Bharathi Engineering college for women !!!

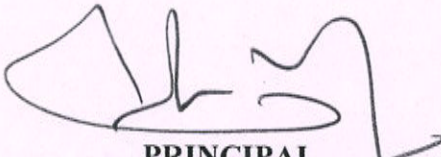
With reference to your letter dated 02.03.2023, we would like to inform you that the consultancy work 'Tensile Strength Test on Steel Rod' may cost around Rs.1250. The detailed charge for the following test is furnished here:

S.NO	TYPE OF TEST	CHARGES IN Rs. PER UNIT	UNIT	TOTAL CHARGES IN Rs.
1	Tensile strength and % of Elongation	250	5	1250

The proposed work would be finished within 10 days. We appreciate your consideration of our proposal, feel free to contact us.

Thanking you

  
Dr. S. THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.

  
PRINCIPAL  
PRINCIPAL 03/03/23  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI - 622 303.  
PUDUKKOTTAI DISTRICT



DATE : 07.03.2023

To

The Principal,  
Sri Bharathi Engineering College for Women,  
Kaikkurichi,  
Pudukkottai – 622 303.

HOD / (ai)  
for necessary action  
please  
R. Arumugam

Dear Sir/Madam,

We approved the consultancy project 'Tensile Strength Test on Steel Rod' with the financial assistance of Rs.1250/- sanctioned to accomplish the proposed work. Please contact us at any moment if you require assistance in completing the consulting test.

Thank you

R. Arumugam  
Managing Partner.  
07/03/2023

  
Dr. S. THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.



**SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN**

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

**Kaikkurichi, Pudukkottai - 622 303.**

**DEPARTMENT OF CIVIL ENGINEERING**

**CONSULTANCY TEST**

**REPORT**

**TENSILE STRENGTH TEST ON STEEL ROD**

**SUBMITTED**

**TO**

**MR Constructions & Promoters  
No. 66/3, Abraham Pandithar nagar,  
5th street,  
Thanjavur - 613001**

**REPORT DATE : 14.03.2023**

**Dr. S.THILAGAVATHI M.E., Ph.D.,**

**PRINCIPAL**

**SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN**

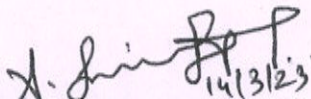
**Kaikkurichi - 622 303, Pudukkottai Dt.**

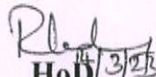



## CONSULTANCY TEST REPORT

**DATE OF TESTING** : 14.03.2023  
**SAMPLES SUPPLIED** : TMT steel rods 10mm - 4 nos, 12mm - 1no  
**TESTS CONDUCTED** : Tensile Strength, Percentage of Elongation (%)  
**GRADE OF STEEL** : Fe 550D

S. no	Size of Bars In mm	Ultimate load in kN	Tensile strength in N/mm <sup>2</sup>	Elongation length in mm	Percentage of Elongation (%)
1	JSW brand 10mm – specimen I	59	751.65	35	8.75
2	JSW brand 10mm – specimen II	58	738.85	95	23.75
3	Shyam brand 10mm – specimen I	52	662.61	35	8.75
4	Shyam brand 10mm – specimen II	55	700.63	45	11.25
5	Shyam brand 12mm	91	684	40	10


  
TEST CONDUCTED

  
HoD/3/23

  
PRINCIPAL  
14/3/23

HOD / CIVIL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI,  
PUDUKKOTTAI - 622 303

PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI - 622 303.  
PUDUKKOTTAI DISTRICT

Received  


  
Dr. S. THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurchi - 622 303, Pudukkottai Dt.





# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

Pudukkottai - Aranthangi Road,  
Kaikkurichi, Pudukkottai - 622 303.

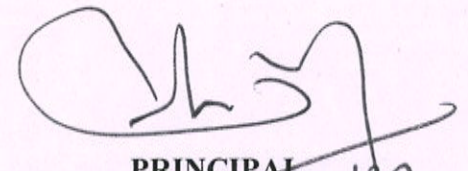
Date : 15.03.2023

## UTILISATION CERTIFICATE

Certified that an amount of Rs. 1250/- (one thousand two hundred and fifty only) sanctioned during the year 2023 in favor of civil engineering received from MR Construction & Promoters has been utilized for the project consultancy work titled "Tensile Strength Test on Steel Rod" . The purpose for which it was sanctioned has been duly fulfilled and delivered as per the conditions of the grant.

A. Singh  
15/3/23

PROJECT INVESTIGATOR

  
PRINCIPAL  
15/03/23

PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI - 622 303.  
PUDUKKOTTAI DISTRICT

  
Dr. S. THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.



DATE:30.08.2022

To

The Principal,  
Sri Bharathi engineering college for women,  
Kaikkurichi,  
Pudukkottai – 622 303.

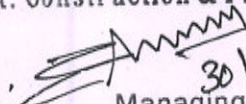
HOD / ai  
Kindly do the needful  
30/08/22

Respected Sir/Madam,

We require Concrete Mix Design M 40. To satisfy our needs, kindly give your budget for the consulting project to determine the optimal combination of cement, fine aggregates, coarse aggregates, water, and admixtures. Please feel free to contact us at your convenience to discuss this matter further or to schedule a meeting.

Thank you

For M.R. Construction & Promoters

R.   
30/08/2022  
Managing Partner.

  
**Dr. S. THILAGAVATHI M.E., Ph.D.,**  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurchi - 622 303, Pudukkottai Dt.





# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

Pudukkottai - Aranthangi Road,  
Kaikkurichi, Pudukkottai - 622 303.

Date : 01.09.2022

To

MR Constructions & Promoters  
No. 66/3, Abraham Pandithar nagar  
5th street  
Thanjavur - 613001

Respected Sir,

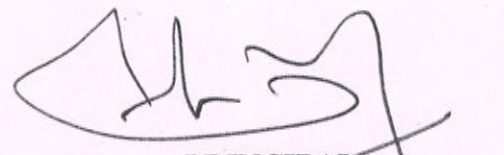
**Sub :** Submission of consultancy work quotation - Reg.

Greetings from Sri Bharathi Engineering college for women !!!

With reference to your letter dated 30.08.2022, we would like to inform you that the estimated cost for the Concrete Mix Design M40 is approximately Rs.15,000/-. Please note that this estimation is subject to change depending on any further project refinements or unforeseen circumstances.

If you have any questions or require additional information regarding the cost estimation or any other aspect of the project, please do not hesitate to contact us.

Thanking you

  
PRINCIPAL  
~~PRINCIPAL~~  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI - 622 303.  
PUDUKKOTTAI DISTRICT

  
Dr. S. THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.



DATE:02.09.2022


To  
The Principal,  
Sri Bharathi engineering college for women,  
Kaikkurichi,  
Pudukkottai – 622 303.

Respected Sir/Madam,

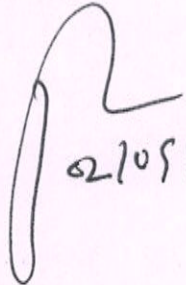
We reviewed your quotation dated on 01.09.2022. Accordingly we sanctioned the financial assistance of Rs.15,000/- to complete the proposed consultancy work. For any queries, please notify us at any time.

Thank you

For M.R. Construction & Promoters

R.  02/09/2022  
Managing Partner.

Hand / air /  
for necessary action  
please.

  
02/09/22

  
**Dr. S. THILAGAVATHI M.E., Ph.D.,**  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.





**SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN**

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

**Kaikkurichi, Pudukkottai - 622 303.**

**DEPARTMENT OF CIVIL ENGINEERING**

**CONSULTANCY PROJECT WORK**

**REPORT**

**CONCRETE MIX DESIGN M 40**

**SUBMITTED**

**TO**

**MR Constructions & Promoters  
No. 66/3, Abraham Pandithar nagar,  
5th street,  
Thanjavur - 613001**

**REPORT DATE : 08.09.2022**

  
**Dr. S.THILAGAVATHI M.E., Ph.D.,**  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.



## CONSULTANCY PROJECT REPORT

### 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	340 m <sup>2</sup> / kg	300-400 m <sup>2</sup> / 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	2.68	2.5-2.9
2.	Grading of fine aggregate	2.46	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	2.78	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	3%	15 - 20%

### Admixture type:

Metakaolin (10%)

  
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SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurchi - 622 303, Pudukkottai Dt.



## STIPULATIONS FOR PROPORTIONING

- |                                      |                             |
|--------------------------------------|-----------------------------|
| a) Grade designation                 | : M40                       |
| b) Type of cement                    | : OPC 43 grade              |
| c) Type of mineral admixture         | : 10% of Metakaolin         |
| d) Maximum nominal size of aggregate | : 20 mm                     |
| 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 (M40 grade)

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

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

$$\begin{aligned} \text{Target strength} &= 40 + 1.65 \times 5 \\ &= 48.25 \text{ N/mm}^2 \end{aligned}$$

### 2. Water cement ratio

From Table 5 of IS 456,

$$\text{Max. Water - cement ratio} = 0.45$$

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

$$0.40 < 0.45$$

Hence O.K

  
**Dr. S. THILAGAVATHI M.E., Ph.D.,**  
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SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurchi - 622 303, Pudukkottai Dt.



### 3. Water content

$$\begin{aligned}\text{Max. Water content for} \\ 100 \text{ slump} &= 186 + 6/100 \times 186 \\ &= 197 \text{ liters} \\ \text{Water content} &= 197 \times 0.71 \\ &= 140 \text{ liters}\end{aligned}$$

### 4. Cement and metakaolin content

$$\begin{aligned}\text{Water - cement ratio} &= 0.40 \\ \text{Cement content} &= 140 / 0.40 \\ &= 350 \text{ kg/m}^3 \\ \text{Min. cement content serve} &= 320 \text{ kg/m}^3 \\ 350 \text{ kg/m}^3 &> 320 \text{ kg/m}^3 \\ \text{Cementitious material content} &= 350 \times 1.10 \\ &= 385 \text{ kg/m}^3 \\ \text{Water content} &= 140 \text{ liters} \\ \text{Water cement ratio} &= 140 / 385 \\ &= 0.364\end{aligned}$$

Metakaolin @ 1.5% of

$$\begin{aligned}\text{Total cementitious content} &= 385 \times 10 / 100 \\ &= 38.5 \text{ kg/m}^3\end{aligned}$$

$$\begin{aligned}\text{Cement (OPC)} &= 385 - 38.5 \\ &= 346.5 \text{ kg/m}^3\end{aligned}$$

Saving of cement while using

$$\text{Metakaolin} = 3.5 \text{ kg/m}^3$$

  
**Dr. S. THILAGAVATHI M.E., Ph.D.,**  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kalkurchi - 622 303, Pudukkottai Dt.



## 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 =  $1 \text{ m}^3$

ii. Volume of cement

$$= \frac{\text{mass of cement}}{\text{specific gravity of cement}} \times \frac{1}{1000}$$

$$= \frac{346.5}{3.15} \times \frac{1}{1000}$$

$$= 0.145 \text{ m}^3$$

iii. Volume of water

$$= \frac{\text{mass of water}}{\text{specific gravity of water}} \times \frac{1}{1000}$$

$$= \frac{140}{1} \times \frac{1}{1000}$$

$$= 0.140 \text{ m}^3$$

iv. Volume of chemical admixture

$$= \frac{\text{mass of chemical ad.}}{\text{sp.gravity of chemical ad.}} \times \frac{1}{1000}$$

$$= \frac{7}{1.145} \times \frac{1}{1000}$$

$$= 0.007 \text{ m}^3$$



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SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
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v. Volume of all in aggregate

$$= [a - (b + c + a)]$$

$$= 1 - (0.11 + 0.014 + 0.140 + 0.070)$$

$$= 0.665 \text{ m}^3$$

vi. Mass of coarse aggregate

$$= e \times \text{Volume of coarse aggregate} \times$$

Specific gravity of coarse aggregate

$$\times 1000$$

$$= 0.665 \times 0.56 \times 2.78 \times 1000$$

$$= 988 \text{ kg}$$

vii. Mass of fine aggregate

$$= e \times \text{volume of fine aggregate} \times \text{Specific}$$

gravity of fine aggregate  $\times 1000$

$$= 0.665 \times 0.44 \times 2.68 \times 1000$$

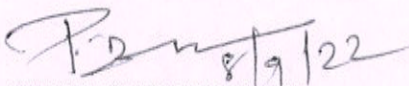
$$= 784 \text{ kg}$$

  
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PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurchi - 622 303, Pudukkottai Dt.





## MIX PROPORTIONS

Cement	= 346 kg/m <sup>3</sup>
Metakaolin	= 38.5 kg/m <sup>3</sup>
Water	= 140 kg/m <sup>3</sup>
Fine aggregate	= 784 kg/m <sup>3</sup>
Coarse aggregate	= 998 kg/m <sup>3</sup>
Water-cement ratio	= 0.364

  
TEST CONDUCTED

  
HOD  
HOD / CIVIL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI,  
PUDUKKOTTAI - 622 303

  
PRINCIPAL  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI - 622 303.  
PUDUKKOTTAI DISTRICT

Received  
R 

  
Dr. S. THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.





# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

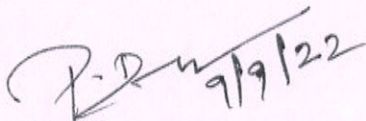
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Pudukkottai - Aranthangi Road,  
Kaikkurichi, Pudukkottai - 622 303.

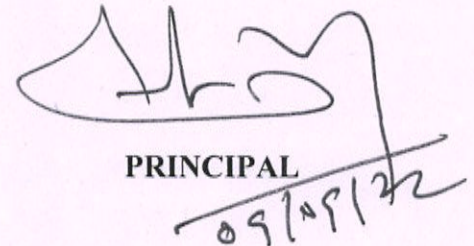
Date : 09.09.2022...

## UTILISATION CERTIFICATE

Certified that an amount of **Rs. 15,000/- (fifteen thousand only)** sanctioned during the year **2022** in favor of civil engineering received from **MR Construction & Promoters** has been utilized for the project consultancy work titled "**Concrete Mix Design M40**". The purpose for which it was sanctioned has been duly fulfilled and delivered as per the conditions of the grant.

  
9/9/22

PROJECT INVESTIGATOR

  
09/09/22

PRINCIPAL



Dr. **S. THILAGAVATHI M.E., Ph.D.**,  
PRINCIPAL

SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.

PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI - 622 303.  
PUDUKKOTTAI DISTRICT