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# Construction Estimating & Costing of a Proposed Boundary Wall

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**Abstract -** *This report, aims to the estimating and costing in construction projects. The study gives the need of estimation of material quantity and cost of the construction project. The main objective of this project is to estimate the required quantity of materials and required cost to complete the construction of proposed boundary wall of SPITM college, Mandleshwar, (M.P.). For this purpose survey of the site was carried out which given the length of boundary wall as 1131.61 m. Also estimated the quantity of cement, sand and aggregate required for entire construction work. The total cost estimated for this construction project is Rs.4996031.50/-.*

***Key Words***: Estimation, costing, boundary wall, construction, quantity.

## 1. INTRODUCTION

Estimation requires a thorough knowledge of the construction procedures and cost of materials. It is totally different from calculation of the exact cost after completion of the project. Estimation is the scientific way of working out the approximate cost of an engineering project before execution of the work. For a good estimate the, actual cost of the proposed work after completion should not differ by more than 5 to 10 % from its approximate cost estimate, provided there are no unusual, unforeseen circumstances.
An estimate is the anticipated or probable cost of work and is usually prepared before the construction is taken up. It is indeed calculations or computations of various items of an engineering work. When some additions are done in the original work, a fresh detailed estimate is prepared to supplement the original work. This estimate is called supplementary estimate. It is also accompanied by all the papers as required in the detailed estimate.

### 1.1 Need for Estimation & Costing

a) It helps to work out the approximate cost of the project in order to decide its feasibility with respect to the cost and to ensure the financial resources, if the proposal is approved.

b) Estimate is required to invite the tenders and quotations and to arrange contract.

c) Requirements of controlled materials, such as cement and steel can be estimated for making applications to the controlling authorities.

d) It is used for framing the tenders for the works and to check contractor's work during and after its execution for the purpose of making payments to the contractor.

e) From quantities of different items of work calculated in detailed estimation, resources are allocated to different activities of the project and ultimately their durations and whole planning and scheduling of the project is carried out.

### 1.2 Site Conditions Affecting the Overall Cost

1. Each type of work requires a different method of construction. Construction may be of an ordinary house or office and it may also be of a Dam, Tunnel, Multistory building, Airport, Bridge, or a Road, already in operation. Each of these works requires totally different construction techniques, type of machinery, and formwork.

2. Quality of labour and labour output varies in different localities.

3. Weather conditions greatly affect the output and, hence, the overall cost.

4. Ground conditions vary and change the method of construction. For example, excavation may be dry, wet, hard, soft, shallow or deep requiring different efforts.

## 2. OBJECTIVES

Following are the objectives:

1. To study the need for estimating & costing in construction work.
2. To study different aspects of estimating & costing.
3. To give the estimated quantities and cost requirement for a boundary wall for proposed construction of SPITM, Mandleshwar (M.P.).

## 3. TECHNICAL TERMS USED IN PROJECT

**Estimate:**
An estimate is the anticipated or probable cost of work and is usually prepared before the construction is taken up. It is indeed calculations or computations of various items of an engineering work.

**Quantity survey:**
It is the schedule of all items of work in a building. These quantities are calculated from the drawing of the building. Thus quantity survey gives quantities of work done in case of each items, when priced it gives the total cost. In short, quantity survey means calculations of quantities of materials required to complete the work concerned.

**Specifications:**
Detailed specifications gives the nature, quality and class of work, materials to be used in the various parts of work, quality of the material, their proportions, method of preparation, workmanship and description of execution of work are required.

**Rates:**
The rates of various items of works, materials to be used in the construction and the wages of different categories of labor (skilled and unskilled) should be available for preparing an estimate. The cost of transportation charges should also be known. As far as possible sanctioned "Schedule of Rates" shall followed or the rates may be worked out by the "Analysis of Rates" method.

**Site Plan:**
It is the plan drawn for a particular construction showing its position with respect to approaching roads, main bazaars, market and other permanent features in a populated area. It shows the location of the area under construction with respect to the other areas and on it generally then a means of the owners of areas or property holder said joining to it is also denoted. North line is also clearly marked on it.

**Line Plan:**
Line plan can be defined as the plan of a particular construction simply showing main features with the help of the single lines of different portions of the constructions. Details of constructions are not generally shown on this plan. This inside and outside dimension shown on this plan should necessarily be corresponding to actual dimensions.

**Detailed Plan:**
This plan indicates a plan of a construction drawn to a definite scale, showing all detailed information required for its execution. Various sections and elevations are clearly drawn on this plan.

**Supplementary Estimate:**
When some additions are done in the original work, a fresh detailed estimate is prepared to supplement the original work. This estimate is called supplementary estimate. It is also accompanied by all the papers as required in thru detailed estimate.

**Administrative Approval:**
For any project required by the department an approval so sanction of the competent authority with respect to the cost and work is necessary at the first instance. Thus administrative or oval denotes the formal acceptance by the administrative department concerned of the proposals for incurring expenditure.

**Technical Sanction:**
It means the sanction and order by the competent authority of the department for the detailed estimate design calculations quantities of work rates and cost of work after the technical sanction of the estimate is received the work is then taken up for construction.

**Ordinary Measurement Book:**
It is measured book in which entries regarding the work done or supplies made and services performed are recorded for the purpose of making payments to the contractor so the labor.

## 4. METHODOLOGY

The main objective of this project is to estimate the required quantity of materials and required cost to complete the construction of proposed boundary wall of SPITM college, Mandleshwar, (M.P.). For this purpose survey of the site was carried out which given the length of boundary wall as 1131.61 m. Also estimated the quantity of cement, sand and aggregate required for entire construction work. After the quantity estimation its cost is calculated.

## 5. RESULTS

To give the estimated quantities and costs for the boundary wall of SPITM College, Mandleshwar, results in tabulated form are given below:

**Table -1:** Quantity Estimation

| Sr. No. | Particular of item | Nos. | Length (m) | Width (m) | Height (m) | Quantities (cu.m.) |
|---|---|---|---|---|---|---|
| 1 | Earthwork in excavation | | | | | |
| | L/W | | | | | |
| | A | 1 | 198.61 | 1 | 1.5 | 297.91 |
| | B | 1 | 116 | 1 | 1.5 | 174 |
| | C | 1 | 241 | 1 | 1.5 | 361.5 |
| | D | 1 | 123 | 1 | 1.5 | 184.5 |
| | E | 1 | 186 | 1 | 1.5 | 279 |
| | F | 1 | 135 | 1 | 1.5 | 222.5 |
| | S/W | | | | | |
| | G | 1 | 16 | 1 | 1.5 | 24 |
| | H | 1 | 19 | 1 | 1.5 | 28.5 |
| | I | 1 | 60 | 1 | 1.5 | 90 |
| | | | | | Total | 1661.91 |
| 2 | C.C. in foundation | | | | | |
| | L/W | | | | | |
| | A | 1 | 198.51 | 0.9 | 0.3 | 53.6 |
| | B | 1 | 115.9 | 0.9 | 0.3 | 31.3 |
| | C | 1 | 240.9 | 0.9 | 0.3 | 65.04 |
| | D | 1 | 122.9 | 0.9 | 0.3 | 33.18 |
| | E | 1 | 185.9 | 0.9 | 0.3 | 50.2 |
| | F | 1 | 134.9 | 0.9 | 0.3 | 36.42 |
| | S/W | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | G | 1 | 16.1 | 0.9 | 0.3 | 4.35 |
| | H | 1 | 18.1 | 0.9 | 0.3 | 4.8 |
| | I | 1 | 60.4 | 0.9 | 0.3 | 10.26 |
| | | | | | **Total** | 259.24 |
| **3** | **Brickwork in 1st footing** | | | | | |
| | L/W | | | | | |
| | A | 1 | 198.21 | 0.6 | 0.3 | 35.68 |
| | B | 1 | 115.6 | 0.6 | 0.3 | 20.81 |
| | C | 1 | 240.6 | 0.6 | 0.3 | 43.31 |
| | D | 1 | 122.6 | 0.6 | 0.3 | 22.07 |
| | E | 1 | 185.6 | 0.6 | 0.3 | 33.41 |
| | F | 1 | 134.6 | 0.6 | 0.3 | 24.23 |
| | S/W | | | | | |
| | G | 1 | 16.4 | 0.6 | 0.3 | 2.95 |
| | H | 1 | 19.4 | 0.6 | 0.3 | 3.5 |
| | I | 1 | 60.4 | 0.6 | 0.3 | 10.87 |
| | | | | | **Total** | 196.83 |
| **4** | **Brickwork in 2nd footing** | | | | | |
| | L/W | | | | | |
| | A | 1 | 198 | 0.5 | 0.3 | 29.7 |
| | B | 1 | 115.5 | 0.5 | 0.3 | 17.33 |
| | C | 1 | 240.5 | 0.5 | 0.3 | 36.08 |
| | D | 1 | 122.5 | 0.5 | 0.3 | 18.34 |
| | E | 1 | 185.5 | 0.5 | 0.3 | 27.83 |
| | F | 1 | 134.5 | 0.5 | 0.3 | 20.17 |
| | S/W | | | | | |
| | G | 1 | 16.5 | 0.5 | 0.3 | 2.48 |
| | H | 1 | 19.5 | 0.5 | 0.3 | 2.93 |
| | I | 1 | 60.5 | 0.5 | 0.3 | 9.08 |
| | | | | | **Total** | 163.94 |
| **5** | **Brickwork in 3rd footing** | | | | | |
| | L/W | | | | | |
| | A | 1 | 198.01 | 0.4 | 0.6 | 47.57 |
| | B | 1 | 115.4 | 0.4 | 0.6 | 27.7 |
| | C | 1 | 240.4 | 0.4 | 0.6 | 57.7 |
| | D | 1 | 122.4 | 0.4 | 0.6 | 29.38 |
| | E | 1 | 185.4 | 0.4 | 0.6 | 44.5 |
| | F | 1 | 134.4 | 0.4 | 0.6 | 32.26 |
| | S/W | | | | | |
| | G | 1 | 16.6 | 0.4 | 0.6 | 3.4 |
| | H | 1 | 19.6 | 0.4 | 0.6 | 4.7 |
| | I | 1 | 60.6 | 0.4 | 0.6 | 14.54 |
| | | | | | **Total** | 261.7 |
| **6** | **Brickwork in superstructure** | | | | | |
| | L/W | | | | | |
| | A | 1 | 197.81 | 0.2 | 2 | 79.12 |
| | B | 1 | 115.2 | 0.2 | 2 | 46.08 |
| | C | 1 | 240.2 | 0.2 | 2 | 96.08 |
| | D | 1 | 122.2 | 0.2 | 2 | 48.88 |
| | E | 1 | 185.2 | 0.2 | 2 | 74.06 |
| | F | 1 | 134.2 | 0.2 | 2 | 53.68 |
| | S/W | | | | | |
| | G | 1 | 16.8 | 0.2 | 2 | 6.72 |
| | H | 1 | 19.8 | 0.2 | 2 | 7.92 |
| | I | 1 | 60.8 | 0.2 | 2 | 24.32 |
| | | | | | **Total** | 436.584 |

**Table -2:** Cost Estimation

| Sr. No. | Particulars | Quantity or Nos. | Rates | Cost rate (Rs.) |
|---|---|---|---|---|
| **1** | **Earthwork in Excavation** | | | |
| | Mazdoor | 20 | 250 Rs./day | 5000 |
| | Coolies | 16 | 200 Rs./day | 3200 |
| | | | **Total** | 8200 |
| **2** | **C.C. in Foundation** | | | |
| | Cement (bags) | 891 | Rs. 300/bag | 267441.18 |
| | Sand (cu.m.) | 121 | Rs. 800/cu.m. | 97059.47 |
| | Aggregate (cu.m.) | 242 | Rs. 1400/cu.m. | 339708 |
| | | | **Total** | 704208.65 |
| **3** | **Brickwork in Foundation** | | | |
| | Bricks (No.) | 311240 | Rs. 5/brick | 1556175 |
| | **Mortar (1:6)** | | | |
| | Cement (bags) | 784 | Rs. 300/bag | 235412 |
| | Sand (cu.m.) | 168.59 | Rs. 800/cu.m. | 124877.8 |
| | | | **Total** | 1916464.8 |
| **4** | **Brickwork in Superstructure** | | | |
| | Bricks (No.) | 218500 | Rs. 5/brick | 1092225 |
| | **Mortar (1:6)** | | | |
| | Cement (bags) | 555 | Rs. 300/bag | 166500 |
| | Sand (cu.m.) | 112.71 | Rs. 800/cu.m. | 90175 |
| | | | **Total** | 1348900 |
| **5** | Column in wall | 242 columns | rs. 1500/column | 363750 |
| | Deduction in wall | | | 68600 |
| | | | Total | 259150 |
| **6** | **Labour Required for Construction** | | | |
| | Head Mason | 2 | Rs. 350/day | 700 |
| | Mason | 5 | Rs. 300/day | 1500 |
| | Mazdoor | 10 | Rs. 250/day | 25000 |
| | Woomen coolie | 10 | Rs. 220/day | 2200 |
| | Bhisti | 5 | Rs. 200/day | 1000 |
| | | | **Total** | 30400 |
| | Add 2% of water charges | | | 86138.47 |
| | Add 10% of contractor profit | | | 430692.35 |
| | Add 4% of contingencies | | | 172276.94 |
| | **Grand Total** | | | 4996031.5 |

## 6. CONCLUSION

Within the scope of present study from the estimation of quantities and costing of proposed boundary wall of SPITM College, Mandleshwar, following conclusions are drawn:

The total length of boundary wall is 1131.61m. Estimated time for the construction of wall is 5 months. The estimated

cost for this boundary wall is around Rs. 4996031.50/-. From quantity estimation cement required is 2230 bags, sand required is 402.3 cu.m., aggregates required 242 cu.m. and bricks required 218500.

## REFERENCES

[1] Estimating & costing in civil engineering - B.N. DUTTA

## AUTHOR

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