



SOME COMMON RELATIONS USED IN BUILDING ESTIMATES

1- MORTARS

(a) Cement-Sand Mortars

120 cft dry yields 100 cft wet

(b) Lime-Sand Mortars

113 cft dry yields 100 cft wet

(C) Cement-Lime-Sand Mortars

112 cft dry yields 100 cft wet

(d) Dry mortar required for 100 sft of 1/2" thick cement plaster

=6 cft

2- CEMENT CONCRETE

154 cft dry yields 100 cft wet

3- BRICKWORK

(a) 100 cft Brick masonry

Bricks -----1350
Dry Mortar ----- 30 cft
Wet Mortar ----- 25 cft

(b) 100 sft surface area using bricks on bed

Bricks -----360
Mortar ----- 9 cft

(b) 100 sft surface area using bricks on edge

Bricks -----540
Mortar ----- 13 cft

4- POINTING PER 1000 SFT AREA

| Ingredient | 1:1 | 1:2 | 1:3 |
|------------|-------|--------|----------|
| Cement | 8 cft | 5 cft | 3.8 cft |
| Sand | 8 cft | 10 cft | 11.4 cft |

5- EARTHWORK

Output of labor assuming one man working 8 hours per day with lift up to 5 ft or less

| TYPE OF SOIL | EXCAVATION PER DAY |
|-------------------|--------------------|
| Medium Soil | 75 – 100 cft |
| Hard / Stiff Soil | 50 – 75 cft |
| Rocky Soil | 25 – 30 cft |

6- BITUMEN

| | | |
|--|---|-------|
| Bitumen for 100 sft of DPC (first coat) | = | 15 Kg |
| Bitumen for 100 sft of DPC (second coat) | = | 10 Kg |

7- CEMENT

1 Bag ----- 50 Kg (Weight), 1.25 cft (Volume)

8- SPECIFIC WEIGHTS

RCC ----- 150 lbs / cft

PCC ----- 145 lbs / cft

Aggregate ----- 166 lbs / cft

9- TIMBER

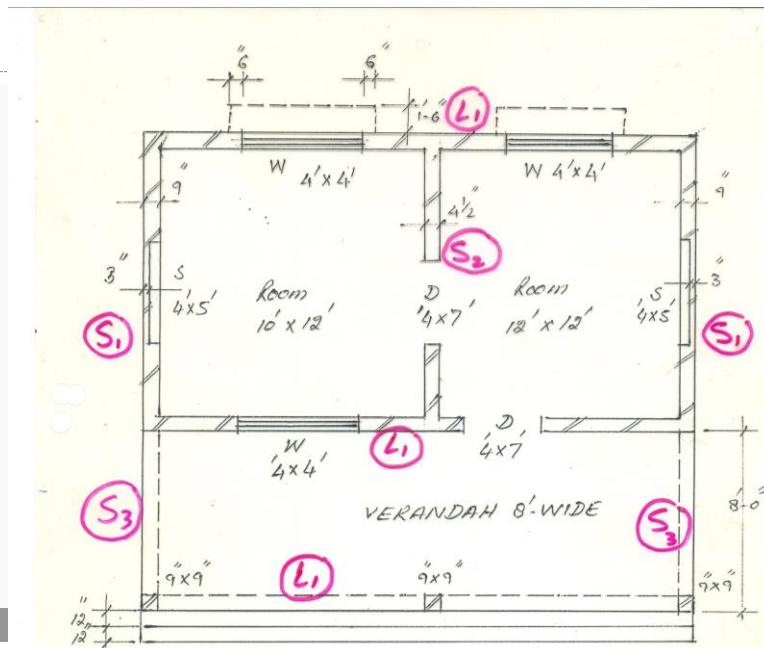
| | | |
|--|---|--------|
| Timber for 100 sft of Panelled Doors and Windows | = | 13 cft |
| Timber for 100 sft of Glazed windows and Ventilators | = | 8 cft |

10- WHITE WASH

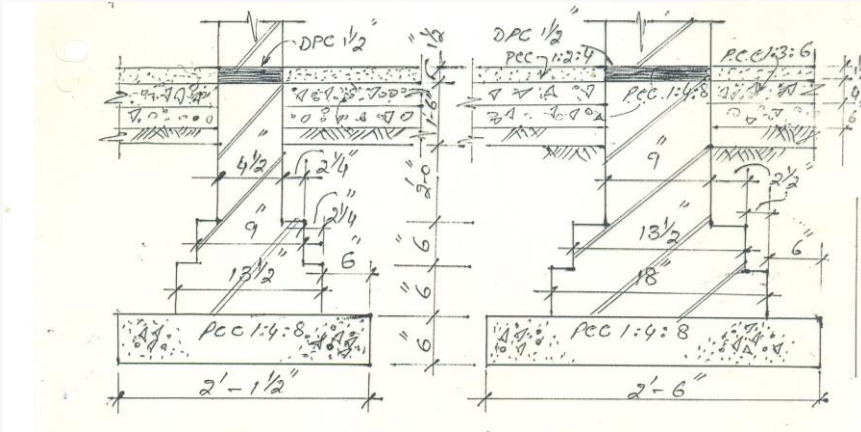
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| Lime for 100 sft of white wash (one coat) | = | 1.00 Kg |
|---|---|---------|

ESTIMATION OF A SIMPLE BUILDING

PLAN



FOUNDATIONS



SPECIFICATIONS

- **Clear height of rooms:** 12'
- **Clear height of Verandah:** 10'-0"
- **Plinth level:** 1'-6"
- **Thickness of roof slab:** 4"
- **Thickness of RCC shade:** 3"
- **Depth of RCC Beams in Verandah:** 1'-6" below verandah slab
- **Parapet wall:** 1'-0" (Clear height above roof tiles)
- **Ventilators (4 No.):** 2'-6" x 1'-6"
- **RCC lintel:** 6" in depth
- **Damp proof coarse:** 1 1/2" thick PCC (1:2:4) + 2 coats of hot bitumen + polythene sheet

- **Full foundation** up to plinth level along verandah periphery is provided
- **Internal finishes:** Three coats of white wash/distemper paint
- **External finishes:** Three coats of Weather shield paint

Center to Center Lengths



- $L1 = (10'-0'') + (12'-0'') + (0'-4 \frac{1}{2}'') + (0'-4 \frac{1}{2}'') + (0'-4 \frac{1}{2}'') = 23'-1 \frac{1}{2}''$
- $S1 \& S2 = (12'-0'') + (0'-4 \frac{1}{2}'') + (0'-4 \frac{1}{2}'') = 12'-9''$
- $S3 = (8'-0'') + (0'-4 \frac{1}{2}'') - (0'-4 \frac{1}{2}'') = 8'-0''$

BILL OF QUANTITIES

1- CIVIL WORKS

| S. No | Description of item | No | Measurement | | | Quantity | Total Quantity | Remarks | |
|-------|---|----|-------------|--------------|-------------|----------|----------------|-------------|--|
| | | | Length | Breadth | Depth | | | | |
| 1 | Earthwork for excavation in foundation trenches | | | | | | | | |
| | | L1 | 3 | 25'-7 1/2" " | 2'-6" | 3'-6" | 224.22 cft | 672.66 cft | L = 23'-1 1/2''+(2'-6)'' = 25'-7 1/2'' |
| | | S1 | 2 | 10'-3" | 2'-6" | 3'-6" | 89.69 cft | 179.38 cft | L = 12'-9''-(2'-6)'' = 10'-3" |
| | | S2 | 1 | 10'-3" | 2'-1 1/2" " | 3'-6" | 76.23 cft | 76.23 cft | L = 12'-9''-(2'-6)'' = 10'-3" |
| | | S3 | 2 | 5'-6" | 2'-6" | 3'-6" | 48.13 cft | 96.25 cft | L = 8'-0''-(2'-6)'' = 5'-6" |
| | | | | | | | Total = | 1024.52 cft | |

| | | | | | | | | |
|---|---|---|-------------|------------|------------|-----------|------------|--|
| 2 | Earth work in filling under floors | | | | | | | |
| | Room No.1 | 1 | 12'-0" | 12'-0" | 0'-6 1/2 " | 78.00 cft | 78.00 cft | $D = 1'-6'' - (0'-11\frac{1}{2}'') = 6\frac{1}{2}''$ |
| | Room No.2 | 1 | 10'-0" | 12'-0" | 0'-6 1/2 " | 65.00 cft | 65.00 cft | |
| | Veranda | 1 | 22'-4 1/2 " | 7'-3" | 0'-6 1/2 " | 87.87 cft | 87.87 cft | $L = 10'-0'' + (0'-4\frac{1}{2}'') + (12'-0'') = 22'-4\frac{1}{2}''$ $B = 8'-0'' - (0'-9'') = 7'-3''$ |
| | | | | | | Total = | 230.87 cft | |
| 3 | P.C.C (1:4:8) in foundation using crushed or broken stones | | | | | | | Length & Breadth same as for Foundation trenches (Item No. 1) |
| | L1 | 3 | 25'-7 1/2 " | 2'-6" | 0'-6" | 32.00 cft | 96.00 cft | |
| | S1 | 2 | 10'-3" | 2'-6" | 0'-6" | 12.81 cft | 25.63 cft | |
| | S2 | 1 | 10'-3 | 2'-1 1/2 " | 0'-6" | 10.89 cft | 10.89 cft | |
| | S3 | 2 | 5'-6 | 2'-6" | 0'-6" | 6.87 cft | 13.75 cft | |
| | | | | | | Total= | 146.27 cft | |

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| 4 | Burnt brick work in foundation and plinth using first class bricks in (1:6) cements sand mortar. | | | | | | | |
| | (a) L1 | | | | | | | |
| | 1 st step | 3 | 24'-7 1/2 " | 1'-6" | 0'-6" | 18.47 cft | 55.40 cft | $L = 23'-1\frac{1}{2}'' + (1'-6'') = 24'-7\frac{1}{2}''$ |
| | 2 nd step | 3 | 24'-3" | 1'-1 1/2 " | 0'-6" | 13.64 cft | 40.92 cft | $L = 23'-1\frac{1}{2}'' + (1'-1\frac{1}{2}'') = 24'-3''$ |
| | 3 rd step up to plinth level | 3 | 23'-10 1/2 " | 0'-9" | 3'-4 1/2 " | 60.43 cft | 181.30 cft | $L = 23'-1\frac{1}{2}'' + (0'-9'') = 23'-10\frac{1}{2}''$ $D = 2'-0'' + (1'-6'') - (0'-1\frac{1}{2}'') = 3'-4\frac{1}{2}''$ |
| | | | | | | Total= | 277.62 cft | |
| | (b) S1 | | | | | | | |
| | 1 st step | 2 | 11'-3" | 1'-6" | 0'-6" | 8.44 cft | 16.88 cft | $L = 12'-9'' - (1'-6'') = 11'-3''$ |
| | 2 nd step | 2 | 11'-7 1/2 " | 1'-1 1/2 " | 0'-6" | 6.54 cft | 13.08 cft | $L = 12'-9'' - (1'-1\frac{1}{2}'') = 11'-7\frac{1}{2}''$ |
| | 3 rd step up to plinth level | 2 | 12'-0" | 0'-9" | 3'-4 1/2 " | 30.37 cft | 60.75 cft | $L = 12'-9'' - (0'-9'') = 12'-0''$ |
| | | | | | | Total= | 90.71 cft | |

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|---|---|-------------|-----------|-----------|-----------|------------|--|
| (c) S2 | | | | | | | |
| 1 st step | 1 | 11'-3" | 1'-1 1/2" | 0'-6" | 6.33 cft | 6.33 cft | $L = 12'-9" - (1'-6") = 11'-3"$ |
| 2 nd step | 1 | 11'-7 1/2" | 0'-9" | 0'-6" | 4.36 cft | 4.36 cft | $L = 12'-9" - (1'-1 1/2") = 11'-7 1/2"$ |
| 3 rd step up to plinth level | 1 | 12'-0" | 0'-4 1/2" | 3'-4 1/2" | 15.19 cft | 15.19 cft | $L = 12'-9" - (0'-9") = 12'-0"$ |
| | | | | | Total= | 25.88 cft | |
| (d)S3 | | | | | | | |
| 1 st step | 2 | 6'-6" | 1'-6" | 0'-6" | 4.87 cft | 9.75 cft | $L = 8'-0" - (1'-6") = 6'-6"$ |
| 2 nd step | 2 | 6'-10 1/2" | 1'-1 1/2" | 0'-6" | 3.86 cft | 7.73 cft | $L = 8'-0" - (1'-1 1/2") = 6'-10 1/2"$ |
| 3 rd step up to plinth level | 2 | 7'-3" | 0'-9" | 3'-4 1/2" | 18.35 cft | 36.70 cft | $L = 8'-0" - (0'-9") = 7'-3"$ |
| | | | | | Total= | 54.18 cft | |
| (e) steps in front of verandah | | | | | | | |
| 1 st step | 1 | 23'-10 1/2" | 2'-0" | 0'-6" | 23.88 cft | 23.88 cft | $L = 23'-1 1/2" + (0'-4 1/2") + (0'-4 1/2") = 23'-10 1/2"$ |
| 2 nd step | 1 | 23'-10 1/2" | 1'-0" | 0'-6" | 11.94 cft | 11.94 cft | |
| | | | | | Total= | 35.82 cft | |
| | | | | | G.Total= | 484.21 cft | |

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|---|--|---|-------------|-----------|---|-------------|--|
| 5 | 1-1/2" thick P.C.C (1:2:4) in DPC including two coats of hot bitumen & 2 layers of Polythene sheet | | | | | | Length & Breadth same as for plinth wall |
| | L ₁ | 2 | 23'-10 1/2" | 0'-9" | - | 17.9 sft | 35.81 sft |
| | S ₁ | 2 | 12'-0" | 0'-9" | - | 9.00 sft | 18.00 sft |
| | S ₂ | 1 | 12'-0" | 0'-4 1/2" | - | 4.5 sft | 4.50 sft |
| | Verandah columns | 3 | 0'-9" | 0'-9" | - | 0.56 sft | 1.69 sft |
| | | | | | | Total = | 60.00 sft |
| | Deduction of Door sills | 1 | 4'-0" | 0'-9" | - | 3.00 sft | 3.00 sft |
| | | 1 | 4'-0" | 0'-4 1/2" | - | 1.50 sft | 1.50sft |
| | | | | | | Total= | 4.50 sft |
| | | | | | | Net Total = | 55.50 sft |

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|---|---|---|-------------|------------|-------------|---------------|-------------------|--|
| 6 | Brick work in super structure using first class bricks in (1:4) cement sand mortar | | | | | | | Length & Breadth same as for plinth wall |
| | L1 | 2 | 23'-10 1/2" | 0'-9" | 13'-10 1/2" | 248.45 cft | 496.90 cft | H = 12'-0" (Room height) + 0'-4" (Slab) + 0'-4" (Earth filling) + 0'-1" (Mud plaster) + 0'-1 1/2" (Tiles) + 1'-0" (P. wall) = 13'-10 1/2" |
| | S1 | 2 | 12'-0" | 0'-9" | 13'-10 1/2" | 124.87 cft | 249.75 cft | |
| | S2 | 1 | 12'-0" | 0'-4 1/2 " | 12'-0" | 54.00 cft | 54.00 cft | No Parapet Walls |
| | Verandah columns | 3 | 0'-9" | 0'-9" | 8'-6" | 4.78 cft | 14.34 cft | H=10'-0"- (1'-6")=8'-6" |
| | Verandah parapet walls | | | | | | | |
| | (i) L1 | 1 | 23'-10 1/2" | 0'-9" | 1'-6 1/2" | 27.60 cft | 27.60 cft | H = 0'-4" (Earth filling) + 0'-1" (Mud plaster) + 0'-1 1/2" (Tiles) + 1'-0" (P. walls) = 1'-6 1/2" |
| | (ii) S3 | 2 | 7'-3" | 0'-9" | 1'-6 1/2 " | 8.38 cft | 16.76 cft | |
| | | | | | | Total= | 859.35 cft | |

| Deduction | | | | | | | |
|------------------|------------------|---|-------|------------|--------|--------------------|-------------------|
| | Doors | 1 | 4'-0" | 0'-9" | 7'-0" | 21.00 cft | 21.00 cft |
| | | 1 | 4'-0" | 0'-4 1/2 " | 7'-0" | 10.5 cft | 10.50 cft |
| | Windows | 3 | 4'-0" | 0'-9" | 4'-0" | 12.00 cft | 36.0 cft |
| | Ventilators | 4 | 2'-6" | 0'-9" | 1'--6" | 2.81 cft | 11.25 cft |
| | Shelves | 2 | 4'-0" | 0'-6" | 5'-0" | 10.00 cft | 20.00 cft |
| | RCC lintels over | | | | | | |
| | (i)doors | 1 | 5'-0" | 0'-9" | 0'-6' | 1.87 cft | 1.87 cft |
| | | 1 | 5'-0" | 0'-4 1/2 " | 0'-6' | 0.93 cft | 0.93 cft |
| | (ii)Windows | 3 | 5'-0" | 0'-9" | 0'-6' | 1.87 cft | 5.62 cft |
| | (iii)Ventilators | 4 | 3'-6" | 0'-9" | 0'-6' | 1.31 cft | 5.25 cft |
| | (iv)Shelves | 2 | 5'-0" | 0'-9" | 0'-6' | 1.87 cft | 3.75 cft |
| | | | | | | Total = | 116.18 cft |
| | | | | | | Net Total = | 743.17 cft |

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|---|--|---|------------|----------|-------|-----------|-----------|--|
| 7 | Reinforced cement concrete (1:2:4) as in roof slab, lintels, columns, beams etc., (reinforcement will be measured separately) | | | | | | | There is 4½" bearing of both slabs on all walls |
| | Roof slab of rooms | 1 | 23'-1 ½" | 12'-9" | 0'-4" | 98.28 cft | 98.28 cft | $L = 10'-0" + 12'-0" + 0'-4\frac{1}{2}" + 0'-9" (2 \text{ bearings}) = 23'-1\frac{1}{2}"$ |
| | | | | | | | | $B = 12'-0" + 0-4\frac{1}{2}"(\text{bearing}) + 0'-4\frac{1}{2}"(\text{bearing}) = 12'-9"$ |
| | Roof slab of Verandah | 1 | 23'-10 ½ " | 8'-4 ½ " | 0'-4" | 66.65 cft | 66.65 cft | $B = 8'-0" + 0'-4\frac{1}{2}"(\text{bearing}) = 8'-4\frac{1}{2}"$ |
| | Verandah beam | | | | | | | |
| | Long beam | 1 | 23'-1 0½" | 0'-9" | 1'-6" | 26.86 cft | 26.86 cft | |
| | Short beam | 2 | 7'-7 ½ " | 0'-9" | 1'-6" | 8.59 cft | 17.18 cft | $L=8'-0"-(0'-9") + (0'-4\frac{1}{2}") = 7'-7\frac{1}{2}"$ |

| Lintels | | | | | | | |
|----------------|---|-------|---------|-------|---------------|-------------------|--|
| Doors | 1 | 5'-0" | 0'-9" | 0'-6' | 1.87 cft | 1.87 cft | |
| | 1 | 5'-0" | 0'-4½ " | 0'-6' | 0.93 cft | 0.93 cft | |
| Windows | 3 | 5'-0" | 0'-9" | 0'-6' | 1.87 cft | 5.62 cft | |
| Ventilators | 4 | 3'-6" | 0'-9" | 0'-6' | 1.31 cft | 5.25 cft | |
| Shelves | 2 | 5'-0" | 0'-9" | 0'-6' | 1.87 cft | 3.75 cft | |
| Shades | 2 | 5'-0" | 1'-6" | 0'-3" | 1.87 cft | 3.75 cft | |
| | | | | | Total= | 226.39 cft | |

| | | | | | | | |
|---|---|---|-------------|--------|---------|---|--|
| 8 | Mild steel round bars as reinforcement including cutting, bending, binding and placing reinforcement in position | | | | | 6.75 lbs/cft steel of 226.39 cft concrete =1528.13 lbs | |
| | | | | | Total= | 1529.00 lbs | |
| 9 | Roof insulation comprising of 2 coats of hot bitumen, 4" thick earth filling, 1" thick mud plaster and 1-1/2" thick brick tiles jointed and pointed in cement sand mortar (1:3) | | | | | | |
| | Rooms (1 & 2) | 1 | 22'-4 1/2 " | 12'-0" | - | 268.50 sft | 268.5 sft $L = 10'-0" + (12"-0") + (0'-4\frac{1}{2}") = 22'- 4-\frac{1}{2}"$ |
| | Verandah | 1 | 22'-4 1/2 " | 7'-3" | - | 162.22 cft | $B = 8'- 0" - (0'-9") = 7'-3"$ |
| | | | | | Total = | 430.72 sft | |

| | | | | | | | |
|----|--|---|-------------|--------|-------|-----------|------------|
| 10 | Sand under floors | | | | | | |
| | Room No.1 | 1 | 10'-0" | 12'-0" | 0'-6" | 60.00 cft | 60.00 cft |
| | Room No.2 | 1 | 12'-0" | 12'-0" | 0'-6" | 72.00 cft | 72.00 cft |
| | Verandah | 1 | 22'-4 1/2 " | 7'-3" | 0'-6" | 81.11 cft | 81.11 cft |
| | | | | | | Total = | 213.11 cft |
| 11 | Cement concrete (1:4:8) as under layer of floors | | | | | | |
| | Room No.1 | 1 | 10'-0" | 12'-0" | 0'-4" | 40.00 cft | 40.00 cft |
| | Room No.2 | 1 | 12'-0" | 12'-0" | 0'-4" | 48.00 cft | 48.00 cft |
| | Verandah | 1 | 22'-4 1/2 " | 7'-3" | 0'-4" | 54.07 cft | 54.07 cft |
| | | | | | | Total = | 142.07 cft |

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|----|---|---|-------------|------------|---|------------|------------|---|
| 12 | 1-1/2" thick cement concrete (1:2:4) as top layer of floor, finished smooth | | | | | | | |
| | Room No.1 | 1 | 10'-0" | 12'-0" | - | 120.00 sft | 120.00 sft | |
| | Room No.2 | 1 | 12'-0" | 12'-0" | - | 144.00 sft | 144.00 sft | |
| | Verandah | 1 | 23'-10 1/2" | 8'-0" | - | 191.00 sft | 191.00 sft | $L = 10'-0" + (12'-0") + (0'-4 \frac{1}{2} ") + (0'-9") + (0'-9") = 23'-10 \frac{1}{2} "$ |
| | Door sill 1 | 1 | 4'-0' | 0'-9" | - | 3.00 sft | 3.00 sft | |
| | Door sill 1 | 1 | 4'-0" | 0'-4 1/2 " | - | 1.50sft | 1.50sft | |
| | | | | | | Total= | 459.5 sft | |
| | <u>Deduction</u> | | | | | | | |
| | Columns | 3 | 0'-9" | 0'-9" | - | 0.56 sft | 1.68sft | |
| | | | | | | Net Total= | 457.80 sft | |

| | | | | | | | | |
|----|---|---|-------------|---|--------|------------|------------|---|
| 13 | 1/2" thick (1:3) cement sand plaster to walls finished smooth | | | | | | | |
| | <u>Inner side</u> | | | | | | | |
| | Room No.1 (Long wall) | 2 | 12'-0" | - | 12'-0" | 144.00 sft | 288.00 sft | |
| | Room No.1(Short wall) | 2 | 10'-0" | - | 12'-0" | 120.00 sft | 240.00 sft | |
| | Room No.1 (Ceiling) | 1 | 10'-0" | - | 12'-0" | 120.00 sft | 120.00 sft | |
| | Room No.2 (Long wall) | 2 | 12'-0" | - | 12'-0" | 144.00 sft | 288.00 sft | |
| | Room No.2(Short wall) | 2 | 12'-0" | - | 12'-0" | 144.00 sft | 288.00 sft | |
| | Room No.2 (Ceiling) | 1 | 12'-0" | - | 12'-0" | 144.00 sft | 144.00 sft | |
| | Verandah wall | 1 | 23'-10 1/2" | - | 10'-0" | 238.75 sft | 238.75 sft | $L = (10'-0") + (12'-0") + (0'-4 \frac{1}{2} ") + (0'-9") + (0'-9") = 23'-10 \frac{1}{2} "$ |
| | Verandah ceiling | 1 | 22'-4 1/2" | - | 7'-3" | 162.26 sft | 162.26 sft | $L = (10'-0") + (12'-0") + (0'-4 \frac{1}{2} ") = 22'-1 \frac{1}{2} "$ |
| | Columns | 3 | 3'-0" | - | 8'-6" | 25.50 sft | 76.5 sft | $L = (0'-9") + (0'-9") + (0'-9") + (0'-9") = 3'-0 "$ |
| | Long beam (internal side) | 1 | 22'-4 1/2" | - | 1'-6" | 33.55 sft | 33.55 sft | |
| | Long beam (soffit) | 2 | 10'-9 3/4" | - | 0'-9" | 8.10 sft | 16.21 sft | $L = \{(22'-4 \frac{1}{2} ") - (0'-9")\} / 2 = 10'-9 \frac{3}{4} "$ |
| | Short beam (internal sides) | 2 | 7'-3" | - | 1'-6" | 10.87 sft | 21.74 sft | $L = \{(8'-0") - (0'-9")\} = 7'-3"$ |
| | Short beam (soffit) | 2 | 7'-3" | - | 0'-9" | 5.43 sft | 10.87 sft | |

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|---|---|-----------|---|-----------|------------|------------|--|
| Door jambs | 2 | 0'-9" | - | 7'-0" | 5.25 sft | 10.50 sft | |
| | 2 | 0'-4½" | - | 7'-0" | 2.63 sft | 5.25 sft | |
| | 1 | 0'-9" | - | 4'-0" | 3.0 sft | 1.50 sft | |
| | 1 | 0'-4½" | - | 4'-0" | 1.50 sft | 3.00 sft | |
| Window jambs | 6 | 0'-9" | - | 4'-0" | 3.00 sft | 18.00 sft | |
| | 6 | 0'-9" | - | 4'-0" | 3.00 sft | 18.00 sft | |
| Ventilator jambs | 8 | 0'-9" | - | 2'-6" | 1.88 sft | 15.00 sft | |
| | 8 | 0'-9" | - | 1'-6" | 1.19 sft | 9.00 sft | |
| Shelves | 4 | 0'-6" | - | 5'-0" | 2.5 sft | 10.00 sft | |
| | 4 | 0'-6" | - | 4'-0" | 2.0 sft | 8.00 sft | |
| Outer side | | | | | | | |
| Rear wall (From 6" below G.L. to Parapet walls) | 1 | 23'-10 ½" | - | 15'-10 ½" | 379.00 sft | 379.00 sft | $H = (0'-6") + (1'-6") + (12'-0") + (0'-4") + (0'-4") + (0'-1") + (0'-1½") + (1'-0") = 15'-10½"$ |
| Left & Right side wall | 2 | 13'-6" | - | 15'-10 ½" | 214.32 sft | 428.64 sft | $L = (12'-0") + (0'-9") + (0'-9") = 13'-6"$ |
| Front side (above verandah roof) | 1 | 23'-10 ½" | - | 3'-0" | 71.63 sft | 71.63 sft | $H = (12'-0") + 0'-10½") + (1'-0") - (10'-10 ½") = 3'-0"$ |
| Left & Right side plinth of verandah | 2 | 8'-0" | - | 2'-0" | 16.00 sft | 32.00 sft | $H = (1'-6") + (0'-6") = 2'-0"$ |

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|--------------------------------|---|-----------|---|---------|-----------|-----------|---|
| Parapet wall | | | | | | | |
| Inner side of rooms | 2 | 22'-4 ½" | - | 1'-0" | 22.37 sft | 44.70 sft | $L = (10'-0") + (12'-0") + (0'-4 ½") = 22'-4 ½"$ |
| | 2 | 12'-0" | - | 1'-0" | 12.00 sft | 24.00 sft | |
| Inner side of Verandah | 1 | 22'-4 ½" | - | 1'-0" | 22.37 sft | 22.37 sft | |
| | 2 | 7'-3 " | - | 1'-0" | 7.25 sft | 14.50 sft | |
| Outer side of Verandah | 1 | 23'-10 ½" | - | 3'-4 ½" | 67.66sft | 67.66 sft | $H = (1'-6") + (0'-4") + (0'-6 ½") + (1'-0") = 3'-4 1/2"$ |
| | 2 | 8'-0" | - | 2'-10" | 22.67 sft | 45.33 sft | |
| Top of parapet wall (Rooms) | 2 | 23'-10 ½" | - | 0'-9" | 17.9 sft | 35.80 sft | |
| | 2 | 12'-0" | - | 0'-9" | 9.00 sft | 18.00 sft | |
| Top of parapet wall (Verandah) | 1 | 23'-10 ½" | - | 0'-9" | 17.90 sft | 17.90 sft | |
| | 2 | 7'-3" | - | 0'-9" | 5.43 sft | 10.87 sft | |

| <u>Steps</u> | | | | | | |
|------------------|---|-------------|---|-------|------------|-------------|
| Tread | 2 | 23'-10 1/2" | - | 1'-0" | 23.87 sft | 47.74 sft |
| Riser | 3 | 23'-10 1/2" | - | 0'-6" | 11.93 sft | 35.80 sft |
| Sides | 2 | 2' - 00" | | 0'-6" | 1.00 sft | 2.00 sft |
| | 2 | 1' - 00" | | 0'-6" | 0.5 sft | 1.00 sft |
| | | | | | Total= | 3316.07 sft |
| <u>Deduction</u> | | | | | | |
| Doors | 2 | 4'-0' | - | 7'-0" | 28.00 sft | 56.00 sft |
| Windows | 3 | 4'-0' | - | 4'-0" | 16.00 sft | 48.00 sft |
| Ventilators | 4 | 2'-6" | - | 1'-6" | 3.75 sft | 15.00 sft |
| | | | | | Total= | 119.00 sft |
| | | | | | Net Total= | 3197.07 sft |

| | | | | | | | |
|----|--|---|-------|---|-------|-----------|--------------------------------------|
| 14 | Wood work as in | | | | | | |
| | (i) 1 1/2" thick wooden doors with chowkat, | 2 | 4'-0' | - | 7'-0" | 28.00 sft | 56.00 sft |
| | | | | | | Total = | 56.00 sft |
| | (ii) Glazed and gauzed windows and ventilators. | 3 | 4'-0' | - | 4'-0" | 16.00 sft | 48.00 sft |
| | | 4 | 2'-6" | - | 1'-6" | 3.75 sft | 15.00 sft |
| | | | | | | Total = | 63.00 sft |
| | | | | | | G.Total = | 119.00 sft |
| 15 | Three coats of painting to doors , windows and ventilators | - | - | - | - | - | .(2 x Qty of item No.14) = 238.0 sft |
| | | | | | | Total | 238.00 sft |

| | | | | | | | | |
|----|--|---|-------------|---|--------|------------|------------|--|
| 16 | Three coats of distempingering/ white washing to walls (Internal Side) | | | | | | | |
| | Room No.1 (Long wall) | 2 | 12'-0" | - | 12'-0" | 144.00 sft | 288.00 sft | |
| | Room No.1 (Short wall) | 2 | 10'-0" | - | 12'-0" | 120.00 sft | 240.00 sft | |
| | Room No.1 (Ceiling) | 1 | 10'-0" | - | 12'-0" | 120.00 sft | 120.00 sft | |
| | Room No.2 (Long wall) | 2 | 12'-0" | - | 12'-0" | 144.00 sft | 288.00 sft | |
| | Room No.2 (Short wall) | 2 | 12'-0" | - | 12'-0" | 144.00 sft | 288.00 sft | |
| | Room No.2 (Ceiling) | 1 | 12'-0" | - | 12'-0" | 144.00 sft | 144.00 sft | |
| | Verandah wall | 1 | 23'-10 1/2" | - | 10'-0" | 238.75 sft | 238.75 sft | |
| | Verandah Ceiling | 1 | 22'-4 1/2" | - | 7'-3" | 162.26 sft | 162.26 sft | |
| | Columns | 3 | 3'-0" | - | 8'-6" | 25.50 sft | 76.50 sft | |
| | Long beam (sides) | 1 | 22'-4 1/2" | - | 1'-6" | 33.55 sft | 33.55 sft | |
| | Long beam (soffit) | 2 | 10'-9 3/4" | - | 0'-9" | 8.10 sft | 16.21 sft | $L = \frac{\{(22'-4 \frac{1}{2}'')-(0'-9'')\}}{2} = 10'-9 \frac{3}{4}''$ |
| | Short beam (sides) | 2 | 7'-3" | - | 1'-6" | 10.87 sft | 21.74 sft | |
| | Short beam (soffit) | 2 | 7'-3" | - | 0'-9" | 5.43 sft | 10.87 sft | |

| | | | | | | | | |
|--|------------------|---|-----------|---|-------|-------------|-------------|--|
| | Door jambs | 2 | 0'-9" | - | 7'-0" | 5.25 sft | 10.50 sft | |
| | | 2 | 0'-4 1/2" | - | 7'-0" | 2.63 sft | 5.25 sft | |
| | | 1 | 0'-9" | - | 4'-0" | 3.0 sft | 1.50 sft | |
| | | 1 | 0'-4 1/2" | - | 4'-0" | 1.50 sft | 3.00 sft | |
| | Window jambs | 6 | 0'-9" | - | 4'-0" | 3.00 sft | 18.00 sft | |
| | | 6 | 0'-9" | - | 4'-0" | 3.00 sft | 18.00 sft | |
| | Ventilator jambs | 8 | 0'-9" | - | 2'-6" | 1.88 sft | 15.00 sft | |
| | | 8 | 0'-9" | - | 1'-6" | 1.19 sft | 9.00 sft | |
| | Shelves | 4 | 0'-6" | - | 5'-0" | 2.5 sft | 10.00 sft | |
| | | 4 | 0'-6" | - | 4'-0" | 2.0 sft | 10.00 sft | |
| | | | | | | Total = | 2017.16 sft | |
| | <u>Deduction</u> | | | | | | | |
| | Doors | 4 | 4'-0' | - | 7'-0" | 28.00 sft | 112.00 sft | |
| | Windows | 4 | 4'-0' | - | 4'-0" | 16.00 sft | 64.00 sft | |
| | Ventilators | 6 | 2'-6" | - | 1'-6" | 3.75 sft | 22.50 sft | |
| | | | | | | Total= | 142.5 sft | |
| | | | | | | Net Total = | 1874.66 sft | |

| | | | | | | | | |
|----|---|---|-------------|---|------------|---------------|--------------------|--|
| 17 | Three coats of Weather shield paint to walls. (External side) | | | | | | | |
| | Rear wall | 1 | 23'-10 1/2" | - | 15'-4 1/2" | 367.07 sft | 367.07 sft | $H = ((15'-10 \frac{1}{2}'' - (0'-6'')) = 15'-4 \frac{1}{2}''$ |
| | Left & Right side wall | 2 | 13'-6" | - | 15'-4 1/2" | 207.5 sft | 415.13 sft | |
| | Front side (above verandah roof) | 1 | 23'-10 1/2" | - | 3'-0" | 71.63 sft | 71.63 sft | |
| | Left & Right side wall of verandah | 2 | 8'-0" | - | 2'-0" | 16.00 sft | 32.00 sft | |
| | <u>Parapet wall</u> | | | | | | | |
| | Inner side of rooms | 2 | 22'-4 1/2" | - | 1'-0" | 22.37 sft | 44.70 sft | |
| | | 2 | 12'-0" | - | 1'-0" | 12.00 sft | 24.00 sft | |
| | Inner side of Verandah | 1 | 22'-4 1/2" | - | 1'-0" | 22.37 sft | 22.37 sft | |
| | | 2 | 7'-3" | - | 1'-0" | 7.25 sft | 14.50 sft | |
| | Outer side of Verandah | 1 | 23'-10 1/2" | - | 2'-10 1/2" | 67.66 sft | 67.66 sft | |
| | | 2 | 8'-0" | - | 2'-10 1/2" | 22.67 sft | 45.32 sft | |
| | Top of parapet wall (Rooms) | 2 | 23'-10 1/2" | - | 0'-9" | 17.9 sft | 35.80 sft | |
| | | 2 | 12'-0" | - | 0'-9" | 9.00 sft | 18.00 sft | |
| | Top of parapet wall (Rooms) | 1 | 23'-10 1/2" | - | 0'-9" | 17.90 sft | 17.90 sft | |
| | | 2 | 7'-3" | - | 0'-9" | 5.43 sft | 10.87 sft | |
| | | | | | | Total= | 1186.95 sft | |

| | | | | | | | |
|------------------|-------------|---|-------|---|-------|-------------------|--------------------|
| <u>Deduction</u> | | | | | | | |
| | Windows | 2 | 4'-0" | - | 4'-0" | 16.00 sft | 32.00 sft |
| | Ventilators | 2 | 2'-6" | - | 1'-6" | 3.75 sft | 7.50 sft |
| | | | | | | Total= | 39.50 sft |
| | | | | | | Net Total= | 1147.45 sft |

ABSTRACT OF QUANTITIES

1- CALCULATIONS

1. Excavation in Medium soil

Quantity from BOQ item No. 1 = 1024.52 cft

Output of one labourer working 8 hrs = 75 cft

04 labourers are required for 3 ½ days to excavate 1050 cft earth.

2. PCC (1:4:8)

| | | |
|---|---|-------------------|
| Quantity of BOQ item No.3 (Foundations) | = | 146.27 cft |
| Quantity of BOQ item No.11 (Floors) | = | <u>142.07 cft</u> |
| Total | = | 288.34 cft |
| Dry material for 100 cft of cement concrete | = | 154 cft |

Note:**Materials**

| | | |
|---|---|------------|
| (i) Cement = $154 \times 1 \times 288.34 / (100 \times 13)$ | = | 34.15cft |
| (ii) Sand = $154 \times 4 \times 288.34 / (100 \times 13)$ | = | 136.62 cft |
| (iii) Coarse aggregate = $154 \times 8 \times 288.34 / (100 \times 13)$ | = | 273.25 cft |

3. Ist Class Burnt brick work in foundation in cement sand mortar (1:6)

| | | |
|---------------------------|---|------------|
| Quantity of BOQ item No.4 | = | 484.21 cft |
|---------------------------|---|------------|

| | | |
|---|---|-----------|
| Note: Bricks for 100 cft of brick work | = | 1350 Nos. |
| Dry mortar for 100 cft of brick work | = | 30 cft |

Material

| | | |
|---|---|-----------|
| (i) Bricks = $1350 \times 484.21 / 100$ | = | 6537 Nos. |
| (ii) Cement = $30 \times 1 \times 484.21 / (7 \times 100)$ | = | 20.75 cft |
| (iii) Sand = $30 \times 6 \times 484.21 / (7 \times 100)$ | = | 124.51cft |

4. 1 ½" thick PCC (1:2:4) in DPC including two coats of hot bitumen & 2 sheets of Polythene.

Quantity of BOQ item No.5=55.50x0.125 = 6.93 cft

Note: (i) Dry material for 100 cft of cement concrete = 154 cft
(ii) Bitumen for 100 sft of DPC (first coat) = 15 Kg
(iii) Bitumen for 100 sft of DPC (second coat) = 10 Kg

Material

(i) **Cement**=154x1x6.93/(100x7) = 1.52 cft
(ii) **Sand**=154x2x6.93/(100x7) = 3.04 cft
(iii) **Coarse aggregate**=154x4x6.93/(100x7) = 6.09 cft
(iv) **Bitumen** =25x55.50/100 = 13.87 Kg
(v) **Polythene Sheet** (2 x 55.5) = 111.0 sft

5. Ist Class Burnt brick work in Super structure in cement sand mortar (1:4)

Quantity of BOQ item No.6 = 743.17 cft

Note: (i) Bricks for 100 cft of brick work = 1350 Nos.
(ii) Dry mortar for 100 cft of brick work = 30 cft

Material

(i) **Bricks**=1350x743.17/100 = 10033 Nos.
(ii) **Cement**=30x1x743.17/(5x100) = 44.59 cft
(iii) **Sand**=30x4x747.13/(5x100) = 178.36 cft

6. Reinforced cement concrete (1:2:4)

Quantity of BOQ item No.7 = 226.39 cft

Note: Dry material for 100 cft of cement concrete = 154 cft

Materials

(i) **Cement** = $154 \times 1 \times 226.39 / (100 \times 7)$ = 49.80 cft

(ii) **Sand** = $154 \times 2 \times 226.39 / (100 \times 7)$ = 99.61 cft

(iii) **Coarse aggregate**
= $154 \times 4 \times 226.39 / (100 \times 7)$ = 199.22 cft

(iv) **Mild steel round bars** = 1529 lbs

= 693.55 Kg

(Note: 1 Kg = 0.454 lbs)

7. Roof insulation

Quantity of BOQ item No.9 = 430.72 sft

Note: (i) Brick tiles for 100 sft roof insulation = 360 Nos.

(ii) Dry mortar for 100 sft = 9.00 cft

(iii) Bitumen for 100 sft of DPC (first coat) = 15 Kg

(iv) Bitumen for 100 sft of DPC (second coat) = 10 Kg

Material

(i) **1 1/2" thick brick tiles** = 1551 Nos.

(ii) **Cement** = $9 \times 1 \times 430.72 / (4 \times 100)$ = 9.69 cft

(iii) **Sand** = $9 \times 4 \times 430.72 / (4 \times 100)$ = 29.07 cft

(iv) **Bitumen** = $430.72 / 100$ = 107.68 Kg

(v) **Mud / Earth filling** = 430.72×0.42 = 180.90 cft

(vi) **Polythene sheet** (2 x 430.72) = 862 sft

| | | | |
|--------------|---|---|------------|
| 8. | Sand under floors | | |
| | Quantity of BOQ item No.10 | = | 213.11 cft |
| | Material | | |
| | Sand | = | 213.11 cft |
| 9. | 1 ½" thick cement concrete (1:2:4) in floors | | |
| | Quantity of BOQ item No.12=457.80x0.125 | = | 57.23 cft |
| Note: | (i) 1 ½" = 0.125 ft | = | 154 cft |
| | (ii) Dry material for 100 cft of cement concrete | | |
| | Materials | | |
| | (i) Cement =154x1x57.23/(100x7) | = | 12.59 cft |
| | (ii) Sand =154x2x57.23/(100x7) | = | 25.18 cft |
| | (iii) Coarse aggregate =154x4x57.23/(100x7) | = | 50.36 cft |

| | | | |
|--------------|--|---|------------------|
| 10. | 1/2" thick cement plaster in cement sand mortar (1:3) | | |
| | Quantity of BOQ item No.13 | = | 3197.07 sft |
| Note: | Dry mortar for 100 sft of ½" thick cement plaster | = | 6 cft |
| | Material | | |
| | (i) Cement =6x1x 3197.07/(4x100) | = | 47.96 cft |
| | (ii) Sand =6x3x 3197.07/(4x100) | = | 143.87 cft |
| 11. | Wood work in door, windows ventilators | | |
| | Quantity of BOQ item No.14 (i) Doors | = | 56.00 sft |
| | Quantity of BOQ item No.14 (ii) Windows | = | 63.00 sft |
| Note: | (i) Timber for 100 sft of Panelled Doors | = | 13 cft |
| | (ii) Timber for 100 sft of Glazed windows and Ventilators | = | 8 cft |
| | Material | | |
| | (i) Timber for doors =13x56/100 | = | 7.28 cft |
| | (ii) Timber for windows and Ventilators =8x63/100 | = | 5.04 cft |
| | Total | = | 13.32 cft |

12. White wash / Distemper

Quantity of BOQ item No.16 = 1872.9 sft

Note: Lime for 100 sft of white wash (one coat) = 1.00 Kg**Material****Lime for three coats**= $1 \times 3 \times 1872.9 / 100$ = 56.24 Kg**13. Weather Shield**

Quantity of BOQ item No.17 = 1143.45 sft

14. Earth filling under floors

Quantity of BOQ item No.2 = 230.87 cft

Material

Earth for filling = 230.87 cft

2- SUMMARY

| S.No. | Description of material | Quantity |
|-------|--|---------------------------|
| 1. | Cement (From 2,3,4,5,6,7,9,10) | 220.68 cft or 177 Bags |
| 2. | Sand (From 2,3,4,5,6,7,9,10) | 740.26 cft |
| 3. | Coarse aggregate (From 2,4,6,9) | 528.92 cft |
| 4. | Mild steel round bars (item No: 6) | 693.55 Kg |
| 5. | Burnt bricks 1st class (From 3,5) | 16570 Nos. |
| 6. | 1/2" thick Brick tiles (item No: 7) | 1551 Nos. |
| 7. | Bitumen (From 4,7) | 121.55 Kg |
| 8. | Polythene sheet (From 4,7) | 973 sft |
| 9. | Timber (item No: 11) | 13.32 cft |
| 10. | Lime (item No: 12) | 56.24 Kg |
| 11. | Mud/Earth filling (From 7,13) | 411.77 cft |

- Report gives brief information of whole project. It should consist of the following :
 - Brief history (with proposal)
 - Necessity and feasibility of project
 - Selection of site
 - Survey
 - Brief description of works
 - Nature of soil, topography of land etc.
 - Basis of design calculations
 - Arrangement for water supply, sanitation and electrical installations etc.
 - Roads and drains
 - Temporary accommodations for staff, labour etc included in misc.
 - Manner of execution
 - Total cost and how to be financed
 - Return or revenue income
 - Rent statement
 - Time of execution