

# Electrical Wiring Estimating and Costing

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**Abstract:** Estimate give an idea of the cost of the work and hence its feasibility can be determined i.e whether the project could be taken up with in the funds available or not. Estimate gives an idea of time required for the completion of the work. Estimate is required to invite the tenders and Quotations and to arrange contract Estimate is also required to control the expenditure during the execution of work. Estimate decides whether the proposed plan matches the funds available or not. Estimating is the technique of calculating or Computing the various quantities and the expected Expenditure to be incurred on a particular work or project. In case the funds Available are less than the estimated cost the work is done in part or by reducing it or specifications are altered, the following requirement are necessary for preparing an estimate. Drawings like plan, elevation and sections of important points. Detailed specifications about workmanship & properties of materials etc. Standard schedule of rates of the current year

**Keywords:** Drawing Of the work i.e.plans, elevations, sections etc., Specification, Rates, Details of the necessary material with it's Costing, Sequence of the operation to be performed

## I. INTRODUCTION

For the Completion of electrification work of any building, with in time limit uninterruptedly and without misuse of money, estimating and costing prior to starting of the work is necessary. The estimator will make complete planning of electrification including designing of wiring, location of points and preparation of a complete estimating form. After purchase of materials according to the report, the work should be completed under the supervision of some qualified and supervisors.

The electrical engineer should be conversant with the specifications and drawings of the proposed building before preparing an estimate. After getting the plan from the architect, the estimator goes through the plan and prepare wiring plan of the building Based on the wiring plan he prepares an estimate which comprises the estimates for 1.Cost of wiring material used 2.Accessories required and their cost 3.Labour Cost 4.Overhead expenses and profit of the contractor.

The Planning and design of wiring should be done before the civil work starts, to avoid wastage on alteration and modifications. The layout of the electrical wiring should be prepared in advance and is given to the engineer in charge of construction work to make necessary provisions in the building for electrical wiring.

Essential elements of Estimating and Costing is the estimator should see that the following essential elements of Estimating and cisting are well considered. 1.Specification of material 2.Latest market cost of material 3.Price list and net prices 4.Calculation of material and labour cost.

It will be very difficult to purchase the material from the market without it's exact specifications. A market survey has to be conducted for Estimating the cost of estimated materials so that the supplier cold not deceive the party by overcharging. After market survey, quotation are invited for the enlisted necessary materials from related shops. Market surveying and purchasing of materials is a very delicate job and one should be fully expert in this field.

The labour cost is the most difficult part to be assessed. It varies from place to place and depends on nature of work and skill of workers. Usually labour charges are decided as under. 1.As a percentage of material cost: here a fixed percentage of material cost (say 15 to 20%) is taken as labour cost 2.As per work duration and labour rates: the number of electricians, wiremen and other persons needed for the job are determined on the basis of amount of work. Labour rates are decided on the basis of prrvailing rates in the area. Total labour cost is calculated considering the above two

3.As per unit work basis: In this system labour cost is fixed for each item separately and is added to the material cost to get installed cost.

All electricians have to do some estimating and costing. People want to know what it will cost before contracting for a job. In electrical wiring, estimating requires a lot of time and effort. The electrician must charge the customer for the materials to be used (e.g., wires, switches, plugs), the cost of labor and supervision, overhead expenses (e.g., the cost of maintaining an office and operating trucks) plus enough to make a profit.

If you bid on a commercial or industrial job, as the electrical contractor you must provide a detailed listing of what it will cost to do the job. A bid on residential wiring does not require so much detail. However, before preparing any bid, you should have a set of drawings that specify all of the materials to be used and what is to be done.

## II. METHODOLOGY

Electrical Installation in Building- General guidelines

1. Energy meter, main switch and main distribution board are installed close to each other and near to the commencement of supply.
2. The wires used for connecting main switch and distribution board be of rating based on total load requirements in the building, as these wires are to withstand the entire load in the building.
3. P.V.C Insulated wires are to be used for conduit wiring.
4. Phase wires should be protected by a fuse /Mcb of suitable rating based on load.
5. Earth terminals of all 3pin socket outlets are connected permanently to earth wire.
6. All socket outlets are to be controlled by individual switches which are to be located adjacent to it on the right hand side.
7. Only 3pin ,5Amp Socket outlets are to be used in all light and fan sub circuit, but 3pin 15amp socket outlets are to be used in all power sub circuits.
8. Each light circuit (light, fan, 5A socket etc....) is not to have more than ten points or 800watts.
9. Power circuits shall be generally designed with only one outlet per circuit. However in no case more than two 15Amp Sockets totalling a maximum load of 3000watts should be put on one sub circuit.
10. 14 SWG G.I wire is to be used as earth wire for house wiring ; but 8SWG GI wire is used to connect main switch, and distribution board to earth electrode buried deep into the earth.
11. The neutral wire of each circuit may not be looped from one circuit to another, however looping of neutral within the sub circuit is allowed.
12. The height of ceiling for a normal residential building may be taken as 3 to 3.5 meters.
13. The height of wires running parallel to floor along vertical walls (known as Horizontal Run-HR) may be taken as 0.5 meters below ceiling.
14. Height Of switch boards from floor is 1.5 metres and that of main switch and D.B is 2 metres.
15. For connected load calculation, rating of lights, fans and 5A socket outlets are taken as 60watts.
16. While calculating capacity of main switch, 20% extra load shall be added to the actual connected load as to meet future requirements.
17. In industries the energy rate is different for light and power circuits. So they are to be separately metered.
18. In Large building where 3phase 4wire supply is to be given, the load is to be distributed equally on all the three phasea.



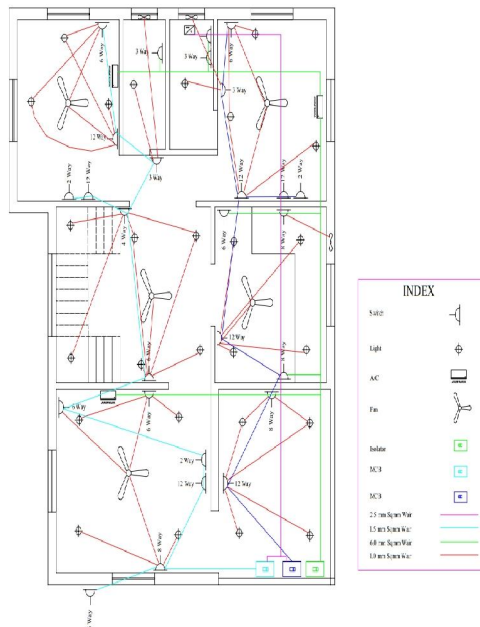
**III. MATERIAL CHART**

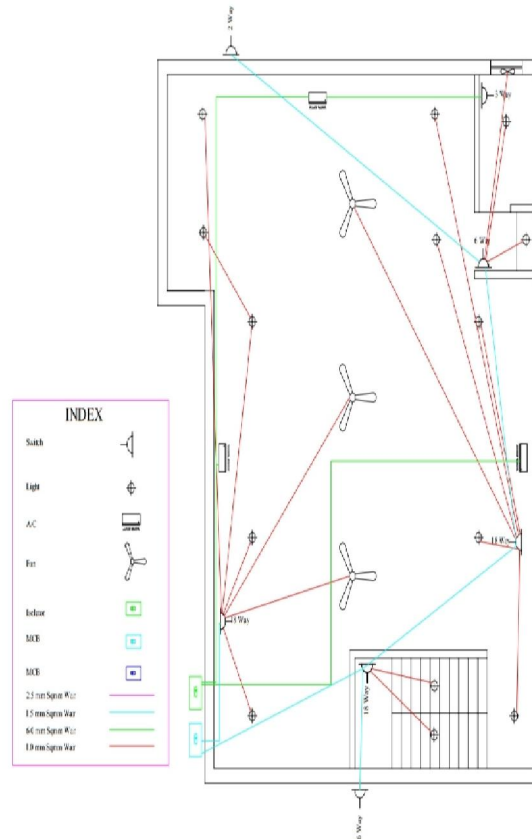
ESTIMATION AND COASTING OF RESIDENTIAL BUILDING				
SR NO	Items	Quantity	Rate(RS)	Amount
1	Switch 16 amp	7	90	630
2	light	35	250	8750
3	AC switch	6	600	3600
4	fan	8	2000	16000
5	isolator	2	900	1800
6	MCB	3	205	615
7	1 mm sq wire	12	1300	15600
8	1.5 mm sq wire	10	1850	18500
9	2.5 mm sq wire	6	2450	14700
10	4 mm sq wire	5	3750	18750
11	6 mm sq wire	8	4150	33200
12	2 way switch board	4	60	240
13	3way switch board	5	80	400
14	4 way switch board	1	100	100
15	6 way switch board	9	120	1080
16	8 way switch board	4	140	560
17	12 way switch board	6	180	1080
18	18 way switch board	3	240	720
19	6 amp 2 way piano type switch	18	50	900
20	60 watts electric bulb	5	300	1500
21	Pvc tape role(10mtr) (steel grip)	30	10	300

22	Fan regulator	8	320	2560
23	Casing and caping 25mm (2mtr long)	60	10	600
24	Raw pulg 25*8mm	30	5	150
25	Iron screws 35*8mm	30	2	60
26	Iron screws 25*8 mm	30	3	90
27	Iron screws 50*8 mm	30	3	90
28	Iron screws 75*8 mm	30	5	150
29	houlder	35	35	1225
30	Blank plate	20	30	600
31	Seeling nose	8	40	320
32	Round plate	120	8	960
33	Isolate box	1	700	700
34	Spot light	15	150	2250
35	Pipe(white)	40	100	4000
36	4 way (j box)	25	25	625
37	3 way (j box)	40	40	1600
38	Fan box	8	60	4800
39	L bow	48	10	4800
40	Tape bandle	30	10	300
41	1 way (j box)	20	20	400
42	2 way (j box)	20	15	300
43	Surface metal box			
44	18 way metal box	3	120	360
45	12 way metal BOX	6	90	540
46	8 way metal box	4	80	320
47	6 way metal box	9	60	540

48	3 way metal box	5	20	100
49	4 way metal box	1	30	30
50	2 way metal box	4	20	80
51	Tv socket	3	40	120
52	Copper plate	1	550	550
53	Copper rod	1	1500	1500
54	Copper nut bolt	2	80	190
55	Meter board	1	200	200
56	Earting powder	10kg	30	300
57	6 amp 5 pin socket	37	60	2220
58	16 amp 5 pin socket	7	130	1820
60	Switch 6 amp	83	30	2490
61	indicator	3	25	75
	Total			177040

#### IV. RESULT





## V. ADVANTAGES

1. Save Money on Projects. More accurate estimations result in smoother execution of the project.
2. Cost estimation helps you determine your project's budget, schedule the work necessary and manage new resources.
3. The estimates help to get an idea about costing and plan accordingly to complete the project efficiently.
4. Estimate gives the estimated duration of the work.
5. The estimated cost of the work can be known from the estimate.
6. More accurate estimates simplify the project. Unexpected costs and blocked working capital can therefore be avoided.

## VI. FUTURE SCOPE

Estimate gives the estimated duration of the work. The estimated cost of the work can be known from the estimate. More accurate estimates simplify the project. Unexpected costs and blocked working capital can therefore be avoided. Properly guessed work is flawless, and projects are completed quickly. Various things related to that work can be made available. Staff can be counted from estimates such as supervisor, engineer, senior engineer, etc. Work planning can be made easier with estimates. The estimate is made keeping in view the previous years so the mistakes made in the previous years can be removed. Materials can be ordered as required. By using this method you will get lots of benefits.

## VII. CONCLUSION

It is necessary to know the necessary material and the cost to be incurred before starting the project. To ensure all the materials required for the execution of the project. To avoid the misuse of money Estimating and costing of electrical projects is a crucial step in every construction project. Without electrical estimating, it is difficult for owners to

accurately calculate total project costs. Proper Project reports Should be maintained for the successful Implementation of the Programme.

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