Review on Planning, Designing & Estimating the Proposed Plan At 3rd Floor for Civil Lab in NIT Polytechnic Nagpur

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Abstract- ***Some construction projects are small-scale renovation projects or renovation projects, in which the owner can act as the designer, payer and worker of the entire project. However, more complex or ambitious projects usually require more interdisciplinary knowledge and manpower so that the owner can hire one or more professional companies to carry out detailed planning, planning, construction, and delivery. Usually, the owner will hire a company to oversee the project (it can be a designer, contractor, site manager or other consultant). These experts are usually appointed based on their experience in the project and assist the owner in preparing the project report, agreeing on the budget and timetable, contacting relevant government agencies and using the services of other experts (supply chain). (Including subcontractors). All companies negotiate service contracts with other detailed plans to ensure that the work is done legally, on time, on budget, and safely.***

The design, financial and legal aspects overlap and are interrelated. It is only structurally reasonable and suitable for use and placement, and must also be economically feasible and legal to use. The financial structure must be suitable for creating the submitted project and paying the legally required arrears to ensure compliance with financial and construction processes. These processes can also affect purchasing strategies. For example, customers can entrust companies to develop projects. Then a competitive process is carried out to appoint a general contractor to build the factory (project bidding). You can appoint a company to be responsible for design and build (design-build). Or they can directly appoint designers, contractors and professional subcontractors (site management). Various forms of procurement emphasize the importance of collaborative relationships (partnerships, alliances) between customers, contractors, and other stakeholders in construction projects.

I. INTRODUCTION

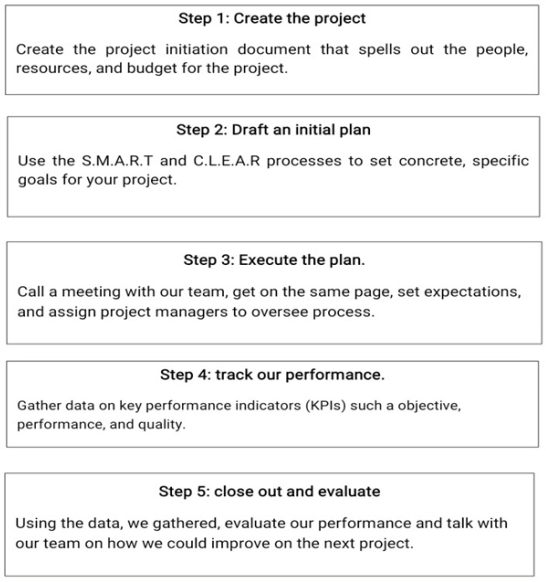
The project includes the design, analysis, planning and cost estimation of an institutional building in Nagpur, Maharashtra. The building has 3 floors, and the laboratories of different departments should start from the 3rd floor. Building planning can be done manually or with the help of software. We choose part manual and part software because completely manual design is time-consuming, easy and error-prone. Using local methods can save time and get error-free results. Consider using software to obtain approximate values and avoid human error. There are various structural analysis and design software on the market, such as B. ETABS, STAAD Pro, STRUDS, etc. We currently use AutoCAD software to develop some software. The software is mainly used for the final cross-validation of analysis results. Various amounts and costs that may occur in a particular job/project. For all engineering work, it is necessary to know the possible construction cost in advance, that is, the estimated cost. To create a budget, you need blueprints such as plans, views and highlights, detailed specifications for process and material characteristics, and standard price plans for the year. When working, it is necessary to control costs. The budget estimate will determine whether the proposed plan is in line with the available funds. In this project, we estimate the volume required

to build an independent villa, and then calculate the cost to prepare the final cost.

In an integrated system, the planning for both design and construction can proceed almost simultaneously, examining various alternatives which are desirable from both viewpoints and thus eliminating the necessity of extensive revisions under the guise of value engineering. Furthermore, the review of designs with regard to their constructability can be carried out as the project progresses from planning to design. For example, if the sequence of assembly of a structure and the critical loadings on the partially assembled structure during construction are carefully considered as a part of the overall structural design, the impacts of the design on construction falsework and on assembly details can be anticipated. However, if the design professionals are expected to assume such responsibilities, they must be rewarded for sharing the risks as well as for undertaking these additional tasks. Similarly, when construction contractors are expected to take over the responsibilities of engineers, such as devising a very elaborate scheme to erect an unconventional structure, they too must be rewarded accordingly. As long as the owner does not assume the responsibility for resolving this risk-reward dilemma, the concept of a truly integrated system for design and construction cannot be realized.

II. CONSTRUCTION PLANNING

Construction planning is the specific process construction managers use to lay out how they will manage and execute a construction project, from designing the structure to ordering materials to deploying workers and subcontractors to complete various task. A construction plan lists out each step that it will take to achieve the desired result.



a) Estimation of Work

- Purposes of Estimation:

1) To know the approximate cost of work.
2) To know the approximate quantity of various materials and labors required**.**
3) For technical sanction and to arrange contract.
4) To have an idea about the time of completion of project.
5) To give an idea about the time of completion of project.

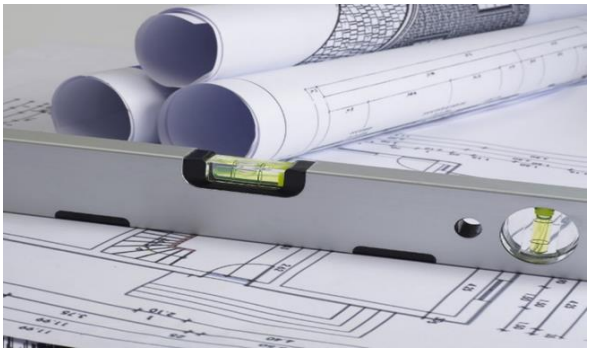
b) Types of Estimation

1) Approximate or Preliminary estimate.
2) Detailed estimate or item rate estimate.
3) Plinth area estimate.
4) Cubical content estimate.
5) Revised estimate.
6) Supplementary estimate.
7) Revised and supplementary estimate.
8) Annual repair and annual maintenance estimate.

c) Designing

Every design process is unique, and the generic step by step to the design process is indicative only. The number of steps varies depending on the complexity of the project and whether you're building a new home, renovating or simply making a few small home improvements. Designers fit into two main categories:

1) Architect
2) Building designers.



d) Formwork
Scope: Covers the activity of formwork for foundation, plinth beam, columns, slab
Manpower:
Engineer - As required.
Surveyor - As required
Supervisor - As required
Labor - As required
Equipment:
Shuttering Plates
Adjustable Props

III. METHODOLOGY

Formwork for footings, plinth beam, columns, beams & slabs for shuttering will be M.S. (Fabricated with M.S. sheet and M.S. angles). The shutters shall be made free from dirt and dead mortar. Appropriate shutter releasing oil shall be applied all over the shutter. All the joints of the shutters are pasted with 3mm form to avoid slurry leakage. Adequate support is provided to formwork to maintain the alignment, verticality at the time of concrete. Alignment, verticality of formwork shall be checked. All dimensions and levels of the formwork shall be as per the drawings. For facilitating concreting and for inspection, a staging with working platform shall be provided. To check the verticality, A plumb bob weighing 1kg tied to a binding wire shall be made to fall from top. To avoid slurry leakage, 3mm foam shall be pasted on the face of the shutters as well as on all the joints of the shutters.

a) Reinforcement
Scope: Covers the Activity of reinforcement for foundations, columns, plinth beams & slabs.
Manpower:
Engineer - As required
Surveyor - As required
Supervisor - As required
Labor - As required

Equipment:
Rod cutting machine
Rod bending machine

After receiving G.F.C (Good for construction) drawings from the client B.B.S may be prepared as per drawings and it should be summited to client. After getting required approval from the client, cutting, bending, and tying of reinforcement steel will be done as per approval B.B.S and drawings. Bar bending and cutting machines shall be used for bending and cutting of steel. All laps in reinforcement shall be in accordance with the drawings and shall be provided in the “Lap zone” as indicated in the drawings. Bars shall be firmly fixed using 18 gauges annealed stell bending wire. Bending wires shall be bent inwards and lose ends out, so that they do not protrude out of concrete. Clear cover of 15mm to 50mm to all outer reinforcement shall be maintained or as shown in drawings.

b) Preparation of B.B.S and record of consumption

1) Prepare bar bending schedule from approved, latest revised drawings and check for error / inconsistencies and take approval from consultant / client.
2) Plan and check for fix ability and sequence of fixing.
3) Plan intelligent cutting from full length bars by preparing cutting length.
4) Cutting length shall be worked out after considering bend effect.
5) Check the bent shapes for dimensional accuracy against full scale template and gate approval from client.
6) Keep painted spaceman bars for comparison with production.
7) Use cut pieces for ancillary works and record consumption.

c) Fixing of reinforcement
Avoid sub-situation of bars, If unavoidable check for over consumption.

Do not use tack weld at cross points.

Avoid excessive chairs, arrived at optimum spacing of chairs by trials.

Use cut pieces / welded scraps for chairs. Avoid using full length bars for making chairs.

Use spider beam to lift heavy cages.

Check spacing's, number of bars, location of bar etc. Before start of concrete.

Fix the bars accurately with specified cover of size and grade. Plan best fixing sequence to achieve accuracy and to accommodate form work, void formers, starter bars etc.

Ensure inspection of reinforcement fixing intermittently to avoid redoing.

Avoid large time gape between the concrete pores to prevent deterioration of projected reinforcement. Lowered and stacked neatly over the ground at the allotted area. Dust, dirt shall be removed.

d) Curing

Quality of water: Rain water, fresh water and bore water can be used. However, salty / sea water cannot be used. Curing shall be commenced on immediate removal of formwork. Curing shall be done by applying wet jute bags, sprinkling. Sampling and testing concrete in the field: facilities required for sampling materials and concrete in the field, if engineer – in-charge so desires, shall be provided by contractor at no extra cost. The falling equipment with operator shall be made available at engineer's request (All must be in serviceable condition).

CONCLUSION

In the process of implementing this project, we learned how to apply the theoretical aspects of evaluation in actual projects. We checked the process of evaluating and calculating costs and found that this is an important aspect of providing financial resources in the project. Necessary to complete the work. Our calculations are based on precise measurements, which can provide us with approximate and accurate values. The structural evaluation has been developed in detail so that these values can be used in actual projects in progress. When compiling the cost estimate summary, it is necessary to take into account the current unit unfinished rate of each work item, so that the cost estimate also meets the structural requirements of the project. Therefore, this project is not a draft, but rather an accurate one of the estimated quantities and estimated cost, and is very useful for the current project that is executing the project.

The analysis and design of the entire structure is carried out using AutoCAD pro. The results include different forces acting on different elements and different patterns of different elements. In addition, with the help of the software, we received specific start information and the weight of various steel bars, thus reducing the burden of cost estimation. Using soil conditions as a medium, the foundation is designed as an isolated foundation.

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