

# **PLANNING AND ANALYSIS OF MULTI-SPECIALITY HOSPITAL BUILDING**

**<sup>1</sup>RAJASHREE ACHARYA,**

*Gandhi Institute of Excellent Technocrats, Bhubaneswar, India*

**<sup>2</sup>PREETI NANDA GOUDA,**

*HI-Tech College of Engineering, Bhubaneswar, Odisha, India*

**Abstract** -The technological developments is growing up fast, and it is going to talk about the structural developments on constructions. Software is urgently needed to simplify calculations and analysis of stability and deformation. CSI SAFE is a software which is intended for stability and deformation analysis in structural engineering. This project concerns with a private multi- speciality hospital building at Kolenchery near Kochi in the state of Kerala. At present it is home to a Medical College, College of Nursing, a super specialty hospital. The increased flow of people led to the building of a new hospital block.

**Key Words:** Planning, Surveying, Earthwork

## **1. INTRODUCTION**

### **1.1 General**

The development of modern future technology has a great impact in various fields, such as education, economy, industry and construction etc. In this case it is going to talk about construction and how does technology has its effect on it. Structural engineering is a field of engineering that deals with the structural integrity and strength of a building or structure. Structural engineering is a specialty of civil engineering that ensures the structures are safe, stable and don't collapse under applied loads.

A hospital is a structure that is built, staffed and furnished for the diagnosis of diseases, for the treatment, both medical and surgical of the ill and injured and for their accommodation during the process. Multi-specialty hospital is one which has all the different branches of medicine and surgery under one roof. To elaborate

### **Objectives**

1. Surveying of land and selection
2. Quantity surveying
3. Detailed study of building foundation and its analysis

### **1.2 Scope**

- a) Easy analysis of building foundations
- b) Increases the safety of structure
- c) Use of technologies in construction field

## **2. METHODOLOGY**

- a) Literature survey
- b) Preparation of work plan
- c) Drawing the reinforcement plan and details
- d) Analysis using CSI SAFE
- e) Surveying and plotting the points
- f) Excavation and oversight
- g) RCC works
- h) Completion works

## **3. PLAN**

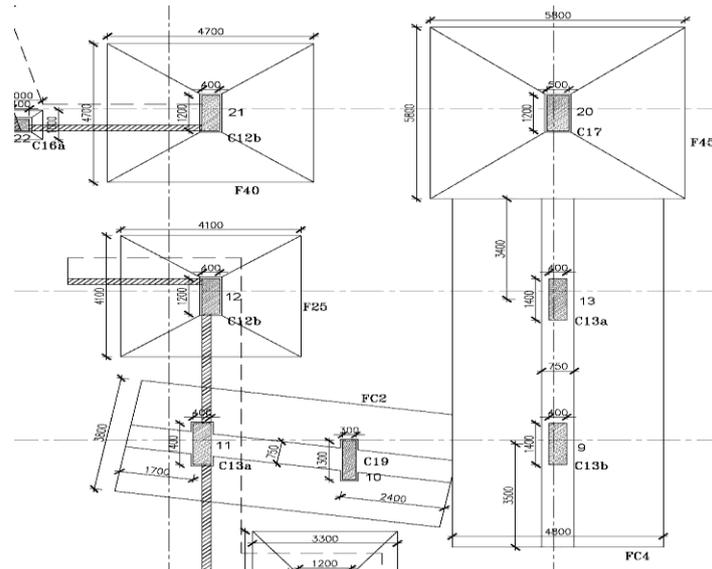


Figure 1: Plan of the Selected Section

### 3. PROCEDURE FOR CONSTRUCTION OF FOUNDATION

#### 3.1 Surveying of land for site selection

The scale or size of the proposed project should relate to the level of need for the requirement as planned for the expansion. The site selection process includes a detailed evaluation of project needs. The proposed building should be able to accommodate the staffs and, machineries and other inventory required for the smooth functioning of the hospital.

The surveying of the land was done in early months of 2021 and the survey drawing was drawn. The site was segmented into coordinates. The placing of building was done by comparing the surveying and structural drawing and plotting the coordinates on the land. The potting of points on land was done using Total Station. Machine manufactured by Kolida was used for this process. The machine was back sighted to the known coordinates and re-sectioned. Then the new points were entered and the corners of the required elements were found.



Figure 2: Total Station Surveying Equipment

#### 3.3 Excavation of earthwork in trenches in foundation

1. Foundation trenches shall be dug out to the of foundation concrete with extra cover of 60cm/100cm according to element in question and sides shall be vertical.
2. The depth of the cutting required is checked using an auto level instrument and cross staff.
3. The back sighting of the auto level instrument is done to the completed floor of an existing building.
2. If the soil is not good and does not permit vertical sides, then the sides should be sloped back.
3. Excavated earth shall not be placed within one meter of the edge of the trench.
4. Excavated earth is transported to a nearby dumping sight or used to fill over others completed elements.

5. The bottom of foundation trenches shall be perfectly leveled both longitudinally and transversely and the sides of the trench shall be dressed perfectly vertical from bottom up to the least thickness of loose concrete so that concrete may be laid to the exact width as per design.



Figure 3: Auto Level Instrument



Figure 4: Land excavation using excavating machine

### 3.4 PCC

Plain cement concrete is the mixture of cement, fine aggregate and coarse aggregate without steel. PCC is an important component for a building that is laid on the soil surface to avoid direct contact of reinforcing bars of concrete with soil and water. It is laid on the soil within the points specified during the process of surveying. The laying of PCC was mostly done during another main RCC works so that there is no requirement of functioning of mixing machine only for a small volume of concrete. In this case the PCC was found to acquire more strength as a result of the concrete drawing out the abundant presence of water present as result of rain.



Figure 7: Completed RCC work

The RCC must be cured for 28 days. In this case concrete mixes were found to acquire more strength even within the 28 days required due to presence of the moisture present in the soil due to heavy rain in the following days.

**3.5 RCC**



Figure 5: Placing PCC

**3.6 Completion Works**

The completed column is again checked using a Total Station Instrument to check if the corners of footing are well within the required margin of error. Then the pit is filled with soil and is leveled.

It is most commonly used in construction for the footings in foundations. Its compressive and tensile strength means it can withstand the weight of a building being built up on it and the forces exerted by the weight of the structure and its live loads. The reinforcement bars were laid on top of the PCC. The concrete was mixed on site and pumped to the required point.



Figure 6: Laying reinforcement bars



Figure 8: Completed Footing

**4. CONCLUSION**

Foundation is the base of all structures, so it essential to consider the planning, designing and construction of the same. In this day and age, the world is developing with the support of technology. Advanced technologies decrease human effort and at the same time it helps to make the works accurate. Each and every field make use of technology in this competitive world for fast and perfect completion of works. In construction field, use of advanced technologies can contribute highest possible perfection for each work. Today, many software's are

available for the analysis of building from its first stage itself. SAFE is a new emerging software for foundation analysis. It helps to make the quantity surveying and evaluation procedure faster and with greater accuracy. The goal of this project which was to achieve knowledge in construction practices and to construct multi-speciality hospital building works efficiently. This was achieved.

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