

Important things to consider while constructing the structure of the building

Article talks about the additional knowledge for a practicing civil engineer, apart from the curriculum taught

Sri Lanka is under the category of developing country and the economy of the country sinks day by day due to the economic crisis aggravated by the pandemic situation. There are some major industries which harbour foreign currency for Sri Lanka such as tourism, hospitality, exports of products, foreign investments etc. which help could potentially assist recover the economy. Hotels and real-estate industries are considered to be the major players in construction investments. Quite blatantly, the construction of buildings plays a considerable role in countries economy, therefore, in my point of view optimizing the cost without compromising the quality in construction is vital. There are many stages to optimize the cost of the construction where finishing of a building is a significant element.

Yes, general process of construction of a building is to initially create a concept and the design of the building, which then forwarded for approvals. Once the approvals are obtained, the site clearance and the excavation for foundation or pile foundation process will be initiated. Thereafter, the construction of the superstructure and then masonry works followed by Mechanical Electrical Plumbing Works (MEP) will be carried out. As the last step, the finishing of the buildings is given prominence in the construction work.

I would like to discuss the importance of the finish of a building, from my experience as a structural field engineer. In my understanding, the structural part of any building may incur around 20–30 percentage of the construction cost while the rest is spent on finishing including MEP works. Therefore, a proper (well defined) and accurate vision of anticipated finishes of the building during the construction phase of the structure of the building will definitely help in optimizing the cost. So here I would like to share my experience in correct engineering practices which I

learnt in the industry regarding the finishes of the building.

Measurement error and poor knowledge on post activities of the building finishes are the major cost factors for the unexpected cost incurred. As of my point of view with the experience I had, the structure part of any building may cost around 20–30 percentage of the construction cost and rest are for finishing works including MEP works, so the proper and accurate vision of the finishes of the building while constructing the structure of the building will definitely help in optimizing the cost. So here I would like to share my experience in correct engineering practices which I learnt in the industry regarding the finishes of the building,

ANTI-TERMITE TREATMENT PROCESS

There are two types of anti-termite treatment and one is pretreatment and the other is post treatment. As we are in the construction stage, it is all about pretreatment and there are two ways to treat the termites pre-stage like surface pressurized injection and pre-installed chemical recharging system (advanced anti termite reticulation system). It is prudent and apt to know what type of anti-termite treatment anticipated to be carried out for our building before the foundation and ground floor Concreting is carried out. In a way if it is “advance anti termite reticulation system” is opted over surface treatment, network of pipes should be installed before concreting the foundation and floor. Failing to do so would require drilling later in time that would in turn damage the structure after while also incurring extra cost



simultaneously.

PLUMBING SLEEVES FOR SEWAGE OUT

Water supply and sewage pipe installation is one of the critical part of the building construction this also the one which has to be decide earlier at the design stage some are designing it to have through MEP Ducts some are planning to have outside along with the walls depends on the quantity as well, so normally we are structurally dropping the slab about a difference of 6-7” from the immediate floor level to install the sewage and water drain pipes so here if the ducts are inside the bathrooms no issue must be an opening in the bathroom slab itself and we can get the out through that (not a good practice in the sense of bathroom space) if not we should get it through beams “now we came to our topic, let say if you forgot to place the sleeves on the beam or placed in a wrong place, then the beam should be damaged or horizontally bored to take the pipes out, it is an extra cost. Another interesting part I have experienced here is, my site officer kept the sleeves yes, place is perfect to get all the pipes out but, immediate below that beam there is a large window so what we can do we should turn the pipes by bends again it will consume cost and time.

WATERPROOFING PROCESS

The best building designers and the architects will definitely think a little on water protection of a building, because once it starts to leak it would be hard to stop it. Constructing a building on slopy lands

Adaptation of bacteria and its implications in environmental application

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due to rapid urbanization is also critical in the case of water proofing and therefore water proofing and diverting the ground water flow should be inevitably considered. Even the design favours avoiding contact with water, roof top terraces and balconies need to be waterproofed using chemicals. "Do we need to consider this before concreting; **YES**. Let's say a building has a large roof top terrace or a balcony and that needs essential waterproofing. And if you see the best practice of water proofing is applying a base coat of a chemical sloping towards the drain; for that what the waterproofing team should do is that they design a slope by doing a cement mortar bed and applying on it. It can be easily by sloping the concrete itself towards the drain by adjusting the concrete slump while concreting. If the concrete is sloped, then we can save money and time by not including a cement mortar".

CRITICAL PLACES OF MATERIAL EXPANSION

Every material we are using in the construction has its own shrinkage and expansion ability during the weather cycle for example steel and concrete. There are so many places we will meet during the construction of a building, where we would need to join a masonry wall to a steel column or concrete on top of permanent steel panel. Therefore, these points would be critical and need consideration of expansion of material. If we do not considering and failed to keep the expansion in

design of joints where the steel and concrete would join, it would crack with time. Let's say we are concreting a long slab on top of steel a panel providing a construction joint and should a crack appear, the rectifying cost after completion of the building would definitely incur huge cost and put project managers and clients jeopardy.

Considering plastering thickness while giving measurements before starting the construction is inevitable. Normally construction drawings were issued to the sites with many general notes and so many clauses. In addition, there must be door openings and window openings, and therefore, before starting the masonry works would need to clarify whether the door and windows manufacturing process was based on site measurements or ready-made based on the drawings. It will consume more time and manpower to rectify, if we ignored to study the drawing correctly. Let's say you have given the measurements to the door and window openings without considering the plaster thickness; and on other hand the door and aluminum contractor manufactured considering the dimensions in the drawings. This would make the design ineffective. Thereafter, we would not be able to change the door and window sizes as that would not be practical in a way considering the cost of repair. Obviously, we would have to then break the masonry wall or a column; and how many millimeters would need to be removed? maximum of 25mm with the use of power tools. As I said earlier it would not be a good practice to start the work without studying the drawings well.



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