A Study on Modular Construction Technique

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Abstract: "Modular Construction is a pre-engineered process of making any structures or elements in a factory that is off-site and are delivered to the sites and assembled as large volumetric components or as substantial elements of any structures." It can also be defined as "A modular building is a pre-engineered structure that is flexible enough to satisfy virtually any requirement tougher than standard drywall construction, expandable, can be relocated and completely re-usable."

KEYWORDS: Prefabricated, Sustainability, Modularity, Conventional.

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INTRODUCTION

MODULAR CONSTRUCTION

- With increasing industrialization to the building industry, steadily larger parts of buildings are made up of prefabricated components, delivered to the building site from the factories.
- Modular design, or "modularity in design", is a design approach that subdivides a system into smaller parts called modules or skids that can be independently created and then used in different systems.

CONSTRUCTION PROCESS OF MODULAR HOUSE

Modular construction is the process of manufacturing multiple building sections in a facility for assembly at a remote building site. The building sections, called modules, will fit together once assembled on site with plumbing, hvac and electrical connections running throughout. One of the great advantages in the modular construction process is that many of the processes happen at the same time which can cut the construction time in half.

While the planning to ensure all connections fit together properly involves some complexity, the overall modular construction strategy isn't hard to understand. In fact, we have broken the modular construction process down to 7 easy steps from concept to completion: Design, Engineering, Permits & Approvals, Site Development, Plant Fabrication, Transportation, and Installation. And in the modular construction the containers that are shippable to one place to another having the sizes of 20 feet by 8 feet or 40 feet by 8 feet. The smaller of the two equals about 160 square feet of living space, while the larger container gets you 320 square feet. There are also heights type, regular (8.5 feet height) or a high cube container that provides about a foot of extra vertical living space.

Some of the example pictures are shown below:

Design

Every construction needs an architectural design. The first step for modular construction is similar. A design is created for the house or building that has to be erected. The designer takes into context the following markers:

What the client wants, e.g. number of rooms, style of the roof, number of floors, floor design, kitchen design, etc.

Environment and climatic conditions of the site to determine how many floors can be erected and what material and method should be used to tackle harsh weathers.

The budget of the client. Properties of the ground to ascertain the type of foundation.

Engineering Reviews

After the designs have been finalized, they go to the engineering department for a review of the standards of safety and performance. Engineering reviews are mandatory in order to make sure that the building meets certain codes of building and construction set by the government like the International Energy Conservation Code (IECC).

Getting Permits

A construction or major renovation of any building requires permits from the state jurisdiction. The client is responsible for getting the permits by appointing a general contractor as his representative so he can acquire the required permits for construction on his Property. Failure to do the same results in Penalties or even demolition of the building by government officials. The permits generally include:

Site plan
Building permit
Mechanical permit
Plumbing permit
Concrete permit

Site Development

While the modules for the building are fabricated in the offsite factory, the site is developed for the installation of modules. Firstly, the site is surveyed for contours of the land. Secondly, the land is excavated and graded to a level for the foundation. Then the drainage for the site is laid down and finally the foundation on which the modules are to be installed is constructed.

Module Fabrication

The fabrication of the module begins with a welded steel frame loaded onto the assembly line. The base floors, walls and ceilings are then fabricated on the frame and the electrical and plumbing services are added. The module is then insulated with the main floors and walls. Then the interior finishing, including painting and flooring, is completed while the windows and doors are attached. The module is prepared for transportation after the exterior finish is completed.

Transportation Module

After finishing the module fabrication, the modules are transported to the site for installation. The modules are transported by road on trailers or tow trucks. The transportation depends on the design or purpose of the modules. For a big settlement like a workmen's camp, the modules are transported in stages for the installation.

Installation

After the modules have been transported to the site of construction, they are set in place to fix the panels and joints. For a permanent or grade foundation, the modules are supposed to be put in place by a crane, while for temporary foundations the modules are placed using simpler mechanical methods. The contractor, who is experienced in modular construction, then installs and fixes the modules and installs the utility and electrical services.

If you are interested in a modular home or a business-oriented building, contact Northgate Industries, the first choice for South Edmonton in modular building

This is the detailed procedure that to build the modular house.

ADVANTAGES OF MODULAR CONSTRUCTION TECHNIQUE IN CONSTRUCTION INDUSTRY:-

1. Modular construction technique can also be adopted for building medium residential buildings as well as high rise buildings, cafeterias, public toilets and other uses that are usually associated with brick and mortar buildings.

2. As modular construction technique saves time, it can be used for disaster management such as earthquakes, hurricanes, and other World calamities that require emergency shelters and housing for displaced persons as in the case of Refugees crises in some parts of the world that require emergency shelters, hence modular construction technique is best suited to address shelter problems as the process is past compare to on-site construction technique

3. Modular construction technique can be used to build large modular buildings such as office complexes, retail shopping centers, churches, temple, mosque, government facilities, fire stations, schools, medical and health complexes, etc

CONCLUSION

Modular construction technique is a technique that uses prefabricated modules/units and it is a technique that has perfect solution in remote, rural and urban areas where conventional or traditional construction may not be possible. Modular construction technique should be adopted for construction of buildings such as churches building, temple, mosque, medical and healthcare facilities and retail shops, fast food joints, etc. also the modular construction technique generate less waste on-site because building elements are prefabricated in the factory and then transported to the site for their final installation; therefore, saving time and money. Therefore modular construction technique is much more efficient and sustainable

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