

The Comparative Study of Traditional and Modern Construction Materials & Techniques

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Abstract:- The paper here outlines favourable conditions, inequalities, and ways to overcome barriers to a wide selection of different current development programs that can help the development industry and its relevance to traditional processes. With all these advances in building strategies and the need for end users of creative buildings we in terms of builders and design engineers must innovate new and creative to meet their needs. Intelligent architecture and material technology is a tool for spreading information on how different structural materials effectively increased productivity and profitability through newly developed communication, collaboration and management technologies. We have seen rapid development of modern patterns, building materials, and advances in the International Construction Industry exhibition. From now on, photography has a huge impact on how development is done later. This paper includes different types of resources that provide new insights into new approaches and opens new doors for development and improvement in the construction industry.

General Terms

Tradition and modern construction techniques.

Keywords:- Advanced technology, construction industry, development, intelligent architecture, productivity, resource, smart buildings, strategy.

I. INTRODUCTION

There are many inventions that are used today in the modern technology of construction, including different construction materials in the construction industry, additional metals, different types of machinery, etc. In this competitive world, it has become increasingly necessary to deal with neighbouring countries in terms of infrastructure growth. All of these modern techniques help to reduce additional costs, reduce labour costs, reduce transportation costs, longevity of building materials, and much more. With newly coming technology construction operations, materials and their maintenance based on the requirements of low power consumption, low CO₂ emissions, serviceability and long-lasting quality, the construction industry is adopting various new methods to upcoming creative construction techniques and methodology.

Therefore, the main focus is basically on sustainable construction based on the evaluation and optimum use of building materials and construction methods themselves. Rather than continuing the traditional methods of construction, many technologies developed and accepted by construction industry. Many of these technologies have already there in industry but very few of them are known and

used by engineers and architectures. This study is to explore new and innovative building methods and technologies that work in Indian markets. and to link their opportunities with high demand for responsible building construction.

II. OBJECTIVES OF STUDY

- To study how the new methods, technology and strategies will be beneficial to the effectiveness in construction industry.
- Historically determine how an organization changes its methods and technologies and accepted new techniques in construction planning.
- To study building materials, as well as temporary works needed for convenience construction process.
- Introducing new Civil Engineering technologies and concepts related to Advanced Construction Technology.
- To learn and understand the latest building techniques used in engineering construction of various types of buildings.

III. TRADITIONAL AND MODERN CONSTRUCTION MATERIALS & TECHNIQUES

A. Historic Construction Materials & Techniques

It is noteworthy that there are several construction techniques in the area of cultural construction (apparently unrelated) that originate in the ancient world. In ancient times, skilled architects lived. They built various structures like houses, temples, and mausoleums with natural materials. Some of the structures are thousands of years old and are still intact today. Scientists are studying how powerful structures were then built. Let's take a look at the details about ancient building techniques in India.

a) Mud construction

The old method of construction of any structural component used different types of building materials that require a particular construction method. However a lot of these production techniques are strength green. All herbal assets are depleted, which has forced it to choose constructing materials and production structures that require much less energy in its operation. The mortar gadget does not save energy and works pleasant below unique weather conditions. The earth is one of the oldest human building materials, and plenty of historical civilizations used it in a few way. It become with no trouble available, cheaper and sturdy and required only a few simple technology.

b) Construction using Lime Mortar

Lime mortar is considered a respirator, which lets in moisture to waft freely and evaporate from the surface. In older buildings with walls that change over the years, cracks may additionally appear, allowing rainwater to seep into the

building. Lime mortar lets in this moisture to evaporate and dry out the wall. Re-pointing or providing a vintage wall with cement mortar stops evaporation and reasons troubles related to moisture in the back of the cement.

c) *Construction using stones*

The history of the stone used in the construction of buildings has been connected with people since the beginning of our times. It was the refuge of the prehistoric man who lived in caves, taking from the beginning of our existence its telluric character and understood it as our connection with the Earth. Our ancestors understood its timelessness and its reminder. The stone was always in a different form than the man; unable to shape or move it with his bare hands, humans had to be skilled at working with stones. Therefore, technological advances have been in line with the history of stone used in architecture and construction.

d) *Construction using timber*

From prehistoric times mankind has used timber for construction and, in rural "tree-rich" communities, timber has remained a major building block since then. This shows the ease with which it can be obtained, its excellent mechanical properties, light weight and easy design. Over the centuries, however, there has been widespread hatred among the prosperous urban areas for the use of timber, as construction processes have led to poor fire performance when timber is used. Urban communities have forgotten in recent centuries that wood, if properly used, is a highly efficient building material. Modern advances in construction knowledge and firefighting techniques combined with concerns about the sustainability of other options, have created situations where timber re-emerges as a major building material. Timber has begun to be used in the construction of tall urban buildings, rather than being considered suitable only for smaller buildings, as well as large exhibitions from time to time away from neighboring buildings.

B. *Modern Construction Materials & Techniques*

Construction techniques have undergone effective improvements in recent times, as new technologies are now put to good use in order to improve the quality index of buildings. This has meant great benefits to end users like us who can be protected from the ongoing costs of repairs and other defective properties - related tasks. Construction lead time has been reduced and construction costs have been adjusted.

A. *Precast Flat Panel System/Precast Foundations*

Build envelope panels with manufacturing facility-equipped insulation and decorative cladding and may be used as loaders. This gives factory high-quality and accuracy, in addition to on-site set up speed. This sort of production is often referred to as go-wall creation. Precast concrete structures can be used to construct foundations quick. The factors are regularly prioritized and thrown into the manufacturing unit location, which ensures the finished product. Foundations are frequently supported by way of concrete piles and are related. these systems enhance productiveness, mainly in awful weather, and reduce the specified excavation - which could be very useful when working with infected soil.

B. *3D Volumetric Construction*

Volumetric 3D construction (additionally called modular production) includes the manufacturing of three-dimensional devices in managed factory situations prior to move to the site. Modules may be delivered to the website in an expansion of approaches, from the basic building to the one with internal and external edges and mounted services, all prepared to be incorporated. Modular utilization makes use of the blessings of manufacturing facility situations to create gadgets which can be most in need of provider in which a excessive stage of replication and the want for rapid integration on web site make their use particularly acceptable.

C. *Wooden Formwork Systems*

A timber structure, because the name implies, is using wood to make diverse molds a good way to have concrete poured later. nations like India, Japan, China, and other jap countries observe this formwork fashion. most Villas and private houses are constructed this way. It is easy to build and retract, smooth to act because of its light weight and extreme flexibility.

D. *MIVAN Construction Technology*

Mivan generation, also higher referred to as Mivan shuttering, got here into massive use whilst there rose a need for efficient housing production era in India. Following the identical machine as wood formwork but using aluminium instead of wooden to behave as a mould into which concrete is poured. it is also known as an aluminum formwork system. Mivan Formwork era is especially used for big scale creation ventures and larger building web sites. Aluminium being more durable, proof against seismic activity, lowering production time, and including that clean end at a low price makes it a famous preference.

E. *Tunnel Formwork systems*

The tunnel form is a formwork device that permits the contractor to construct monolithic walls and slabs in a unmarried operation in a every day cycle. It includes the velocity, exceptional, and accuracy of the manufacturing unit / outdoors of the geared up-to-blend concrete and formwork with flexibility and financial system of forged-in-situ creation. This rapid-paced constructing approach is suitable for repetitive mobile projects, such as inns, apartments, and pupil houses. It presents financial system, pace, pleasant, and accuracy and utilizes the herbal advantages of concrete, along with fire and noise resistance. The formwork parts of the tunnel form are essential and want to be pushed by way of the crane out of the facet of the building when the concrete is struck. this means they're no longer appropriate for solid web sites.

F. *Flat Slabbing Technology*

This process uses the simplicity of the modern form to quickly build flat slabs to make it easier and faster to place horizontal objects and partitions. Expansion of pre-built services takes place as services can be performed in a non-disruptive way in low-lying areas. Every top-notch Construction Company uses the same as the internal structures can be easily modified to meet the changes over

time. In addition, the necessary reinforcement is less which reduces labor costs significantly.

G. Pre-cast Foundation Technique

Foundations can be quickly constructed of factory-produced precast concrete units and high-quality quotient. Power is supplied to the building materials associated with the foundation through the use of concrete blocks. This process allows construction work to thrive even in adverse weather conditions and reduces excavation work.

H. Hybrid Concrete Building Technique

This process speeds up the transition time of the construction by combining the benefits of pre-concrete distribution with in-situ structure. The standard is improving, and construction costs are down. Combined concrete buildings are easy to build, are naturally competitive and consistently functional.

I. Thin Joint Masonry Technique

The use of this method leads to a reduction in the amount of mud used by rubbing it from 10mm to less than 3mm. As a result, mud can be quickly applied with improved production to long wall panels. With large concrete blocks, high construction efficiency and significant cost reduction can be achieved. In one day, the number of mud lessons set is high as mud healing occurs quickly without disrupting the binding capacity leading to the elimination of the floating problem.

J. Insulating Concrete Formwork (ICF) Technique

The ICF strategy uses polystyrene blocks with twin walls and can be quickly assembled to form the structure of a building wall. The formwork is then installed with high quality, ready-made, factory-made concrete. The process of building a building becomes foolproof and the resulting building has a high level of noise and heat.

K. Building Information Modelling

Better known as BIM is a brand new production generation in India this is on the upward push. This technique involves the usage of three-dimensional, pc-generated models of the building. With those fashions, the factors of time and fee are brought to offer an average hen's eye view of how the venture will look. This allows developers plan accordingly in the preliminary levels itself. With smart pc programming and date inputs, many developers can venture onto a laptop. The mind that would as soon as only reside completely inside the leader architect's thoughts. BIM is correctly used in many nations and in sure parts of metropolitan India to assist build homes that require significant making plans.

L. Virtual Reality

Many human beings in recent times are eager about the idea of digital fact, the idea of being in a fact that isn't always your own. more often than not used for fun and adventurous way to pass the time is now a way to have a look at a building that has no longer even all started production. This facilitates the architects to cautiously have a look at the shape and plan at the same time as assessing the strengths and weaknesses the constructing may additionally face in the end. This new creation era is based totally on the premise that " if you could see the structure before it is constructed, no matter

how complicated the plan, it is able to still be achieved." This also facilitates in cutting down pointless charges and fabric wastage; therefore, it aids in a better building system.

M. Augmented Reality-Assisted Building

One of the most predicted modifications to the brand new building approach is the unpopular digital truth integration we see (AR) in the process. through combining constructing records Modeling (BIM) with modern AR clothes, engineers can see a completely-fledged demonstration of what a creation task will seem like. further to the obvious benefits of planning beforehand for the construction of each improvement, this technology will guide new constructing strategies in all components of town planning: housing development making plans, useful resource control, site visitors route, and more.

AR can also help determine the types of building materials used on a site and whether the building needs protective concrete, for example.

N. Artificial Intelligence in construction

Most of the many Indian production technologies, artificial intelligence is the most sought after. Many people confuse synthetic intelligence or AI into SIRI or google assistant on our telephones, but this is not the case. AI is something synthetic, guy-made that is capable of expressing ingenuity in a selected discipline. From automation to self-propelled drones, all of this is AI. From the varieties of bricks utilized in production to the proper mix to make the most powerful concrete for the specified undertaking. Longer or quicker AI control has human experts who can calculate all the variables which can occur while the specified information is entered. Now you may think that AI simplest facilitates us to create art that spans the sky, but AI does now not forestall there.

AI has now made the concept of a smart city greater reachable in the destiny. With AI-controlled energy, automated restore features, and speedy reaction time. Many conflicts can quit before everybody sees them. AI isn't some thing that takes people, but something that covers human shortcomings. Our fragile lives, limited questioning, and imagination are all superior via the use of AI. therefore, to help us create terrific, environmentally pleasant, and inventive systems that mirror the true nature of endless wondering.

O. 3D Printed Buildings

Nowadays 3D printing technology has progressed creation inside the place of business. businesses now use 3-d printing to create on-website items in almost equal manufacturing unit settings. This reduces reliance on the broader supply chain and reduces ordinary task costs. but now, we see great use situations where architectural designs are loaded at once into 3-D printing software. This allows developers to automate the construction system as much as viable and opens the doorways to a faster, smarter, less time-consuming and efficient system for all parties worried. now not terrible with a brand new build machine.

IV. CONCLUSION

With the growth of range, each traditional and new production technologies are used in various construction industry. the construction enterprise is present process fast alternate, with increasing use of generation. Engineers had been capable of lessen charges and fee greater efficaciously. creation methods have grown substantially because of advances in era. smart builders use these methods that will help you improve your funding. homes constructed in these approaches provide exceptional cost opposition, quality guarantee and excessive cease result. once you realize the numerous construction strategies, it is easy to choose the only to be able to pleasant healthy your wishes. The sort of creation is selected based totally at the purpose and size of the constructing, the load-bearing barriers, the desired constructing velocity, environmental features, and cloth prices.

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