

A Comparison on Modern Construction Techniques for Different Components of Building Structure

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ABSTRACT

The basic point of the current development method is growth profitability, productivity, customer fulfillment, natural performance, superior quality, maintainable growth and sustainability of the enterprise's time. In this paper, explore the proposal, which has touched the premise from an audit of writing on the use of current development systems for productivity development, that traditional methods used for development are not adequate and not adequate or that of development. These processes are required to redesign in the context of the worldwide situation. These are usually mixed with cement, mortar or lime. The stone originates during excavation or from the demolition of old buildings. According to the survey's findings, the "major reason for not recycling waste from the construction industry is the lack of information about recycling technologies". Modern construction techniques are a very important part of civil engineers. A good number of old buildings in India are mainly made of good quality bricks. Where is all this waste of C&D going? It is being used extensively by land sharks to fill water bodies and wetlands around urban centers for real estate development. It is easy just being thrown into rivers and open places. The largest contribution to waste construction comes from the demolition of buildings. As a rule the demolition of old buildings generates waste such as brick, wood and steel. In recognition of the need to reduce waste, the study of this paper has been developed to provide practical guidance for professionals in the building structure.

Keyword: - Major, Development, C&D, Construction, Quality, Industry, MT etc

1. INTRODUCTION

Recently, environmental sustainability became a significant problem from the point of view of natural resources and waste. Both the construction and construction materials sector processes include: the construction industry is the largest user of natural materials and in addition a large proportion of the waste arises from the demolition of the constructions. The building materials industry is an area of interest for using waste and researchers have tried to produce new building materials that incorporate waste. The new generation of building materials is developing on other principles along with environmental sustainability. Systems that are evolving into land divisions fundamentally withdraw from traditional development strategies, for example, a limited structure or block and piece. Currently development techniques are about more prominent items and game-plans. There are currently development strategies, typically higher than the fitting concentration in light of the item. They involve individuals in the development business and strategy who seek deadline responsibility and progress in development execution.

2. 12 BASIC BUILDING STRUCTURE COMPONENTS

Here we see that foundations, floors, walls, beams, columns, roofs, ladders etc. are the basic components of a building structure. These elements serve the purpose of supporting, enclosing and protecting the building structure.

There are the 12 basic components a building structure Mention as below [1]

1. Roof 2. Parapet 3. Lintels 4. Beams 5. Columns 6. Damp proof course (DPC) 7. Walls 8. Floor 9. Stairs 10. Plinth Beam 11. Foundation 12. Plinth



Fig.1.1. Building Basic Components : Image Courtesy: Decole

(Source: <https://theconstructor.org/building/12-basic-components-building-structure/34024/>)

3. CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT

The term "aggregate" is widely used by the construction industry to refer to natural mineral materials used for various types of construction. Robinson, Menzie, and Hyun (2004) described 16 terms as "an industrial commodity term for sand, gravel, and crushed rock material in a natural, processed state," used in bulk, strength, and wear resistance. Construction applications "(Berkdale, 2000, as cited in Robinson, Menzie & Hyun, 2004, p. 276) in the US, primarily Portland cement concrete, as part of the construction of asphalt pavements and as structural fills in construction and maintenance. Is used of roads and buildings (Tepordei, 1999). In Europe, the term "concrete" is also used to describe recycled concrete, Bricks and ceramics that are often crushed and used as filler for civil engineering projects. Recently, these recycled aggregates have begun to be used in Europe for the production of new concrete (Weil, Jeske, and Szebeck, 2006). Aggregates often represent a large portion of an area's C&D waste stream due to its predominance in construction and modern construction techniques. If torn asphalt pavements are included during the repair of roads, the total amount of waste aggregates produced is very large. Whereas in Canada and other northern regions, such as Scandinavia, home foundations, large public buildings, and transportation infrastructure, individual houses are often constructed from wood. In Europe and other parts of North America, aggregates are more commonly used for all types of construction and represent an even greater proportion of total C&W waste produced. For example, a Spanish national plan for C&D waste of 2001 shows that 75% of Spain's C&D waste was made up at that time (Merino et al., 2010).

4. TYPES OF MODERN CONSTRUCTION TECHNIQUE

The different MMC used in construction field includes:

1. Precast Flat Panel System
2. 3D Volumetric Modules
3. Flat Slab Construction
4. Precast Cladding Panels
5. Concrete Wall and Floors
6. Twin Wall Technology
7. Precast Concrete Foundation
8. Concrete Formwork Insulation

A. Classification of construction waste

- Residential
- Industrial
- Commercial
- Institutional
- Agricultural
- C&D

B. Amount of C&D waste as per types

- Based on structure type
 - (Residential, Commercial, Industrial, Institutional)
- C. *Based on construction structure size*
 - (Heavy,Med,Light)
 - Activity being performed

5. FUTURE TECHNOLOGY AND DEVELOPMENT

[10] In a study by Leiva et. al. 2013 It has been found that the fire insulation characteristic of C&D waste blocks is improved. Concrete blocks were prepared using recycled aggregates from 20 to 100% replacement of natural aggregation. These blocks were tested and found to have improved w.r.t reference concrete for fire resistance, heat insulation and acoustic insulation. The reason for this improved properties was the lower density in the blocks and more voids in these blocks thus making them suitable for non-structural use such as blocks and prefabricated concrete. Panels. In another study in Mexico [11] by Osasa et. Al In 2016 it was recommended to use recycled aggregate up to a replacement of 20% in hot asphalt mixtures to pave urban roads. Similar results [21] were obtained by Gomes and Perez et. Al 2014 for using C&D waste aggregate in cold asphalt mixtures. As we have seen the use of RA as Subbase has a huge potential for road construction. These recycled materials are not affected by weathering, Friction, physical and chemical changes are therefore very suitable for the sub-base layer in pavement construction. ([22] Jimenez 2013)

6. RESULT AND ANALYSIS

Insulation - By keeping and keeping the home to more natural warm temperatures during the winter and cooler in the summer season, when modern construction techniques are being applied to house construction, its beneficial effect will be on the lifestyle of the people and Will make it more comfortable.

Better for the environment - In addition to saving money and keeping the temperature constant at the same time, the material used for this including such technology proves to be good for the environment as it emits very little emissions. And if these technologies are being combined with additional energy-saving features, carbon footprints may be acutely reduced.

Lower bills - When a place is very well insulated, it does not require so much energy to cool or warm even if it is necessary. If it usually happens every time, it will pay a very low bill for thorough heating and air conditioning. Remember, at a time when energy costs are constantly rising, modern construction technology is definitely a sensible option. In actuality, prefabricated material is now available. This type of material is intentionally designed for rapid construction, yet to maintain high quality infrastructure, buildings, facilities that can withstand the elements strongly. Prefab construction consists in the concrete components of the building that are actually being built before being moved from one factory environment to another. It is also important to remember that prefabricated materials are included for much faster construction times, including panelized systems, pods, and volumetric construction.

A. Brick Test (Strength test)

Concrete Brick

Load = 40 KN

Area = $12.3 \times 8.3 = 102.09 \text{ mm}^2$

Strength = load/ area

= 39.18 N/ mm^2

Reconstructed brick test

Load 20.50 KN

Area = $11.19 \times 8.23 = 92.09 \text{ mm}^2$

Strength = Load/Area

= 22.26 N/ mm^2

B. Concrete cube test

Size of mould 20cm x 20cm x 20cm.

For M 30 Grade of Concrete

Cement = 2.235 kg

Sand = 2.933kg

Coarse Agg = 4.35 kg

W/C = 0.8

Strength = 24.8 N/mm^2 (7 Days)

= 39.56 N/mm^2 (30 Days)

Table 1.1: Properties of Coarse Aggregate and Demolished Waste

Parameters	Coarse aggregate	Demolished waste
Specific gravity	4.35	2.51
Water absorption	0.5%	4.54%
Crushing value	25%	40.25%

7. COCLUSION

In the modern state of the world, the construction industry is considered an important occupation that aids in the development, growth and achievement of particular types of objectives of the society. The nature and use of various types of modern construction techniques is of paramount importance in light of the fact that their non-presence can drastically change the economy, efficiency, speed, and growth of construction companies. Prior information on modern construction techniques before construction can make our methods easier and help in general execution. After conducting the study, it has been concluded from the work on the use of C&D waste that C&D shows a great commercial potential for reuse and recycling of waste. Its success depends on the creation of incentives and standards by the government, strict compliance with regulations and a superior state-of-the-art technology for recycling these wastes. Research deals with building materials by physical means with cost analysis, so that we can use the reconstruction and construction of paving roads and the construction of low-rise buildings and many other construction works. This paper will help in better utilization of construction waste and property in relation to concrete and will also improve various properties of materials. Currently development techniques are about more prominent items and game-plans. There are currently development strategies, typically higher than the fitting concentration in light of the item. They involve individuals in the development business and strategy who seek deadline responsibility and progress in development execution.

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