

The construction of a house or buildings construction essay



In this modern world an builders faces lots of challenges in the construction of a house or buildings to compete the world in the form that how to make a modern house or building which is environment friendly, energy saving and low cost etc, such sort of problems putting pressure on builders now a days.

Because of the rising cost of the material which is used in traditional construction methods which are unlikely to meet the demands for future developments. That's why more and more builders or designer are now understand the benefits of the development of modern material which are gradually used in the buildings now a day's.

Housing associations are now encouraging the housing corporation to use the modern ways of construction known as modern methods of construction when building new developments. This policy is a direct result of the Government's response to a number of drivers that have resulted in what it perceives to be a crisis in housing supply.

In areas of growth, house construction in the private sector has tended to focus on the production of traditional houses – either semi-separate family homes or larger separate executive homes. These private sector dwellings are beyond the reach of most first time buyers, particularly key-workers in comparatively low-paid jobs in the public sector. The Government is looking to housing associations to give dwellings for those who can't afford to buy the house. The Housing Corporation is the key agency regulating

The Housing Corporation is the key agency regulating delivery of housing in the social housing sector. They assist with delivery of policy via grants awarded through the Approved Development Programme (ADP). A proportion

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of the ADP has been ring-fenced (The Challenge Fund) for the delivery of new homes quickly and cost effectively, in areas of high demand as well as stimulating a step change in supply by encouraging innovative forms of construction.

In the face of the support from political and regulatory authorities to make greater use of modern methods, lots of stakeholders are still unsure about modern methods of construction for some of reasons. In the case of housing associations there is doubt about whether or not modern methods are able to deliver energy efficient homes at good reasonable prices. This pamphlet aims to demonstrate that homes that cross the requirements of building regulations in sense of their material efficiency can be built cost-effectively.

SIPS

Structural insulated composite panels are one of the most satisfying technologies in the construction industry. Started in the years of 1940s when the new sandwich design concept was generated, where there were two wooden materials and a different element between them generating maximum strength to the structure.

Design

As mentioned earlier, the SIP has an insulated structure between two wooden boards. This most commonly used materials are expanded polystyrene (EPS), extruded polystyrene (XPS) or rigid polyurethane foam.

Figure : STRUCTURAL INSULATED COMPOSITE PANELS

Figure : STRUCTURAL INSULATED PANELS
Other materials can also be used for example, steel, aluminium, stainless steel, fibre-reinforced plastic, and magnesium oxide. http://www.wbs-ltd.co.uk/images/photos/newbuild_mmc_sips1a.gif

Advantages

the structure is more Tougher and stronger due to the sandwich pattern of the material

More insulated than any of the materials

Less operating cost and can be used almost everywhere for eg. Roof, floor, walls etc.

Drawbacks

The manufacturing and the production can take some time

Expensive manufacturing cost

Have to prevent the composite from moisture and keep it ventilated

The material creeps over time

Figure : VOLUMETRIC CONSTRUCTION
VOLUMETRIC CONSTRUCTION
<http://www.scrapbookscrapbook.com/DAC-ART/images/hoodsinside.jpg>

The volumetric construction is also, known as the modular construction. This kind of construction is mostly used at places where the employer cannot afford waste time and material for e. g. a busy road, a hospital etc.

Design

The construction components are manufactured and processed and are stacked onto prepared foundations to form dwelling. The materials used to make the components include light gauge steel frame, timber frame, concrete and composites.

Advantages

Saves time and also the labour cost.

Can reduce the waste significantly generated during construction and also comparatively the least amongst other construction methods

It is the most efficient when using identical units as it is the same common production line used.

Improved quality compared to the other construction methods

Disadvantages

Setting up a manufacturing and production line could be a major concern issue when considering cost

Transporting could be expensive depending upon the size of components

Also, installations and other factors would affect the construction workers if the components are heavy or complex structure and have to be perfectly installed

STEEL FRAME CONSTRUCTION

The steel frame construction is usually used for constructing bigger structures like building, sky scrapers etc due to its durability and toughness. The SFC is one of the most efficient construction methods which use steel beams, T shaped and I shaped beams as to resist the stresses.

Design

Figure : STEEL FRAME CONSTRUCTION Oakridge, a development of 299 dwellings for Sentinel Housing Group, utilised light gauge steel frame panellised construction for the first two phases. The homes, constructed from steel frames manufactured by Ayrshire Steel Framing, share standardised layouts – visual variety was achieved externally by incorporating a variety of physical features (such as bays, dormers and balconies) along with a variety of finishes (different coloured renders, brick and timber cladding). Dormers and balconies were also prefabricated in glass reinforced plastic (GRP). <http://www.airport-technology.com/projects/raleighdurham/images/7-frame-construction.jpg>

2. Advantages of Steel Frame Construction:

They can build very high and large

They are light weight and strong

They are easy to fix or assemble

They are accurate and predictable

3. Disadvantages of Steel Frame Construction:

Steel is an expensive material Frames are unstable

These types of frames needs fire protection

They needs separate “ skin”

TIMBER FRAME CONSTRUCTION

Figure : TIMBER FRAME CONSTRUCTION Timber frame is a modern method of construction that offers an important high-quality solution to the many housing and construction challenges facing the UK. As one of the leading modern methods of construction, timber frame has grown consistently year on year. It's regarded as a means of achieving good quality, reducing time spent on-site, increasing safety and overcoming skills shortages in the industry, and will play a very important role in the formation of homes in sustainable communities by 2016. http://www.lizmale.co.uk/uploadFiles/mciFiles/Timber_frame_construction1.jpg

Design

Wood is the only renewable commercial building material and as a way of construction is effectively carbon neutral. When you use timber frame you're actively helping to reduce the belongings of global warming. Further improved by its low embodied energy and excellent insulation properties, it

means happy customers with lower heating bills and a good future for the planet.

Advantages of Timber Frame Construction

In timber frame construction needs small amount of labour.

It can be seen that the benefit in terms of time saving on site manifests itself as a saving in construction risk.

Timber frame construction is environment friendly but the environmental benefits of timber frame construction are reduced when timber is imported from sources outside non local and requiring substantial fuel consumption in transportation.

Disadvantages of Timber Frame Construction

Apparently problems with timber frame construction in the housing industry from each end users and local establishment would include a perceived huge risk of fire, problem of sound lessening in a timber structure and the impact such a structure might have on the security of the end user.

Basingstoke timber frame construction site fire

Figure : CONSTRUCTION FIRE

Timber frames are designed and manufactured to tight tolerance and require correct setting and other adjacent construction such as chimneys, rising walls and block construction. As a result, these works need to be set out with a good degree of accuracy.

Panels should be stacked on a flat surface so that warping or buckling does not happen. Proper on-site practices and skill of deliveries can address this matter.

Where housing is proposed in areas at threat of flooding, the planned construction methods undertaken need to be reviewed in order to measure the possible risks or implications should flooding occur.

BRICK and MORTAR CONSTRUCTION

Figure : BRICK AND MORTAR CONSTRUCTION
Brick is a timeless, classic building material. The Chinese, and Egyptians understood the value of this simplest of rectangular solids over three thousand years ago. Brick structures still stand that were already ancient at the time of Christ. Invented in antiquity, brick remains the one exterior building material with a human scale, rich variegated colours, and flexibility of use. Modern man has crafted building materials from concrete, plastic, glass and steel, but none approach this unique elementary product. <http://www.chemexfranchises.co.uk/anglesey/images/construction.jpg>

Design

The brick making process is unchanged from primitive times in its necessary elements. A modern brick plant carries out the same functions that a Babylonian craftsman once performed. That craftsman mortar and sand, mixed the two with water to form a flexible clay mass or clot, formed the clot in a wooden mould, dried the green, unfired brick in the sun, baked it to nearly 2000 degrees, and cooled the now permanent brick, which then went

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to the mason to be laid in mortar to become part of a temple, Great Wall, or simple home.

Figure : BRICK AND MORTAR CONSTRUCTION Advantages of Brick and Mortar construction <http://www.bandwbuilders.co.uk/ImageHandler.ashx?>

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true&=~/App_Data/UserImages/Image/11125%20100910%20001.jpg

The bricks walls protects the houses from noises that's comes from outside.

Bricks are beautiful when we go to the residential area we can compare the beauty of brick structure to the other structural work like steel, wood etc.

Brick structures are easy to maintain and there is nearly no cost to maintain the exterior of an all brick home.

Bricks will not burn and in those disastrous situations where a fire does occur it will certainly not fuel the situation.

Disadvantages of Brick and MORTOAR CONSTRUCTION

The one main disadvantage of bricks and mortar is the high cost of both material and labour.

Bricks and mortar construction is much sturdier than wooden homes because of the thickness, hardness and weight of the materials used to build the home

bricks and mortar construction is very old traditional construction.

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ANALYSES AND EVALUATION

For the particular construction, the author supposes that the steel frame construction would be the best possible way to build the structure. As the main concern is time efficiency it would be quicker and easier to install the steel frame structure and to complete the work on time.

Talking in terms of cost efficiency and reliability, in the steel frame structure has to be compromised in one of the two factors. The demand of this kind of structure is to be tough and reliable and therefore have to spend some money on the manufacturing of the steel frames and also keeping the quality into consideration.

The manufacturing cost and the transportation cost would be the only concern issues for the company where as the labour cost would be comparatively less. As the steel frames could be easily assembled and fixed.

Architecting on the building would be easier and also it would give a freedom to the architect to design his particular construction as the steel frame could be manufactures in almost any possible way.

Method

Cost

Time efficiency

Structural reliability

Environmental friendly

sustainability

SIP

Expensive manufacturing cost and nominal labour cost

Moderate

Good

Moderate

Best

Volumetric construction

Expensive manufacturing and labour cost

Good

Moderate

Moderate

Less

Timber frame construction

Nominal cost

Less

Moderate

Less

Good

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Brick and Mortar construction

Least amongst all the methods

Least

Good

Less

Less

Steel Frame Construction

Expensive manufacturing cost but cheap labour cost

Best

Best

Best

Good

SCHEDULING AND PROCEDURES

Designing

The plan starts by taking the structure into consideration. Keeping the limitations, constrains and the difficulties in mind. The Architecting Part takes place after the cost estimation and the legislations have been considered.

The designing process is a time taking process as it helps in knowing all most everything which is to be used in the construction and the quantity of materials which have to be ordered or manufactured.

Foundation

The execution starts by evacuating the area and excavating to make a foundation for the building. The foundations build is made up of cement, which is a common process for all the construction.

During the initial construction, the skeleton of the structure is build by the steel frame construction method. The steel frame construction helps in giving the toughness to the structure and also, the freedom to building almost any kind of structural shape.

The concern issues for steel frame structure are as follows:

Time delay in manufacturing and transportation

Waste parts could affect the expected budget

Construction

The method suitable with the steel frame structure is the SIPS. The Structural insulated panels can be used in making roofs, floor and also the walls. The reliability and the strength of the combination of the structures would improve the life and the toughness of the building.

Concern issues for this kind of construction method are:

Weather: it could be a serious issue and could delay the work plan, therefore the construction plan has to be well organised and executed.

Labour cost : these kind of construction methods have nominal labour cost but since it is a combination of two types of construction methods, the labour demand could be higher

Lastly, legislation: the legislations are the most important factor of concern for the employer and as well as the management.

Finishing

The finishing consists of the final construction steps like greasing, oiling, painting etc.

REFERENCE

Figure 1: modern method of construction ;

<http://www.tommy popeconstruction.com/Building-Construction.htm>

Date: 3rd may 2011 time: 4: 00pm

Figure 2 : Modern building;

Shift Housing by AquiliAlberg

Date: 3rd may 2011 time: 4: 20

Figure 3 : <http://www.thermalconstruction.co.uk/about-us-1>

DATE: 9th may 2011 11: 41

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Figure 4 : SIPS

http://www.wbs-ltd.co.uk/newbuild_mmc_sips.htm

Date: 9th may 2011 12: 00

Figure 5: VOLUMETRIC CONSTRUCTION

<http://www.scrapbookscrapbook.com/DAC-ART/dac-artblocks.html>

Date: 10th may 2011 1: 12pm

Figure 6: STEEL FRAME CONSTRUCTION

<http://www.airport-technology.com/projects/raleighdurham/raleighdurham7.html>

Date: 10th may 2011 1: 30pm

Figure 7 : TIMBER FRAME CONSTRUCTION

<http://www.lizmale.co.uk/clients-case-studies/uktfa>

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Figure 8: CONSTRUCTION FIRE

<http://faast.co.uk/2010/09/15/basingstoke-timber-frame-frame-fire-prompts-construction-fire-safety-warnings/>

Date: 11th may 2011 2: 00pm

Figure 9 : BRICK AND MORTAR CONSTRUCTION

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<http://www.chemexfranchises.co.uk/anglesey/construction.html>

Date: 11th may 2011 2: 10pm

Figure : BRICK AND MORTAR CONSTRUCTION

<http://www.bandwbuilders.co.uk/blog>

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