



**DEPARTMENT OF BUILDING
UNIVERSITI TEKNOLOGI MARA
(PERAK)**

METHOD CONSTRUCTION OF SUPERSTRUCTURE WORK

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METHOD CONSTRUCTION OF SUPERSTRUCTRE WORK

Be accepted in partial fulfillment of requirement has for obtaining Diploma in Building.

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ABSTRACT

Superstructure is a very important part when building a house or building. Without a proper superstructure, a building or house cannot be construct. Superstructure is a part that above the foundation where ever thing such as furniture, people, and inventory will be located at. Therefore, this report will talk about how to do superstructure work but only focused on RC beam and RC column. The objective of this report is to explain method statement on how to build RC beam and RC column, to identify problem while construct RC beam and column and solution for the problem. Advantage of building house is also included in this report. With this, people can learn and study, the process of building RC column and RC beam to understand more. And also compare which is better between building a new house or buy a already built house.

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CHAPTER 1.0

INTRODUCTION

1.1 Background of Study

The superstructure is the section of a structure that is built above ground level and performs the structure's intended purpose. People will spend the majority of their time in a building's superstructure. The first and second storeys of a house, as well as any number of floors in bigger building, fall into this category. Elements such as beams, columns, finishes, windows, doors, the roof, floors and everything else make up the superstructure. The superstructure's components are substantially longer than the substructure's components. This isn't surprising given the superstructure's size advantage over the substructure. A range of factors the type of superstructure chosen for a home, ranging from maintenance concerns to personal choice. Material function and availability, building cost, speed of construction and constructability, maintenance costs and life expectancy, environmental issues, and aesthetics are some of the most widely used criteria in determining the type of superstructure to be used. There are no hard and fast rules about which of the factors listed above is more significant than the other. Gopal Mishra(2010)

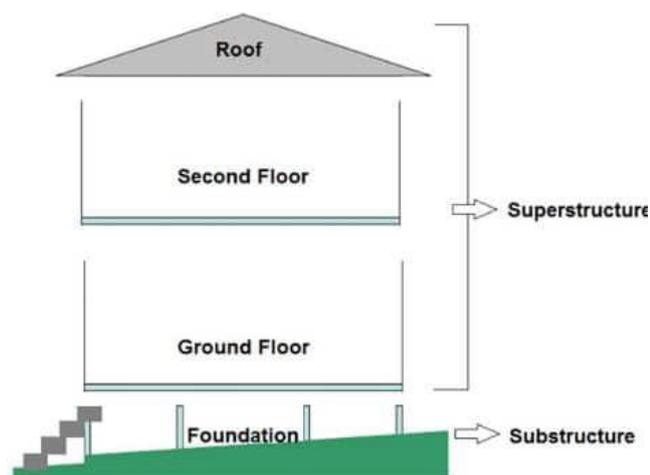


Figure 1.1 Superstructure and Substructure in a Building

(<https://theconstructor.org/building/superstructure-substructure-building-construction/1651/>)

Beams are lateral load-carrying horizontal structural elements. Raker beams are referred to as one of the when they are inclined or slanted. In a reinforced concrete construction, floor beams are often intended to withstand loads from the floor slab, their own weight, the weight of partitions/cladding, the weight of finishing, and other action. The selection of the right beam size and area of reinforcement for carrying the imposed load without falling or deflecting unduly is part of the design of a reinforced concrete (R.C) beam. A horizontal reinforced concrete beam will be subjected to bending moment and shear force as a result of the operations outlined above. Torsion (twisting) of the beam may occur depending on the loading and orientation, as seen in curved beams or beams supporting canopy roofs. The presence of axial force in the design of rake beams can be fairly significant. There are different types of beam according to end support such as simply supported beam, continuous beams, overhanging beams, cantilever beams and fixed beams.

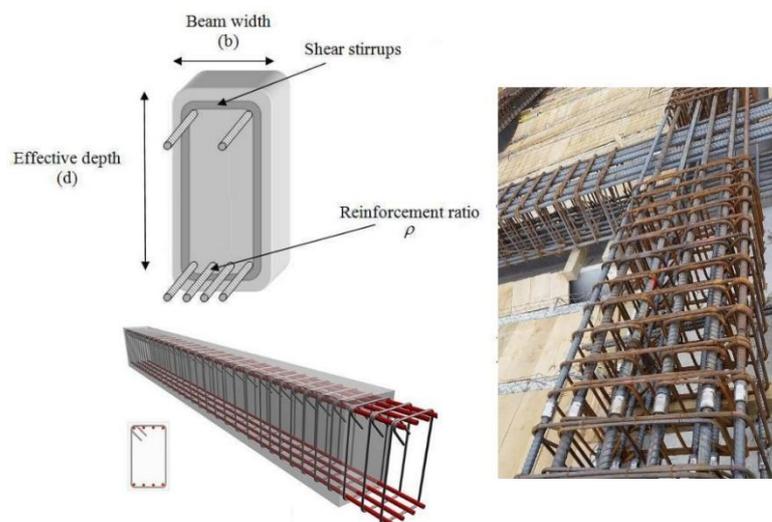


Figure 1.2 Reinforced Concrete Beam

(<https://i1.wp.com/theconstructor.org/wp-content/uploads/2013/11/rectangular-reinforced-concrete-beam-design.jpg?fit=920%2C624&ssl=1>)

Columns are compression members that are used to carry superstructure load to the base. They can be vertical or inclined. The provision of suitable compression reinforcement and member size in the structural design of reinforced concrete (R.C) columns ensures the structure's stability. The most common shapes for columns are rectangular, square, and circular. Other shapes, such as elliptical, octagonal, and hexagonal sections, are also possible. The slenderness ratio of a column determines whether it is short or slim, and this is, in turn, determines the method of collapse. Depending on their location and loading situation, columns in framed constructions are subjected to axial, uniaxial, or biaxial loads. Columns are very important components of a structure. Failure of the column results in the collapse of the structure. There are different types of columns used in building construction. They are different type of column based on the construction materials such as reinforced concrete column, steel column, timber column, brick column, block column and stone column. However, in this report, reinforced concrete ground beam and reinforced column is the main focus.

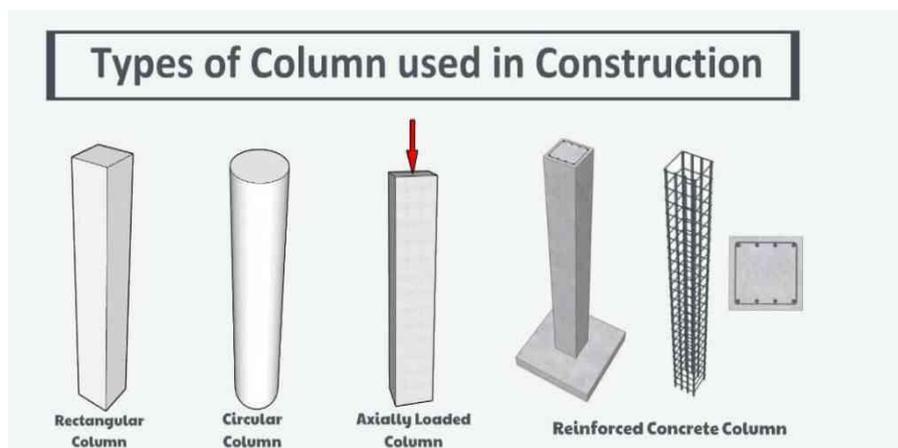


Figure 1.3 Types of Column used in Construction
(<https://civiconcepts.com/blog/types-of-column>)

1.2 Objectives

- 1) To identify method construction of superstructure specific to RC beam and RC column.
- 2) To determine the problems and solution of constructing superstructure work.
- 3) To list the advantages of building your own house

1.3 Scope of Study

The study is carried out at one storey bungalow located at Kubang Palas, Kota Bharu, Kelantan. The objective of this study focused on how superstructure work such RC beam and RC column were constructed. A comprehensive explanation regarding method super superstructure works also included material, workers and equipment. Apart from this, several problem and solution were also identified. Aside from that, recognizing the benefits of creating your own home is essential. Nevertheless, this study not focused on cost and quality. The approaches used to create this research is observation method, interview method and document reviews.

1.4 Methods of Study

Three method of study were undertaken to address the above objectives :

I. Observation Method

This method is carried out directly through site visit. At the site location, the main focus to been observed is the progress of making RC ground beam and RC column. The observation took around 3 months. The only tool used in this observation method is smartphone's camera.

II. Interview Method

This method is making unstructured interview with several respondents at the site while doing observation. The people that got interviewed are supervisor and the worker. The interview took around 10 to 10 minutes per session. While doing interview, all the data and information were collected and write down in the note book.

III. Document reviews

a. Journal

One of the reading material created by a person is a journal. The use of a journal can provide you with a wealth of knowledge. Journals are normally kept for a small group.

b. Books

The book was utilised as a secondary source in this assignment to learn more about the construction of a superstructure work. There have been various books used to gather information. These book can be found on the internet through the use of Google Books.

CHAPTER 2.0

COMPANY BACKGROUND

2.1 Introduction of Company

The company FAHAR GLOBAL RESOURCES was founded in 2018. Despite the fact that they are a new company, they have already built a lot of homes. The company's primary goal is to engage in building based on cutting-edge technology as well as strength in terms of house organization and high quality. To assist the organization, establish trust from a variety of customers and interact with them. FAHAR GLOBAL RESOURCES also constructs residences from the ground up based on the preferences of its customers. The slogan used by this company is "Cantik itu pasti, murah itu kami" which mean the company provide cheap service yet the customer will receive a first-rate house. Other than that, this company also do another service for example residential home advisory services, housing loan matters, residential home renovation works, road construction and house planner services.

2.2 Company Profile

| | | |
|-------------------|---|--|
| Company name | : | FAHAF Global Resources |
| Registration no | : | 895318-M |
| Registration date | : | 10/7/2018 |
| Company address | : | 8077-1, Jalan Pasir Puteh, Bandar Satelit Islam Pasir Tumboh , 16150 Kota Bharu, Kelantan |
| No. Tel | : | 09-7382204 |
| No. Fax | : | 09-7382204 |
| Business | : | General Contractor, Housing Developer & Real Estate |
| Business status | : | Sendirian Berhad |
| Owner | : | Fadir Fuzai 017-9646603 fadirfuzai@yahoo.com |
| Slogan | : | “Cantik itu Pasti, Murah itu Kami” |

2.3

Company Organization Chart

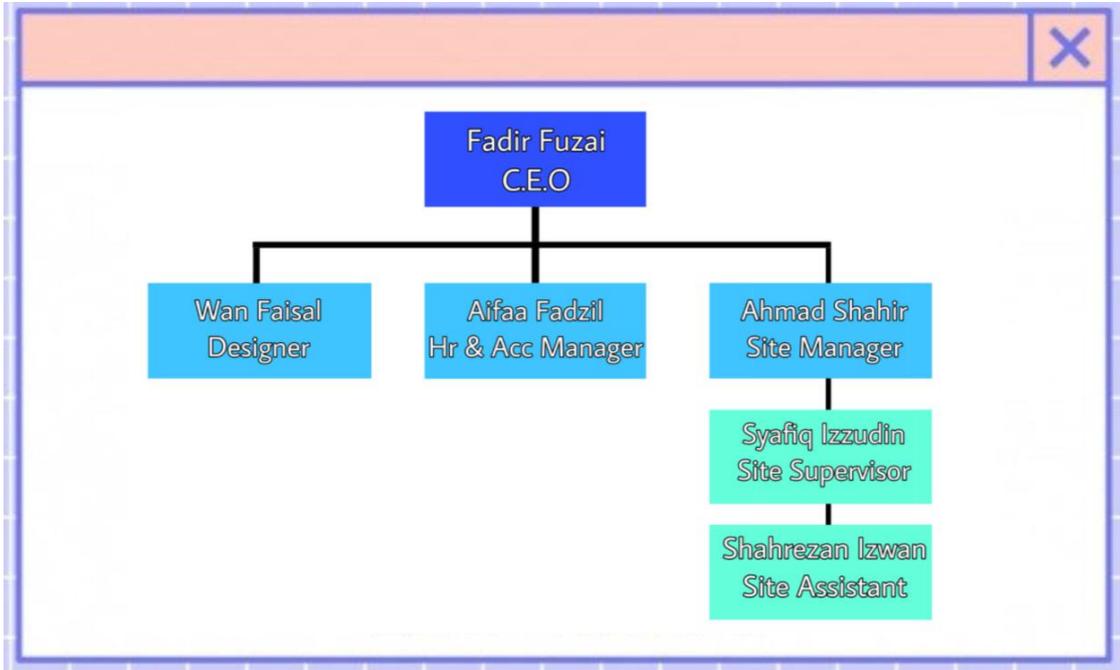


Table 2.1 Fahaf Global Resources's Organization Chart

2.4 List of Projects

2.4.1 Completed Project

| No. | Project Title | Project Value | Start Date | Completion Date | Project Duration | Client |
|-----|----------------------------------|---------------|------------|-----------------|------------------|--------------|
| 1 | Che Hasnah's Bungalow | RM190,000 | 30/8/2018 | 16/6/2019 | 6 Month | Che Hasnah |
| 2 | Abdul Rahmat's 2 Storey Bungalow | RM290,000 | 1/9/2018 | 20/7/2019 | 6 Month | Abdul Rahmat |
| 3 | Yusri's Bungalow | RM195,000 | 7/12/2018 | 18/5/2019 | 5 Month | Yusri |
| 4 | Diyana's Bungalow | RM175,000 | 2/2/2019 | 6/6/2019 | 4 Month | Diyana |
| 5 | Ain's Bungalow | RM200,000 | 2/5/2019 | 2/11/2019 | 6 Month | Ain |
| 6 | Asri's Bungalow | RM200,000 | 18/9/2019 | 20/2/2020 | 5 Month | Asri |
| 7 | Syafiq's Bungalow | RM210,000 | 19/1/2020 | 20/6/2020 | 6 Month | Syafiq |
| 8 | Aizzat 2 Storey's Bungalow | RM300,000 | 30/5/2020 | 28/12/2020 | 7 Month | Aizzat |
| 9 | Osman's Bungalow | RM200,00 | 1/2/2021 | 7/6/2020 | 6 Month | Osman |
| 10 | Azman's Bungalow | RM190,000 | 3/2/2021 | 20/5/2020 | 5 Month | Azman |

Table 2.2 Completed Project

2.4.2 Project in Progress

| No. | Project Title | Project Value | Start Date | Completion Date | Project Duration | Client |
|------------|---------------------------|----------------------|-------------------|------------------------|-------------------------|----------------|
| 1 | Saiful's Bungalow | RM190,000 | 7/7/2021 | 19/1/2022 | 6 Month | Rahman |
| 2 | Paweh's Bungalow | RM200,000 | 10/9/2021 | 19/2/2022 | 6 Month | Paweh |
| 3 | Afiqah's Bungalow | RM195,000 | 20/9/2021 | 29/2/2022 | 6 Month | Afiqah |
| 4 | Muqsiet's Bungalow | RM197,000 | 15/10/2021 | 25/4/2022 | 6 Month | Muqsiet |

Table 2.3 Project in Progress

CHAPTER 3.0

METHOD CONSTRUCTION OF SUPERSTURCTURE WORK

3.1 Introduction to Case Study

The project that was carried out in practical training is project construction of one unit of one storey bungalow at Kampung Palas, Kota Bharu, Kelantan. The total amount of this construction of one storey bungalow is RM370,000. Contact period for this project is around 6 months starting from 30/8/2021 and estimated to finish on around early February 2022.

In this construction project, there are a bunch of activities were done to reach the objective to finish the construction. However, the only activities managed to get record is a few. Such as site cleaning, material delivery, build temporary storage and many more. But the main focus of this report is only the construction of RC ground beam and RC column.

3.2 Method Statement of Superstructure Work

3.2.1 Beam

- 1) Arrange the rods in two layers of an equal numbers, such as two rods above, two rods beneath. There are at least 3-4 worker doing this job to avoid making mistake.



Figure 3.1 Arranging the Rods



Figure 3.2 Rods lay on the Ground

- 2) Build formwork around the steels rods, ensuring that the rods will run through the center of the concrete beam. In this project, 3 worker are doing this action since it is easy to make a mistake if doing it alone.



Figure 3.3 Ground Beam Formwork

- 3) Pour concrete into the formwork, ensuring all the steel is covered. Allow the concrete to cure for a few days. 3 worker working together to pour the concrete to finish it faster.



Figure 3.4 Pouring the Concrete

- 4) Release the formwork after the concrete is complete hard.



Figure 3.5 Complete Ground Beam

3.2.2 Column

- 1) This is the initial stage in constructing a column. The placement of the column is decided practically in the field at this step. It is accomplished by laying rope in accordance with the grips depicted in the figure, and then marking the placement of columns.



Figure 3.6 Setting Out for Column

- 2) Following the marking of the column, the reinforcement of the column is set in accordance with the structural drawing.



Figure 3.7 Reinforced for Column

- 3) The next stage is making column formwork. The floor height is normally kept at 10 feet. This stage usually done by 3-4 worker to avoid making mistake and get a better result since this job quite complicated to do alone.



Figure 3.8 Formwork for Column

- 4) After done making formwork for column, the process of pouring concrete into column was done. This method can be done manually or using machine or pump. But in this site, only manual way was done. 3 worker pouring concrete together to save more time.



Figure 3.9 Pouring the Concrete in Column Formwork

- 5) Release the formwork after the concrete is complete hard.



Figure 3.10 Completed Column

3.3 The Problem and Solution of Constructing Superstructure Work

The most common problem when constructing superstructure work especially when making RC column is crack. However, there are many type of crack that can be recognized. Diagonal cracks, horizontal cracks, splitting crack, and corrosion cracks are the four types of crack that arise in reinforced concrete column. Column cracks can be caused by improper design, shoddy construction, overloading, corrosion of reinforcement, isolated foundation settlement, creep and shrinkage. Cracking in reinforced concrete column is severe issue that can result in a loss of strength, stability and longevity, as well as a negative impact on aesthetics. As a result, different types of cracks that can form in columns must be investigated in order to develop effective ways to prevent them.

Diagonal cracks in reinforced concrete columns form and spread across the column's whole face at any point along its height. Inadequate load carrying capacity of the columns, insufficient cross-section, and inadequate reinforcement steel are the main causes of diagonal fractures in concrete columns. Diagonal cracks can compromise structural integrity, thus they must be addressed carefully. Next, horizontal cracks in reinforced concrete columns are frequently detected at the beam-column junction and on the column face, where tensile stress is high. Due to the effects of shear force, direct load, and uniaxial bending, column with insufficient moment resistance capacity, insufficient reinforcements, or the placement of installed reinforcement are prone to horizontal cracking. Finally, the horizontal cracks significantly lower the column's shear strength, increasing the likelihood of failure. As a result, it must be addressed as quickly as possible.

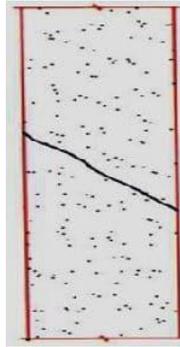


Figure 3.11 Diagonal Crack

(<https://theconstructor.org/concrete/types-cracks-concrete-columns/26433/>)

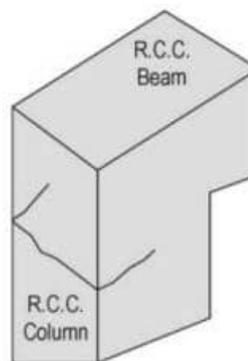


Figure 3.12 Horizontal Crack

(<https://theconstructor.org/concrete/types-cracks-concrete-columns/26433/>)

The axial dead load, axial live load, horizontal load, and associated moments must all be known before commencing to repair a concrete column. Concrete column repairs can be classified into two types. Surface or cosmetic repair only addresses localised damage, whereas structural repair repairs or reinforces the problematic columns. Conventional concrete repair can be used successfully if the deterioration does not significantly lower the cross section. Columns may be repaired by using encasement or enlargement of the column cross section (jacketing), cathodic protection to stop reinforcing steel corrosion, confinement using steel plate, carbon, or glass fiber materials, addition of shear collars to increase the shear capacity of intermediate floors, and addition of a steel plate assembly to increase moment capacity.

3.4 Advantage of Building Your Own House

Building a home entails much more than simply constructing a structure. Building a house entails creating a quiet haven, a place where you can unwind after a long day at work, make memories with your loved ones, and socialise with friends. When you decide to construct your own home, you're embarking on a thrilling journey with your entire family. There will be plenty of ups and downs along the way, but you'll soon realise that starting from scratch is one of the best decisions you'll ever make for your family. That is why your new home must be unique. It must cater to all of your requirements and represent your personal preferences. Here are some reasons why creating a bespoke home is preferable to buying one that has already been constructed:

1. Express Yourself

A bespoke home is a blank canvas waiting for your personal touches. You may create a home that expresses your taste, personality, and style by working with an interior designer and an architect. If you have a huge collection of art, for example, you can invest in specialised lighting and enormous gallery walls. You can build a large deck with a covered area and some comfortable outdoor seating if you like to drink your morning coffee outside. You'll feel more at ease at home if your home reflects your personality. Rather than feeling like you're living in someone else's house, it will feel more like your own.

2. Maximize Functionality

A custom house builder will assist you utilise every inch of useful space rather than working with a pre-existing floor plan and ending up with a semi-functional home. Your home will be tailored to your specific lifestyle and demands, whether you want a custom library wall, a staircase in the centre of the house, separate rooms, or an open floor plan. In addition, Barter

Design suggests laying out the types and styles of furniture you'll want to fill each area with so you can make the most of the space.

3. High-Quality Materials

When purchasing a pre-built home, you have no way of knowing the quality of the construction materials utilised. Custom builders collaborate with reputable vendors who deliver high-quality materials and workmanship. You can trust that only the greatest brands, products, and materials are used when building a custom home. Building a house entails striving for the long-term aim of having a place to call home. You don't want to be compelled to perform costly upgrades on a frequent basis due to damaged materials.

4. Budget Control

Many people feel that constructing a bespoke home is far more expensive than purchasing an existing home. This isn't always the case. When you build a custom house, you get to choose how your new home is built while staying within your price constraints. You have complete control over the cost of everything in your new home, from construction materials to customised extras. Throughout the construction process, your custom house builder will keep your budget in mind.

CHAPTER 4

4.1 Conclusion

The conclusion of this report is about 1 storey bungalow construction that located at Kampung Palas, Kota Bharu, Kelantan for Saiful Aizzat bin Ahmad Taleq however the focus of this report only about superstructure especially reinforced concrete beam and reinforced concrete column. The objective of this report is to identify method construction of superstructure specific to RC beam and RC column. From this report, the procedure and how many worker necessary can be learned. Other than that, this study managed to recognize the problem and solution when constructing reinforced concrete column and reinforced concrete beam. Last but not least, this report also list a lot of advantages of building your own house from the start instead of buying house that already being build. Building your own house is more efficient, cheap, and many more.

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