

B) FRONT COVER



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

**PRACTICAL REPORT TITLE
SUPER STRUCTURE WORK FOR
SEMI-DETACHED FACTORIES
ATI I-PARK SAC, SENAI**

**Prepared by:
MOHAMAD SOLEHIN BIN
SHHRIN
201407966**



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

**PRACTICAL REPORT TITLE
SUPER STRUCTURE WORK FOR SEMI-DETACHED
FACTORIES AT I-PARK SAC, SENAI, JOHOR**

**Prepared by:
MOHAMAD SOLEHIN BIN SHAHRIN
201940766**

**DEPARTMENT OF BUILDING
FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING
UNIVERSITI TEKNOLOGI MARA
(PERAK)**

AUGUST 2021

It is recommended that the report of this practical training provided

By

**Mohamad Solehin Bin Shahrin
2019407966**

entitled

Super Structure Work for Semi-Detached Factories at I-Park SAC JOHOR

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

Report Supervisor : Ts. Muhammad Redza Bin Rosman

Practical Training Coordinator : En. Muhammad Naim Bin Mahyuddin

Programme Coordinator : Dr. Dzulkarnaen Bin Ismail.

**DEPARTMENT OF BUILDING
FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING
UNIVERSITI TEKNOLOGI MARA
(PERAK)**

AUGUST 2021

STUDENT'S DECLARATION

I hereby declare that this report is my own work, except for extract and summaries for which the original references stated herein, prepared during a practical training session that I underwent at AME Construction for duration of 20 weeks starting from 16 August 2021 and ended on 7 January 2021. It is submitted as one of the prerequisite requirements of BGN310 and accepted as a partial fulfillment of the requirements for obtaining the Diploma in Building.

.....

Name : Mohamad Solehin Bin Shahrin

UiTM ID No : 2019407966

Date :

ACKNOWLEDGEMENT

ABSTRACT

Super structure is one of the major components in building, this is an interesting thing to elaborate. Therefore, this report will discuss about super structure work, based on CIS-9_2008, JRK 20800, CIS18_2018, This report was conducted at Semi-Detached factories at I-Park SAC, Senai, Johor. The objective of this report is to investigate how super structure work being managed in construction site and how it will affect the building condition if one of the components is missing. This will focus on how super structure work being done and to illustrate the function of super structure work in building construction that not only being focus on external and internal only and then to evaluate the super structure work that can be fulfill the building criteria that have been prescribed by the requirement of British Standard (BS) and (British Standard European Norm (BS EN). This report will also look at work progression for super structure building and to evaluate at qualities of material use for superstructure work based on British Standard (BS) and Malaysian Standard (MS)

-

CONTENTS	PAGE NO
Acknowledgements	i
Abstract	ii
Contents	iii
List of Tables	iv
List of Figures	v
CHAPTER 1.0 INTRODUCTION	
1.1 Background of Study	2
1.2 Objectives	3
1.3 Scope of Study	6
1.4 Methods of Study	8
CHAPTER 2.0 COMPANY BACKGROUND	
2.1 Introduction of Company	11
2.2 Company Profile	13
2.3 Organization Chart	14
2.4 List of Project	19
2.4.1 Completed Projects	21
2.4.2 Project in Progress	23
CHAPTER 3.0 CASE STUDY (BASED ON TOPIC OF THE REPORT)	
3.1 Introduction to Case Study	25
3.2 Subtopic	28
3.3 Subtopic	40
3.4 Subtopic	45
CHAPTER 4.0 CONCLUSION	
4.1 Conclusion	50

REFERENCES

LIST OF TABLES

Table 1: PROJECT IN PROGRESSJ

LIST OF FIGURES

Figure 1:AME CONSTRUCTIONJ
Figure 2: project signboard at SAC, Senai:..... K
Figure 3 : keyplanJ
Figure 4 : location plan K
Figure 5 : site plan.....L

CHAPTER 1.0

Construction industry in Malaysia has been evolve in the past decades because of foreign investor that want to invest in construction company in Malaysia, such as KAJIMA COPERATION a Japanese construction that have construct many buildings in Malaysia such as IKEA Batu Kawan, PENANG and else. After all, population density and lack of occupation also played a major role in construction industry in Malaysia because of the population density, it attracts government interest to make more factories that can help to serves for higher chance for occupation

Building consists of two major components that are sub-structure and superstructure. A superstructure is an upward extension of an existing structure above baseline, called ground level and usually serves the purpose of the structure intended use. Several building components that are located above ground level such as column, beam, floor, roof, and etc. are called superstructure. Also, another component in building is sub-structure, sub-structure describes as the part of the building that is beneath the ground, the purpose of sub-structure of a building is to transfer the loads of the upper structure to the soil underneath

Super structure contains many components such as beam, column, walls, and etc. Beam is a horizontal element that withstands all vertical loads. All the weight from the vertical loads are supported at the endpoints of the beam and the weight is then transferred to the column or the beam support. Also next is column, column is vertical structure that can hold a lot of weight, it because of column transferred the loads direct to the foundation and if the column is not placed properly it will collapse once additional weight is put on the top of them. Wall are also one of the major components in super structure as most of the wall are made from concrete or masonry and it can hold the weight from the slab, roof, and beam and also it supported the loads coming

Super structure also played a major role in transporting loads such as live load and dead load, for example of dead load is, roof beam, roof structure and for specific example is tank, sprinkler tank, water tank and else. for example, sprinkler tank, sprinkler tank is placed on top of big beam that consists many rebar placed by variety of size such as y25, y20, y12, y10 and else. this beam supports the loads and transfer the loads to column underneath and directly transfer to the ground beam underneath that can hold many loads at one time. another example is live loads, live loads consists many other loads such as people, furniture, equipment and else. live loads is can be expressed as a uniformly distributed load (UDL) or as one acting on concentrated area (point load) it may eventually be factored into the calculation of gravity loads. Outside of Malaysia such as UK and much country around Europe live loads are expressed as kilo Newtons per square while in the Us the unit are pound per square foot

Building construction in Malaysia need to follow QLASSIC system, QLASSIC is a system or method used to measure and asses the quality of construction work based on the construction industry standard (CIS 7:2014). As the superstructure work played a major role in QLASSIC assessment as QLASSIC establish the standard on the quality of workmanship for different construction components of building construction work. the CIS 7:2014 is separated into four principal components. The assessment of workmanship is carried out based on the components as establish under the standard points are awarded if the workmanship compliance to the standard. These points are then summarized, giving a total quality (TQ) score called the QLASSIC Score for the building (CIDB QLASSIC 2006). the assessment will be do by many aspects such as structural work, architecture work etc. for structural work in QLASSIC assessment it is to find the integrity of the building since the cost of any failure and repairs is significant. The assessment comprises of site inspection of formwork, steel reinforcement, prefabricated or pre-cast elements, etc. during construction. The structural work assessment also includes laboratory testing on compressive strength of concrete and tensile strength of steel reinforcement and non-destructive testing of the uniformity and the cover of hardened concrete

For architectural work for QCLASSIC assessment it is mainly deals with finishes, which is where the quality and standard of workmanship are most visible. Architectural works include floor, internal walls, ceilings, door and windows, fixtures and fittings, external works, roof driveways, porches and aprons. The QCLASSIC assessment also include Mechanical and Electrical (M&E) works. the quality of m&e works is important as its increasingly high-cost proportion to the project and impact on the performance of a building. Generally, the assessment addresses electrical work, air-conditioning and mechanical ventilation works (ACMV) fire protection works, sanitary and plumbing works, lifts escalators and other basis M&E fittings. Also, for external works, it covers elements in building construction such as link-ways, shelter, drains and etc. under the Construction Industry Standard (CIS), the weightage for structural, architectural, M&E, and external works are allocated in accordance with four categories of building. The weightage system, which aimed to achieve the objective of the QCLASSIC assessment represent the overall quality of a building

1.1 Background of Study

super structure Is the section of a structure That Is built above grounds level and performs the structure intended **purpose**. Columns, beams slab upwards with all finishes, door and window schedules, flooring, roofing, lintels, and parapets are all included. There are two type to building the super structure such as conventional method and IBS construction method, the type of construction method is depending on client budget, time or contract period, design intent or else. furthermore, this element will decide whether the building will be construct in either conventional method or IBS construction method for super structure. Conventional method contains, for example Reinforce Concrete Column, Reinforce Concrete Beam , Reinforce Concrete Slab, and else. for IBS construction method, this contain components such as Precast Column, Precast Wall , Precast Beam and else. Also for IBS construction method, this contain components such as steel column, for steel column there are many type of steel column and steel beam that going to be use to construct the building such as Universal Beam that also called I-Beam or H-beam, Angle Beam , Bearing Piles , C Shaped beam, Hollow steel section units, T-shape column, Square or Rectangular column, L-shape column and else. The method that will be used to construct the building will be determine by the client budget, time frame and design intent. It is because , for example production area in factories , if the client intent to have a full access to the entire production area, the super structure design will be using full steel structure beam , column , roof and else or using reinforce concrete column , beam, truss and else, but it will be utilize the use of larger rebar size as large rebar size will help to transfer the loads

1.2 Objectives

To investigate how super-structure work is being done in construction site, it is different for other components such as walls, beam, column, pre-fabricated wall, steel reinforcement. All of this element is completely different from one another. Also, the objective of this report is to investigate the cost and time for super structure work to be fully finished from above the ground level to the roof. It is also to determine the problem that can occurred while building the super-structure and how the solution can be taken to the solve the problem

1.3 Scope of Study

This study is being carried out on ‘ *JENIS Y3 (PLOT36) DI ATAS PTD 112800 , ASALNYA SEBAHAGIAN PTD 10464, TAMAN PERINDUSTRIAN IPARK SAC, MUKIM TEBRAU DAERAH JOHOR BAHRU , JOHOR DARUL TAKZIM*’. This study is to find and Analyze the method use to build the superstructure for Semi-Detached Factories including the material and machineries that going to be use for superstructure work. This study will include the quantity of labor and mischievous activities that are going to be carried out that are not in the specific procedure that usually being written

1.4 Methods of Study

There are many typical data collection for This super structure work such as observation, interview, document review and many else. One of That Is observation, by observing the super-structure work almost 5 month and involving in the super structure work. To learn more about super structure the best way is to observed how super structure work is, it is because by observing it can get to know the pros and cons while on site rather than just learning it theoretically. Either than observation, the data collection of this report can be got by arrange an interview, either the structured interview or unstructured interview, by using interview, it can get every little thing that can be overlooked at. Additionally, by using interview, it can get much more knowledge based on the connoisseur of super structure work, such as project engineer, QA/QC engineer, steel structure engineer, land surveyor, quantity surveyor and project managers. Other than that, by arranging the interview, it can get more knowledge based on other designation people perspective and experience that the people had faced one. Additionally, other than observation and interview, the data collection process also can be got by, document reviewing. by reviewing the documents such as architect drawing, structure drawing, steel structure drawing, bondek drawing and else. It is a major very helpful process of data collection as this process will help to understanding how the super structure work will be done before observing and interviewing process

CHAPTER 2.0

COMPANY BACKGROUND

2.1 Introduction of Company



Figure 1: AME CONSTRUCTION

AME Construction is a construction companies that provide high quality construction services to a wide range of clients, AME Construction specialize in the construction of purpose-built building mainly on factory and warehouse building. AME Construction was establish in 1995 and have been in construction industry for almost 26 years and been hold tight and also been high demand on construction market. AME Construction work with clients carefully and throughly understand their business objective, and work in locations and industries where clients need it to be. AME Construction position itself to serve clients' customized needs effectively.

2.2 Company Profile

Company : AME CONSTRUCTION SDN.BHD

**REGISTRATION :278191-X
NUMBER**

COMPANY

**ADDRESS : No 2 , Jalan I-Park SAC 1/1 Taman Perindustrian
I-Park SAC , 81400 Senai, Johor**

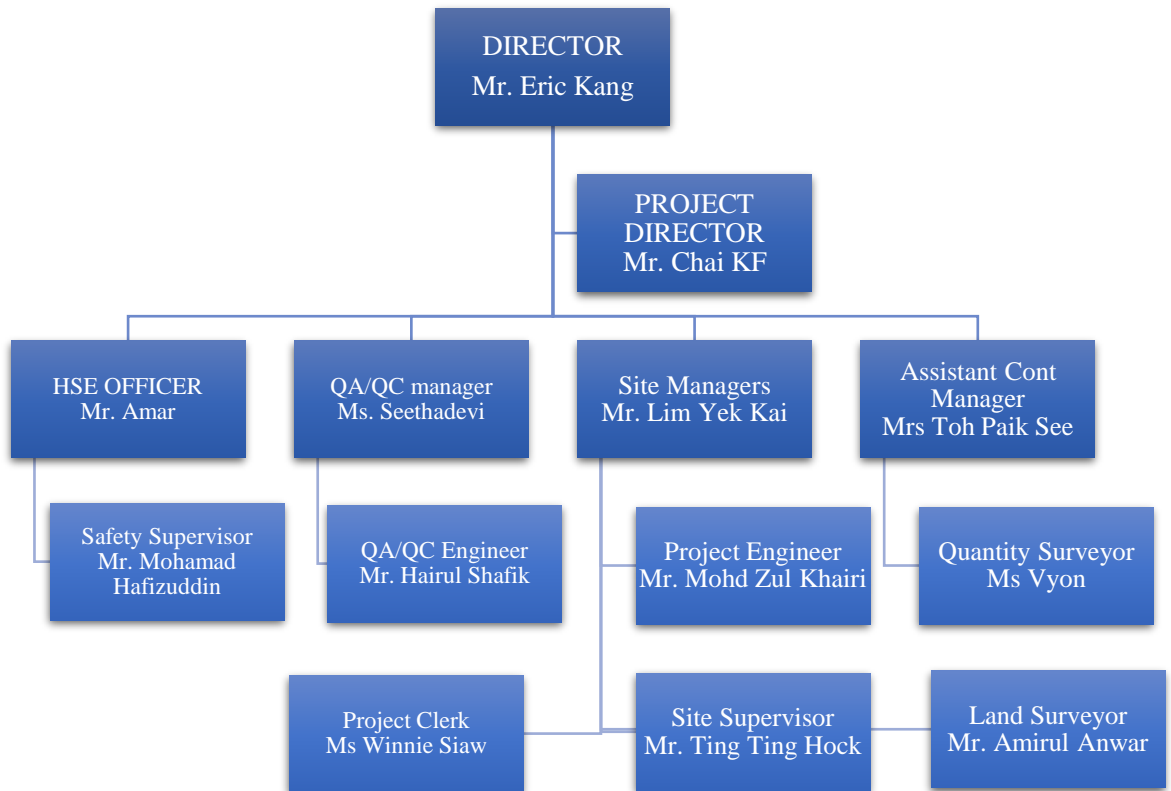
EMAIL : info@ameconstruction.com.my

PHONE NUMBER :07-5959 666

FAX NUMBER :07-5959 668

GRADE CIDB : G7

2.3 Company Organisation Chart



This are the part of company organizational chart, this is site organizational chart for “JENIS Y3 (PLOT 36) DI ATAS PTD 11280, ASALNYA SEBAHAGIAN PTD 10464,TAMAN PERINDUSTRIAN IPARK SAC, MUKIM TEBRAU, DAERAH JOHOR BAHRU, JOHOR DARUL TAKZIM”, this are the important people that handle and managing the project for this plot, building a Semi-Detached Factories for fitson Sdn.Bhd.

2.4 List of Projects

2.4.1 Completed Projects

NO-	Project Title	Project Value	Start Date	Completion Date	Project Duration	Client
1.	Logistic Warehouse	2,000,000.		2019	24 Month	
2.	Stainless Steel Manufacturer	10,000,000		2012		Acerinox Group
3	IBS Manufacturer	20,000,000		2010		AME Engineering SDN BHD
4	Aerospace Manufacturer	100,000,000		2019		
5	Detergent And Personal Care Manufacturer	980,000		2011		LION

Table 1: PROJECT IN PROGRESS

2.4.2 Project in Progress

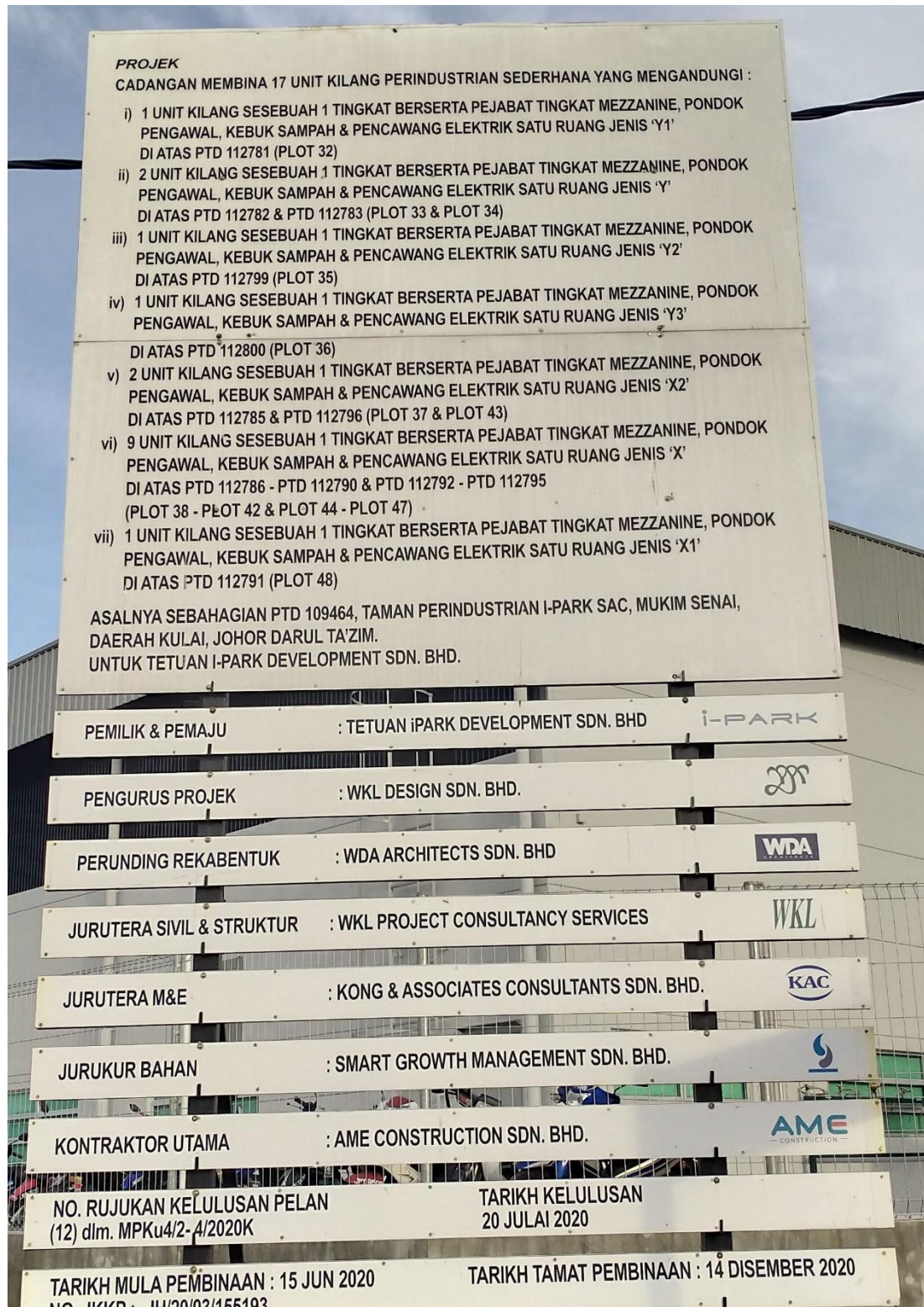


Figure 2: project signboard at SAC, Senai:

CHAPTER 3.0

CASE STUDY (BASED ON TOPIC OF THE REPORT)

3.1 Introduction to Case Study

The project that I able to supervise, observe and learn how super structure work is being done is at” **JENIS Y3 (PLOT 36) DI ATAS PTD 11280, ASALNYA SEBAHAGIAN PTD 10464,TAMAN PERINDUSTRIAN IPARK SAC, MUKIM TEBRAU, DAERAH JOHOR BAHRU, JOHOR DARUL TAKZIM**”, the building is for Fitson Sdn Bhd. This type of factories is semi steel structure as the interior for office area is using reinforcement column, reinforcement beam , reinforcement roof beam and else and mostly used steel structure erection such as steel column, bondek slab and else. other than that, the project value is 1.5 million and the completion is going to be estimated around mid-February 2022.. this plot expansive is $15,128.95 m^2$ or 3.738 acres for land area and it is grand total of this building is $11,071.84 m^2$ including production area that are $9162.39 m^2$, $1893.71m^2$ for mezzanine floor office and it also including $15.74m^2$ for Auxiliary building such as guard house and refuse room. The surrounding area of this plot is, it is situated at SAC area and on corner plot beside Hershey factories and near SDE highways. This plot also contains mostly steel structure work instead of conventional method of construction such as steel column, bondek, pre-cast wall, and else.

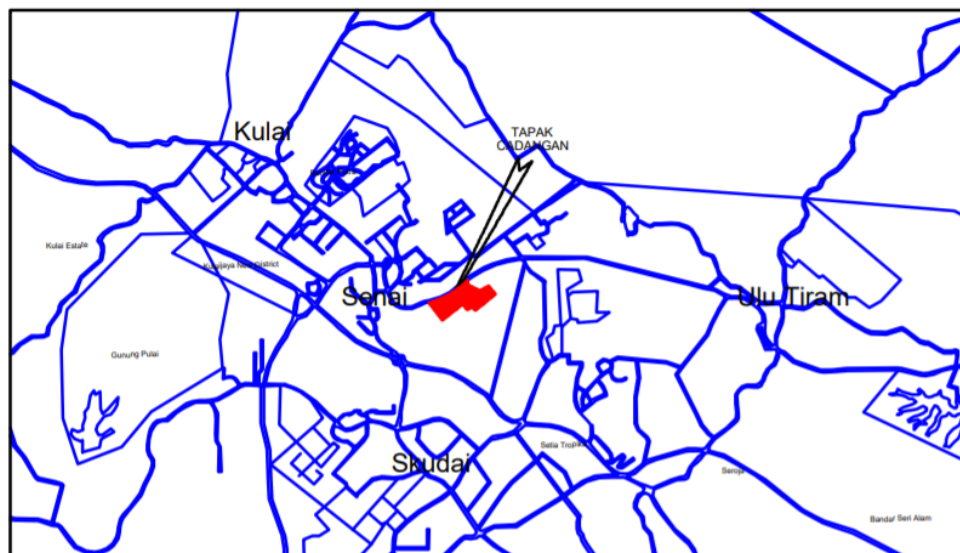


Figure 3 : keyplan

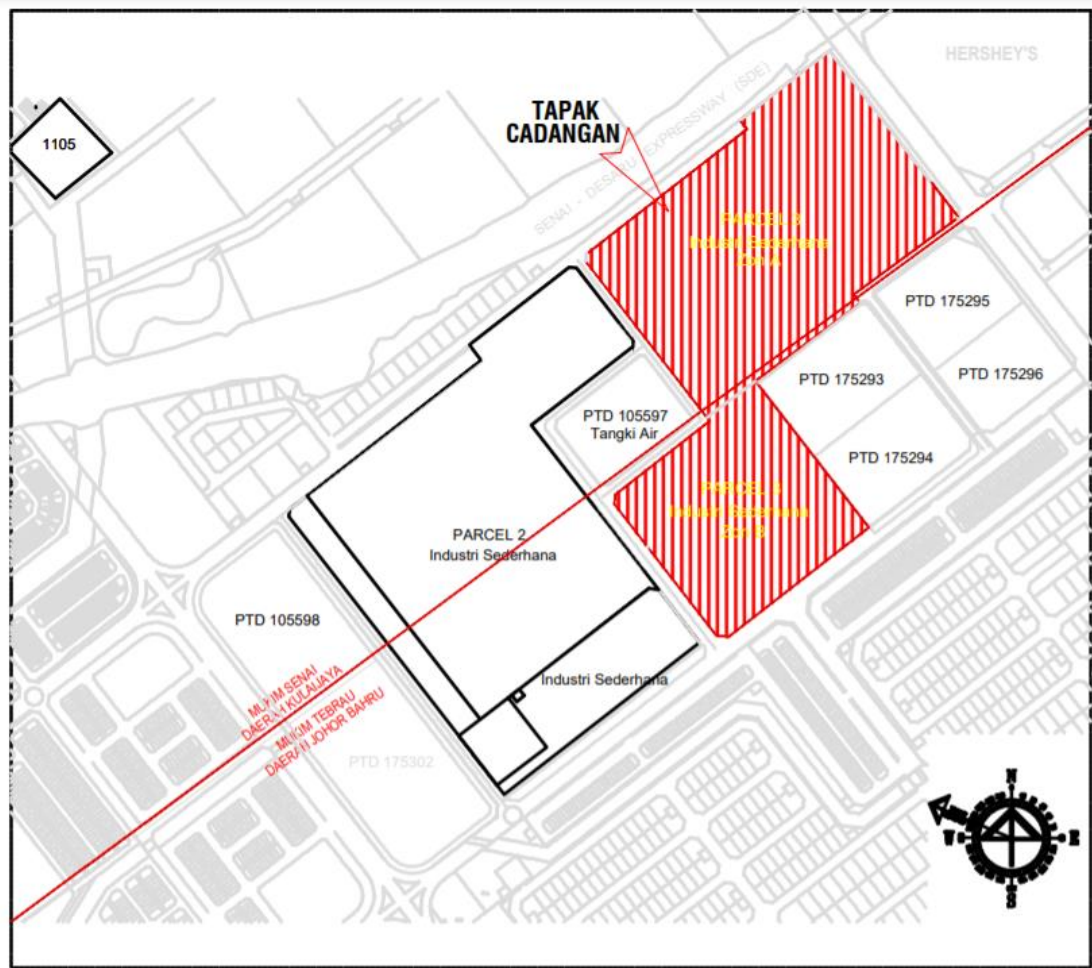


Figure 4 : location plan

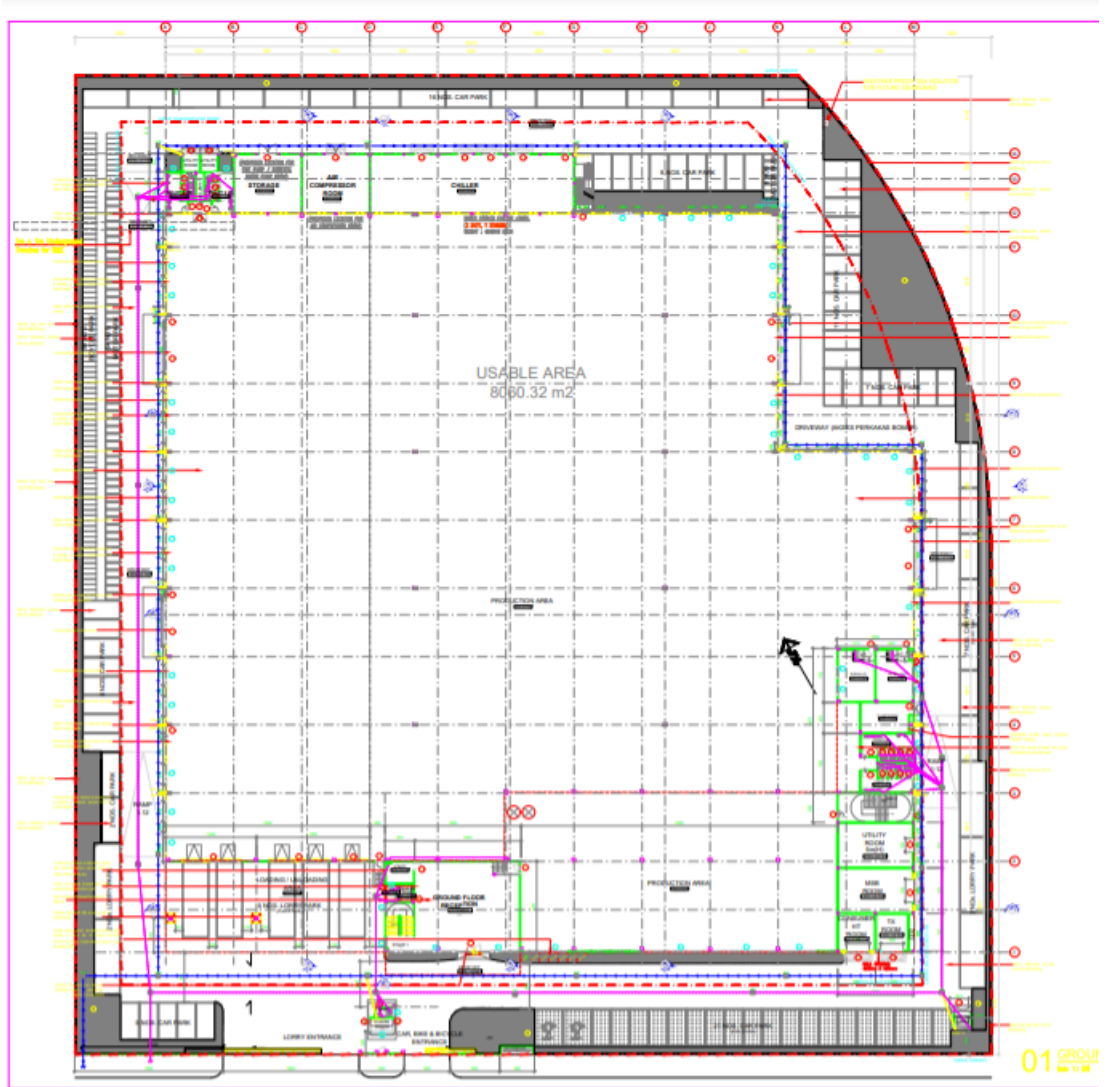


Figure 5 : site plan

3.2 Subtopic (Based on objective 1)

Based on objective that are to investigate how super structure work is being done in construction site, it can say that the Standard Operation Procedure of building a super structure can say almost the same for all building that being build. it is because the step of building a super structure is always start after constructing ground beam , and then being followed by erecting a column either steel column or Reinforce concrete column (RC Column), after building column then being followed by constructing a mezzanine slab and beam, then also being followed by mezzanine column and lastly roof beam. This are the Standard Operation Procedure for building super structure.

This will get different at this point as this plot that I being able to observe as this company workflow is bit different compared to SOP of building super structure. Although it may be the same but different work schedule This plot started constructed super structure after finishing ground beam and that's normal, this plot continues by erecting steel column and being followed by installing roof steel structure, as this plot priorities the steel structure installation first and continue with a reinforce concrete material as this plot almost 70% of the structure is using steel structure either column, roof , and else

Either way, this factory also used precast wall about almost 80% of the wall instead of using the brick walls. This factory also included the curtain wall on the mezzanine floor at office area. After have installation of the steel structure column and roof, this plot also proceeds to installation of the roof truss, it because the roof truss will help to hold down the components either steel structure column or reinforce concrete column . After the installation of the roof truss, purlin, and bracing, then being proceed to installation of the glass wool insulation

Glass wool insulation is a component that absorbed sound from the roof such as raindrop as this will make the inside factories is not much noisy, also the type of glass wool insulation that are being use is different density from production area and office area as for the production area the density is $16\text{kg}/\text{m}^3$ and for office area is density is $32\text{kg}/\text{m}^3$ as the different of the density played a major role in sound insulation as for the office area this may need to be a more quiet compared to production area.

3.3 Subtopic (Based on objective 2)

Next is based on second objective that are about to investigate the cost and time for super structure work to be fully finished from above the ground level to the roof, as it can see, the project costing may be different depending the method of construction that will be use in the project. But for the plot that I be able to observe, the estimated project value is around 1.5 million and estimated to finished and ready to hand over to client around mid-February. The building is estimated to completed within 6 month and without the intervention of variation order, (VO), Variation Order is an amendment of the original scope of work , that originally not have in contract, still, the building will be construct in time frame of 6 month if there are no Variation Order and Extensive of Time (EOT). Furthermore, the costing of building may vary on the middle of the projects, such as the use of bigger crane for installing the roof, the use of extra loads of material, the use of scaffolding material needed extra and else.

3.3 Subtopic (Based on objective 3)

The next objective is to determine common problem that can happen while building a super structure , first of all the problem that can happen is the lack use of rebar in reinforce concrete column for example, this may seems a small matter but if anything happen he client may charge NCR to the main contractor as this problem can effect a major disaster, such as the load transferring may have some void to the structure. Also if any company that faced NCR it will be very bad as the NCR is a nonconformance report that addresses specification deviation or work that fail to meet quality standard, the report is used for the quality control process, in which details that state the problem how it happen and how to prevent it from again in the future. Other than that the common problem that can happen while building a super structure is for example for my plot there are wrong level of roof beam , the roof beam supposedly is 4 meter from the slab soffit to the bottom of the roof , but the scaffolding worker mistaken it for doing 4 meter from slab soffit to the upper beam, this may have seems minor problem but the cost of curing the concreted beam is almost RM40-50k all of it . it because the curing company, sinma genko charge the main con for 1 curing brick is almost RM300 per piece and the total of the curing brick almost reach 30 piece and maybe more. This problem happen because of lack off alertness of the people who work there don't want to double check, this may have seems minor problem but can make lose of thousand ringgit Malaysia

CHAPTER 4.0

CONCLUSION

Super structure work is one of the components to build a building as the major components that transfer the load from slab, beam, column, ground beam and pile caps. There are many ways to construct a super structure for a building for example using a conventional method or using a prefabricated element such as precast wall, precast beam, column steel structure, steel beam, steel roof beam and else. The process to build using conventional method may take time but for the cost to build the super structure using conventional method it have the personal advantages such as low in cost but also there are cons for the method conventional such as may take some times, maybe late to construct as conventional method use rebar, the rebar needed to fabricate . it is another case for prefabricated method as prefabricated method may have cons such as a higher cost but in term of pros, the prefabricated method can help to save much time, as the components is plug and play for example. The prefabricated method is easy but it may need a specialise in that area for the installation process but for all reason prefabricated method is the best as the method can save much much time compared to the conventional method

Lastly the use of method in building a super structure played a major role in construct a super structure, in all the reason the method too construct a building depend on the client.

REFERENCES

Super structure. (2021). Wikipedia. Retrieved November 2, 2021, from available :

[https://en.wikipedia.org/wiki/Superstructure#:~:text=A%20superstructure%20is%20an%20upward,terms%20of%20theory%20of%20machines\).](https://en.wikipedia.org/wiki/Superstructure#:~:text=A%20superstructure%20is%20an%20upward,terms%20of%20theory%20of%20machines).)

Super Structure Works. (2021). Nam Aik. Retrieved December 20, 2021, from

[http://www.namaik.com/super-structure-](http://www.namaik.com/super-structure-works/#:%7E:text=Superstructure%20means%20by%20structure%20works,as%20columns%2C%20beams%20and%20slabs.)

[works/#:%7E:text=Superstructure%20means%20by%20structure%20works,as%20columns%2C%20beams%20and%20slabs.](http://www.namaik.com/super-structure-works/#:%7E:text=Superstructure%20means%20by%20structure%20works,as%20columns%2C%20beams%20and%20slabs.)

ATAD STEEL STRUCTURE CORPORATION. (2020, November 17). *Steel*

Structure Introduction. Retrieved December 19, 2021, from

<https://atad.vn/steel-structure-introduction/>