**DEPARTMENT OF BUILDING**

**UNIVERSITI TEKNOLOGI MARA**

**(PERAK)**

# CONSTRUCTION AND COMPELETION OF PEDESTRIAN BRIDGE


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**UiTM ID NO**

**2019283946**

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# CONSTRUCTION AND COMPELETION OF PEDESTRIAN BRIDGE AT PERSIARAN SARJANA, JALAN PANCHOR, BANDAR UNIVERSITI PAGOH

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**FEBRUARY 2022**

**By**

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**2019283946**

# PROPOSED CONSTRUCTION AND COMPLETION OF PEDESTRIAN BRIDGE AT PERSIARAN SARJANA, JALAN PANCHOR, BANDAR UNIVERSITI PAGOH

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

| | | |
|---|---|---|
| Report Supervisor | : | _____<br>Mr. Ezzat Fahmi Bin Ahmad |
| Practical Training Coordinator | : | _____<br>Dr. Nor Asma Hafizah Binti Hadzaman |
| Programme Coordinator | : | _____<br>Dr. Dzulkarnaen Bin Ismail. |

**DEPARTMENT OF BUILDING**

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**(PERAK)**

**FEBRUARY 2022**

## 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 Manzeal Enterprise Sdn Bhd for duration of 20 weeks starting from 23 August 2021 and ended on 7 January 2022. 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 : LUQMANULHAQIM BIN MOHD YUSRI

UiTM ID No : 2019283946

Date : 10 January 2022

## ACKNOWLEDGEMENT

I would like to express my thanks for the guidance, advice and helped throughout the period of my practical training by the following group of amazing individuals. First, I would like to thank Mr. Mohd Roziat for the opportunity given, to allow me having a practical training in his company. His team of professionals comprising of Mrs. Nurul Huda, Mr. Faiz, Ms. Nik Umi, Ms. Sufiah, Mr. Faiz Haikal, Mr. Shahril, Mr. Fitri, Mr. Nazeri, Mr. Mohd Noor, Mr. Azlan and Ms. Najihah, have enabled me to learn and develop my understanding, knowledge and feel of real time projects, and the theory involved in analysis of structures and civil works. They are also responsible towards streamlining and assessing my training. Also, to the site personnel in both Manzeal Enterprise Sdn Bhd and Sime Darby, which is our client, who have extended their cooperation and help to further enhance my ability in understanding the procedures in construction and site administration, tests procedures, site safety and best practices in the industry. It is an honor for me to be given the opportunity to involve with all of you.

I would also like to thank all the UiTM lecturers that have taught me in becoming a better student and person. I would also like to extend my deepest appreciation to the lecturers who are directly involved during my training stint. To Mr. Ezzat Fahmi, Supervising Lecturer, Dr. Nor Asma Hafizah Binti Hadzaman, Valuation Lecturer, Encik Muhammad Naim Mahyuddin, Practical Training Coordinator and Dr. Dzulkarnaean Bin Ismail, Programme Coordinator, I value the time, effort, encouragement, and ideas that they have contributed towards the successful completion of my training, this report and the valuable knowledge that have been shared over the last few semesters.

Last but not least, my special thanks to my beloved parents for their sacrifices over the years. Thank you so much.

## ABSTRACT

Pedestrian bridge is a bridge that is only for pedestrians. While the most common definition of a bridge is a structure that connects two points at a height above the ground. Pedestrian bridges are built in a variety of constructions and materials to enable the safe passage of pedestrians. There are bridge or passage designed to enable vehicles and pedestrians, bicycles and trains, as well as bridges that are solely utilised by pedestrians. The purpose of this report is to deepen the understanding of construction for pedestrian bridge at Persiaran Sarjana, Bandar Universiti Pagoh. The objectives for understanding pedestrian bridge structure are to identify the work process of pedestrian bridge construction including the material and tools are used for this project. Also, to identify the common problem including their solution. Observing and interviewed several professional roles for information in pedestrian bridge, including document and drawing review based on theory.

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# CHAPTER 1

# 1.0 INTRODUCTION

## 1.1 Background of Study

Walking is considered the most basic and simple mode of transportation, and a pedestrian is defined as someone who walks rather than riding in or on a motor vehicle or other vehicle. Unlike other road users, pedestrians, also known as Vulnerable Road Users (VRU), are not associated with any vehicle mode. (Aqbal, 2010). The pedestrian bridge is defined as a structure that supplements the road and helps to provide interrupted traffic at both ends of the route owing to obstructions such as rivers, channels, canals, straits, valleys, and crossing highways and railroads. (Yohannes Firza and Yulia Rahmawati, 2021).

There are many types of pedestrian bridge which is truss bridge, girder (beam) bridge, arch bridge, and long span bridge. Truss bridge is a bridge whose load-bearing structures are made up of a sequence of wooden or metal triangles known as trusses. Girder (beam) bridge is a construction term that refers to a horizontal beam that can be formed of a range of materials such as stainless steel, concrete, or a mix of these materials. A girder bridge is a simple, typical style of bridge in which the bridge deck is built on top of these supporting beams. Arch bridge is made of corrugated steel or precast concrete plates that are supported by cast-in-place foundations, and therefore require excellent quality backfill surrounding the structure. Lastly, long span bridge is a suspension or cable-stayed forms, which consist of vertical pylons and networks of cables supporting a bridge deck, have typically been used for long-span bridges. The optimality of such structures across extremely long spans, on the other hand, appears to have never been thoroughly studied, and the theoretically optimal form for a given span carrying gravity loads remains unknown.

Pedestrian bridge is one of the infrastructure projects, such as walkways and so forth. (Sarah,2017) which can be classified in two forms such as in-situ concrete and precast concrete. Pedestrian bridge is a passage for pedestrian that connecting two place and to across road, river, or any obstacle. Therefore, the purpose of this study is to explain further regarding pedestrian bridge at Jalan Panchor, Bandar Universiti Pagoh.

## 1.2 Objectives

1. To identify the method of construction for the pedestrian bridge.
2. To investigate the problems that occurred during the construction of the pedestrian bridge.

## 1.3 Case of Study

The case study of this report was Construction and Completion of Pedestrian Bridge located at Persiaran Sarjana, Jalan Panchor, Bandar Universiti Pagoh. Currently this project has been 25% of progress. The start date is in September 2021 and the value of this project is RM 1.713,000.00 and the date of completion is March 2022. The owner of this project is Pagoh Higher Education Hub, which is the clients of Sime Darby Property Selatan Sdn Bhd. The main contractor is Manzeal Enterprise Sdn Bhd.

The scope of works comprises the Construction and Completion of Pedestrian Bridge at Persiaran Sarjana, Jalan Panchor, Bandar Universiti Pagoh are General Conditions and Preliminaries, Site Clearance and Demolition Works, Landscaping Works, Roadworks, Piling Works, Pedestrian Works, Traffic Management Plan, Environment Protection Works, Electrical and Associated Works, and Provisional Sum.

### 2.4.1 Method of Study

1. Document Review

   Several documents, including the tender document, construction drawings, progress report, and standard operating procedure, have been evaluated. Aside from that, the firm profile was examined in order to gather data for this case study.

2. Observation

   Observation was undertaken at the site located at Persiaran Sarjana, Bandar Universiti Pagoh to obtain information regarding the construction process of the pedestrian bridge. Therefore, several methods applied during conducting the observation by taking several pictures.

3. Interview

   An unstructured interview was performed with numerous interviewees, including the project's Site Coordinator and laborer. The interview questions revolved around the construction of pedestrian bridges. The aim of conducting interviews with chosen respondents is to have a better understanding of the research while it is being observed. A face-to-face interview lasts around 20 to 30 minutes every session. As a result, the interview data was gathered via recording the talk on a smartphone. Simultaneously, written brief notes were used to acquire detailed information on the study.

# CHAPTER 2

# 2.0 COMPANY BACKGROUND

## 2.1 Introduction of Company

Manzeal Enterprise Sdn Bhd began operations in early 2007 and was registered with the Registrar of Companies (ROC) on March 27, 2009. Mohd Roziat Bin Ali and Nurul Huda Binti Hamim are the directors of the Private Limited Company. The organization is established and managed by a group of specialists with vast expertise in civil engineering and construction.

The firm began by accepting minor refurbishment jobs from private owners and private companies, especially in Klang Valley. As a result of the company's experience and competence in the construction industry, it is currently capable of doing the following works and services. ;-

1. Design, Build and Construction of Bungalow
2. Design, Build and Construction of Commercial Buildings
3. Renovation works for Residential and Offices
4. Landscaping works and Infrastructure

Mohd Roziat Ali, who has extensive building experience, is in charge of the firm. He handles the project to ensure that our clients are satisfied. Extensive experience managing projects of varying sizes and complexity. Manzeal Enterprise combines the expertise and full assistance of experienced and trusted technical team members including a Quantity Surveyor, Architect, Civil and M&E Engineer. Manzeal Enterprise guarantees that it will always provide high job performance, full commitment, and dedication to meeting the needs of its clients.

## 2.1 Company Profile

The managing director of Manzeal Enterprise Sdn Bhd is Mr. Mohd Roziat Ali. He was appointed as a Managing Director in 2009, graduated with MSc in Project Management. He has 19-year work experience in Civil and Building Construction. The company also experienced in managing a variety of big projects such as Wetlands and Phase 1A Lake Use and Foreshore Activities for Perbadanan Putrajaya (20 million).

Next is Mrs. Nurul Huda Binti Hamim is a HR & Finance Director of Manzeal Enterprise Sdn Bhd. She is appointed as HR & Finance Manager in 2009, graduated with Diploma in Quantity Surveying. She has 16-year experience in HR and Finance for variety project such as Construction Of 1228 Beds Pysiciatric Hospital Permai, Tampoi, Johor Bharu, Johor (Building and Infrastructure Works) (RM614 Million).

Furthermore, there is a professional and qualified employee that has been with MESB for many years in order to build a fantastic firm. Muhammad Faiz bin Jamaluddin, the Project Manager, has 7 years of professional experience in civil construction. He completed his BSc Architecture degree from UiTM Shah Alam (2014). Expertise in a wide range of architecture software and design. Next is MESB's Accountant, Nik Umi Rahyu, who has been in accounting for over 17 years and has also worked outside of Malaysia, in Norway. Furthermore, the Project Coordinator, Mohd Faiz Haikal, Mohd Fitri, Mahathir, Mohd Azlan, Mohd Noor and Nazeri, all of whom have a Bsc in Construction Management, support the Project Manager on a range of projects. Also, Assistant Project Coordinator is Nur Najihah.

Last but not least, the Admin and Finance Assistant, Siti Sufiah, who is experienced in Manzeal Enterprise Sdn Bhd for 2 years, graduated with Bsc Administrative Business. These experienced employees are the key of success of MESB. As well as the Board of Director which has almost 20 years' experience in civil and building construction.

| | |
|---|---|
| **Name of Company** | Manzeal Enterprise Sdn Bhd |
| **Business Registration Certificate No.** | 770416-K (200701012411) |
| **Registration Address** | No. 27B, Jalan Alfa F U6/F, Pusat Perdagangan Subang Permai, 40150 Shah Alam, Selangor Darul Ehsan. |
| **Telephone** | 03-7831 5148 |
| **Email** | iinfo@manzealgroup.com |
| **Date of Incorporation** | 27th March 2009 |
| **Type of Organization** | Private Limited Co. |
| **Directorship & Shareholders** | Mohd Roziat Bin Ali<br>Nurul Huda Binti Hamim |
| **Nature of Business** | Building & Civil Engineering |
| **Principal Banker** | AMBANK ISLAMIC BERHAD<br>Bank Account No: 074-202-2004978 |
| **Capital** | Authorized: RM 1,000,000.00<br>Paid Up: RM 750,000.00 |
| **Registered** | CIBD G7 CONTRACTOR<br>Kementerian Kewangan |

*Table 2.1 Company Profile*

## 2.3 Company Organization Chart

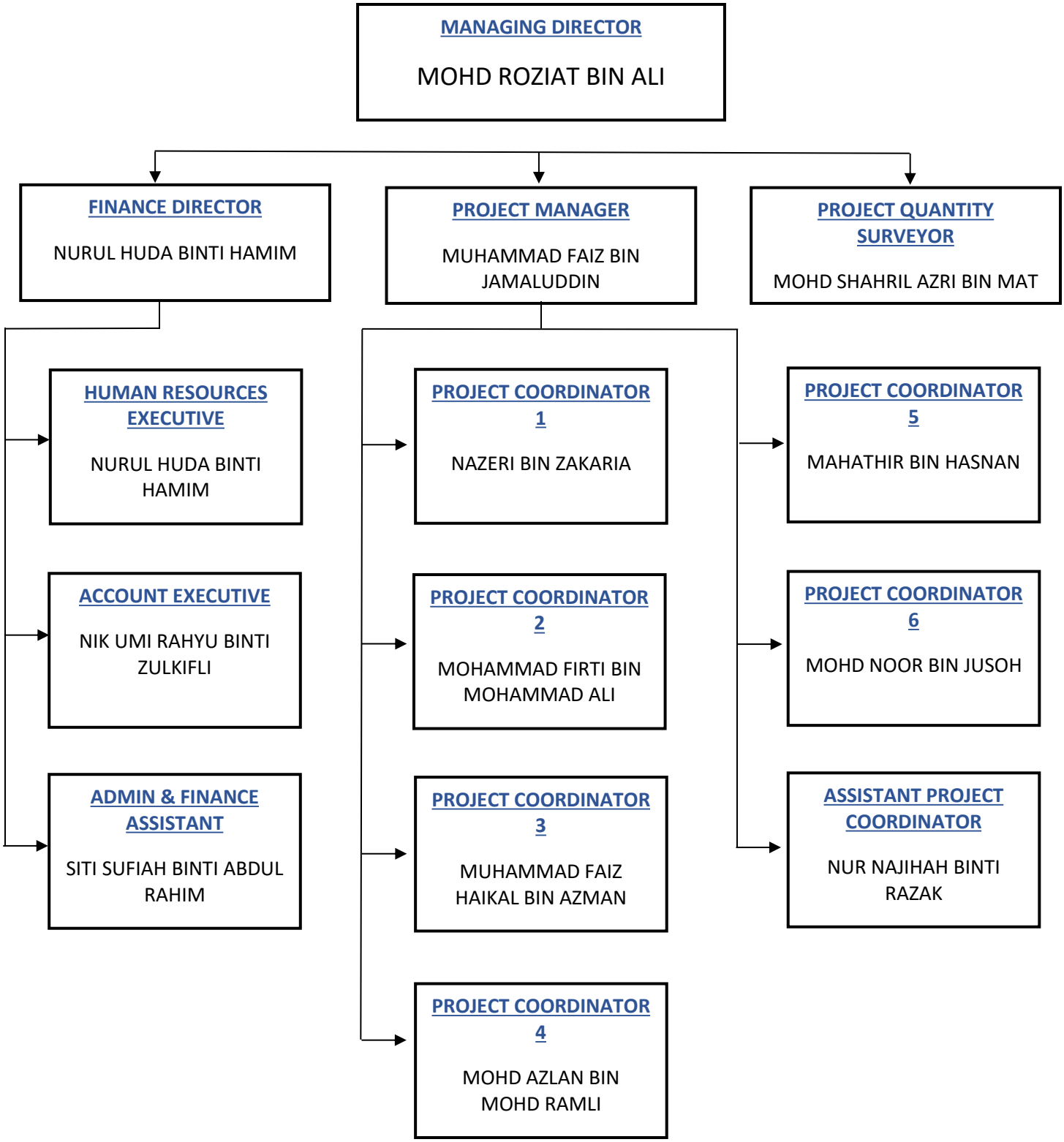



*Table 2.2 Company Organization Chart*

## 2.4 List of Projects

### 2.4.1 Completed Projects

| No | Project Title | Project Value | Start Date | Date Completion | Project Duration | Client |
|---|---|---|---|---|---|---|
| **1** | Proposed infrastructure works for the development of Phase 3C, Lot 74079, Pulau Indah Industrial Park, Mukim Klang, Daerah Klang, Selangor Darul Ehsan | RM 15,600,000 | September 2017 | March 2020 | 2 years | Central Spectrum(M) Sdn Bhd |
| **2** | Kerja-kerja mengecat dinding luar Hospital Gleneagles Kuala Lumpur | RM 374,000 | June 2019 | August 2019 | 2 months | Hospital Gleneagles Kuala Lumpur |
| **3** | Cadangan merekabentuk, membına dan menyıapkan 8 buah reban ayam moden ystem tertutup dan ınfrastruktur dı jengka 11 dan Kuala Atok, Raub, Pahang | RM 9,797,534 | December 2017 | January 2018 | 1 month | Windflex Marketing Sdn.Bhd/ QSR Brands Berhad |
| **4** | Project Mass Rapid (SSP) Package V202: Construction and Completion of Viaduct Guideway and Other Associated Works from Persiaran Dagang to Jinjang: Supply and Install Handrail | RM 720,000 | December 2019 | August 2020 | 8 months | Mass Rapid Transit Corporation Sdn Bhd & MMC Gamuda KVMRT Sdn Bhd |

*Table 2.3 Completed Projects*

### 2.4.2 Projects in Progress

| No | Project Title | Project Value | Start Date | Date Completion | Project Duration | Client |
|---|---|---|---|---|---|---|
| **1** | Project Mass Rapid Transit Laluan 2: (SSP) Package V202: Construction and Completion of Viaduct Guideway and Other Associated Works Covered Walkway and Layby for Stations | RM 3,019,272.25 | March 2020 | December 2021 | 10 months | Mass Rapid Transit Corporation Sdn Bhd & MMC Gamuda KVMRT (PDP SSP) Sdn Bhd |
| **2** | Project Mass Rapid Transit Laluan 2: (SSP) Package V202: Construction and Completion of Viaduct Guideway and Other Associated Works Supply and Install Broom Finish Slab | RM 460,852.00 | June 2020 | December 2021 | 7 months | Mass Rapid Transit Corporation Sdn Bhd & MMC Gamuda KVMRT (PDP SSP) Sdn Bhd |
| **3** | Construction PNB Merdeka Ventures Sdn Bhd (PNB118)<br>i) Supply And Install for Architectural Works at Gallowa | RM 322,932.00<br>RM1,685,285.45 | July 2020 | N/A | | Ahmad Zaki Sdn Bhd |

| | | | | | | |
|---|---|---|---|---|---|---|
| | y Pedestrian Bridge and Fan Rooms<br>ii) Supply And Install Reinforced Concrete, Steel & Architectural Works for Walkway Shelter | | | | | |
| **4** | Proposed Construction and Completion of 2 Blocks of Office Buildings, Retail Spaces and External Works on Plots Z1 and Z2, 3 Levels of Basement Parking and Access Road on Plots Z1, Z2, Z3 and Z4. | RM 725,000.00 | | | | Ahmad Zaki Sdn Bhd |
| **5** | Proposed Construction and Completion of Pedestrian Bridge at Persiaran Sarjana, Jalan Panchor, Bandar Universiti Pagoh | RM 1,717,000.00 | September 2021 | March 2022 | 7 months | Sime Darby Property Selatan Sdn Bhd |

*Table 2.4 Projects in Progress*

# CHAPTER 3

# 3.0 CASE STUDY

## 3.1 Introduction of Case Study

This case study focused on construction and completion of pedestrian bridge at Persiaran Sarjana, Jalan Panchor, Bandar Universiti, Pagoh. The value of the projects are RM 1,717,000.00 and the date of completion on March 2022. The owner of this project is Pagoh Higher Education Hub, which is the clients to Sime Darby Property Selatan Sdn Bhd. The main contractor is Manzeal Enterprise Sdn Bhd.

This case study included the installation of foundations and structures for a pedestrian bridge that will connect the Students Hostel to the UTHM, Pagoh Studies Center. The scope of work includes the construction of piers, the launch of a prefabricated bridge, the installation of a precast staircase, and the metal work of roof supporting columns and roof covering at Persiaran Sarjana, Jalan Panchor, Bandar Universiti Pagoh.

The project's construction staging will include activities on the sites of Persiaran Sarjana, Jalan Panchor, and Bandar Universiti Pagoh, where all in-situ work such as foundation and micro pile construction, brick wall, and ceiling work will run every day pending Client or Main Contractor approvals, and loading and lifting work will take place during night possessions. Prefabrication of the bridge, precast staircase, and other associated components will take place off-site in tandem with the site building operations. The project will reach the conclusion with the construction of a pedestrian bridge over Jalan Panchor, which will take place at night with traffic diverted by traffic management,

and will be followed by the installation of metal works, such as roof supporting columns, roof coverings, and finishing works for brick walls, ceilings, and floors finishes.

### 3.2 Method of construction for the Pedestrian Bridge.

The project requires the installation of three major bridge columns and foundations, as well as the launch of a prefabricated pedestrian bridge with a 40-meter span. The bridge construction would have been prefabricated off-site, transported in short lengths, and preassembled on a launching platform built on the same alignment as the bridge on the North and South approaches.

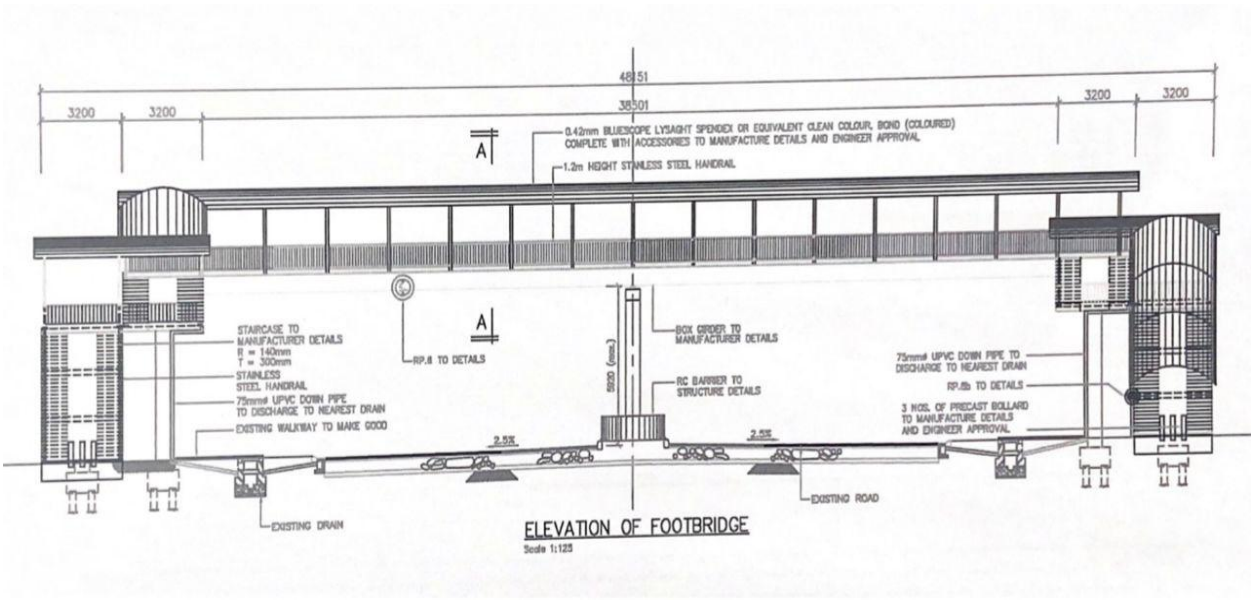



*Figure 3.1 Pedestrian Bridge*

The procedure will be divided into four stages in order to effectively manage the building of the Pedestrian Bridge at Persiaran Sarjana, Jalan Panchor, Bandar Universiti Pagoh:

Stage 1: Work before the Prefabricated bridge launching process

Stage 2: Launching Prefabricated Bridge and Precast Concrete Staircase

Stage 3: Work after Prefabricated Bridge Erection.

Stage 4: Installation of Roof Supporting Column and Roof Covering.

Stage 1: Work before the Prefabricated bridge launching process

Site clearing and preparations, as well as the building of bridge foundations, micro piles, and bridge supporting columns (Piers) from Panchor's direction to Pagoh access, are all part of the project.

1. Site Establishment
   - Site preparation, includes pegging, installing hoarding, safety signage, temporary road signage and traffic management plan.

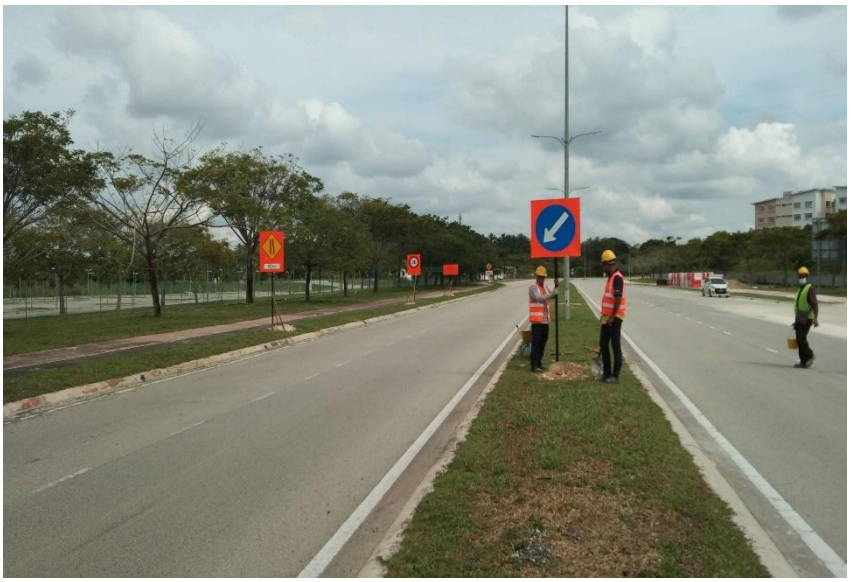


*Figure 3.2 Site Establishment*

2. Site Inspection
   - The site and all nearby structures that may be affected by the piling activities were examined and inspected. Such as topography survey, utility detection and mapping plan prior to beginning work on the job.

3. Piling work
    - Piling work is being done on three main bridge columns as well as a staircase supporting column.
    - A 200mm borehole was dug up to stratum utilizing bentonite slurry and rotary drilling equipment.

*Figure 3.3 Piling Work*

4. Cutting Off Pile Heads

- When the pile installation reaches the stratum, the head of the pile's concrete must be chopped off to the specified level, and reinforcing bar must be projected.

5. Pile Testing
   - 500kN operating load on a 150mm diameter RC pile.
   - Using the Pile Dynamic Analyzer (PDA), Maintain Load Test (MLT) pile testing and computer CAPWAP analysis to stimulate pile or soil model and load settlement. To identify the load that the piles can carried out.

*Figure 3.4 Pile Testing*

6. Pile Cap
   - RC pile is capped with a 12mm thick M.S capping plate.
   - The foundation was poured with 50mm lean concrete.

- Welding a U bar to the pile head and pouring G40 concrete mix into the pile cap.

7. Construction of Bridge Piers

a) Vertical Column

- Conducting Joint survey with Main Contractor to allocate the position and alignment of the bridge piers.
- Scaffold erection to assist the worker to install steel reinforcement and formwork.
- Installing a grillage of steel reinforcement for the piers to the starter bar.
- Erecting vertical formwork for piers with shores and bracing.
- Special mix concrete G40 are cast into the formwork and uniformly vibrates the mix to ensure the concrete are fully casting the structure.

b) Horizontal Bridge Support

- Installing a grillage of steel reinforcement for the piers and tight to the vertical column starter bar.
- Erecting horizontal formwork for piers with shores and bracing.
- Special mix concrete G40 are cast into the formwork and uniformly vibrates the mix to ensure the concrete are fully casting the structure.

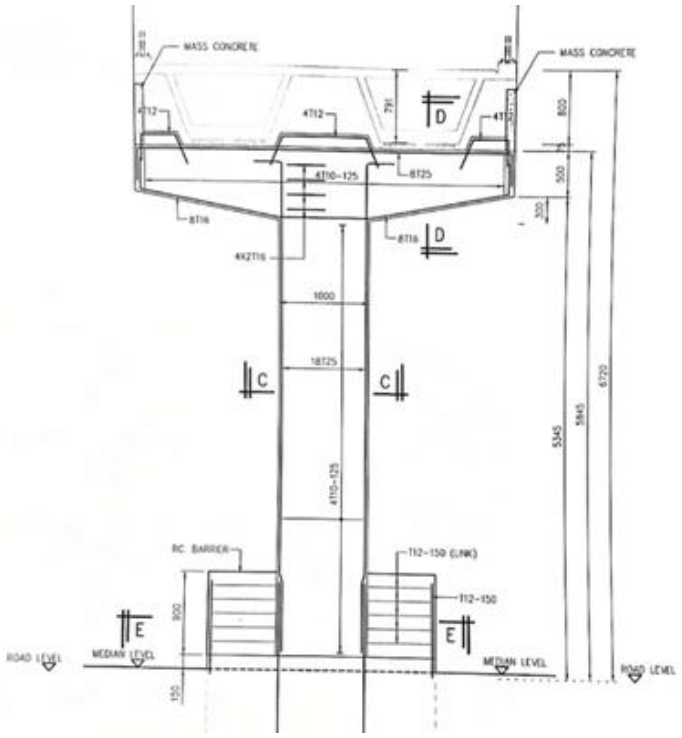



*Figure 3.5 Bridge Support*

Stage 2: Launching Prefabricated Bridge and Precast Concrete Staircase

Launching works for prefabricated material will be done at night where the traffic flow are lows, all necessary traffic diversion and road closure will be conducted by trained personnel.

1. Launching Prefabricated Box Girder
   - Beam Detail:
   - Length = 19.25m
   - Weight = 20 tons
   - Quantity = 4 beams girder

   - Manpower:
   - 1 supervisor

- 1 crane operator
- 4 riggers

- Equipment

- 1 unit of 45 tons Mobile Crane.
- 1 unit of trailer for beam transportation.

a) Pre-Launching Process.

- All machines and equipment must be inspected and verified before being used.
- The Contractor will perform the Tool Box Meeting and Safety Induction.
- The crane parking platform and operating access must be levelled and double-checked for stability, the working platform must be backfilled to the abutment wall and compacted well.
- The contractor must correctly indicate the centerline of the beams on the abutments.

b) Site Preparation.

- Position the crane in the most efficient and ideal location for moving and lifting the beam.
- With the proper setup, the crane's maximum working radius is not greater than required, making it safe to lift and move the cargo. This is sufficient to cover all four beams.
- Boom crane will be precisely positioned to carry out work in accordance with the load chart, ensuring that the operation is carried out in a safe manner.
- This crane and its setup are adequate and safe for use in this launching operation because the lifting capability exceeds the operational load of 24 tons.

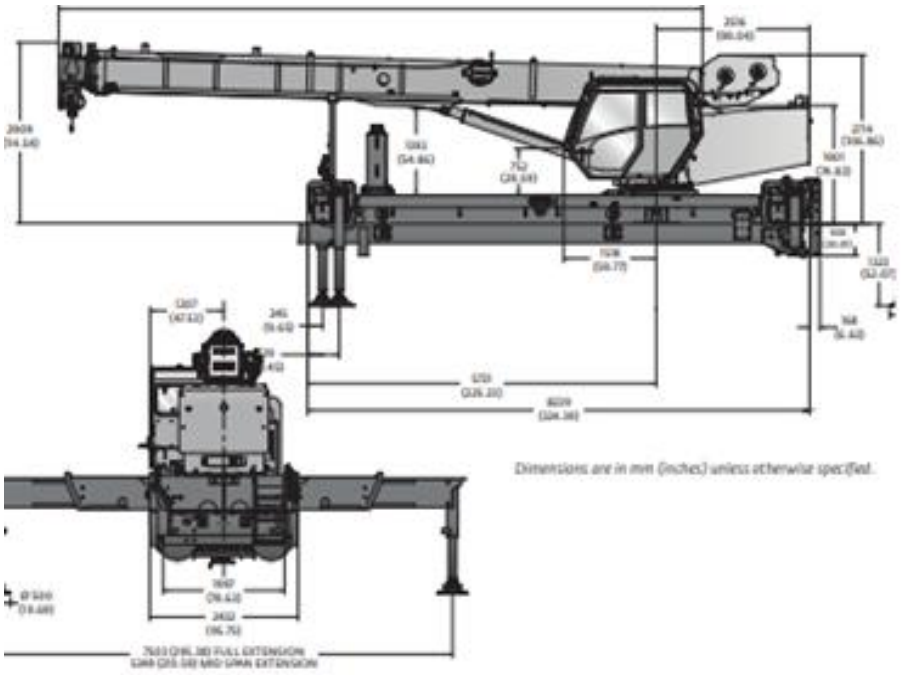



*Figure 3.6 Crane*

c) Launching Sequence.

- The trailer will bring the precast beams into the launching area.
- Each trailer will carry 2 nos of the precast beams.
- Then the crane can lift the first beam off the trailer and place it on the abutments
- Check the accuracy of the beam position and if satisfactory, the lifting slings will be released.
- Repeat the same sequence for the balance 3 beams.

*Figure 3.7 Launching Sequence*

d) Securing Beams.

- Since the beams are resting freely on rubber bearing pads on top of the abutments, these beams are subjected to various vibrations from machineries working nearby and possible movements.

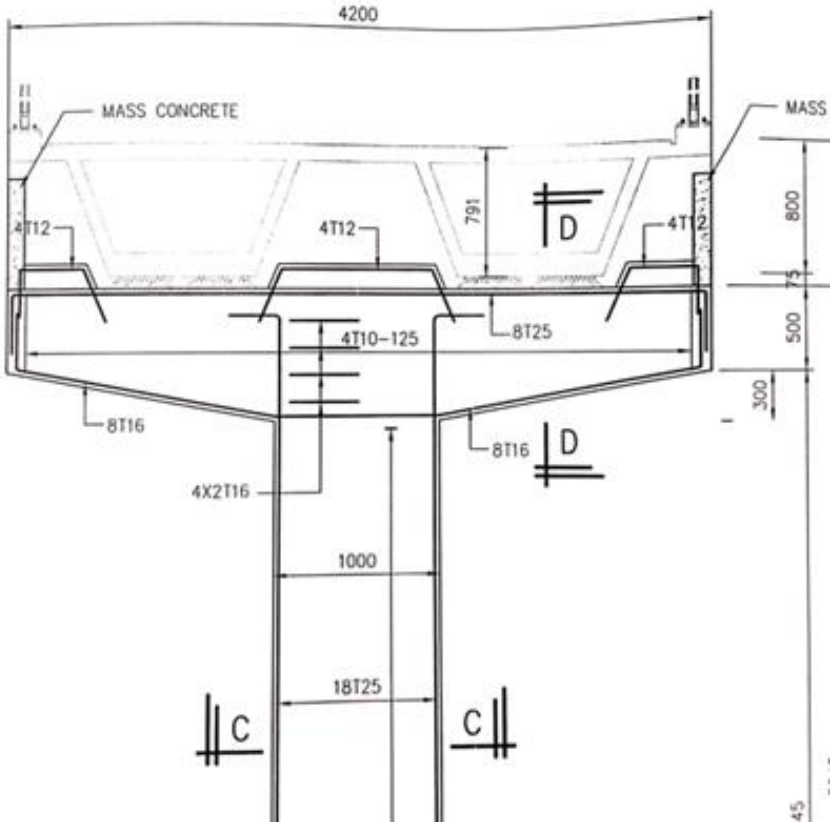



*Figure 3.8 Beam*

2. Launching Precast Concrete Staircase.

The precast staircase will be launched at different times to avoid road closures and risks and hazards that may arise throughout the operation. Because precast concrete staircases are lighter than box girders and may be built with a smaller mobile crane, they can be built throughout the day, but all work must be approved by the primary contractor and the client.

- Precast Concrete Staircase details:
- Length = 5.6m
- Quantity = 4 Precast staircases

- Manpower:
  - 1 supervisor
  - 1 crane operator
  - 4 riggers

- Equipment
  - 1 unit of ton Mobile Crane
  - 1 unit of trailer for beam transportation.

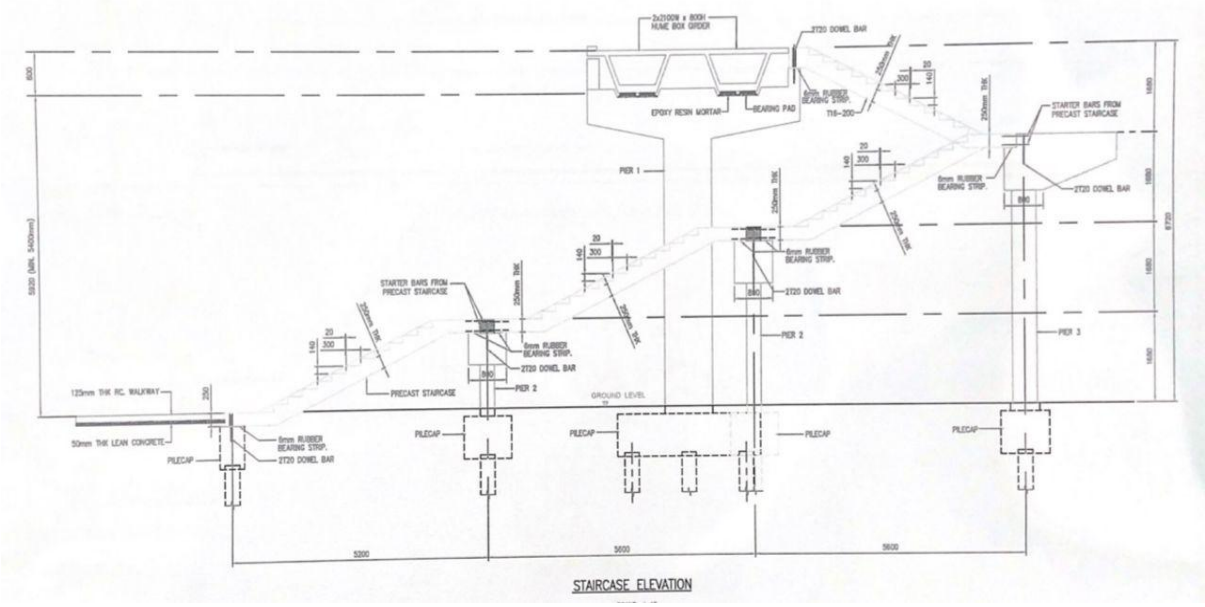



*Figure 3.9 Concrete Staircase*

a) Pre-Launching Process.

- All machineries and equipment shall be inspected and confirmed to be in good conditions.

- Tool Box Meeting and Safety induction shall be conducted by the Contractor
- The working access and crane parking platform shall be levelled and checked. The working platform must be backfilled up to the abutment wall and well compacted for stability.
- Contractor to mark precisely the position for the centerline of the staircase on the abutments

b) Site Preparation.

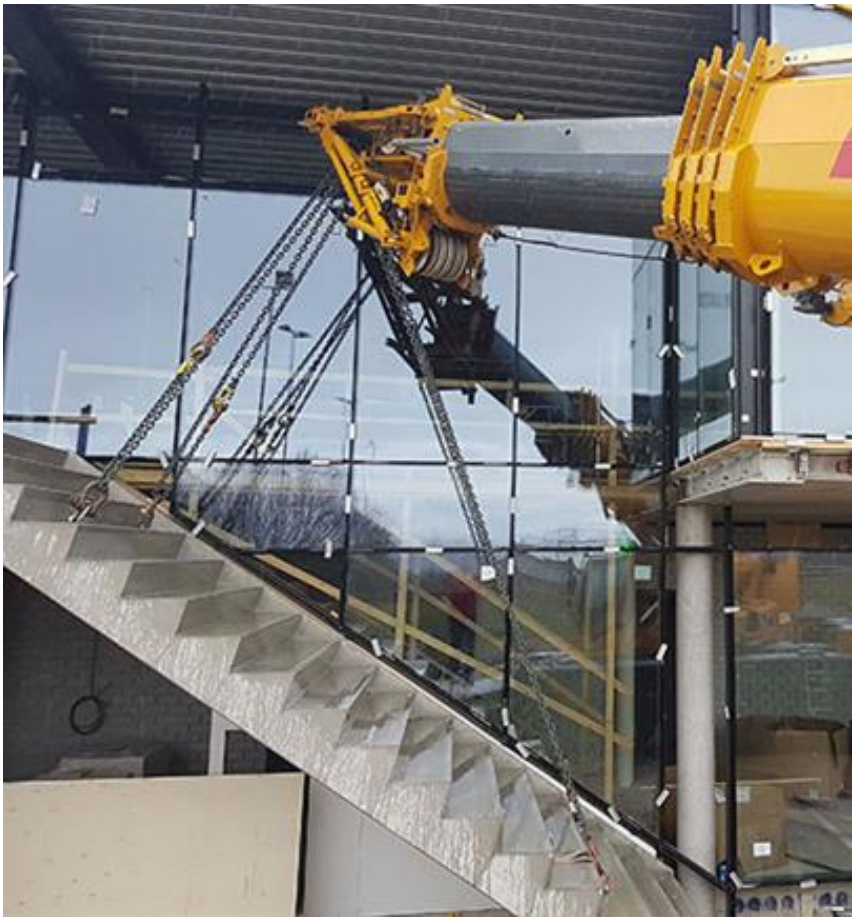
- Position the crane in the most effective and ideal location for moving and lifting the stairs.
- With the proper setup, the crane's maximum working radius is not greater than required, making it safe to lift and move the cargo. This distance is sufficient to cover all four stairwells.

*3.10 Site Preparation*

c) Launching Sequences.

- The precast beams will be delivered to the launching area by the trailer.
- Each trailer will transport four precast stairwells.

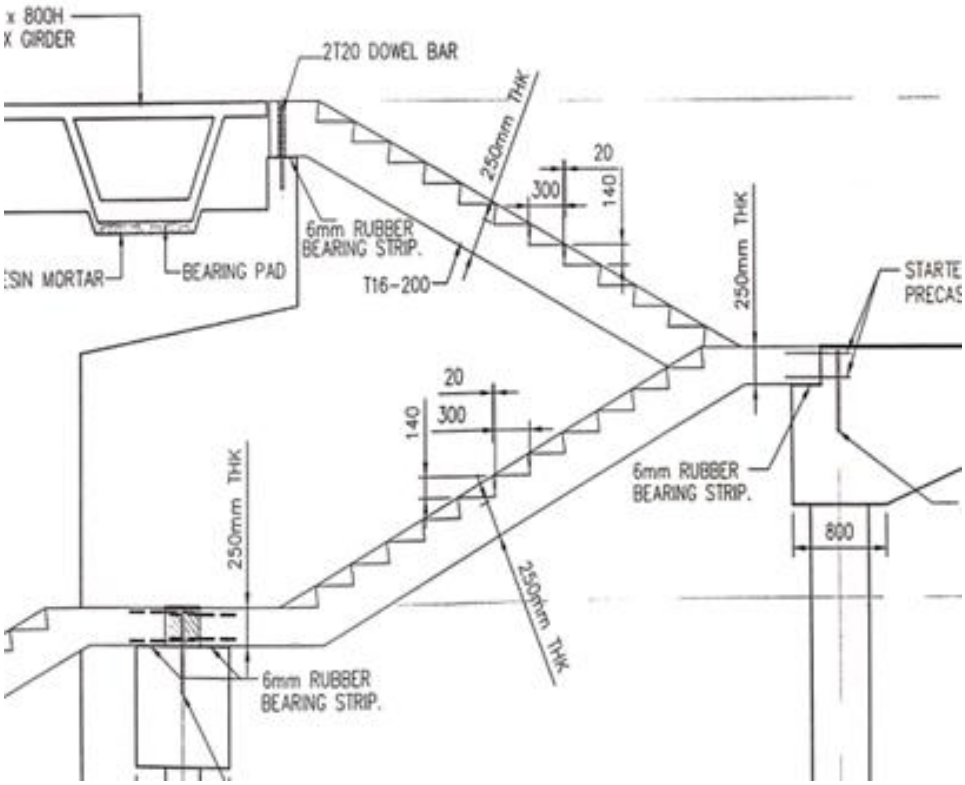
- The crane may then remove the first beam off the trailer and position it on the abutments.
- Verify that the beam location is accurate, and if it is, the lifting slings will be released.
- Repeat the process for the remaining three stairwells.



*3.11 Launching Sequence*

d) Securing Precast Concrete Staircase.

- Since the staircase are resting freely on rubber bearing pads on top of the abutments, these beams are subjected to various vibrations from machineries working nearby and possible movements
- Staircase are secured to dowel bar Pier connected to staircase starter bar.



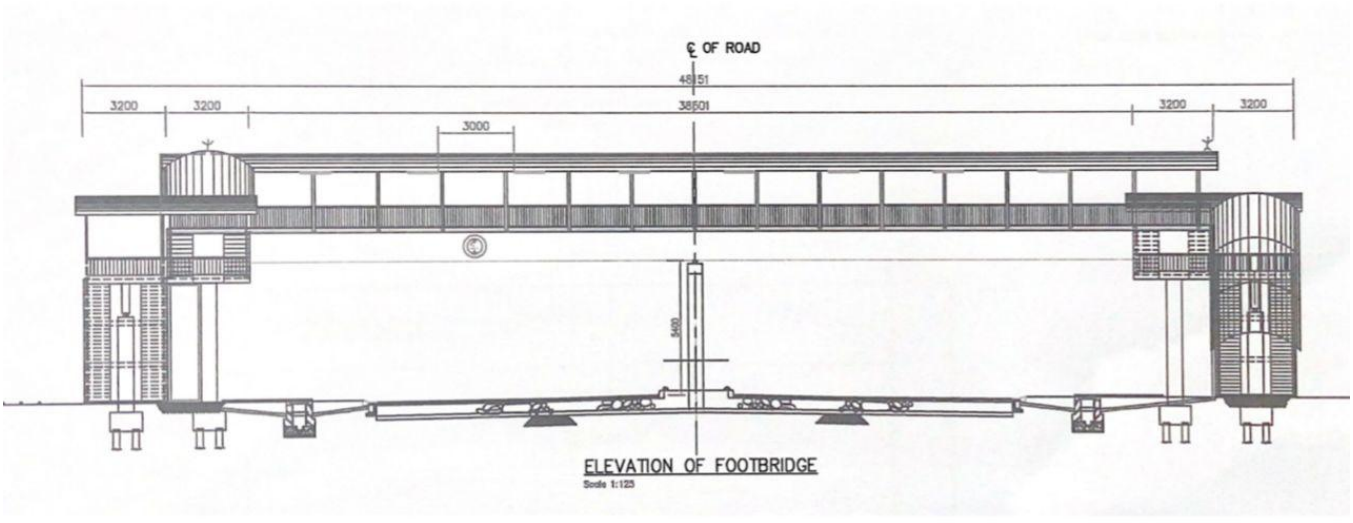

*3.12 Concrete Staircase*

Stage 3: Work after Prefabricated Bridge Erection.

Conventional methods of structural precast concrete erection and in-situ concrete construction will be used to construct the pedestrian bridge, which will include architectural work such as floor finishes, staircase finishes, and tiling.

a) Pedestrian walkway.

- Setting out alignment with surveyor
- Joint survey with Main contractor
- Excavation works of 275mm below finished level.
- Soil compaction to requirement
- Laying 100mm of crusher run
- Formwork erection of 9.1m Length x 3.0m width
- Steel Reinforcement installation.
- 50mm lean concrete on top of crusher run.
- Casting work of concrete slab with thickness of 125mm.




*3.13 Pedestrian Walkway*

b) Precast Bollard.

- 175mm diameter boring to existing beam.
- 750mm height of precast then installed to bored hole and secured with non-shrink cement grout.

c) Staircase Finishes.

- Setting up level to Engineer's detail
- Cement renders the staircase structure, riser to step, landing and Staircase back surface.
- Nosing tile and homogeneous tiles installation.

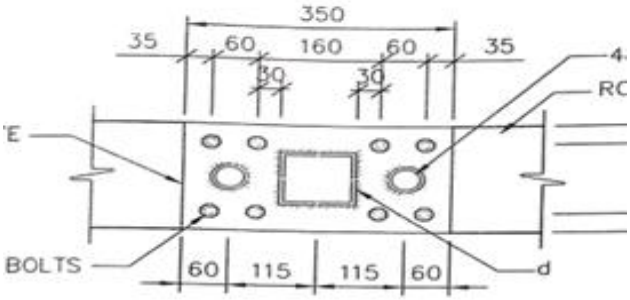
*3.14 Staircase Finishes*

Stage 4: Installation of Roof Supporting Column an Roof Covering.

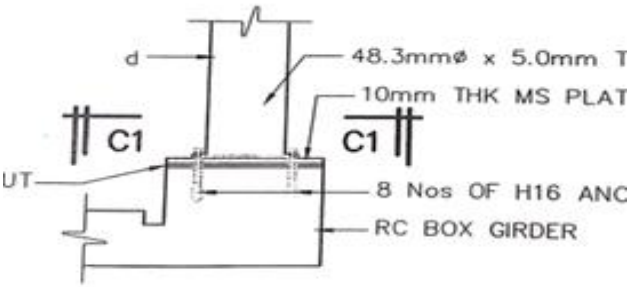
SHS, RHS, and CHS steel are all fabricated off site, which then assembled on site. In these stages it includes working at heights (WAH) and Hot works which is welding works.

1. SHS railing post to Box girder concrete slab.

- SHS railing post welded to 10mm thick MS plate, then attached with 8 H16 anchor bolts on top of RC box girder
- Underneath the steel framework, non-shrink grout is injected.




SECTION C1–C1
SCALE 1:10

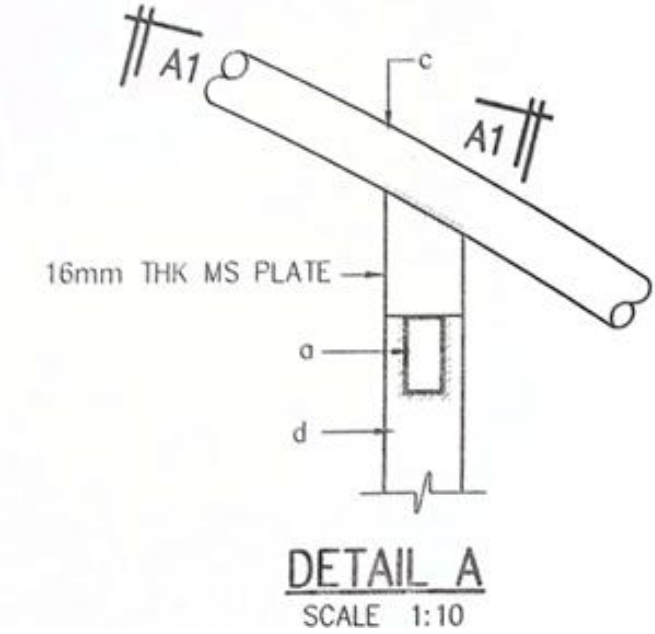



DETAIL C
SCALE 1:10

*3.15 Box Girder*

2. RHS steel roof supporting to SHS railing post.

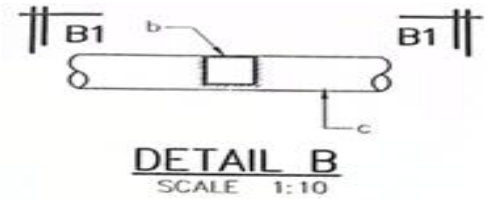
- Scaffold erection for work reaching 1.5m and above.

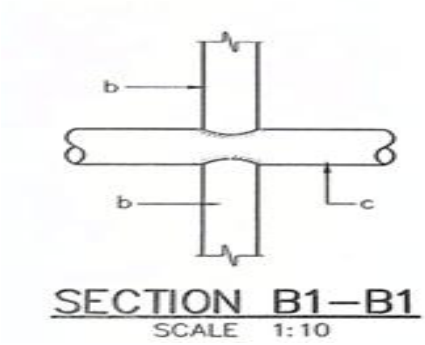



*3.16 Railing Post*

3. SHS steel purlin to Bended CHS steel roof covering.

- Scaffold erection for work reaching 1.5m and above
- Installation of roof covering 0.42mm Bluescope Lysaght Spendex.




*3.17 Steel Purlin*

4. Installations of Stainless-Steel railing

- Stainless steel railing is fabricated at factory but comes separately.
- It was cut into specific short length.
- Then the S/S railing are welded on site according to architectural details.

*3.18 Stainless Steel Railing*

### 3.3 Problems Occurred During the Construction of Pedestrian Bridge and The Solutions

1. Failure of pilling

   Pile foundation is a support for the structure. It's used to transfer loads to a lower level of subsoil. The common failure of piling is the suggested load on the pile is more than the intended load, reinforcement of pile has dislocated, incorrect pile capacity, and much more. But in this case, the failure of piling caused by wrong soil investigation.

   According the first soil investigation, after blowing deep down until 11 meters depth, we encountered hard soil layer. In order to have a consistent result soil strata thickness, it is necessary to blow for five times, on the fifth and final blow which is 17 meters depth, the soil layer turn out to be very stiff instead of hard soil layer. This caused the previous hard soil layer considered as void. After that, we blow again at 18 meres depth and the soil back in hard layer. The process is repeated for five times to ensure consistent results of hard layer.

*3.19 Micro Pile*

So, the solution is redesigning the calculation by increasing the size of piling (diameter) from 150mm to 200/250mm. Also change the type of pile from Micro pile to Reinforcement pile.

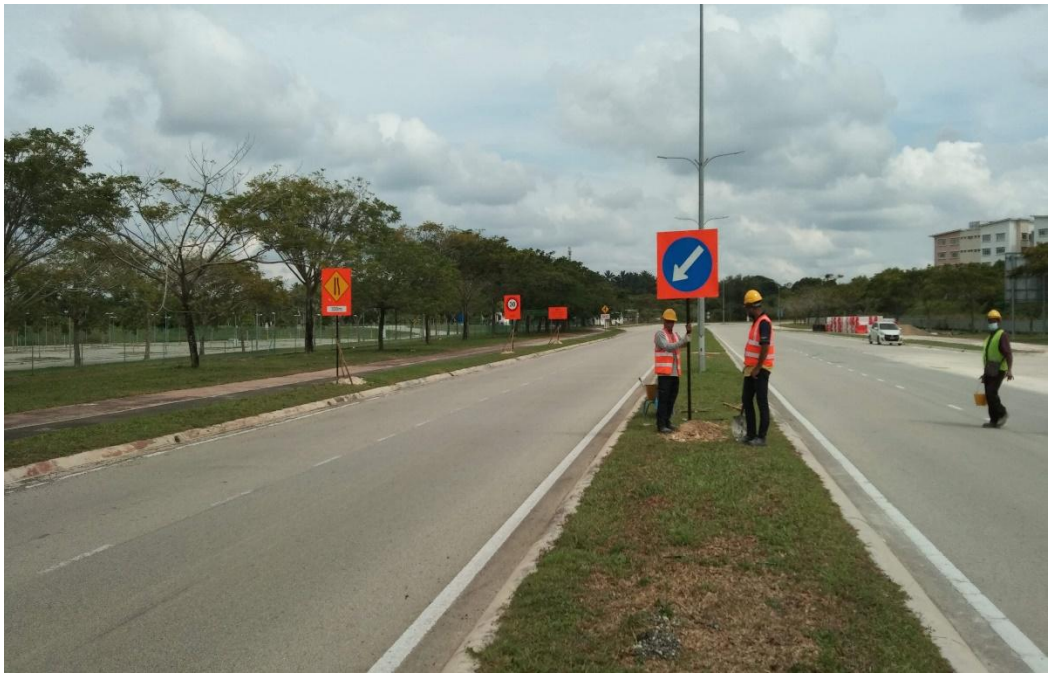
*3.20 RC Pile*

2. Disturbance of pedestrians and vehicles.

   During the construction of pedestrian bridge at Persiaran Sarjana, Jalan Panchor, Bandar Universiti Pagoh, there are a lot of vehicles and pedestrians used the road. It's because of the UTHM's student that used the road from hostel to the UTHM.

   It is critical to carry out traffic management and planning in order to protect the safety of the surrounding environment and the overall public. Precautions will be made to reduce and analyze any possible hazards that may arise throughout the building process.

   To avoid any incidence, happen during the construction that will involve the pedestrian and vehicles, Temporary Traffic Management Guidance should be implemented. The Temporary Traffic Management Guidance that implemented are well manage traffic diversion, properly manage traffic flow, safe and suitable pedestrian access routes are provided, organized and controlled, and install temporary signages.



*3.21 Install Temporary Signage*

*3.22 Install Barrier*


*3.23 Temporary Access Routes*

# CHAPTER 4

## 4.0 CONCLUSION

In conclusion, the process of this pedestrian bridge is similar to another common pedestrian bridge. This report has showed the construction process of pedestrian bridge. also, this study has shown the possibility and common problem occurred during and after the pedestrian bridge done. Several methods have been used for this study which is by observe, interview, and documentation review. Hence, observing and interview session is somehow helped a lot to achieving the main objectives for this report compared to study theoretically by reviewing the document. Although, document review is more effective method for studying in documentation of tendering, material submission, construction drawing and quotation. Next, the most important consequence for this finding is it enhances knowledge to communicate with client, supplier and worker. The outcome here is communication is essential in construction industry. This is because without the communication between individual it can create obstacle during works and the works will be pending that trouble many parties. In this case study, the machineries and tools are also very well maintained including the general worker was skilled enough to handling the tools and machineries. Besides, the quality control was very high demand which makes material is very high quality and it can minimal the problem. Last but not least, the professional and experienced employees and general worker were the biggest contributor to this project also the suppliers who help a lot in maintaining the quality of their material and services.

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