DEPARTMENT OF BUILDING

UNIVERSITI TEKNOLOGI MARA

(PERAK)

METHOD OF SOLID PANEL

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2019295652

DEPARTMENT OF BUILDING

FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING

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FEBRUARY 2022

It is recommended that the report of this practical training provided

By

MUHAMMAD FAQRUL HAZRIN BIN SAMUDI

2019295652

entitled

METHOD OF SOLID PANEL

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

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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 Ampenan Tech 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.

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Date : 10 JANUARY 2022

ACKNOWLEDGEMENT

In the name of Allah the most Beneficent and most Merciful, All praises to Allah, Lord of the universe and peace be upon His Messenger. I want to acknowledge Him on top of all for blessing me with patience and tenacity of mind to complete the internship report. It is undeniably a vital requirement for certified my Diploma in Building with Honor, with flying colours and I have received outstanding helps from many quarters which I would like to put on record here with great pleasure and deep gratitude.

Firstly, I would like to thank and compliment my industrial training supervisor, Nur Firyal Batrisha Binti Zahari. She is very kind in person and keen enough to give any newbie her full attention including me. Without her endless care and wit, I wouldn't have made any clear progression and understand the purpose of being an intern at all. Most thanks for her support, feedbacks and all the worthwhile lessons.

Furthermore, I dedicated this to my beloved family and practical friends, I do appreciated all the helping hands they lend while I had loss courage at certain point and they for sure had gathered me back into conscience effortlessly. There are also seniors outside who share opinions in preparing this report. Not to forget, I valued all the contributions whose articles and publications play part in my working papers. Last but not least, it is a special honour to be part of the firm itself for 20 weeks and thanks goes to my family members who have given me so much support to my life in the university and always provided me with help in many ways to complete 5 months and more of my industrial training, so I acknowledge Encik Faiz Bin Othman, solely for accepting me. All sense of concern towards me are tremendous and unforgettable from the staffs. It is a beautiful experience to engage with the prestige firm. Therefore, the least I can hope is that my hard work and training can be great epitome to a better application of building course in near future.

ABSTRACT

Method statement of the solid panel is defined as all the works and construction activities that has been carried out to the method statement of the solid panel projects. This report will discuss about the IBS lightweight sandwiched panel using UCO superflex boards as external sheaths with lightweight concrete infill. This report was conducted for all IBS solid oanel of Ampenan Tech Builder Sdn Bhd at Umbai, Melacca projects. The objective of this report is to define how to install the solid panel such as procedure in making that. This report also come with objective of attributes that related to solid panel. It is solid and achieves a straight, perfect wall finish. It is confirms to UBBL and has gone throught stringent tests approved by relevant authorities. This report will also look at comparison functional of the solid panel.

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1.1 Background of study

UCO Solidwall System could be a non-load wall system that's ideal for commercial, institutions, residential, resorts and leisure building constructions. It's a CIDB certified Industrial Building System (IBS). UCO Solidwall System comparises UAC's fibre cement sheets fixed onto metal studs as ecternal sheaths and infilled with lightweight concrete mix.

UCO solid panel is an IBS precast lightweight sandwiched panel using UCO Superflex boards as external sheaths with lightweight concrete infill. Uco solid panel is solid and achieves a straight, perfect wall finish. It is confirms to Uniform Building By-Law (UBBL) and has older like SIRIM in Malaysia and TUV- PSB from Singapore.

UCO Panel encompasses a durable timber appeal. Its natural timber textured finish enlivens any wall with a country warmth, be it a feature wall, gable end, screen partition, infill panel or cladding. Strike the correct note by painting it over with the color of your choice. Non-combustible and asbestos-free, UCO Panel is resistant to permanent water damage, termite-proof and doesn't rot. Perfect for renovation work, installation is quick and simple, and it blends with almost any design UCO Panel will offer you a lifetime of beauty that's virtually maintenance-free. UCO Solid Wall may be a versatile and robust system that complies with stringent requirements for fire-rating, sound, thermal insulation, high impact strength, and wet area applications.

1.2 Objectives

The objective of this study:

1. To defined how to install the solid panel such as procedure in making.
2. To find attributes that related to solid panel.
3. To look at comparison functional of the solid panel.

1.3 Scope of Study

This study was conducted with the purpose to gain the knowledge and understand on every method of solid panel works for the building constructions of residential house at 12/200, Jalan Kemaman, Kampung Jeram, Beserah, Pahang. This method statement covers the detailed procedure to be followed for supply and installation of solid panel as per approved shop drawings and schedule of finishes for the project. This procedure shall be read in conjunction with contract specification where applicable.

1.4 Method of study

1. Observation

A person walk out to the site or project places to see the process and items used. Within this observation, we will gain particulars data and details. The data that has been collected as processed, material and information can be used to ourselves in the near future.

A panel design is employed when researchers sample a gaggle, or panel, of participants so measure some variable or variables of interest at quite one point in time from this sample. Ordinarily, the identical those that are measured at Time 1 are measured at Time 2, and soon. The successive measures are commonly spoken as waves. For instance, a three-wave panel study would measure the identical sample of participants on three separate occasions. The number of your time in between measurement is understood because the interweave interval. The utilization of multiple measures on the identical variable over time allows for an assessment of longitudinal changes or stability on the variables of interest.

CHAPTER 2: COMPANY BACKGROUND

2.1 Introduction of Company

Ampenan Tech was registered under the Companies Act 1965 with the Companies Registration Office of Malaysia on 16 September 2016 and is a limited company. The company is a stand-alone company that is competitive to date. This firm was established in 2012. This firm is known as Ampenan Tech Construction. Among the objectives of the firm is to supply a range of specializations in design work, plan drawing and implementation within the project. The corporate has ambitions to try to work effectively and efficiently in utilizing the benefits of technological resources and knowledge on the development site.

Ampenan Tech is a local company that uses IBS method to build a house. Among the IBS products by this company is UCO solid panel. This panel is used as a replacement material for sand bricks, clay bricks and other than that. Ampenan Tech is located at No 30 A, Jalan Hang Tuah, 75300 Malacca. The Ampenan Tech is handled by Encik Muhammad Faiz bin Othman.

Ampenan Tech is a company that has good future planning by organizing the company's strategy to expand the scope of business by engaging in the quotation and tender process. The company's goal is to provide the best quality work and service as well as ensure customers satisfaction.

2.2 Company Profile

Figure 2.2.1: Company logo

1. **Company name:** AMPENAN TECH CONSTRUCTION
2. **Name of Manager:** Encik Muhammad Faiz bin Othman
3. **Address:** No. 30A, Jalan Hang Tuah, 75300, Melaka, Malaysia
4. **Telephone No.:** 016-9808225
5. **Email:** amptech12@gmail.com
6. **Date established:** 6th September 2016
7. **Service provided:** Plan drawing, consulting and construction
8. **No. SSM Registration:** (CA 0188266-u)
9. **Principle Banker:** Maybank
10. **Company Status:** Bumiputera

2.3 Company Organization Chart

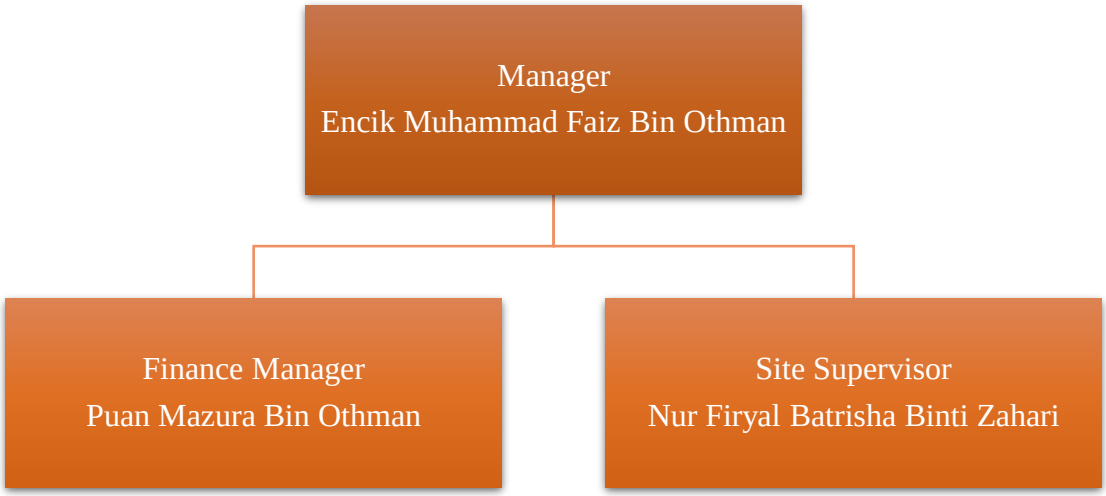

Figure 2.3.1: Company organization chart

2.4 List of Project

2.4.1 Completed Projects

Ampenan Tech has successfully completed several projects as shown in Table 1:

Table 1: Completed projects

NO	PROJECT SITE	STATUS	YEAR
1.	Kampung Serkam Darat, Serkam	Completed	2021
2.	Kampung Tehel, Tehel	Completed	2021
3.	Tambak Bugis, Umbai	Completed	2021
4.	Jalan Bacik, Bukit Katil	Completed	2021
5.	Kampung Jeram, Beserah	Completed	2021

2.4.2 Project in Progress

Ampenan Tech also manages many projects that still ongoing as illustrates in Table 2:

Table 2: Project in Progress

NO	PROJECT SITE	STATUS	YEAR
1.	Bukit Tembakau, Ayer Molek	In progress	2021
2.	Bukit Pulau, Bukit Baru	In progress	2021
3.	Bukit Kepok, Merlimau	In progress	2021
4.	Tedong, Merlimau	In progress	2021

CHAPTER 3: CASE STUDY

3.1 Introduction of Case Study

Ampenan Tech was given responsibility as a contractor to conduct a project which is resident that were located at Kampung Jeram, Beserah, Pahang. The project costed around RM 160, 000. The project itself was started at middle of 2021 which in August 2021 and has been finished in December 2021. The project site was located a few kilometres removed from shops, gas station, restaurants, and other facilities. There are several styles of public transportation which will be seen there like bus, Grab and also the taxi. During this point, the traffic area at this site may not been seen because it's behind the street and at identical location. The working hours are started from 8.00 a.m. within the morning till 5.00 p.m. within the evening which is from Monday till Saturday, but it also depends on the weather and condition surrounded.

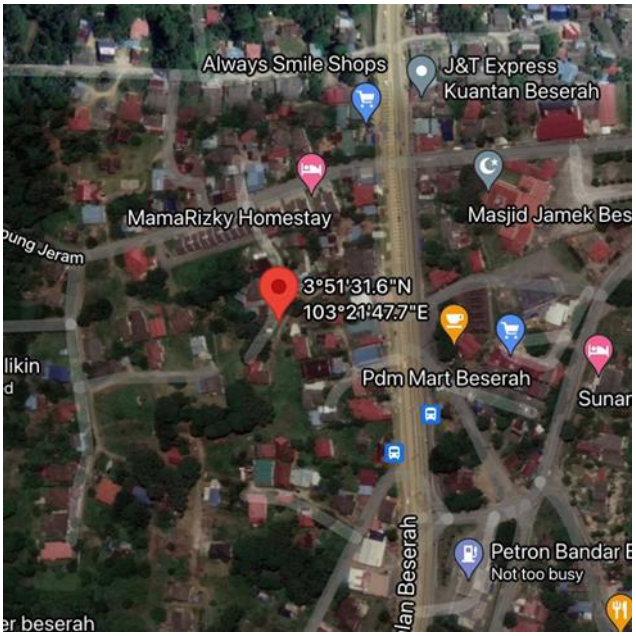

Figure 3.1.1 Satellite image of the project area

Source:

3°51'31.6"N 103°21'47.7"E

https://goo.gl/maps/egoWBMycyvTTVrtz6

3.2 Procedure of Solid Panel

3.2.1 Tools and Items

Table 3: Tools and items

NO	TOOLS AND ITEMS	QUANTITY
1.	Scaffolding	2 Set
2.	Joint bar R6 (stapler shape)	294 Unit
3.	Dowel bar Y10 (7-shape and 1’ length)	84 Unit (7-shape) 95 Unit (1’ Length)
4.	Concrete nails (2 inch)	2 Box
5.	Power drill impact (4”)	1 Set
6.	Circular saw (9”)	1 Set
7.	Scrapper	2 Unit
8.	Handheld diamond cutter	1 Unit
9.	Woods (1” x 2”)	10 Unit
10.	Sika Ceram 288	8 Bags
11.	Sponge	2 Unit
12.	UCO jointing compound / Skim premium grey / gypsum compound	(5 Bucket / 8 Bags / 5 Bucket)
13.	Fibre mesh tape	5 Roles

14.	PVC / Aluminium corner bead	24 Meters
15.	Silicone / Sealant	3 Tube
16.	Sandpaper (120 Grade)	1 Unit
17.	Hammer	1 Unit
18.	Powered drill whisk	1 Unit
19.	Extension	1 Unit

3.2.2 Installation Method of Solid Panel

1. Line marking for wall position.

- Wall position marking work using thread or inked thread according to the approved drawing plan.
- Contractors are advised to level the ground above the wall passage to facilitate the work of raising the panels to the right position.

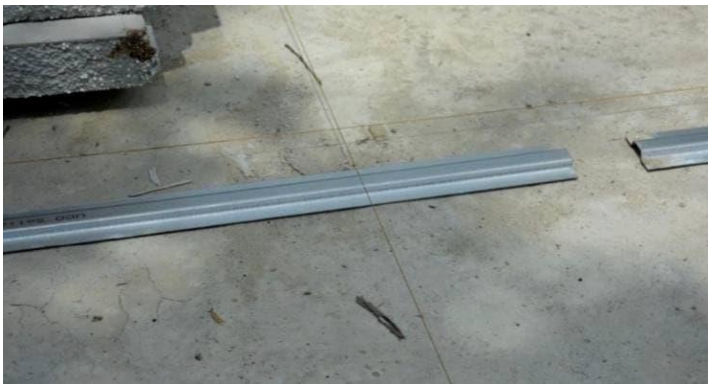

Figure 3.2.2.1: Bottom track

2. Bottom track installation.

- Installation of the underside track per the position of the thread.
- The underside track is nailed to the ground using concrete nails.

Figure 3.2.2.2: Installation of bottom track

3. UCO solid panel installation

- Place Sika Ceram 288 on the side of the panel.
- Sika Ceram 288 is mixed with a combination of water employing a whisk (blender)
- Sika Ceram 288 is fully pasted on the edges of the panel (1 side only)
- Excess Sika Ceram 288 leaking out should be levelled with a wet sponge.

Figure 3.2.2.3: Applying Sika Ceram 288

- Panel that are placed Sika Ceram 288 are lifted and placed vertically above the underside tracks.
- Panels that are placed on the underside track are supported using wood size 1” x 2”.

Figure 3.2.2.4: Installation of panel

4. Marking and cutting of panel for door and windows opening.

- Panels are marked and cut consistent with approved drawing measurement.

Figure 3.2.2.5: Cutting the panel

- Each panel that is upheld must be checked for vertical and horizontal position using water level.

Figure 3.2.2.6: Measure panel straightness

5. Installation of lock on each bottom of the panel, panel surface and top of the panel.

- Bottom track is perforation for Y10 – "7' 'shape installation.

Figure 3.2.2.7: Hacking the panel

- Panels are trimmed employing a Y1 –"7' 'shape on each bottom corner of the panel.

Figure 3.2.2.8: Trimming Y10

- Finish the connection between the 2 panel surfaces using R6 – “U / stapler” shape (at the underside, middle and top of the wall).

Figure 3.2.2.9: Stapler the panel

- Finish the connection between the 2 panels (top) employing a Y10 1’ length.

6. Electrical and piping that added to the wall is cut employing a portable cutter “grinder” and after completion, re-paste the wall using cement mortar.

7. Installation of door and window frames should be done during panel installation.

- Cement mortar is fully filled within the frame of doors and windows.

8. Sika 288 is fully swept between 2 joint panel surfaces (50 mm).

- Sika 288 is flattered and smoothed employing a wet sponge.

Figure 3.2.2.10: Applying Sika Ceram 288

Figure 3.2.2.11: Applying mortar cement

9. Schemes work on the "flush joint" panel connection.

- Schemes work on the connection part between panels only.
- Contractors are advised to begin this work after the roof trusses and roof trusses able to be installed.

Figure 3.2.2.12: Plastering the wall

10. PVC / G.I. corner beads are used on the 4 outer corners of walls and walls that don't seem to be covered with door and windows frames.

Figure 3.2.2.13: Install the corner bead

11. Sandpaper (grade 120) is employed to scrub and smooth the wall surface.

- Contractors are advised to use silicone/sealant between the panel connection surface and therefore the floor (outside wall).

12. Alternatives apart from using silicone, contractors can and do close connecting panels and floors by coping from excess 75 mm wide panels for walls installed parallel to the floor.

Figure 3.2.2.14: Applying the silicone

3.3. Advantages of Solid Panel

UCO Solid panel is an IBS precast lightweight sandwiched panel using UCO Superflex boards as external sheaths with lightweight concrete infill. UCO Solid panel is solid and achieves a straight, perfect wall finish. It is conforms to UBBL and has suffered stringent tests approved by relevant authorities like SIRIM in Malaysia.

- **Fire rated**

- 2 hours fire rated (BS 476: Part 22: 1987) according to the British Standard.

- **Fast track construction**

- Easily and rapidly constructed, cutting down construction times and cost
- Weight of walls is approximately 2 -3 times lighter compared to brick walls.
- Density is 600 – 800 kg/m3.

- **Durable and sound insulation**

- Immune to permanent water damage and impervious to high humidity or moisture. It is does not warp, crack and split easily.
- It is also good sound insulation.

- **Cleaner and safer construction**

- Reduces messiness at site and easy to clean up. It is minimizes inconvenience to other trades compared to the labour intensive conventional trade.

- **Strong anchorage capacity**

- Conform to BS 5234 : Part 2 requirement

3.4 Comparison Functional of Solid Panel

- Cost saving with high walls
- Lightweight infill mix reduces total structural building cost
- Extra usable spaces without compromising wall properties

Table 4: Comparison functional

REQUIREMENTS	UCO SOLIDWALL (104 mm thk)	BRICK (100 mm thk)
1. Weight	250 kg/m	900 kg/m
2. Productivity	Installation and joint treatment (18-23 m2/man day)	Installation and plastering (4-7 m2/man day)
3. Non-combustibility	Deemed to satisfy	Deemed to satisfy
4. Fire rating	120 mins	120 mins
5. Sound insulation	46 dB	35 – 40 dB
6. Thermal resistance	0.31m2K/W	0.068m2K/W
7. Usage in wet area	YES	YES
8. On site installation of concealed wiring, ducting and pipework	Services can be incorporated into the wall during the installation process	By surface hacking

9. Surface appearance	Smooth	Smooth only with skills plasterers
10. Applied finishes: Tiling	YES	YES

11. Fastener types	- Plastic plug - Chemical set anchors	- Plastic plug - Chemical set anchors - Impact anchors
12. Flexibility of relocation	Can be removed and replaced with relative ease and minimal mess	Removal and replacement is messy

CHAPTER 4: CONCLUSION

There are many methods to construct a wall that will be used in construction, and the selection of fabric supported the properties of the wall function for the development and occupation. except for the various aspects to be considered in the selection of a construction such as a wall in terms of costs, resources, and types of projects. Finally, because the project is large and needs to be completed quickly, UCO Solid wall System may be used. The problems with the UCO Solid wall system in construction are not very serious within the building because the problem can still be solved in a variety of ways. The selection of a building's construct wall is critical so that it does not have any problems after completion, as well as being concerned about the comfort and safety of residents living there

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