BANJAR WIJAYA LIBRARY CONCRETE PANEL WALL

Widodo Kushartomo[1], Ariiq Ananta Lukman[2], Ahmad Septian Dewanto[3] dan Ester Stella Luwih Budi[4]

[1]Civil Engineering Undergraduate Study Program, University of Tarumanagara Jakarta
Email: widodo@untar.ac.id
[2]Civil Engineering Undergraduate Study Program, University of Tarumanagara Jakarta
Email: ariiq.325180178@stu.untar.ac.id
[3]Civil Engineering Undergraduate Study Program, University of Tarumanagara Jakarta
Email: ahmad.325180165@stu.untar.ac.id
[4]Civil Engineering Undergraduate Study Program, University of Tarumanagara Jakarta
Email: esther.325180175@stu.untar.ac.id

ABSTRACT

The wall is one of the building elements that serve to separate/form a space. In the construction of the Banjar Wijaya library, Cipete Village, Pinang District, Tangerang City, all the walls use thin and patterned concrete panels. The use of thin concrete walls is intended to make strong and durable semi-permanent buildings. Strong in this case the wall is not easily broken or perforated and durable which means resistant to weather attacks and termites. The building frame is made of galvanized hollow iron, with bolt and weld connection methods to ensure the strength of the building. The concrete panels are installed on the inner wall with a thickness of 6 mm, the ceiling with a thickness of 4 mm, the floor with a thickness of 20 mm, the outer wall with a thickness of 4 mm. All installation is done using bolts for time and cost savings. On the outer wall, the concrete panels are lined with wood-patterned concrete panels with a thickness of 6 mm to enhance the appearance of the library building. The library building is a collaboration between residents of RW 07, Cipete Village, Banjar Wijaya, Tangerang City, and the Tarumanagara University PKM team from the Civil Engineering Undergraduate Study Program.

***Key Words**: library, building, panels, concrete, galvanized*

ABSTRAK

Dinding merupakan salah satu elemen bangunan yang berfungsi untuk memisahkan/membentuk suatu ruang. Dalam pembangunan perpustakaan Banjar Wijaya, Desa Cipete, Kecamatan Pinang, Kota Tangerang, semua dindingnya menggunakan panel beton tipis dan bermotif. Penggunaan dinding beton tipis dimaksudkan untuk membuat bangunan semi permanen yang kuat dan tahan lama. Kuat dalam hal ini dinding tidak mudah pecah atau berlubang dan tahan lama yang artinya tahan terhadap serangan cuaca dan rayap. Rangka bangunan terbuat dari besi hollow galvanis, dengan metode sambungan baut dan las untuk menjamin kekuatan bangunan. Panel beton dipasang pada dinding bagian dalam dengan ketebalan 6 mm, plafon dengan ketebalan 4 mm, lantai dengan ketebalan 20 mm, dinding luar dengan ketebalan 4 mm. Semua pemasangan dilakukan dengan menggunakan baut untuk menghemat waktu dan biaya. Pada dinding luar, panel beton dilapisi panel beton bermotif kayu dengan ketebalan 6 mm untuk mempercantik tampilan bangunan perpustakaan. Gedung perpustakaan ini merupakan kerjasama antara warga RW 07, Kelurahan Cipete, Banjar Wijaya, Kota Tangerang, dan tim PKM Universitas Tarumanagara dari Program Studi S1 Teknik Sipil.

Kata Kunci: perpustakaan, gedung, panel, beton, galvanis

1. INTRODUCTION

Education is the main tool for raising living standards. With education, people can work, improve the economy, and participate in the social environment. In supporting education programs for a just society, the government provides non-formal and informal education channels through the development of non-formal and informal education centers and public libraries. Taman Bacaan or known by the abbreviation TB is a small-scale library known as a reading corner, reading house, smart house, and so on. In the technical guidelines for Community Reading Gardens issued by the Ministry of Education and Culture, reading gardens are places that promote reading habits that provide spaces for reading, discussing, reading books, writing, and other similar activities, complemented by reading materials, such as books, magazines, tabloids, newspapers, comics, and other multimedia materials, and supported by human resources who act as motivators [1]. The

existence of TB aims to assist community development in areas that are difficult to reach by formal educational institutions and public libraries.

2. PARTNER PROBLEMS

Currently, partners are building library facilities to increase children's interest in reading around housing. The building made by partners is a book storage room measuring 3×4 m^2. The building expected by the partners is a simple semi-permanent building, which is easy to renovate if needed urgently. In this case, partners have difficulty in determining the type of material used in the room. The partner area where the library room will be built is famous for termites, so partners do not dare to use wood-based walls. Apart from that, the walls of the room, which are made of wood or plywood, are easily weathered, especially if they are often exposed to water. It takes a lot of money and a long-time allocation to repair a library room with walls made of wood or plywood. If the walls of the room are made of brick, then the building becomes permanent, it is difficult for partners to renovate or shift the location of the room in the future. Apart from that, brick walls require expensive costs, in addition to the material costs, construction workers are also required. Special skills are required to do the work of the walls of the room when using brick walls. partners asked for help from the PKM team for the Untar Civil Engineering Study Program to find alternative solutions to solve the problems they faced.

3. IMPLEMENTATION METHOD

Stages/Steps of Land Area Solution

1. Working together with residents to level the land area where the library building was erected.
2. Prepare materials in the form of cement, sand, and crushed stone.
3. Working together with the residents to make the concrete floor of the library assisted by a professional handyman.

Stages/Steps of Framework Field Solution

1. Prepare materials in the form of lightweight concrete panels, galvanized hollow iron, wood, nails, bolts, and other supporting materials.
2. Assembling materials into a building, assisted by professional builders.

Partner Participation in PKM Activities

Partners participate in the form of preparing professional builders and residents to speed up the building construction process.

Table 1. Roles and expertise of each Team member

No.	Name	Expertise	Roles
1	Dr. Widodo Kushartomo	Concrete Technology	Socialization, coordination with RW management, and implementation.
2	Ariiq Ananta Lukman	Student	Implementation and documentation
3	Ahmad Septian Dewanto	Student	Implementation and documentation
4	Ester Stela Luwih Budi	Student	Implementation and documentation

4. RESULT

Library Building with walls in the form of concrete panels

Installation of concrete panels is carried out by experienced personnel and has been directed by the distributor. In the installation process, it is necessary to pay attention to the prepared framework, the length of the panels and the direction of the fiber of the concrete panels. These three things are important during the installation process so that there is no waste in the use of

concrete panels, strength and beauty. The results of the installation on the front are shown in Figure 1 below.

Figure 1. Plain Concrete Panel Installation

The installation of the panel board on the side of the library building is shown in Figure 2.

Figure 2. Installation of The Left Side Patterned Concrete Panel

The complete installation of concrete panels at the front of the library is shown in Figure 3. The number of bolts used to install the concrete panel boards must meet the adequacy to support the strength, so that the concrete panels can be installed firmly and neatly.

Figure 3. Installation of The Front Side Patterned Concrete Panels

The installation of concrete panel boards on the side of the library building is presented as shown in Figure 4 below. The panel boards are arranged in a stacked technique so that rainwater does not enter the interior of the library building.

Figure 4. Installation of Patterned Concrete Panels on The Right Side

In order to beautify the appearance of the building, painting is carried out using colors that describe wood motifs as shown in Figure 5, Figure 6 and Figure 7. Painting using oil-based materials is intended so that it does not fade when exposed to rain.

Figure 5. Front Side Patterned Concrete Panels Coloring

The painting of the side of the library building shows a more presentable and attractive appearance.

Figure 6. Left Side Patterned Concrete Panel Coloring

The final result of using concrete panel boards as walls of the Banjar Wijaya library is shown in Figure 7 below. Installation of concrete panel boards on all inner and outer surfaces, only takes 4 days. This shows that the use of panel boards is more effective when compared to brick walls in the installation process until the finishing stage. Not only fast in the installation process, strength and weather resistance can also be demonstrated by the concrete panel board.

Figure 7. Finishing of Concrete Panel

5. CONCLUSIONS and SUGGESTIONS

The use of concrete panels on the walls of the Banjar Wijaya people's library has the following benefits:

1. Installation of concrete panel boards requires expertise so that there is no waste during the installation process and shows good results
2. The number of bolts used in the process of installing the concrete panel board must be sufficient to support the strength, considering that the concrete panel board has a greater weight when compared to plywood or plywood.
3. Installation of concrete panel boards is made in stacks to prevent rainwater from entering the concrete building
4. Painting the outer and inner surfaces of the concrete panel board aims to avoid the growth of moss and fungus and add aesthetic value
5. The use of concrete panel boards in the Banjar Wijaya Library Building provides education to the public in the use of strong, durable and fast panel materials for installation.

REFERENCE

[1]. Andri N. 2020. *J. Pendidikan dan Kebudayaan*, **10** (3),282
[2]. Bosspanel, 2020. bosspanel.co.id
[3]. Arsitur Studio . 2020. *Arsitur.com*
[4]. Utomo, P. S., 2017. Jurusan T. Sipil ITS.
[5]. Cristiani, R., 2018. Prodi T. Sipil medan Area.