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Structural Planning Assistance for The Rehap of Jabal Nur Mosque, Takimpo Village

Muhammad Abdu[1]*, Aswad Asrasal[1], La Ode Achmad Suherman[1], Sakinah[1]

[1]Fakultas Teknik, Universitas Muhammadiyah Buton, Indonesia

Correspondence: abdumuhammad54744531@gmail.com

ABSTRACT

The purpose of community service is to assist the people of Takimpo Village in planning the structure of mosque buildings, so that the village government and mosque committees get an idea of the needs of the main structure in the mosque that is safe both from the condition of plates, beams, or columns. Meanwhile, in determining the structure, it cannot be determined by just any other than a civil engineer who must calculate the needs of both the quality, the dimensions of the repeating roof. To achieve this, the concept of design, structural planning is carried out by a team that carries out service so that the final results obtained are the calculation of the structure and work drawings of the structure of the jabal nur mosque in Takimpo Village, Pasarwajo District, Buton Regency

Keywords: *Civil Engineering; Structure; Work Drawings; Mosque; Takimpo*

1. Pendahuluan

Annisa, Ilham, et all (2020) explained that mosques are places of worship for Muslims. In Indonesia, mosque buildings are located in almost all regions of the archipelago with various forms, areas, and scales of services. In a residential neighborhood of about 2000 people, the required islamic religious worship facility is a mosque. According to SNI 03-1733-2004 the types of mosques are planned as follows, namely: 1. Population Group of 250 people, mushola is needed; 2 groups of residents of 2,500 people, mosques are provided; 3. A population group of 30,000 people, provided with a village mosque; 4. A population group of 120,000 people, provided with a subdistrict mosque.

Arie Wibada Baju and Rati Septiani Saraswati (2016) that in planning the construction of this mosque, it is necessary to conduct a good study, experienced, and have an adequate background in construction knowledge. However, when built independently without the assistance of an expert, the question arises about how to make design drawings, how to calculate the cost, how to power and structure the building.

Taking into account the above problems, assistance is needed by building experts who are experienced and have a background in construction knowledge (Catur Budi Setiawan, 2013).

2. Methodology

This service activity plan shows the steps taken from the beginning to the end of the service, namely as follows:

a) Field Survey

Field survey for data collection and measurement of the location of the mosque building plan that will be rehaped and built

b) Modeling Structure Analysis in sap2000

Identification of activities, space standards, space programs and conducting structural analysis of column buildings, beams and DAK domes of mosques

c) Creating a DED Design Drawing

This design drawing will later become the main reference for the construction of the mosque rehap

d) Partner Participation

The participation of partners in this devotion is to pay attention to the explanations of the planners about the building of the mosque.

e) Implementation Evalution Plan

After this service is held, it is hoped that the village government can collaborate with the Faculty of Engineering, University of Muhammadiyah Buton, using socialiasai or trainings to improve the performance of the Takimpo Village Government in the construction sector.

3. Result and Discussion

In the planning of the structure of the Takimpo mosque with an inner size of 16 m x 16.85 m and an outer size of 23.4m x 24.25m with a dome pole distance of 5.5 m and a dome diameter of 7.7 m were obtained, the results above are the results of a survey in the field based on the size of the initial mosque and for the planning stage, it is described as follows

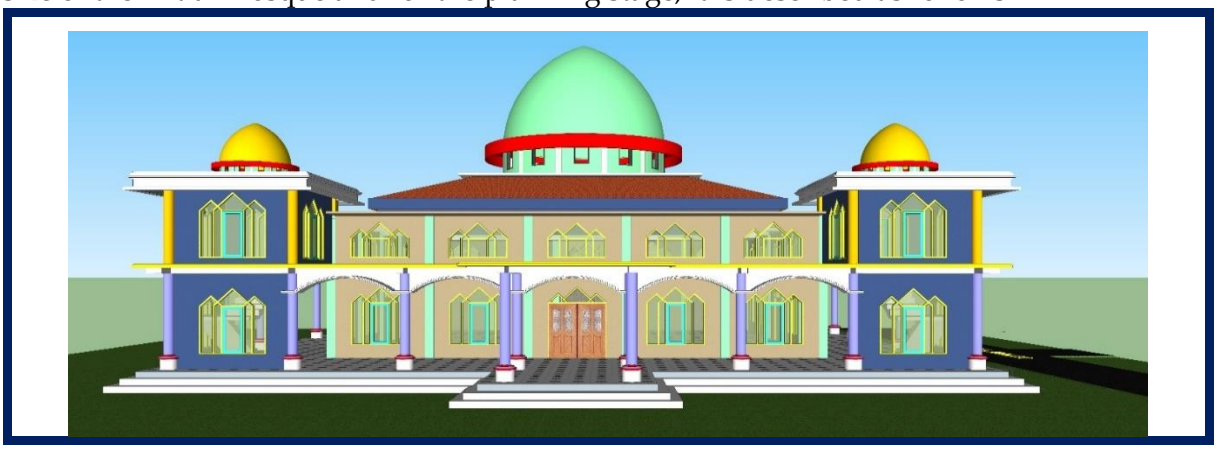

Figure 1. Front View 3d model

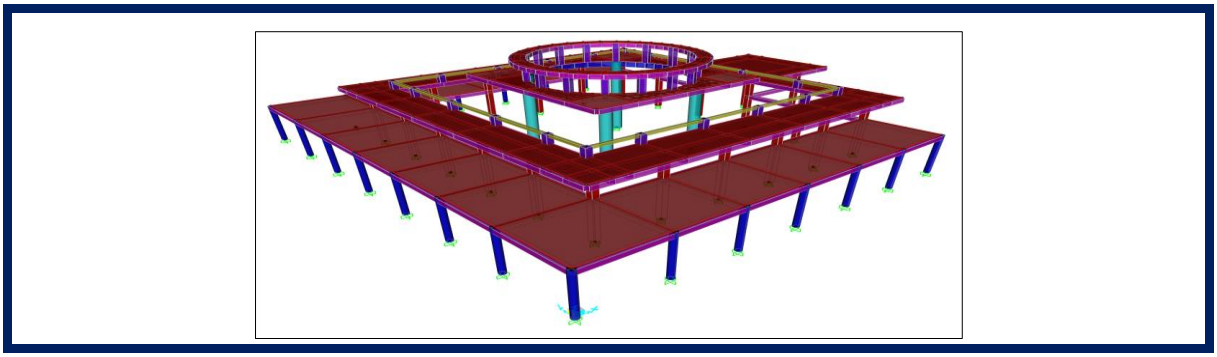

Figure 2. Modeling in sap2000 Software

3.1 Result

Based on the modeling and calculation of the structure, a detailed drawing of the structure of each part is obtained, both from columns, beams, and plates, the results of the analysis and modeling are drawn as follows:

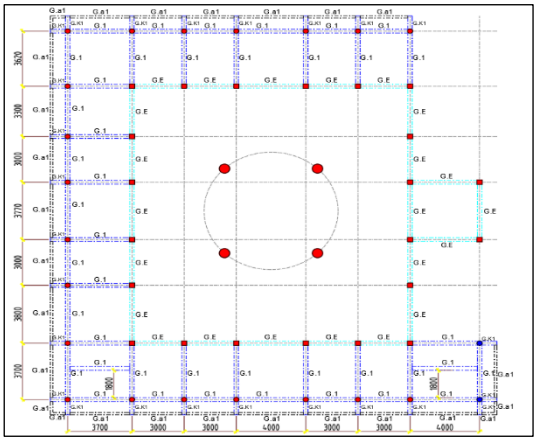

Figure 3. Beam Structure Plan Elv + 1.00m

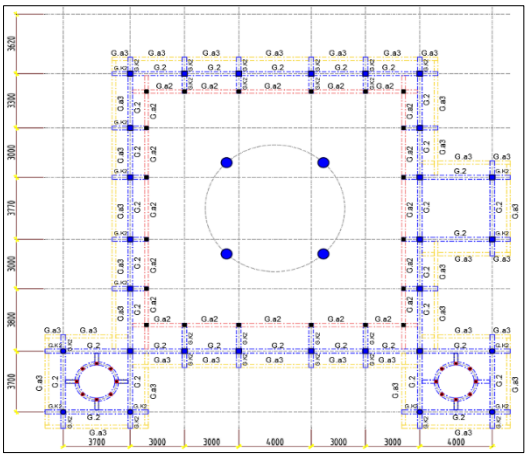

Figure 4. Beam Structure Plan Elv+ 4.75m

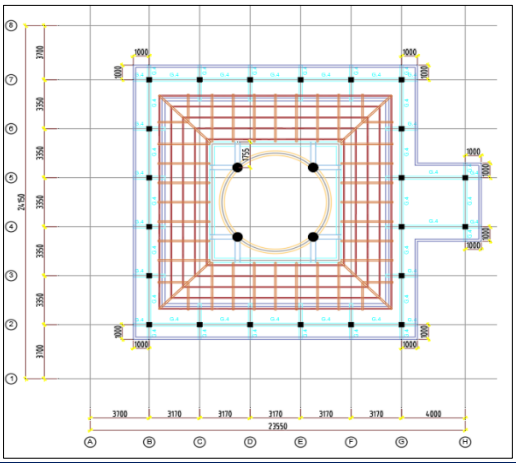

Figure 5. Beam Structure Plan Elv + 6.75m – 8.5m

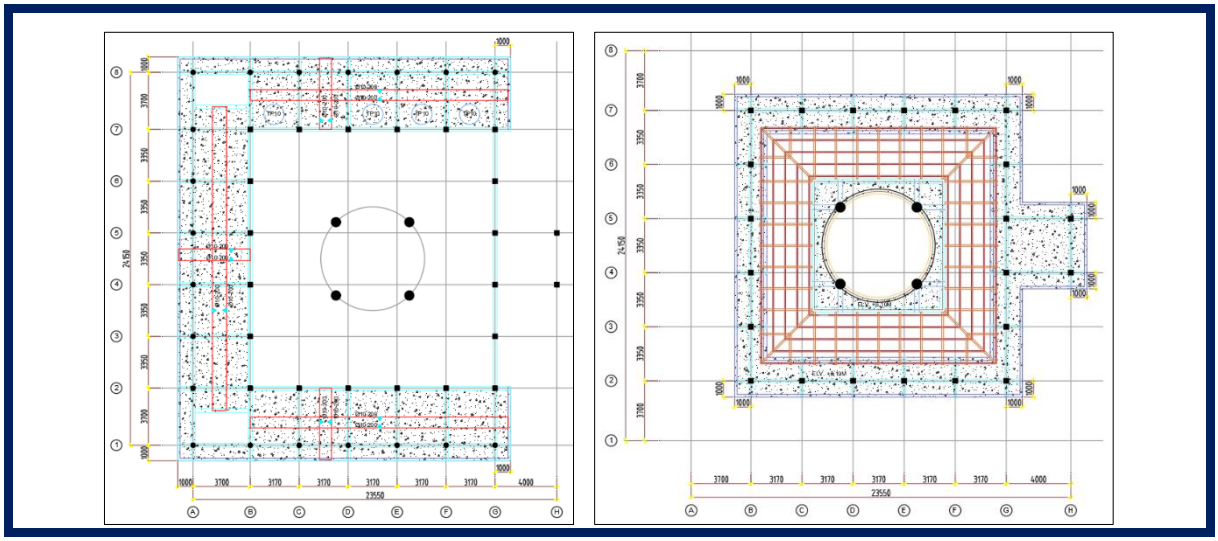

Figure 6. Plate Structure Plan and Looping

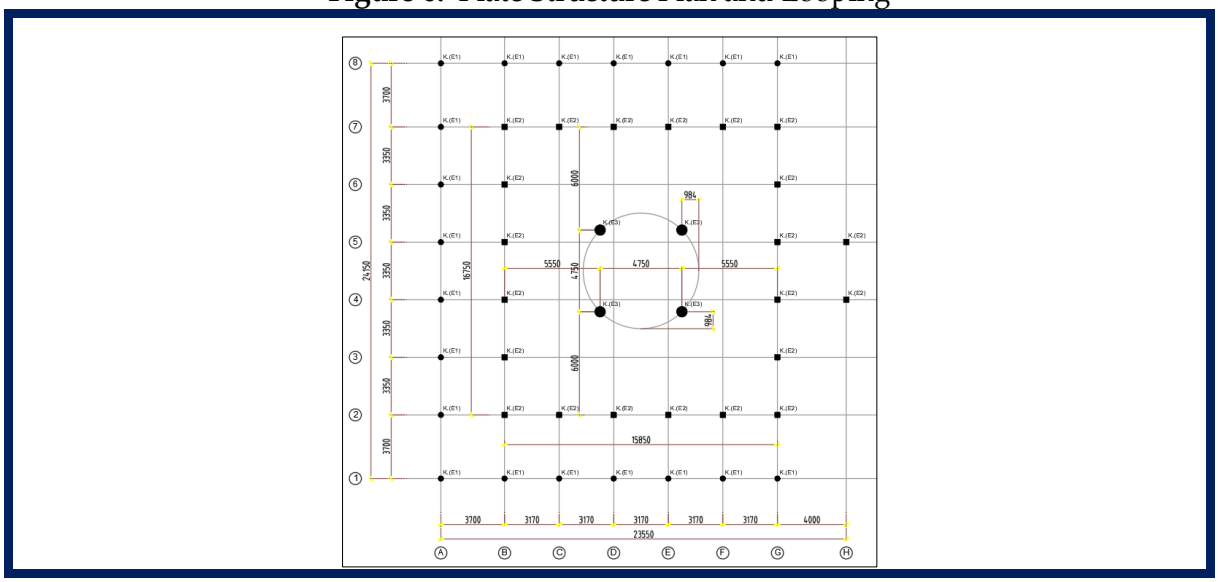

Figure 7. Column Structure Plan

3.2 Discussion

The result of the planning, both calculations and depictions of the structure of the Takimpo mosque, obtained structural dimensions, namely for the D600 dome column, and for other structural columns, namely 30x 30 cm, besides that the dimensions of the dome holding beam were also obtained, namely G25x50 and other beams as for the structure and repeater models as follows:

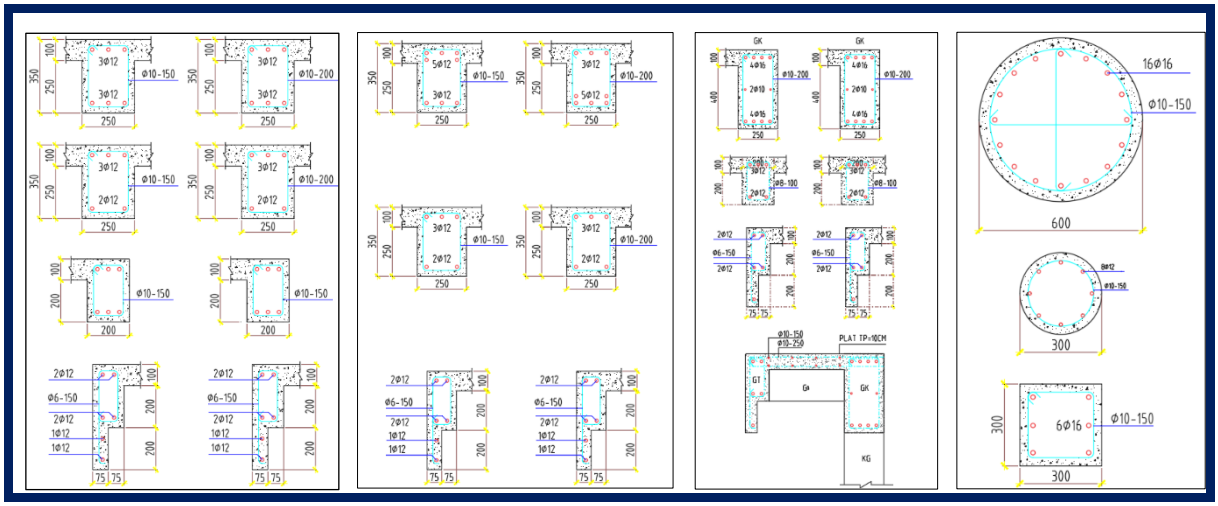

Figure 8. Details of Looping Beam and Column Structures

4. Conclusion

After this service is held, it is hoped that the takimpo village government can cooperate with the UM Buton engineering faculty regarding direct planning assistance, socialization, or training to improve the performance of the takimpo village government in the construction sector.

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