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Execution Method of Column Casting at Stan Bintaro Sector 5 Campus Dormitory

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Abstract: The method of implementation of column construction work is an important part in supporting the success of the building structure in the STAN Bintaro Sector 5 Campus Dormitory construction project. The column functions as the main vertical element that transmits loads from the upper structure to the foundation, so it requires proper planning and implementation, efficient, and according to technical standards. This practical work discusses the steps of implementing column work, starting from the preparation of tools and materials, formwork work, assembly and installation of reinforcement, concrete casting, to the curing process. In addition, it also discusses aspects of work safety, quality control, and obstacles that may occur in the field. With the application of structured work methods and strict supervision, it is expected that the quality of K1 column construction can meet the standards of strength, durability, and durability required in this dormitory construction project.

Keywords: Columns, implementation method, quality.

INTRODUCTION

Educational infrastructure development is one of the priorities in supporting the improvement of the quality of human resources in Indonesia. One of the strategic projects being implemented is the construction of a student dormitory on the STAN Bintaro Sector 5 campus. In the process of building a multi-storey building, the structural column becomes an important element because it functions to distribute the load from above to the foundation vertically. Therefore, the method of execution of column work, especially Columns, must be carefully planned and implemented in order to ensure the strength and stability of the overall structure.

In this project, the column work uses reinforced concrete with a certain quality determined based on the results of structural planning. The work method is prepared to ensure that all stages of work from reinforcement, formwork installation, casting, to formwork dismantling are carried out according to predetermined procedures and quality standards. In

addition, the implementation must also pay attention to work safety, time efficiency, and quality control of materials and work results.

Through this practical work, the author had the opportunity to be directly involved in the process of implementing construction work in the field, starting from the preparation stage, casting, to quality checking. This experience is the basis for the preparation of this report, with the aim of providing a technical description and analysis of the work methods used according to construction implementation standards.

In this study, we analyze the implementation methods of superstructure work to examine the casting system and safety aspects, as well as map all formwork, reinforcement, and casting areas in the dormitory construction project at STAN Campus, Bintaro.

RESEARCH METHODS

The research method used is data collection in the form of primary and secondary data. Primary data in the form of observation data and field observations. Observations were made during column work. While secondary data is data obtained from intermediary media, namely from PT Adi Karya-APG KSO, including shop drawing data, WMS (Work Method Statement). The object of observation is the K1 column work. The following is shown in the flow chart in Figure 1.

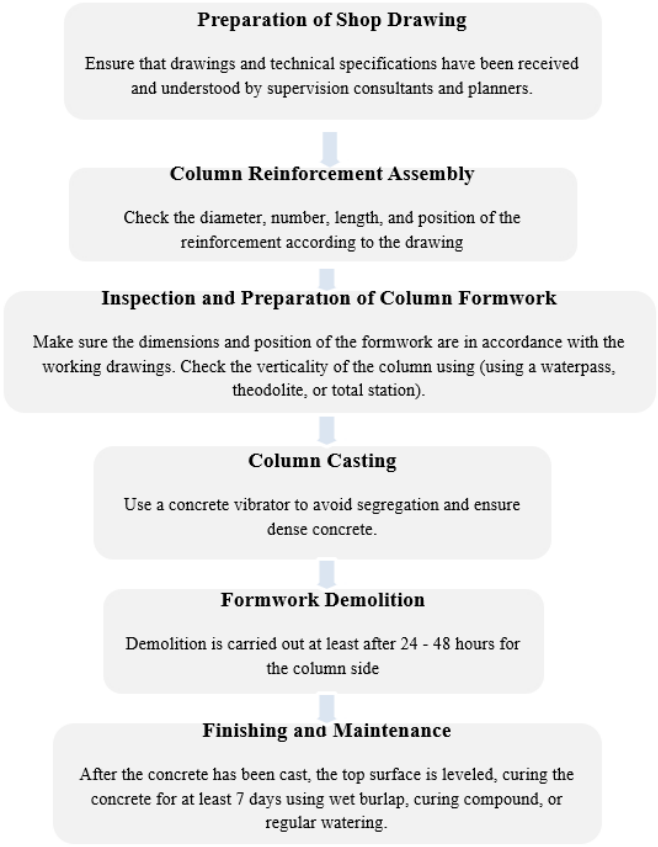

Figure 1. Flowchart of the research method.

RESULTS AND DISCUSSION

The method of carrying out work in a construction project is a technical method that describes the systematic work process carried out from start to finish consisting of the main work stages along with a description of how to work each type of main work activity that can be technically accounted for, and how the stages carried out must be relevant between the method of carrying out work with the schedule or timeframe for carrying out work and technical analysis of work units. In the preparation of the method of implementation of construction work must be in accordance with the substantive requirements that already exist and are set out in a document that describes mastery in the completion of the work from the initial work to the end. The following are the stages of work implementation:

Stage 1

- Fabrication of column *formwork*.
- Install the half panel with the help of the TC.
- Placed on the marking line.
- Reinforce the panel with adj.*Bracerss* and adj.*Kicker* av.
- Straighten the panel by adjusting the adj. *Brace* and adj.*Kicker*.

Stage 2

- Install the 2nd half panel assisted with TC.
- Reinforce the panel with adj.Bracerss and adj.Kicker av.
- Straighten the panel by adjusting the adj. Brace and adj.Kicker.

Stage 3

- Checking the firmness using the scissors by adjusting the adj.Brace and adj.Kicker.
- Final check of formwork and formwork firmness.
- Ready to cast and assisted with the vibrator tool.
- Ensure casting up to full column formwork (bottom level of slab).

Special Problems of Column Casting Method and Solutions

- The column preparation stage consists of:

Determination of column axle points using *theodolite* and *waterpass* tools with reference to BM (*benchmark*) points. The position of the column axle must be symmetrical with respect to the building.

- Steel Reinforcement

Steel reinforcement is the process of making reinforcement in building structures. This work is related to the work of concrete structural components such as main columns, beams, sloofs, plates, floors, and so on. In addition, the work of steel reinforcement is also always related to formwork installation activities and the casting process. Iron that has been cut in bent into reinforcement is assembled in the formwork. Figure 1 shows the bars reinforcement.

Figure 1. Reinforcing bars

Source: Practical Work Documentation

- *Formwork* Installation

Formwork is an absolute necessity in construction to help maintain quality and meet the requirements of stability, strength, rigidity and safety. Figure 2 shows the formwork installation in one of the working point.

Figure 2. Formwork Installation

Source: Practical Work Documentation

- Foundry

Casting is the work of pouring fresh concrete into a mold that has been fitted with a bone iron. To ensure that the mold has been installed according to plan, it is necessary to inspect the work before the casting process begins. In addition to this, it is also important to note that there are many other types of concrete that can be used in the construction industry, such as concrete batching plants, concrete pumps, concrete pumps, and concrete pumps. Figure 3 and 4 show the slump test and column casting processes, respectively.

Figure 3. Slump Test

Source: Practical Work Documentation

Figure 4. Column Casting

Source: Practical Work Documentation

The ready mix concrete mixture is put into the concrete bucket, after which it is directed to the desired location using a tower crane. During the casting process, it must be done carefully, especially the casting of this column; this vibrator must go all the way in at the meeting of the old concrete with the new concrete that will be cast, so that there are no failures such as porosity. As happened in the project, as shown in Figure 5.

Figure 5. Casting a Porous Column

Source: Practical Work Documentation

- Formwork Demolition

Formwork dismantling is carried out after 14 - 28 days of new work can be removed. The formwork is opened by loosening it by turning the push-pull and releasing the column formwork support, which is hooked to the cuttings and moved to the place that will be cast next. Figure 6 shows the formwork demolition process.

Figure 6. Demolition of Formwork

Source: Practical Work Documentation

SOLUTION TO SOLVE POROUS K1 COLUMN

Here's how to deal with porous columns: Patching (plaster), injection (inject with chemicals), and grouting (add with concrete mix and additives). However, this project uses the grouting method to repair it using the following method, as shown in Figure 7. The repair process for damage to the column is as follows:

- Remove the concrete that is still attached around the concrete fragments. Tap around the fragments to make sure there is no more concrete to peel off.
- Restrain the load on the column by placing wood or iron around the column.
- formwork is made around the perimeter of the column.
- Newly recast the chipped part of the column with a mixture of *concrete* and additives or using cement grout, in the project using sika grout so that the quality is like concrete.

Figure 7. Repair of Column K1

Source: Practical Work Documentation

CONCLUSIONS

In this study, the installation of concrete columns in a dormitory construction project by PT Adhi Karya APG - KSO is carried out through a structured and efficient method that emphasizes accuracy, safety, and stability. Stages included preparation of working drawings, assembly of column reinforcement, preparation and installation of column formwork, column casting, demolition, and maintenance. Field observations show that the use of appropriate tools, such as vibrators and column verticality checkers, contributes significantly to the quality of column work. Despite experiencing minor field problems such as concrete porosity appropriate remedial measures were taken, reflecting effective construction management. The practical

field experience provided valuable learning opportunities for students to bridge academic theory with industrial practice, particularly in the application of concrete column construction methods.

REFERENCES

Kukuh Lukiyanto. *Foreman, A Traditional Javanese Leadership Model in Modern Era Construction Projects*. Edited by Maranatha Wijayaningtiyas. Jakarta, 2016.

Muhammad Ridwan Prayoga, Adhi Purnomo, et al. "Analysis and Optimization of Concrete Structure Casting Time Management in Construction Projects: Case Study of Delay in Casting Columns, Beams, and Plates." *Tambusai Education* 8 (2024): 350-58.

Prayoga, Muhammad Ridwan, Adhi Pmomo, and Arief Saefudin. "Analysis and Optimization of Concrete Structure Casting Time Management in Construction Projects: Case Study of Delay in Casting Columns, Beams, and Plates." *Tambusai Journal of Education* 8 (2024): 350-58.

Rantung, Audy H P, Bonny F Sompie, and Robert J M Mandagi. "Analysis of Cost and Schedule Control at the Construction Implementation Stage with 'Earned Value Analysis'." *Scientific Journal of Media Engineering, Civil Engineering, Sam Ratulangi University Manado* 4, no. 3 (2014): 190-203. http://ejournal.unsrat.ac.id/index.php/jime/article/view/6396/5912.

Arais Sastra (2019) Method of Implementation of Column Work and Calculation of Concrete Volume of Semi Basement Floor Column As 31B (Gunadarma University).

Deva Agung Putra Pratama (2022) Review of the Method of Implementation of Beam, Column and Floor Plate Structures in the Indigenous Village Assembly (MDA) Building in Klungkung Regency (Politeknik Negeri Bali).

Mohammad Khoirun Nasikhin, Arik Triarso (2023) Implementation Method of Column Structure Work in the Passenger Terminal Building Construction Project of Dhoho Kediri International Airport (Surabaya State University).

Nida Nahdia Vilanti (2018) Implementation Method of Column Work Using Sateco Formwork and Analysis of Sateco Formwork Productivity at the Patra Jasa Cirebon Hotel Project (UGM).

Navy, Edward G, 1990, Reinforced Concrete A Basic Approach, PT Eresco, Bandung. Pamungkas, A. F. S., & Yasin, N. (2020). Method of Implementation, Column Work and Calculation

Column Casting Volume in Wijayakusma Independent Tower Project.

SKSNI T-15-1991-03 Procedure for Calculation of Concrete Structures for Building.

Sudarmoko, 1996. Design Diagram of Reinforced Concrete Columns, Department of Civil Engineering, Faculty of Engineering, Gadjah Mada University, Yogyakarta.