

ANALISIS PERBANDINGAN STRUKTUR PELAT CENDAWAN DENGAN PENEBALAN PELAT DAN KEPALA KOLON PADA GEDUNG INSPEKTORAT YOGYAKARTA

Alfri Putra Priatna^[1], Dwi Kurniati., S.T., M.T^[2]

^[1]^[2]Program Studi Teknik Sipil, Fakultas Sains dan Teknologi

Universitas Teknologi Yogyakarta

^[1]alfriputra23@gmail.com, ^[2]dwikurniatist@gmail.com

ABSTRAK

Pelat cendawan adalah konstruksi pelat dua arah dimana penggunaan balok dihilangkan, pelat bertumpu pada kolom dan beban dari pelat diteruskan oleh penebalan pelat atau kepala kolom lalu ditransfer ke kolom menerus sampai pondasi. Dalam penelitian ini dilakukan analisa perbandingan pelat cendawan dengan penebalan pelat dan pelat cendawan dengan kepala kolom pada Gedung Inspektorat Daerah Istimewa Yogyakarta untuk mengetahui dimensi struktur serta penulangan dari kolom, penebalan pelat, kepala kolom dan pelat. Metode perencanaan menggunakan SNI 1727:2020, SNI 1726:2019, SNI 2847:2019, Peta Sumber dan bahaya Gempa Indonesia 2017 dan pemodelan digunakan *software* Robot Structural Analysis Professional 2021. Hasil analisa struktur pelat cendawan dengan penebalan pelat memiliki periode 0,86 detik, tebal pelat lantai 180 mm dengan tulangan lajur kolom D13-100 dan lajur tengah D13-150. Tebal pelat atap 120 mm dengan tulangan lajur kolom D13-100 dan lajur tengah D13-125. Tinggi penebalan pelat 150 mm ukuran 1500 x 1500 mm dengan tulangan D13-150 di kedua arahnya, kolom 1 (600 x 600) 8D22, sengkang tumpuan D13-100, lapangan D13-150 dan kolom 2 (400 x 400) 8D16, sengkang tumpuan D13-100 dan lapangan D13-150. Sementara hasil analisa struktur gedung pelat cendawan dengan kepala kolom memiliki periode 1,19 detik, tebal pelat lantai 200 mm dengan tulangan lajur kolom D16-100 dan lajur tengah D16-150. Tebal pelat atap 150 mm dengan tulangan lajur kolom D13-100 dan lajur tengah D13-125. Ukuran kepala kolom 800 x 800 mm tinggi 800 mm, tulangan 16D16 dan sengkang D16-150, kolom 1 (600 x 600) 8D22, sengkang tumpuan D13-150 dan lapangan D13-200 serta kolom 2 (400 x 400) 8D16, sengkang tumpuan D13-100 dan lapangan D13-150. Lalu diketahui bahwa sistem pelat cendawan dengan kepala kolom lebih hemat 22,81% dan pelat cendawan dengan penebalan pelat adalah yang paling efisien yaitu lebih hemat 29,47%.

Kata Kunci: Gedung Inspektorat Yogyakarta, Kepala Kolom, Pelat Cendawan, Penebalan Pelat, Robot

COMPARISONAL ANALYSIS OF THE STRUCTURE OF THE FUNGUS PLATE WITH THE THICKNESS OF THE Slabs and Column Heads in the YOGYAKARTA INSPECTORATE BUILDING

Alfri Putra Priatna^[1], Dwi Kurniati., S.T., M.T^[2]

^[1]^[2] Civil Engineering Study Program, Faculty of Science and Technology

University of Technology Yogyakarta

^[1]alfriputra23@gmail.com, ^[2]dwikurniatist@gmail.com

ABSTRACT

Pile slab is a two-way slab construction in which the use of beams is removed, the slab rests on the column and the load from the slab is transmitted by thickening slabs or column heads and then transferred to the column continuously until the foundation. In this study, a comparative analysis of the fungus plate with plate thickness and the fungus plate with the column head was carried out at the Yogyakarta Special Region Inspectorate Building to determine the dimensions of the structure and reinforcement of the column, plate thickness, column head and plate. The planning method uses SNI 1727:2020, SNI 1726:2019, SNI 2847:2019, Source and Hazard Map of the 2017 Indonesian Earthquake and the modeling uses Robot Structural Analysis Professional 2021 software. The results of the analysis of the structure of the fungus plate with plate thickness have a period of 0.86 seconds, 180 mm thick floor slab with column reinforcement D13-100 and center column D13-150. The roof slab is 120 mm thick with column reinforcement D13-100 and center column D13-125. Thickening plate height 150 mm measuring 1500 x 1500 mm with D13-150 reinforcement in both directions, column 1 (600 x 600) 8D22, support stirrups D13-100, field D13-150 and column 2 (400 x 400) 8D16, support stirrups D13-100 and field D13-150. While the results of the analysis of the structure of the mushroom plate building with the column head has a period of 1.19 seconds, the floor slab thickness is 200 mm with column reinforcement D16-100 and the middle column D16-150. The roof slab is 150 mm thick with column reinforcement D13-100 and center column D13-125. Column head size 800 x 800 mm high 800 mm, reinforcement 16D16 and stirrups D16-150, column 1 (600 x 600) 8D22, support stirrups D13-150 and field D13-200 and column 2 (400 x 400) 8D16, support stirrups D13-100 and field D13-150. Then it is known that the fungal plate system with column heads is 22.81% more efficient and the fungal plate with plate thickening is the most efficient, which is 29.47% more efficient.

Keywords: Yogyakarta Inspectorate Building, Column Head, Fungus Plate, Plate Thickening, Robot