

“STUDI EKSPERIMENTAL PERBANDINGAN KAPASITAS SLAB ON GROUND BERTULANGAN WIREMESH BAJA D8 DAN GFRP MESH D8”

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ABSTRAK

Slab on Ground (SoG) merupakan pelat beton yang banyak digunakan pada lantai gudang, area parkir, dan bangunan industri sehingga memerlukan tulangan untuk meningkatkan kapasitas beban, mengendalikan lendutan, serta membatasi perkembangan retak. Penelitian ini bertujuan membandingkan kinerja Slab on Ground yang menggunakan Wiremesh Baja D8 dan GFRP Mesh D8 terhadap pembebanan terpusat berdasarkan kapasitas beban maksimum, lendutan, dan pola retak. Penelitian dilakukan secara eksperimental di Laboratorium Politeknik Negeri Bengkalis menggunakan empat benda uji berukuran $400 \times 400 \times 100$ mm dengan mutu beton f'_c 25 MPa, terdiri atas dua pelat bertulangan Wiremesh Baja D8 dan dua pelat bertulangan GFRP Mesh D8. Sebelum pengujian, lapisan Base B dipadatkan dan diuji menggunakan metode Sand Cone dengan tingkat kepadatan lapangan sebesar 74%. Pengujian dilakukan pada umur beton 28 hari menggunakan piston hidrolik dengan pengamatan terhadap beban maksimum, lendutan, dan pola retak. Hasil penelitian menunjukkan bahwa kapasitas beban maksimum Wiremesh Baja sebesar 154 kN dan 167 kN, sedangkan GFRP Mesh sebesar 167 kN dan 175 kN. Lendutan maksimum Wiremesh berkisar 16–17 mm, sedangkan GFRP Mesh 18–24 mm. Pola retak kedua variasi diawali dari titik pembebanan dan berkembang menuju tepi pelat. Berdasarkan hasil tersebut, GFRP Mesh mampu memberikan kapasitas beban yang lebih tinggi dibandingkan Wiremesh Baja, namun menghasilkan lendutan yang lebih besar sehingga berpotensi menjadi alternatif tulangan pada Slab on Ground.

Kata kunci: Slab on Ground, GFRP Mesh, Wiremesh Baja, kapasitas beban, lendutan, pola retak.

“EXPERIMENTAL STUDY COMPARING THE CAPACITY OF SLABS ON GROUND REINFORCED WITH D8 STEEL WIRE MESH AND D8 GFRP MESH D8”

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ABSTRACT

Slab on Ground (SoG) is a concrete slab widely used in warehouses, parking areas, and industrial buildings. Reinforcement is required to improve its load-carrying capacity, control deflection, and limit crack development. This study aimed to compare the performance of Slab on Ground reinforced with D8 Steel Wire Mesh and D8 GFRP Mesh under concentrated loading in terms of maximum load capacity, deflection, and crack pattern. An experimental method was employed using four concrete slab specimens measuring $400 \times 400 \times 100$ mm with a design compressive strength of 25 MPa, consisting of two specimens reinforced with D8 Steel Wire Mesh and two specimens reinforced with D8 GFRP Mesh. Prior to testing, the Base B layer was compacted and evaluated using the Sand Cone method, resulting in a field compaction degree of 74%. The specimens were tested at the age of 28 days using a hydraulic piston, while the maximum load, deflection, and crack patterns were observed. The results showed that the maximum load capacities of the steel wire mesh specimens were 154 kN and 167 kN, whereas those of the GFRP mesh specimens were 167 kN and 175 kN. The maximum deflection of the steel wire mesh specimens ranged from 16–17 mm, while the GFRP mesh specimens ranged from 18–24 mm. Crack propagation in both reinforcement types initiated at the loading point and extended toward the slab edges. These findings indicate that GFRP Mesh provides higher load-carrying capacity than steel wire mesh but results in greater deflection, making it a promising alternative reinforcement for Slab on Ground.

Keywords: *Slab on Ground, GFRP Mesh, Steel Wire Mesh, load-carrying capacity, deflection, crack pattern.*

