ABSTRAK

IDENTIFIKASI POLA RETAKAN BETON DI DERMAGA PELINDO, LAMPUNG MENGGUNAKAN METODE *GROUND PENETRATING RADAR* (GPR)

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Ground Penetrating Radar (GPR) merupakan salah satu metode geofisika non-destruktif yang digunakan untuk mendeteksi kondisi internal beton bertulang. Penelitian ini dilakukan di Dermaga Pelindo Panjang, Lampung, dengan menggunakan alat AKULA 9000C berfrekuensi 1 Ghz. Data akuisisi diolah menggunakan software ReflexW sebanyak 15 lintasan. Tujuan utama penelitian ini yaitu untuk mengidentifikasi retakan beton, deformasi, dan juga korosi tulangan beton melalui analisis amplitudo radargram. Berdasarkan hasil pengolahan dan interpretasi data *Ground Penetrating Radar* (GPR), teridentifikasi adanya kerusakan internal pada struktur beton. Indikasi retakan ditemukan pada kedalaman 0–1,5 meter pada bagian pelat atau balok atas, ditunjukkan oleh refleksi radar yang tidak kontinu dengan perubahan amplitudo ±30–60%. Deformasi beton terdeteksi pada kedalaman 0,5–1,5 meter yang ditandai oleh distorsi pola refleksi radar. Selain itu, indikasi korosi tulangan teridentifikasi pada zona tulangan balok atau kolom bawah pada kedalaman 0,6–1,6 meter, dengan perubahan amplitudo tidak seragam sebesar ±20–50%. Kondisi ini diduga berkaitan dengan masuknya air dan zat agresif melalui retakan beton. Hasil penelitian menunjukkan bahwa metode GPR efektif dalam mengidentifikasi retakan, deformasi, dan potensi korosi tulangan secara non-destruktif.

Kata kunci: *ground penetrating radar* (GPR), analisis amplitudo, beton bertulang, kerusakan struktural, metode non-destruktif.

ABSTRACT

IDENTIFICATION OF CONCRETE CRACK PATTERNS AT THE PELINDO PIER, LAMPUNG USING THE GROUND PENETRATING RADAR (GPR) METHOD

By

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Ground Penetrating Radar (GPR) is a non-destructive geophysical method used to detect the internal condition of reinforced concrete. This study was conducted at Pelindo Panjang Pier, Lampung, using a 1 GHz AKULA 9000C device. The acquired data was processed using ReflexW software for 15 traverses. The main objective of this study was to identify concrete cracks, deformations, and corrosion of concrete reinforcement through radargram amplitude analysis. Based on the results of processing and interpreting Ground Penetrating Radar (GPR) data, internal damage to the concrete structure was identified. Indications of cracks were found at a depth of 0–1.5 meters in the slab or upper beam, as indicated by discontinuous radar reflections with amplitude changes of ±30–60%. Concrete deformation was detected at a depth of 0.5–1.5 meters, marked by distortion of the radar reflection pattern. In addition, indications of reinforcement corrosion were identified in the lower beam or column reinforcement zone at a depth of 0.6–1.6 meters, with uneven amplitude changes of ±20–50%. This condition is thought to be related to the ingress of water and aggressive substances through concrete cracks. The results of the study show that the GPR method is effective in non-destructively identifying cracks, deformation, and potential reinforcement corrosion.

Key words: ground penetrating radar (GPR), amplitude analysis, reinforced concrete, structural damage, non-destructive methods.