

# Studi Komparasi Uji Non-Destruktif dengan Alat Ultraportable Ground Penetrating Radar, Profometer, Ultrasonic Pulse Velocity, dan Ultrasonic Tomograph Portable pada Struktur Pelat Beton = Comparative Study of Non-Destructive Tests with Ultraportable Ground Penetrating Radar, Profometer, Ultrasonic Pulse Velocity, and Ultrasonic Tomograph Portable on Concrete Slab Structural

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## Abstrak

Perkembangan teknologi alat investigasi mutu struktur bangunan beton terus berkembang digunakan untuk melakukan pengujian dalam mengevaluasi tulangan dan ketebalan selimut beton dalam beton bertulang tanpa merusak struktur (Non Destructive Test). Alat yang umum digunakan yaitu Profometer dan Ultraportable Ground Penetrating Radar. Dengan perbedaan prinsip kerja, dalam penelitian ini dilakukan studi evaluasi ketebalan selimut beton, identifikasi tulangan dan material isolator, dengan membandingkan hasil pengujian alat profometer, ultraportable ground penetrating radar terhadap struktur pelat lantai ukuran 2x2 m, Hasil pengujian ground penetrating radar dapat divisualisasikan 3D dengan waktu singkat dan lebih diandalkan pendeteksian tulangan bertumpuk juga material isolator. Adapun alat untuk mengukur kecepatan rambat dalam beton menggunakan prinsip transmisi ultrasonik yaitu ultrasonic pulse velocity dan prinsip pulsed echo method (PE) yaitu ultrasonic tomograph portable yang digunakan dalam penelitian ini untuk membandingkan pembacaan pancaran gelombang longitudinal dan transversal pada struktur pelat lantai beton. Tampilan pemrosesan data ultrasonic tomograph portable menggunakan teknologi SAFT (synthetic aperture focusing technique) sehingga selain dapat menghasilkan kecepatan shearwave alat ini dapat menentukan tulangan. Hasil pengujian ultrasonic tomograph portable menunjukkan kecepatan yang lebih konstan dibandingkan ultrasonic pulse velocity dengan konfigurasi indirect pada struktur pelat beton. ....The development of technology for investigating the quality of concrete structures continues to develop and used to evaluate reinforcement and thickness of the concrete cover in reinforced concrete without damaging the structure (Non Destructive Test). Commonly used tools are Profometer and Ultraportable Ground Penetrating Radar. With different working principles, in this research, a study of the thickness evaluation of the concrete cover, identification of reinforcement and insulating material was carried out, by comparing the results of the profometer, GPR to the 2x2 m floor slab structure. The results of the GPR can be visualized in 3D in a short time and more reliable in detecting stacked reinforcement as well as insulating material. The tool to measure the propagation speed in concrete uses the ultrasonic transmission principle, ultrasonic pulse velocity and the pulsed echo method principle, the ultrasonic tomograph portable used in this study to compare the readings of longitudinal and transverse waves on the concrete floor slab structure. Ultrasonic tomograph portable data processing uses SAFT technology, in addition producing shearwave speed, this tool can determine reinforcement. The results of the ultrasonic tomograph portable show more constant speed than the UPV with indirect configuration on the concrete slab structure.