



**REINFORCEMENT BAR MEASUREMENT IN  
STRUCTURAL CONCRETE USING ULTRASONIC  
METHOD**

**MOHD BADRUL HISYAM BIN MD ALI**

**(2002388667)**

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**Faculty of Mechanical Engineering  
Universiti Teknologi MARA (UiTM)**

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## ABSTRACT

Rebar diameter in structural concrete is an important parameter for a structural engineer to calculate the strength of certain construction. For construction, the critical area for structure is at beam, column and slab. At present only Radiography is the reliable and accurate non-destructive method for rebars diameter determination. However, radiography requires accessibility for placement of radiation source and film from both side of the object to be tested and this is not applicable for certain concrete member such as floor slab. In this ultrasonic method, a water column was designed to allow propagation of longitudinal wave into the rebar. A hole of about 15mm diameter was drilled into concrete until it reaches the bar to allow water column to be inserted. Experiment on the laboratory test sample was performed on several rebars of different diameters. At the end of the project, it is observed that UT method is able to gives that accurate bar sizing in concrete. The result of the measurement is in range below than  $\pm 5\%$ . However in these rebar measurement; the output was influenced by numbers of parameters such as Size and shape of the specimen, the distance between rebar, the density or the moisture of the concrete and rebar, the depth of the bar from the surface and temperature. All the parameters need to be considered in order to get a better result. The main parameter which influenced the result is the size of the rebar.

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