

UNIVERSITY OF NAIROBI

ASSESSMENT OF THE POSITION AND DEPTH OF REBARS USING NON-DESTRUCTIVE TECHNIQUES IN AN EXISTING CONCRETE ELEMENT

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Abstract

Non destructive testing is a method of structural health monitoring that involves assessing the structural health of a building without damaging it thus allowing its uninterrupted use. The project involved the use of visual inspection and a covermeter with the objectives of calibrating the equipment, learning how to use it and determining both the cover and size of rebars. The covermeter uses the principle of electromagnetic pulse induction to locate rebars and the model used (Profometer 5+) was said to have a range of up to 180mm, however during tests we were not able to measure cover greater than 55mm..

The methodology was based on the user's manual and BS1881 part 204 to ensure that measurements are in line with the codes. The measuring range was determined to be 120mm so that the range of accuracy remained within +/- 2mm, but as stated above during measurement the device was unable to give bar diameters for covers greater than 55mm.

The sample size was determined to be six columns as the representative 10% of all columns in the first floor of the civil engineering block. Their selection was based on factors such as their accessibility and location. The measurement process was simple to obtain the cover and it was determined to be greater than the nominal cover provided in BS8110 for all columns. The cover is thus sufficient, although there are some cracks and chipped column ends that require the use of other methods of NDT such as X-ray imaging (radiography) to properly determine the structural health of the columns. The measurement of bar diameter was more difficult and this was attributed to factors such as inexperience on the part of the operator, the possible magnetic properties of the aggregates used in construction and the lack of drawings.

All in all the project was deemed successful as the cover and bar diameters were determined. The equipment was well understood and calibrated as well as the determination of the importance of structural health monitoring.

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