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Magnetic Survey for the Delineation of Concrete Pillars in Geotechnical Investigation for Site Characterization

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Abstract : A magnetic survey is carried out in order to locate the remains of construction items, specifically concrete pillars. The conventional Euler deconvolution technique can perform the task but it requires the use of fixed structural index (SI) and the construction items are made of materials with different shapes which require different SI (unknown). A Euler deconvolution technique that estimate background, horizontal coordinate (xo and yo), depth and structural index (SI) simultaneously is prepared and used for this task. The synthetic model study carried indicated the new methodology can give a good estimate of location and does not depend on magnetic latitude. For field data, both the total magnetic field and gradiometer reading had been collected simultaneously. The computed vertical derivatives and gradiometer readings are compared and they have shown good correlation signifying the effectiveness of the method. The filtering is carried out using automated procedure, analytic signal and other traditional techniques. The clustered depth solutions coincided with the high amplitude/values of analytic signal and these are the possible target positions of the concrete pillars being sought. The targets under investigation are interpreted to be located at the depth between 2.8 to 9.4 meters. More follow up survey is recommended as this mark the preliminary stage of the work.

Keywords : concrete pillar, magnetic survey, geotechnical investigation, Euler Deconvolution
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