



## MEASUREMENT OF STRESS-STRAIN RESPONSE OF A RAMMED EARTH PRISM IN COMPRESSION USING FIBER BRAGG GRATING SENSORS

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*Abstract: A comparative study of strain response and mechanical properties of rammed earth prisms, has been made using Fiber Bragg Grating (FBG) sensors (optical) and clip-on extensometer (electro-mechanical). The aim of this study is to address the merits and demerits of traditional extensometer vis-à-vis FBG sensor; a uni-axial compression test has been performed on a rammed earth prism to validate its structural properties from the stress - strain curves obtained by two different methods of measurement. An array of FBG sensors on a single fiber with varying Bragg wavelengths ( $\lambda_B$ ), has been used to spatially resolve the strains along the height of the specimen. It is interesting to note from the obtained stress-strain curves that the initial tangent modulus obtained using the FBG sensor is lower compared to that obtained using clip-on extensometer. The results also indicate that the strains measured by both FBG and extensometer sensor follow the same trend and both the sensors register the maximum strain value at the same time.*

**Index terms:** Fiber Bragg grating sensors, uni axial compression, rammed earth, stress strain response.