Baseline-free Absolute Strain Estimation for Submerged Floating Tunnel

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ABSTRACT

This paper proposes a baseline-free absolute strain estimation technique based on the acoustoelastic effect of the ultrasonic wave for the submerged floating tunnel. Two macro fiber composites (MFC) transducers are installed on the tension leg of the submerged floating tunnel for the generation and measurement of the ultrasonic wave. In addition, one strain gauge is used to obtain the relative strain generated additionally after installing the MFC transducers and strain gauge. The absolute strain is estimated using the ultrasonic wave velocity and the relative strain without the baseline data obtained from the known absolute strain level.
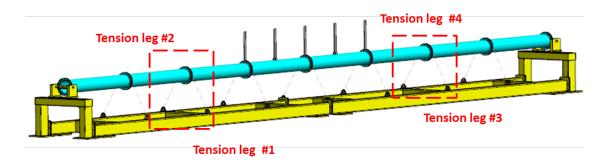
Fig. 1 Geometry of submerged floating tunnel

REFERENCES

Ohjun Kwon, Hoon Sohn, Hyung Jin Lim (2022), "Ultrasonic-based tensile force estimation for cylindrical rod at various temperature conditions", *Eng Struct,* 265, 114509.
Courtney TH, "Mechanical Behavior of Materials", Waveland Pr. Inc. 2005

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