

## **Shear behavior of unbonded post-tensioned beam with greased sheathed-strand tendon**

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### **ABSTRACT**

In response to the demand for high durability, regular inspection, and maintenance, the post-tensioning (PT) method using greased sheathed-strand (GSS) tendons has started to be used for nuclear containment buildings in Russia and India, and tested in France and Korea. The GSS tendon is composed of three-layer filling materials of cement grout, high-density polyethylene (HDPE) sheath, and grease inside the PT duct, which is distinguished from the ordinary unbonded multi-strand tendon that is filled only with flexible fillers (i.e., grease or wax). Due to the composition, the shear resistance behavior of PT members with GSS tendon is expected to be different from that of the unbonded tendon.

In this study, a series of shear tests were conducted for six PT beams with bonded, unbonded, and GSS tendons, having the same design parameters, except the tendon type. The effects of cement grout filling and corresponding effective web width on shear resistance behavior are analyzed. Based on the test results, current code provisions on PT beam shear strength and effective web width, such as ACI Committee 318 (2019) and AASHTO (2017), are compared and discussed.

### **REFERENCES**

- AASHTO (2017), AASHTO LRFD bridge design specifications, 8th Ed., American Association of State Highway and Transportation Officials, Washington, DC.  
ACI Committee 318 (2019), Building code requirements for structural concrete (ACI 318-19), American Concrete Institute, Farmington Hills, MI.

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