

## **Tendon Stress Increment in Post-Tensioned Members with GSS Tendons**

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### **ABSTRACT**

The greased-sheathed strand (GSS) tendon technique is increasingly being adopted to enhance the long-term durability and maintenance efficacy of the post-tensioning (PT) system. The GSS tendon method involves inserting high-density polyethylene (HDPE)-sheathed strands into a PT duct and subsequently filling it with cement grout. This configuration yields structural properties distinct from those of conventional bonded and unbonded tendons. Despite its growing application, there is a notable gap in research primarily having been addressed its construction aspects. This lack of validation underlines the necessity for extensive performance evaluation studies and updating code provisions to accommodate the unique attributes of GSS tendons.

This research explored the flexural behavior of GSS tendon members. Flexural tests were conducted on two-span continuous PT beams with different tendon methods and profiles. The GSS tendon members, which were post-tensioned after grouting, showed a gravitational concentration of strands within the PT duct. This led to higher tendon stress at ultimate ( $f_{ps}$ ) and flexural strength than the conventional unbonded PT members with the same details. The findings suggest that the code provisions for strand eccentricity within the PT duct (**AASHTO, 2017**) should be updated to account for the gravitational eccentricity characteristics of GSS tendons.

### **REFERENCES**

AASHTO (2017), *AASHTO LRFD Bridge Design Specifications, 8th Ed.*, American Association of State Highway and Transportation Officials, Washington, DC.

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