

Development of hybrid H-beam – precast (PC) column joints and PC girder-composite column joint

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ABSTRACT

This paper presents a non-linear finite element (FE) analysis of hybrid H-beam-column joints fabricated from a PC column and H-beam. The hybrid beam-column joints at the shear panel zone also include shear studs in the beam web and beam flange. In addition, an FE model of a PC girder- composite box column joint is built and analysed to verify the structural integrity of the PC girder- composite box column joint. The main objective of the current research project is to undertake a preliminary analysis of the innovative hybrid joints under static loading. In this current paper, the moment resisting behaviour of the hybrid joints, the yielding behaviour of steel in the shear panel zones of the joints and concrete crack pattern under maximum load are investigated. The FE results herein would help to produce future design recommendations for the hybrid beam-column joints.

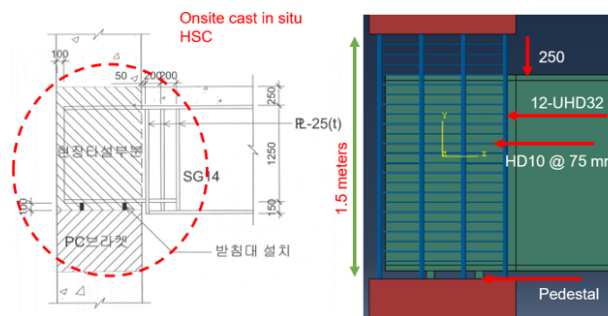


Fig. 1 A side view of a H-beam - PC column joint.

REFERENCES

- Kim, S.E. and Nguyen, H.T. (2010), "Finite element modeling and analysis of a hybrid steel-PSC beam connection", *Engineering Structures*. **32**(9), 2557-2569.
- Zhang, J., Ding, C., Rong, X., Yang, H. and Li, Y. (2020), "Development and experimental investigation of hybrid precast concrete beam-column joints", *Engineering Structures*. **219** 110922.

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