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[\[PDF \(641K\)\]](#) [\[References\]](#)**ANALYSIS OF CORRUGATED STEEL WEB GIRDERS BY AN EFFICIENT BEAM BENDING THEORY**Chawalit MACHIMDAMRONG¹⁾, Eiichi WATANABE¹⁾ and Tomoaki UTSUNOMIYA¹⁾

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An elastic beam bending theory for analysis of prestressed concrete girders with corrugated steel web is derived by the application of the variational principle. The theory is a shear deformable beam theory which is based on three displacement fields and is similar to the classical Timoshenko beam theory. A two-node linear finite element with full and reduced integration of the theory is provided. It is then used to analyze simply supported and continuous I- and box-girders. Their predicted results are found in good agreement with those by the 3D finite element analysis. A simplified theory which is similar to the proposed theory by Kato *et al.* (2002) is also discussed and included in appendix.

Key Words: shear deformable beam bending theory, corrugated steel web, variational principle, finite element analysis, reduced integration

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