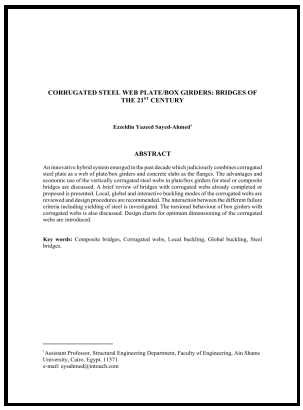
Corrugated webs and lateral restraints in plate girders for bridges

typescript - Design of beams in composite bridges



CORRUGATED STEEL WEB PLATE/BOX GIRDERS: BRIDGES OF THE 21ST CENTURY

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ABSTRACT

An innovative hybrid system emerged in the past decade which judiciously combines corrugated steel plate as a web of plate/box girders and concrete slabs as the flanges. The advantages and economic use of the vertically corrugated steel webs in plate/box girders for steel or composite bridges are discussed. A brief review of bridges with corrugated webs already completed or proposed is presented. Local, global and interactive buckling modes of the corrugated webs are reviewed and design procedures are recommended. The interaction between the different failure criteria including yielding of steel is investigated. The torsional behaviour of box girders with corrugated webs is also discussed. Design charts for optimum dimensioning of the corrugated webs are introduced.

Key words: Composite bridges, Corrugated webs, Local buckling, Global buckling, Steel bridges.

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Horizontally curved composite plate girders with trapezoidally corrugated webs

In seismic design, the fundamental vibration period is generally estimated by empirical formulae corresponding to different types of lateral force-resisting systems.

Corrugated webs in plate girders for bridges

The impact of yield strength and random cross-sectional area of flanges on bending resistance of girders with corrugated web was shown. Where varies thicker elements generally have a lower the resistance moment should be determined directly from the plastic stress blocks.

Plate Girder Bridges

There are limitations in the span of these types of bridges. Experimentally determined partial factor of yield strength γ m values were within the range 1.

Using Steel Corrugated Webs in Bridge Girders for Stability & Stiffness

The different characteristics of the stress distribution in the flange and web plates have an effect on the bending and shear resistance, which can be considered in the design.

[PDF] Corrugated web steel girders

The possible effect on displacements particularly of long girders is an important parameter. If the limiting fibre is on the tensile side, partial plastification of the tension zone of the web may be considered, although this is often ignored.

Composite Bridges Contructed With Corrugated Steel Web Box Girders

The counterweights fixed on the bridge helps the movement of the bridge in the vertical direction. Howe Truss Bridge Hower truss could be constructed from timber iron or steel. The tested group of corrugated web girders included eighteen girders with flanges of 300 x 15 mm, and two girders with flanges of 300 x 20 mm Table.

Different Types of Bridges

Torsional Behavior Compared with conventional PC box girders, the out-plane-stiffness of corrugated steel webs is relatively small, and hence cross-sections with corrugated steel webs tend to distort easily. Later they were mostly constructed from steel, concrete, and timber.

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