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**Stress boundary conditions for plate bending.** (English) [Zbl 1039.74031](#)

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Summary: The determination of appropriate boundary conditions for a two-dimensional theory of elastic flat plates (and shells) consistent with the expected order of accuracy of the theory is both critical and challenging. Here the reciprocal theorem of elasticity is applied in a novel way to obtain the appropriate stress boundary conditions for plate bending accurate to all orders (with respect to the usual dimensionless thickness parameter) for plates of general edge geometry and loading. Kirchhoff's contracted stress boundary conditions are shown to be consistent with a leading term (thin plate) approximation theory, but the more general results obtained herein are needed for higher-order theories.

**MSC:**

[74K20](#) Plates

Cited in **2** Reviews  
Cited in **6** Documents

**Keywords:**

reciprocal theorem of elasticity; dimensionless thickness parameter; Kirchhoff's contracted stress boundary conditions

**Full Text:** [DOI](#)