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MEMORANDUM

Date: December 2, 2005

Subject: **Strength Increase from Cold Work of Forming,
Safety Factors and Bending Stresses**

From: Unistrut Engineering

The American Iron and Steel Institute (AISI) Specification for the Design of Cold-Formed Steel Structural Members recognizes that yield strength increases during cold forming. Section A7 of AISI allows substitution of the increased strength for virgin yield strength when designing cold-formed members.

Unistrut uses ASTM A1011 SS GR33 steel strip for forming channels. This material has virgin yield strength of 33,000 psi. Tests performed by Unistrut show that after cold-forming, strength has increased to 42,000 psi. As allowed by AISI, this is the yield strength is used for determining the beam and column loads in the General Engineering Catalog.

The beam and column load tables in the Engineering Catalog are in accordance with the 2001 Edition of AISI's Cold-Formed Steel Design Manual. Per AISI, beam loads have a 1.67 safety factor, while column loads have a 1.80 safety factor.

For beams, the allowed bending stress = $42,000 \text{ psi} / 1.67 = 25,000 \text{ psi}$.



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