

QE Topics List: *Steel Structures*
August 2003

General: Material Properties & Design Philosophies	Flexural Members (Beams)
<p>Structural steel (coupon and member) material properties; residual stress; yield criteria Basic concepts of load and resistance factor design (LRFD) vs. allowable stress design (ASD)</p>	<p>Elastic flexural behavior (including stress and deflection calculations) Inelastic flexural behavior (from first yield to fully plastic) Design of beams against flexural yielding and shear yielding limit states per LRFD Lateral-torsional buckling behavior and local buckling behavior in beams Plastic analysis of statically indeterminate beams Behavior of (steel-concrete) composite beams Overall design considerations of plate girders for bending and shear Elastic and inelastic web buckling behavior of plate girders due to flexure and shear Design of plate girder bearing stiffeners per LRFD Design of plate girder welds per LRFD</p>

Compression Members (Columns)	Members Subjected to Combinations of Axial Load & Flexure
<p>Elastic and inelastic buckling behavior (including residual stress effects) Design of columns against flexural buckling limit states per LRFD Local buckling behavior in columns Behavior of (steel-concrete) composite columns</p>	<p>Elastic and plastic sectional analysis of members subjected to bending plus tension Behavior of members subjected to bending plus compression (beam-columns)</p>

Framing Systems & Connections
<p>Behavior of steel braced frames (including trusses) and unbraced (moment-resisting) frames Behavior and modeling assumptions for typical connections in steel frames Design of bolted / welded bracing connections and splice connections per LRFD Design of bolted / welded simple-shear and moment-resisting beam-end connections per LRFD Behavior of connections with eccentricity and/or prying action</p>