NOMENCLATURE

A  Cross sectional area (sq. in²)
Aₓ Cross sectional area of flange (in.²)
Cₓ Warping constant for the section (in.⁶)
Eᵧ Modulus of elasticity of steel (29,000 ksi)
Fᵧ'' Specified minimum yield stress (ksi)
Fᵧ'''' Theoretical yield stress at which the shape becomes non-compact as defined by flange criteria (ksi)
H  Flexural constant for channel sections
Iₓ, Iᵧ Moment of inertia of a section (in⁴)
J  The torsional constant for the section (in)
Qₓ Statical moment of flange (in³)
Qₓw Statical moment of a cross section (in³)
Sₓ, Sᵧ Elastic section modulus. (in³)
(based on the exact theoretical value of I)
Sₓw₁ The warping statical moment at a point in the section (in⁴)
T  Tangent distance on the web between fillets
Wₓn₁ The normalized warping function at a point in the cross section (in²)

Wₓn₂ The normalized warping function at a point in the web edge (in²)
Zₓ, Zᵧ Plastic section modulus (in³)
bₓ Width of flange (in)
d Depth of section
h Clear distance between flanges of a section
g Usual gage in flange (in)
k Distance from outer face of flange to intersection if fillet with web (in)
k₁ Distance from center line of web to intersection of fillet with flange (in)
rₓ, rᵧ Radius of gyration (in)
rₓt Radius of gyration of a section comprising of the compression web area, taken about an axis in the of the web
tₓ Flange thickness for shapes with no flange slope (in)
tₓw Web thickness (in)
x, y Distances from outside face of section to neutral axes Y-Y and X-X respectively (in)

Structural grades

ASTM A-36
Mild Steel, General Building Grade

ASTM A572-50
High strength, Low-Alloy, General Building Grade

ASTM A572-50 with AISC Tech Bulletin #3
AISC Specification. Same as A572-50, except the maximum yield of 65, Fᵧ/Fu of .85 and carbon equivalent of .50% maximum.

ASTM A992
Same specification as AISC Tech Bulletin #3, but applies to Wide Flange only

ASTM A572-60
High strength, Low-Alloy Specification

ASTM A572-65
High strength, Low-Alloy Specification

ASTM 328
Sheet Pile Specification

ASTM A529-50
High Strength Non-Alloyed. Generally used in metal building industry. Previous plate specification which now includes structural steel shapes.

ASTM A588, A, B & C
High Strength Corrosion-Resistant. General Building Grade.

ASTM A690
High Strength, Low-Alloy Corrosive-Resistant Specification used in H-Piles and Sheet Piles.