

# Metals

# History of Metal

Copper based metals alloyed into bronze (the bronze age)

Iron alloyed with carbon (mostly charred wood) Not very strong but stronger than bronze. Difficult to produce

Industrial revolution. Mass production of iron based metals with the Bessemer process.

Further manufacturing refinements. Stronger steel throughout the late nineteenth and twentieth centuries

Oxygen injection and electric arc.

# Modern Structural Steel

ASTM A36 steel  $F_y = 36$  KSI (36,000 PSI)  
commonly called mild steel or carbon steel

High strength low alloy  $F_y = 50$  KSI

Numerous ASTM designations

Weathering steel (Cor-ten)

# Bolts

## Unfinished

A 307 usually square head

## Finished

A325 & A490 hex head

# Welding

Gas welding - usually O<sub>2</sub> & acetylene

Electric arc welding

- Gas metal arc (MIG)

- Shielded metal arc (stick welding)

Energy beam – laser & electron beam

- These are emerging technologies for the construction industry

# Steel Open Web Joists

## Joist types

Type K – most commonly used

Type LH – long span

Type DLH – deep long span

24K6 – 24 inches in depth, K series, 6=  
strength