

HDG Process: Surface Preparation

- Thorough cleaning is necessary as zinc will only adhere to clean steel
 - **Degreasing** – removes dirt, oils, organic residue
 - **Pickling** – Removes mill scale and oxides



Pickling Tank

HDG Process: Surface Preparation

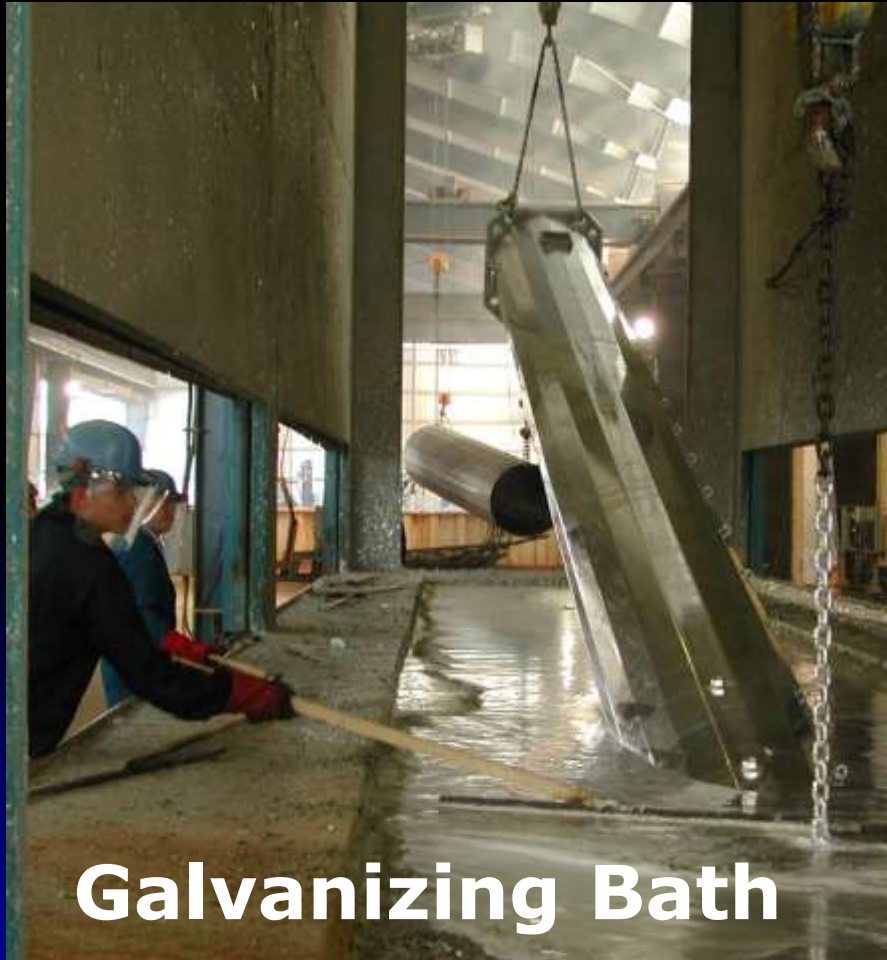
- Thorough cleaning is necessary as zinc will only adhere to clean steel
 - **Degreasing** – removes dirt, oils, organic residue
 - **Pickling** – Removes mill scale and oxides
 - **Fluxing** – Mild cleaning, provides protective layer



Flux Tank



HDG Process: Galvanizing



Galvanizing Bath

- Steel immersed in bath of molten zinc (~830 F)
- > 98% pure zinc, up to 2% additives (Al, Bi, Ni)
- Zinc reacts with iron in steel to form coating
- Reaction is complete when steel reaches bath temperature

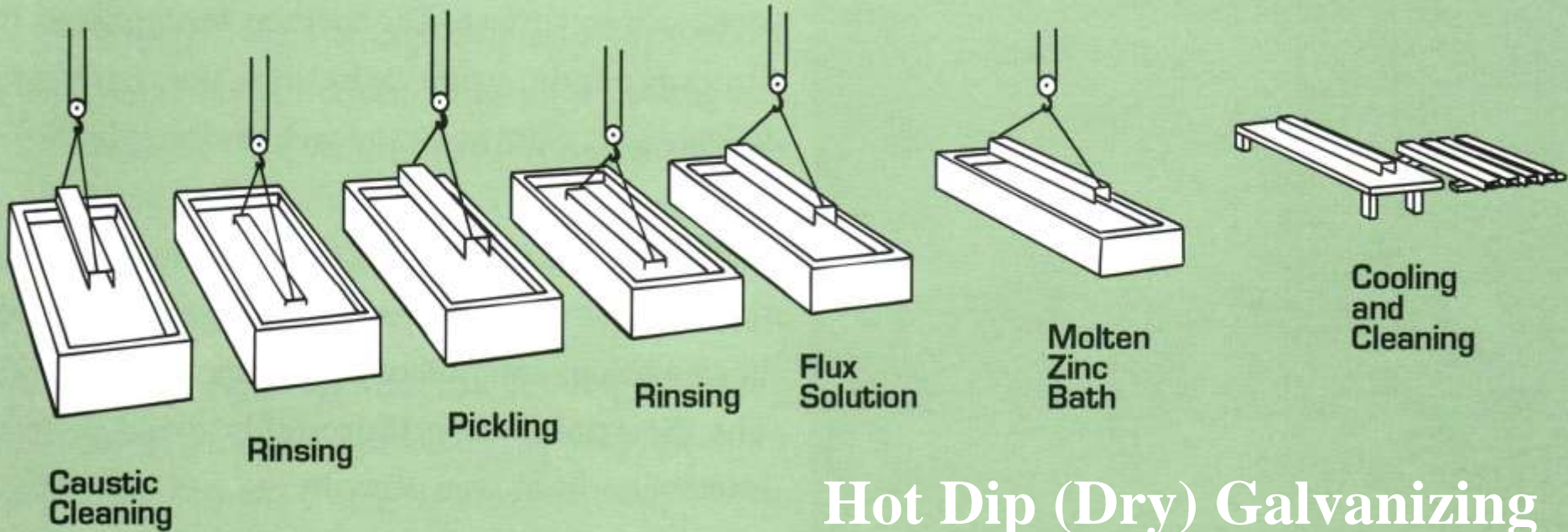




Surface Preparation

Galvanizing

Inspection



Hot Dip (Dry) Galvanizing



HDG Process: Inspection



- Steel is inspected after galvanizing to verify conformance to specs
- Visual inspection to identify any surface defects
- Magnetic thickness gauge to check coating thickness

32 11 28

10422x40

2858-411

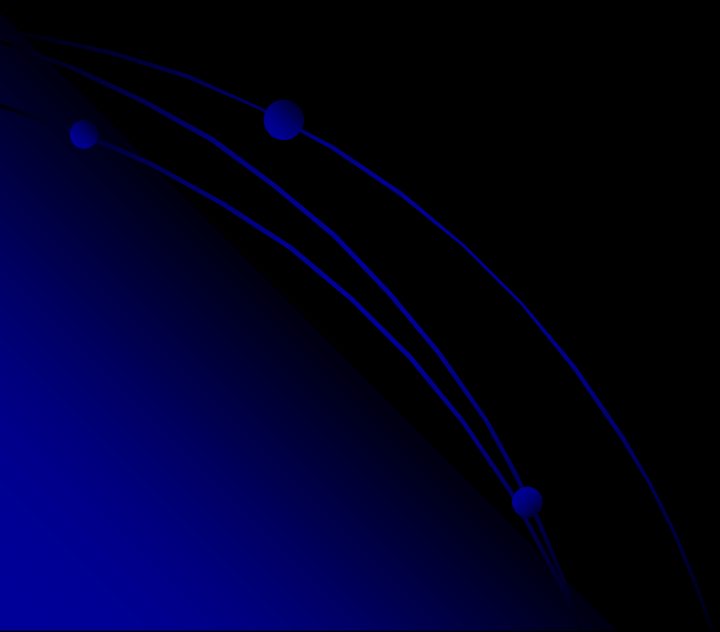
Various Sizes & Shapes





Availability

What is Zinc?



It's a Natural Element



It's Recyclable



Sustainability: Galvanizing is Green

- Zinc and steel are 100% recyclable
 - Properties of zinc (and steel) do not degrade with reprocessing
 - Zinc is a natural element in the Earth's crust
 - Recycled content contributes to LEED
- Galvanizing's maintenance-free durability ensures no additional energy, materials, or emissions during use



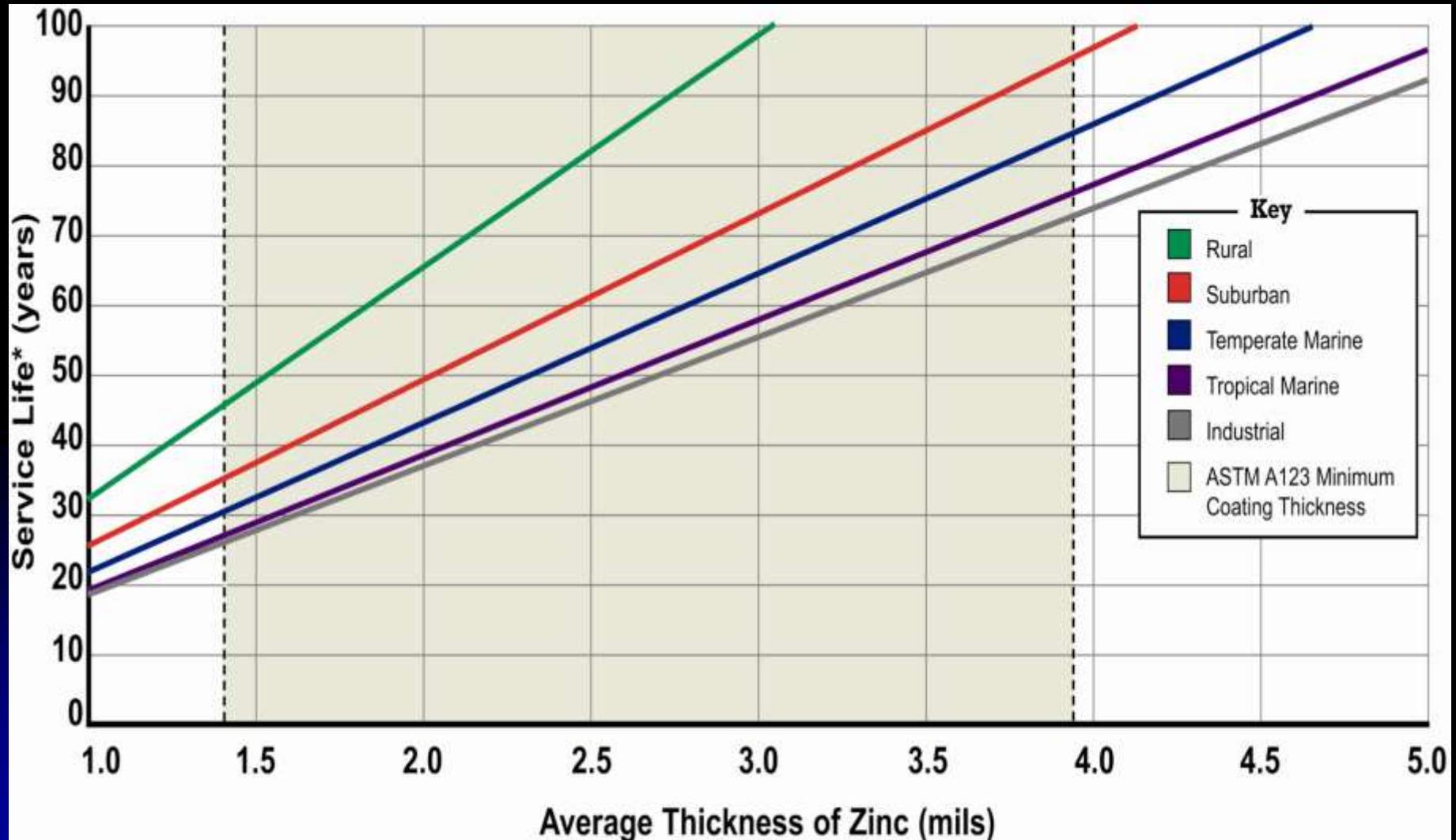


No Volatile Organic Compound's

Zinc Coating Life Predictor

- Anticipates service life
- Program performs calculations
 - Statistical methods
 - Neural network
 - technology
 - Worldwide corrosion database
- Atmospheric categories
 - Rural
 - Suburban
 - Temperate marine
 - Tropical marine
 - Industrial

Estimated Service Life of HDG



*Service life is defined as the time to 5% rusting of the steel surface. 1 mil = 25.4 μ m = 0.56oz/ft²

6.20 6.10 7.60
8.90 7.70

7.60 8.00 5.70
5.50 7.40

$\bar{X}=6.82$

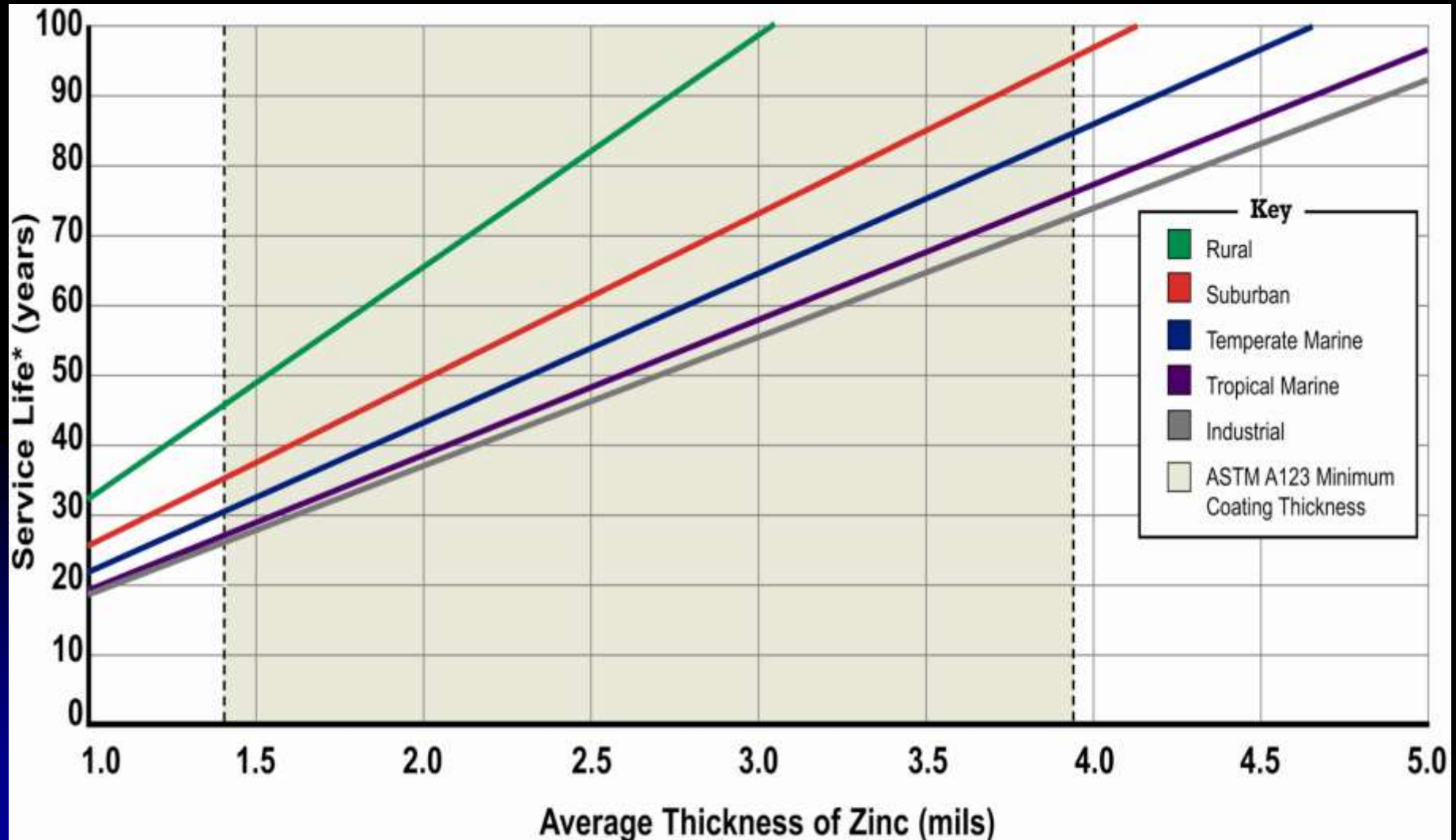
7.60 7.70 6.70
5.80 5.60

6.20 6.10 7.60
8.90 7.70

7.50 7.50 6.60
7.30 5.60

Beam 1

Estimated Service Life of HDG



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Metallurgical Bond

Eta

100% Zinc

94% Zinc
6% Iron

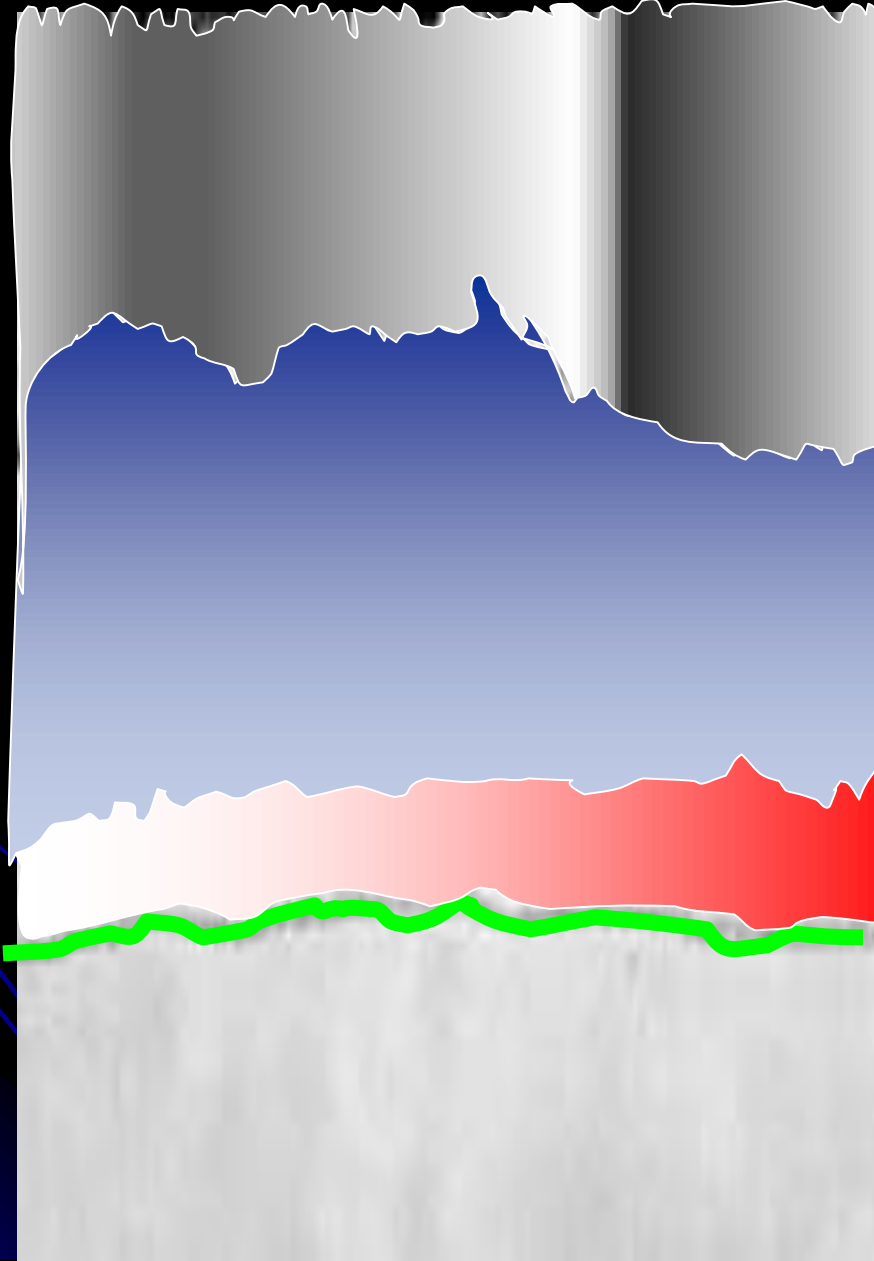
Zeta

90% Zinc
10% Iron

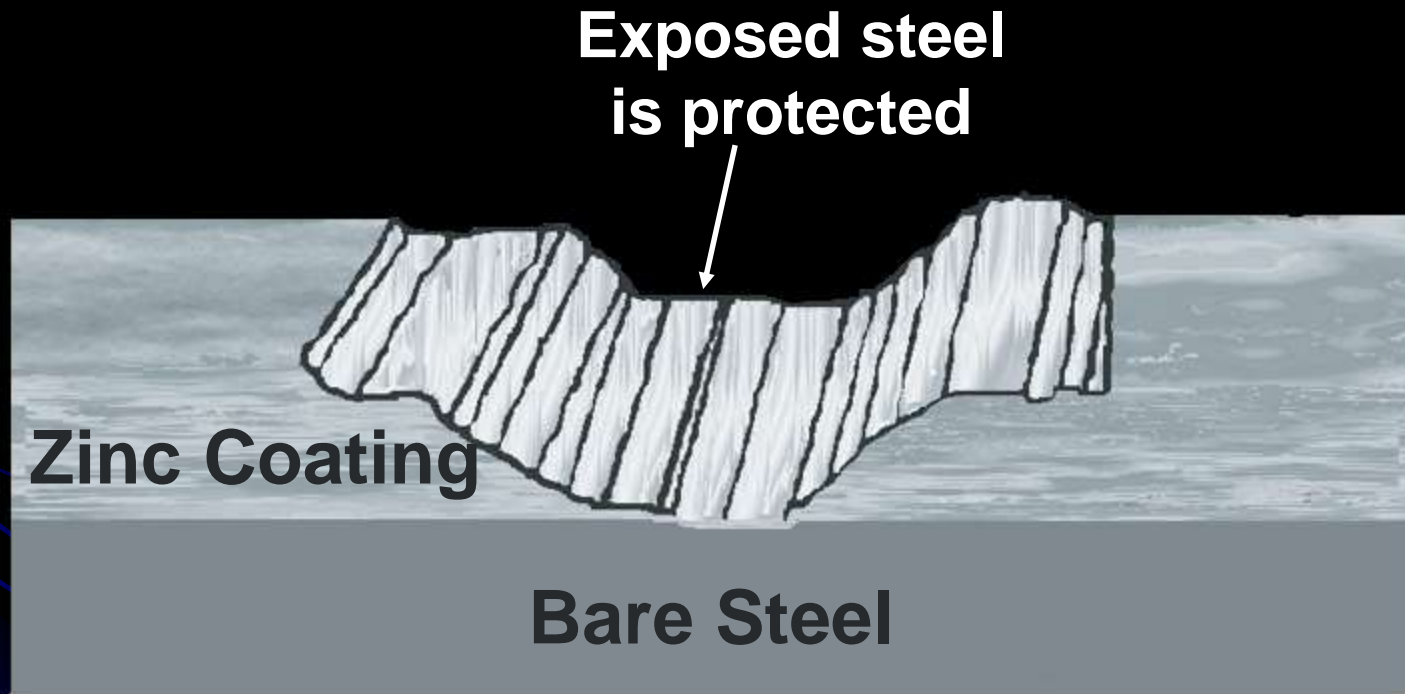
Delta

75% Zinc
25% Iron

Gamma



Cathodic Protection: Sacrificial Zinc



**Even damaged areas of the coating will be
cathodically protected by surrounding zinc**

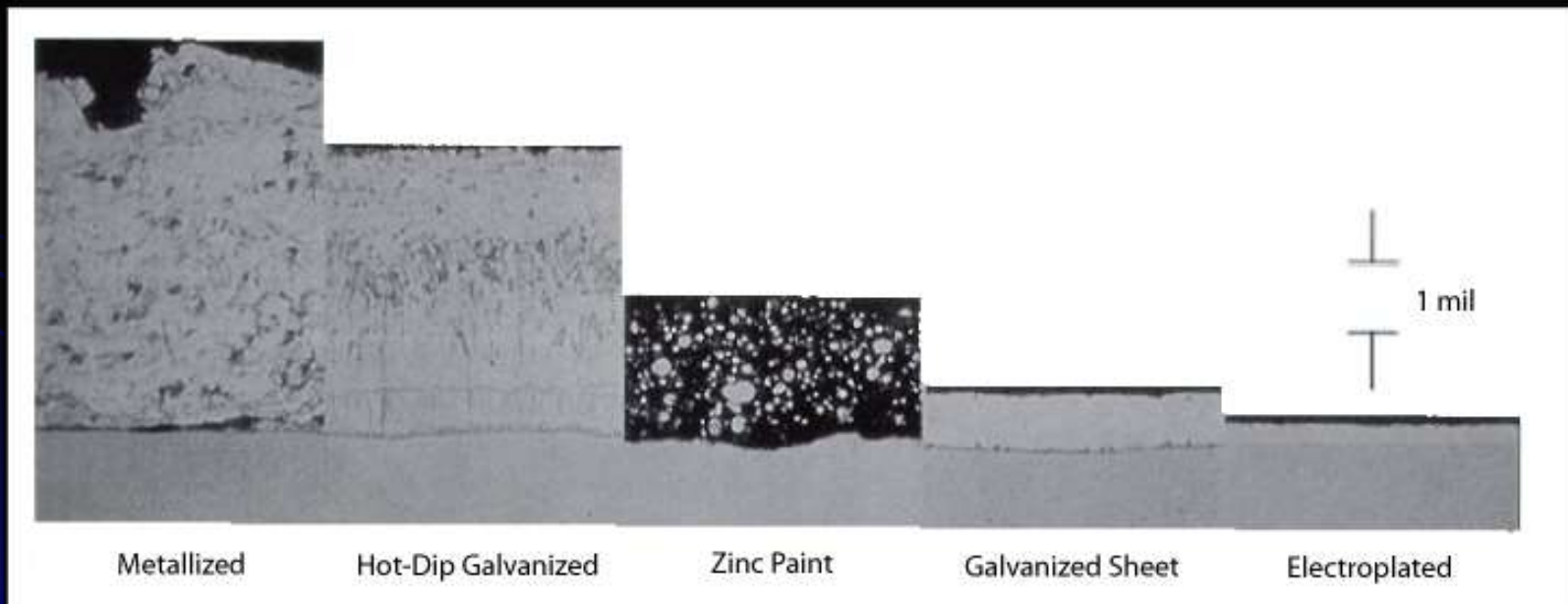
We Protect More Than Steel

Other Zinc Coatings for Corrosion Protection



We Protect More Than Steel

Zinc Coatings Comparison



We Protect More Than Steel

b



Other Zinc Coatings

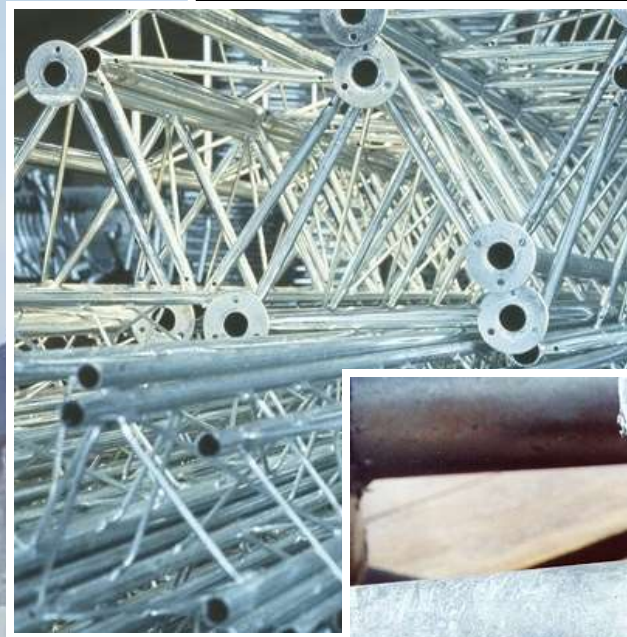
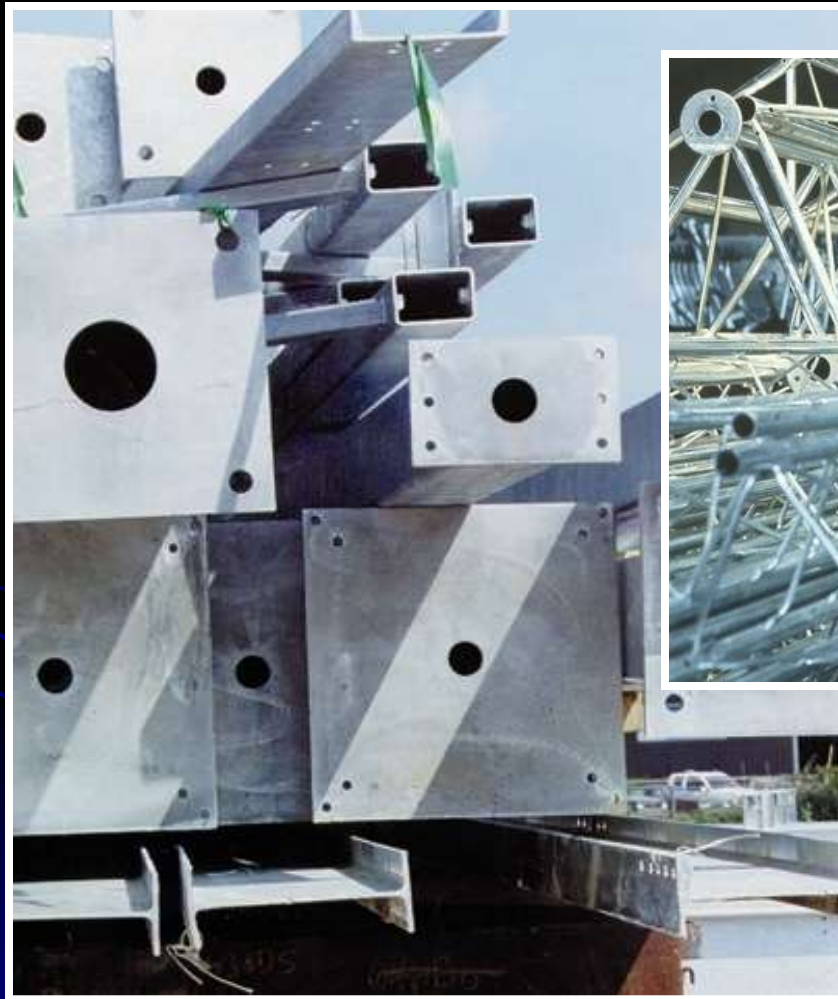
Metallized
Hot-Dip
Galvanized



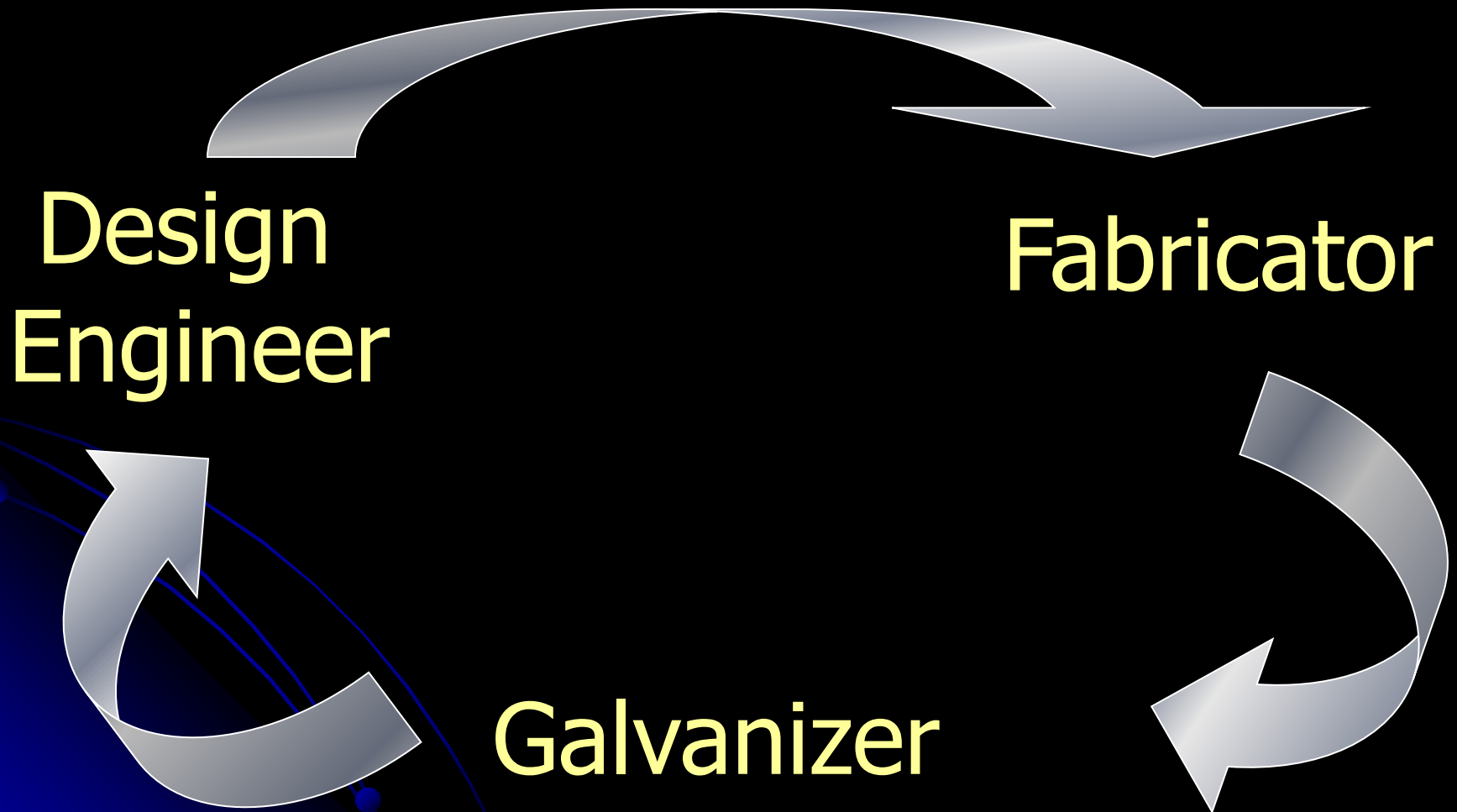
ized
Electroplated

1 mil

Design & Fabrication



Liaison Between...












Galvanizing Oversized Pieces





09.19.2006

A photograph of a concrete bridge structure, likely a pedestrian walkway or ramp. The structure features a curved concrete wall on the left side, topped with a glass railing. The bridge is supported by a series of concrete piers and beams. The text "26th Street & the Dan Ryan" is overlaid on the image in a blue, serif font.

26th Street & the Dan Ryan



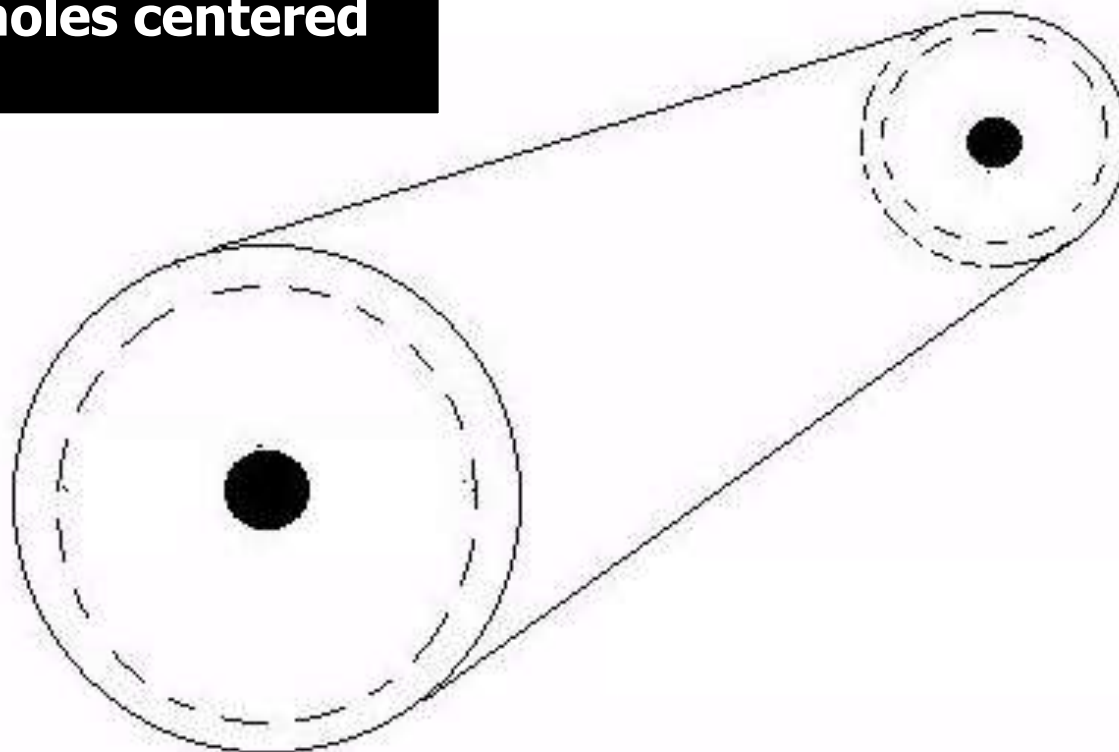


CRYSTEE





**6' long pipe
holes centered**

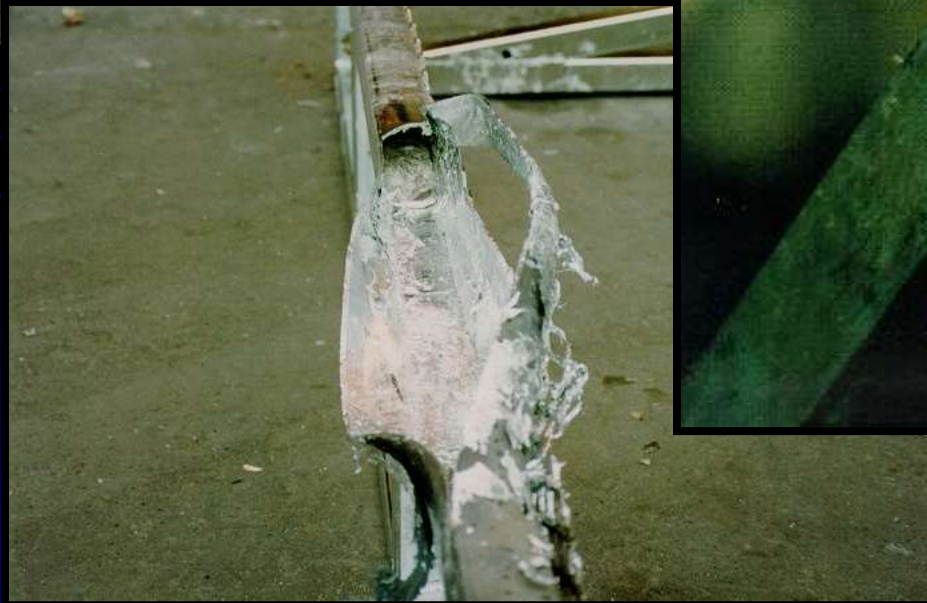
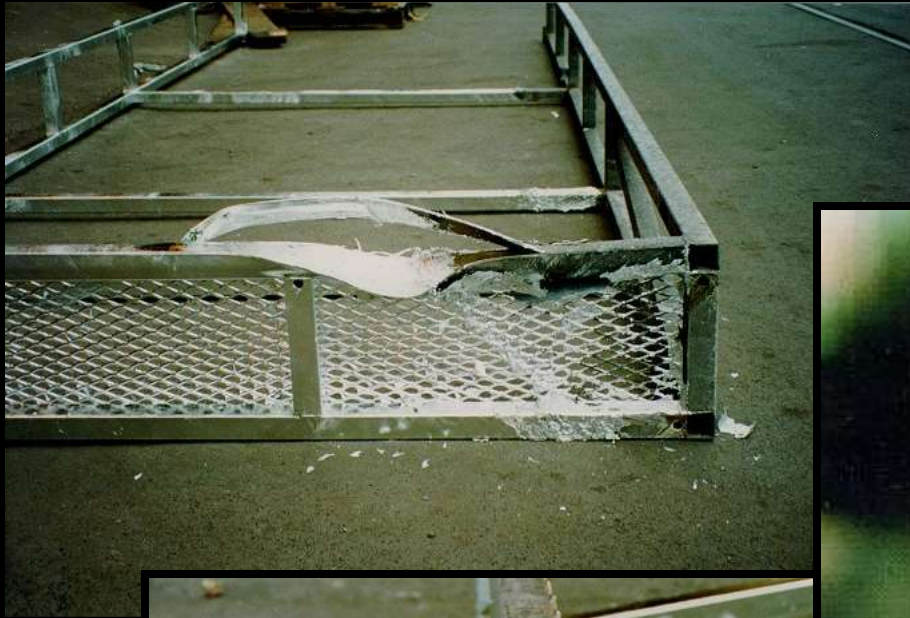




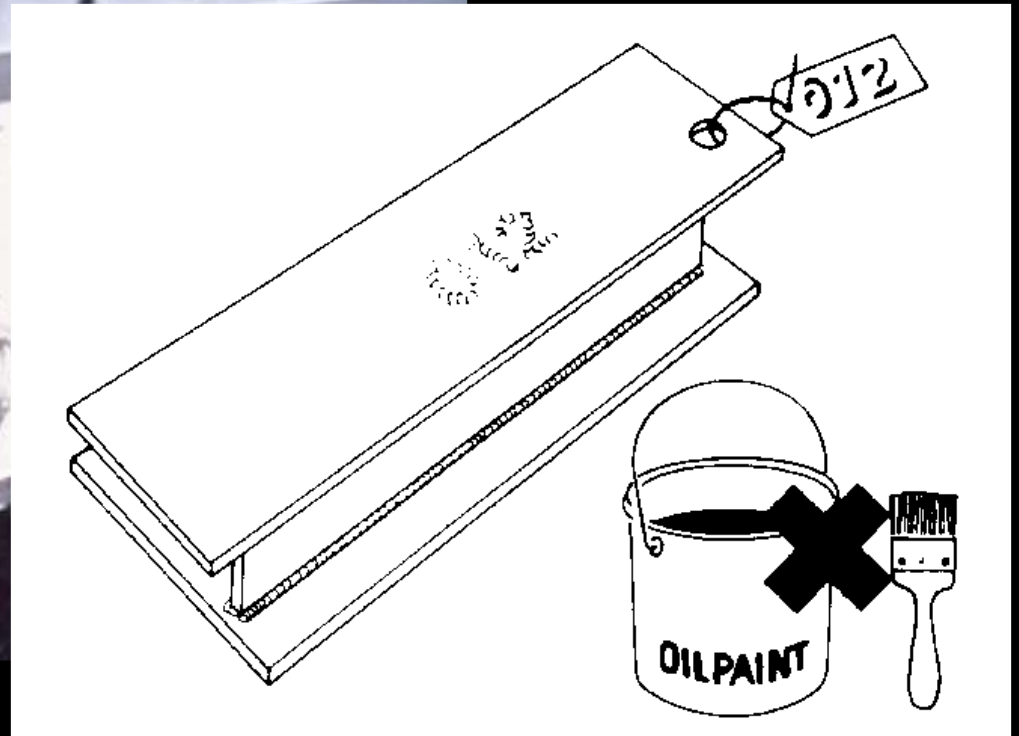
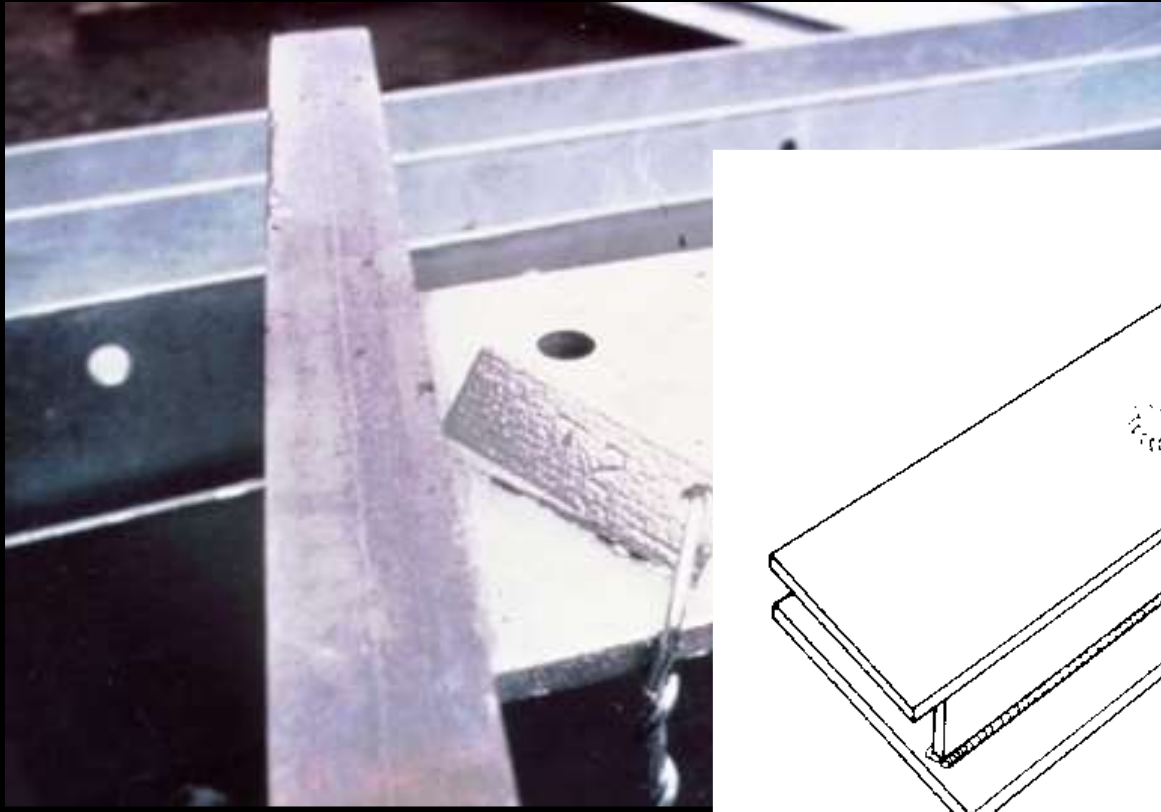
**Trapped air, trapped
ash, internal void**

**Trapped chemicals
& pooled zinc**

Improper Venting



Marking







Marking & Tagging Items

