Choosing Aluminum Railings

for Your Restoration Project

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KINGBIRD INDUSTRIES LLC

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AESTHETICS IN CONCRETE REPAIR

Summary – Aluminum Has Advantages over Steel and Wood

- ✓ *Aluminum – best choice for railings*♪
- Welded – stronger than mechanical♪
- Attachment – engineering critical♪
- Finish – based on the site conditions♪

Why Aluminum?

- Excellent strength-to-weight characteristics♪
- Low maintenance♪
- Corrosion resistant finishes available♪
- Custom extrusions provide design flexibility♪
- Aesthetically pleasing♪

Variety in Design Elements

- Variety of top caps♪
- Mesh infill♪
- Glass infill♪
- Medallions♪
- Vertical or horizontal pickets♪
- Castings for complicated designs♪
- Mix and match castings and extrusions♪

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Mechanical railing systems are less costly upfront, but are less structurally sound and more prone toward mechanical failure♪

Choose All Welded Construction

- Welded joints are stronger than mechanical connections♪
- Yields a more rigid rail system with a longer life♪
- Welded railing systems – hallmark of premium, high-end, exclusive projects♪

All Welded Construction - 50% of Surface Area Welded

Weld Quality is Important

Excellent TIG Weld

Ugly MIG Weld

MIG vs TIG Welding

- MIG Welding♪
  - Volume production welding using a gun♪
  - Welding wire fed to gun using a spool♪
- TIG Welding♪
  - Heat source and a stick, slower welding♪
  - Greater penetration = Greater strength♪
  - Not required for all railing applications♪

Hidden Welds vs Visible Welds

- Design railing to hide welds – under top caps and channels♪
- Clean look♪
- Less grinding♪
- Better finish♪
- MIG production welding♪

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Attachment – Engineering Knowledge is Critical

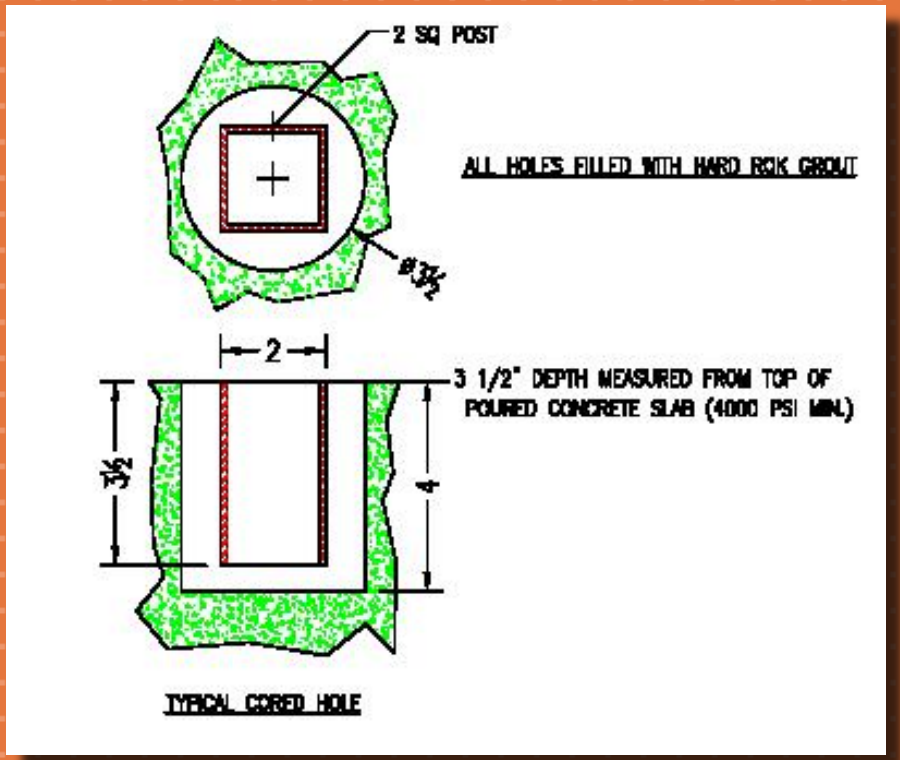
- Submittal drawings♪
- Engineering seals♪
- Design experience♪
  - Beach Club at Windy Hill♪
    - Restoration – existing concrete♪
    - BIG foot-plates (7" x ½") with small anchors (1/4")♪
    - Revised to 5" x 3/8" foot-plates with 3/8" chemical anchors♪

Three Common Mounting Methods

- Core drilled or Block out♪
- Foot-plate with Anchors♪
- Brackets♪

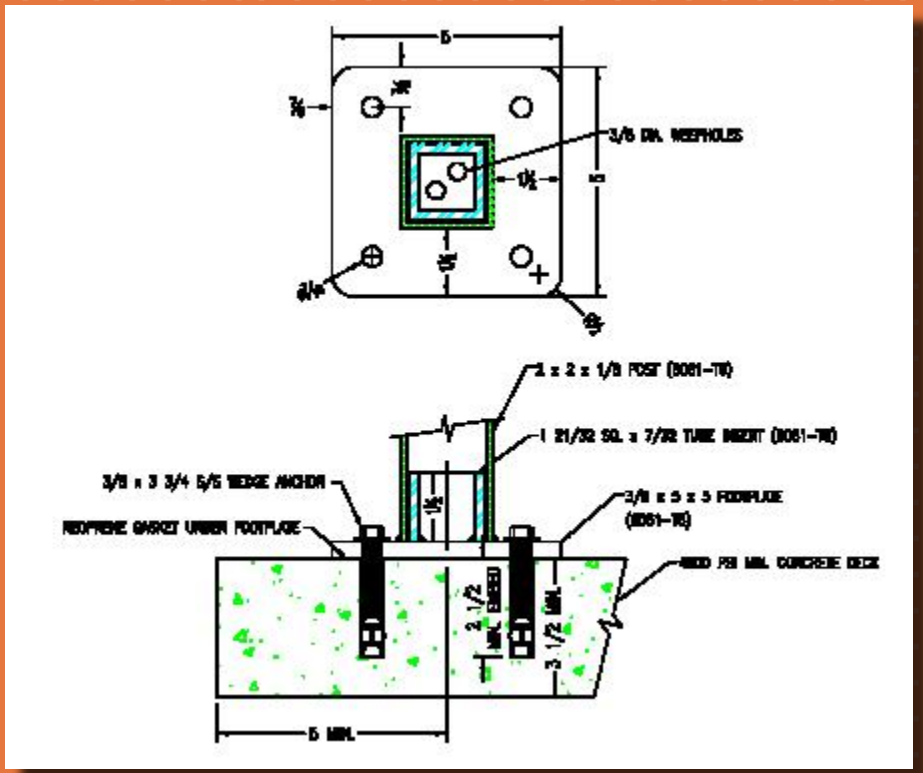
Core Drilled - Not Preferred by Restoration Engineers

- Design choice by architects on new buildings♪
- Non-gypsum grout is critical♪
- Large penetration in slab♪
- Block-outs are better (rebar)♪



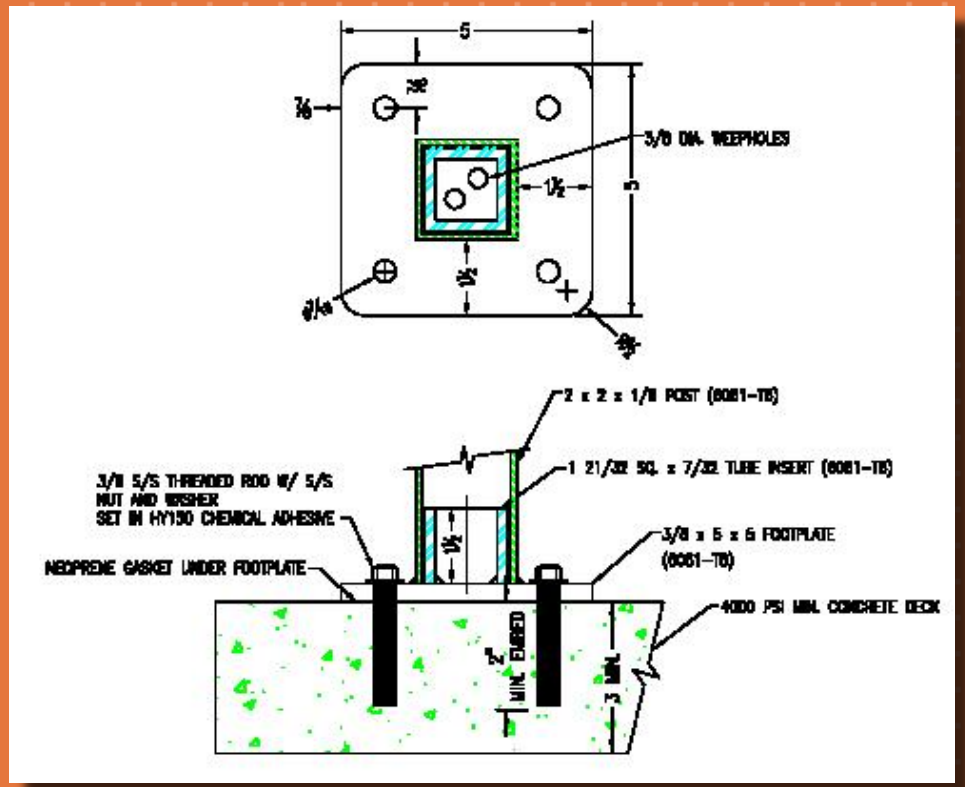
Foot-plate with Anchors - Preferred by Restoration

- Casting or extrusion for foot-plate♪
  - Casting for powder coat♪
  - Extrusion for Kynar or Anodic finish♪
- Anchor into slab♪



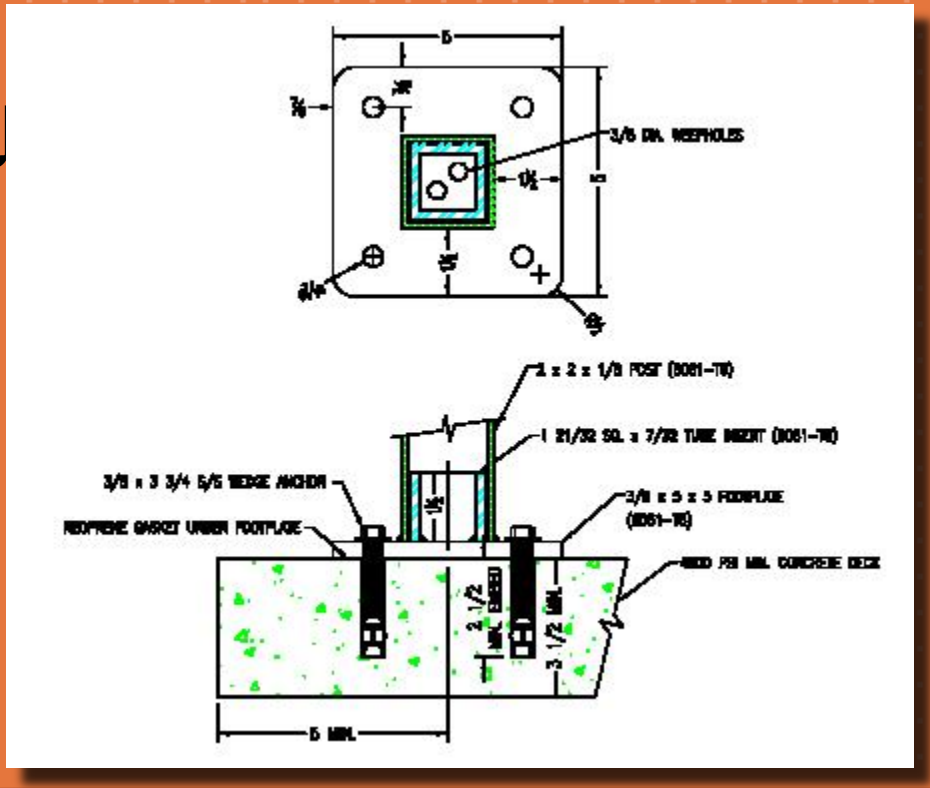
Chemical vs Mechanical Anchors

- Chemical anchors♪
  - Less stress on the concrete♪
  - Allows placement of railing 50% closer to edge♪
  - 3/8” anchors typical♪

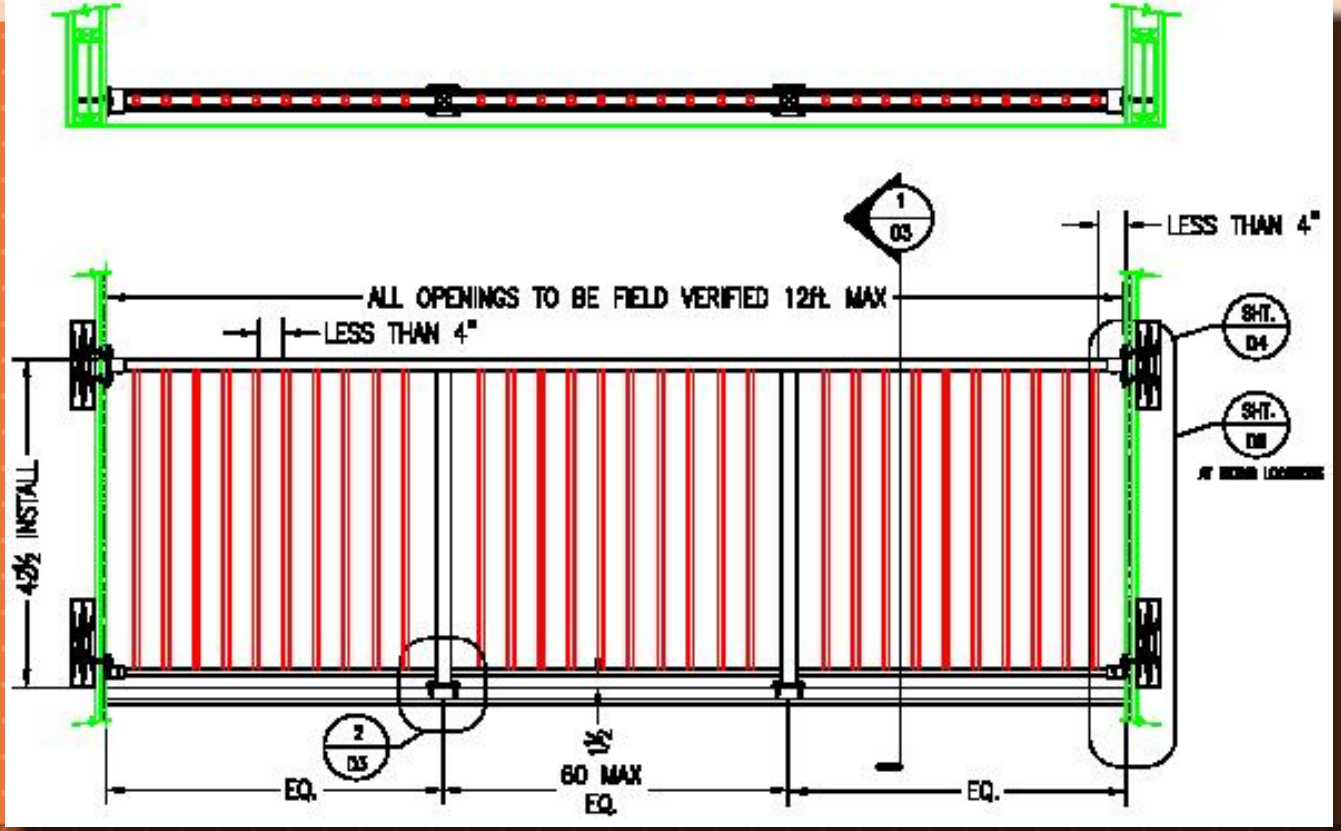


Use Rubber Gaskets Under Footplates

- Protects finish under the footplate♪
- Prevents galvanic reaction with concrete♪
- Custom design based on size of foot-plate♪

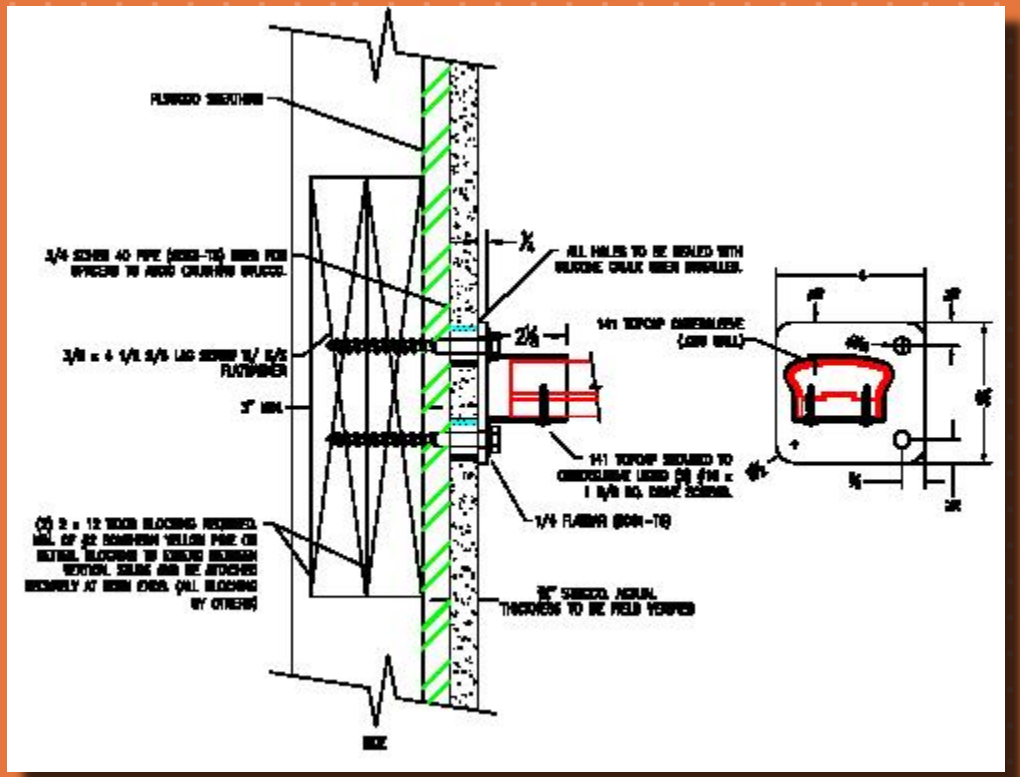


Bracket Attachment - Load Carried by the Brackets



Bracket Attachment - Must Understand the Wall

- Wall must withstand the load of the railing♪
  - Stucco♪
  - Wood♪
  - Brick♪
  - Concrete♪



Hardware - Recommend 316 Stainless

- 304 and 316 stainless steel are compatible with aluminum and concrete♪
- Handles alkaline and acidic conditions♪
- 304 and 316 are effective in corrosive environments due to their low carbon contents♪
- Use 316 stainless at the beach♪

Uneven Concrete - Shims are the Answer

- Shims 'even-up' the railing, straight line-of-sight♪
- Different materials:♪
  - Plastic♪
  - Aluminum♪
- Anchors must be longer♪

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- ✓ *Finish – based on the site conditions*♪

Three Typical Finishes for Aluminum Railings

- Powder Coating♪
- Anodic♪
- Kynar™♪

Powder Coat Finish - Consumer Products in 1960s

- Powder coating is an advanced method of applying a **decorative** and **protective finish**♪
- Process is a mixture of finely ground particles of pigment and resin, which is sprayed onto a surface to be coated♪
- The charged powder particles adhere to the electrically grounded surfaces until heated and fused into a smooth coating in a curing oven♪

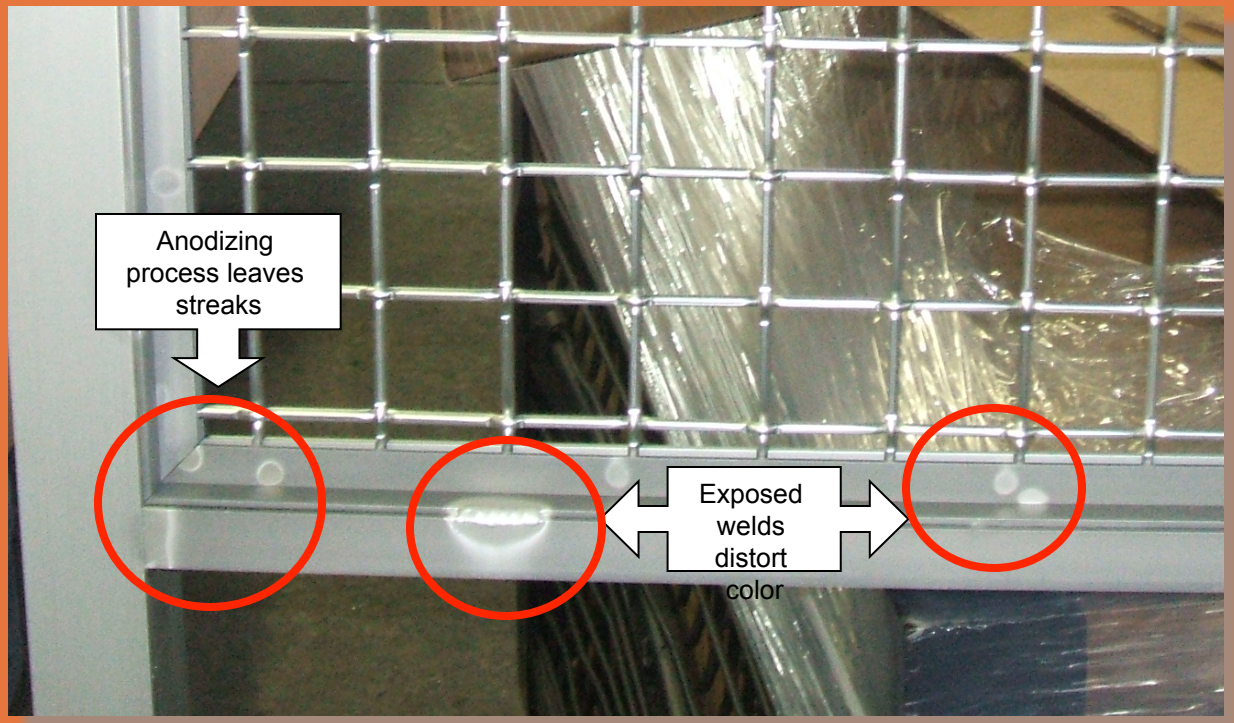
Powder Coat Finish - Durable, Low Cost

- The result is a **uniform, durable, high-quality**, and **attractive finish♪**
- Powder coating is the fastest-growing finishing technology in North America♪

Anodic Finish - Airline Parts in 1950s

- Aluminum is grown on the part by passing a DC current through an electrolytic solution♪
- Very hard finish♪
- Color can vary:♪
  - Different anodic process batches♪
  - Different aluminum alloys (posts, pickets)♪
  - Heat (welding) can change appearance♪

Anodic Finish - Hard Finish, not Ideal for Railings



- Nicks and scratches will be visible and cannot be repaired♪
- No touch up paint is available♪

Kynar – Chemical Industry in 1970s

- PVDF – Polyvinylidene Flouride♪
  - Kynar 500♪
  - Hylar 5000♪
- Used inside pipes for corrosive liquids (bromine, hydrochloric and sulfuric acids)♪
- Liquid applied paint cured in an oven at over 400 degrees F♪

Kynar – Corrosion Resistant, Use at the Beach

- Two and three coat options available (3rd coat is a clear coat)♪
- Best suited for beach applications♪
- Not as tough as powder coat♪
- Warranty from finisher requires maintenance♪

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Finally: Look for a Full Service Company

- Preconstruction / estimating♪
- Field measurement♪
- Submittals♪
- Stamped drawings♪
- Factory♪
- Shipping♪
- Installation services♪

Kingbird Industries, LLC

Strength in Material. Beauty in Design. Quality in Construction.

Questions?

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