Trestle Rebuilds

The Continuing Quest to Fill the Gap

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Out of Date Cultural Reference

You can’t always get what you want

But if you try sometimes, well you might find

You get what you need

Written by Mick Jagger and Keith Richards

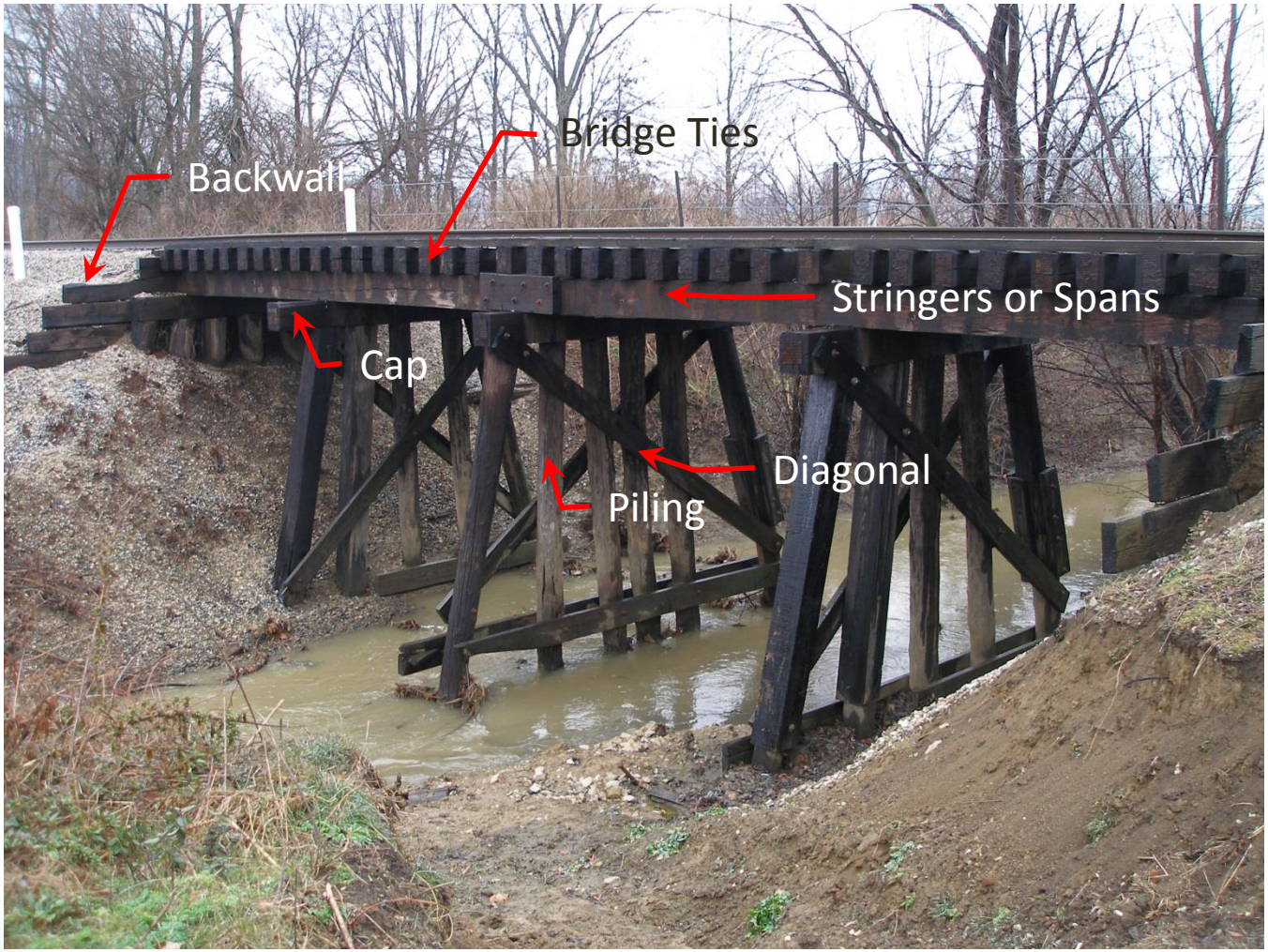
Rolling Stones 1969 album Let it Bleed

What is a Trestle?

- Merriam – Webster definition
  - A braced frame serving as a support
  - A braced framework of timbers, piling or steelwork for carrying a road or railroad over a depression

- A bridge consisting of similar length short spans (under 35’ long spans)
- Supported by pile foundation that was exposed when built

Parts of a Trestle



Timber Trestle - Advantages

- Easy to work with material in remote locations
- Light weight material that can easily be handled
- Long lasting material that does not need coating
- Economical material
- Easy repair and replacement of components

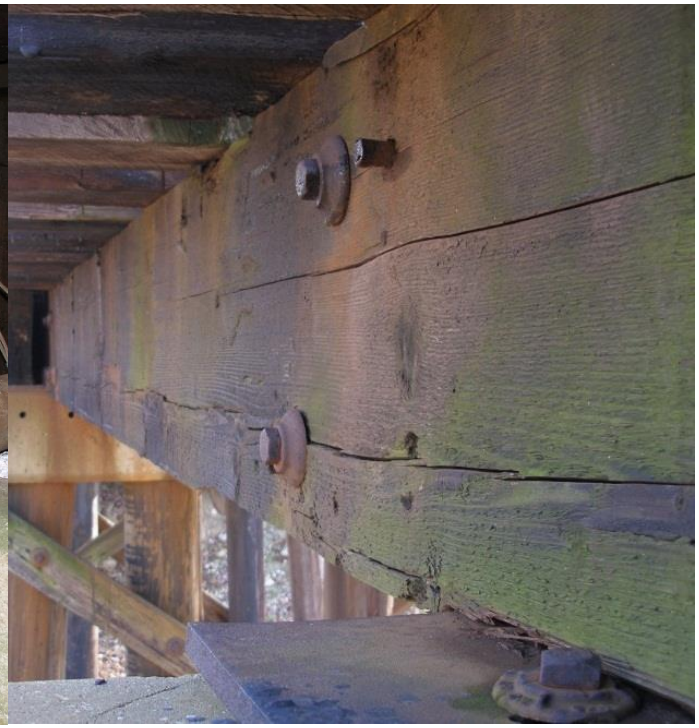
Standard Timber Trestle

Timber Trestle - Disadvantages

- Timber splits and rots
- Timber is flammable
- Timbers large enough to handle modern loads not readily available
- Maximum span about 13’
- Difficult to obtain adequate penetration on timber piling to resisting longitudinal loads
- Open Deck
  - Bridge ties have to be replaced on a regular basis by non-mechanized forces
  - Surface problems at the end of the bridge
- Ballast Deck
  - Stringers separate allowing ballast to leak

Distressed Piling

Crushed or Cracked Stringers



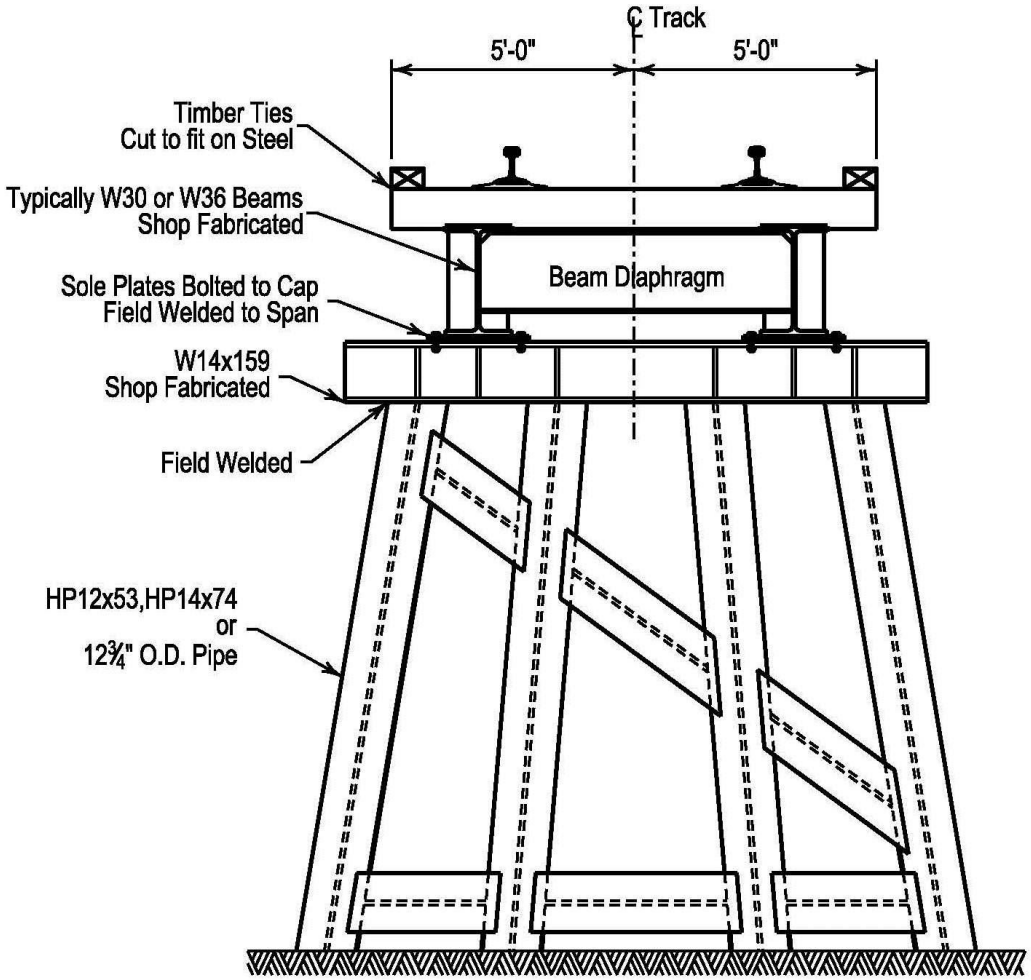
Stringers Separating

Steel Trestle - Advantages

- Readily available material
- Select welded connections can be made at remote locations
- Bolted structural connections of prefabricated members can be made anywhere.
- Easy construction in remote locations
- Work can be done between trains
- Steel piling can be spliced

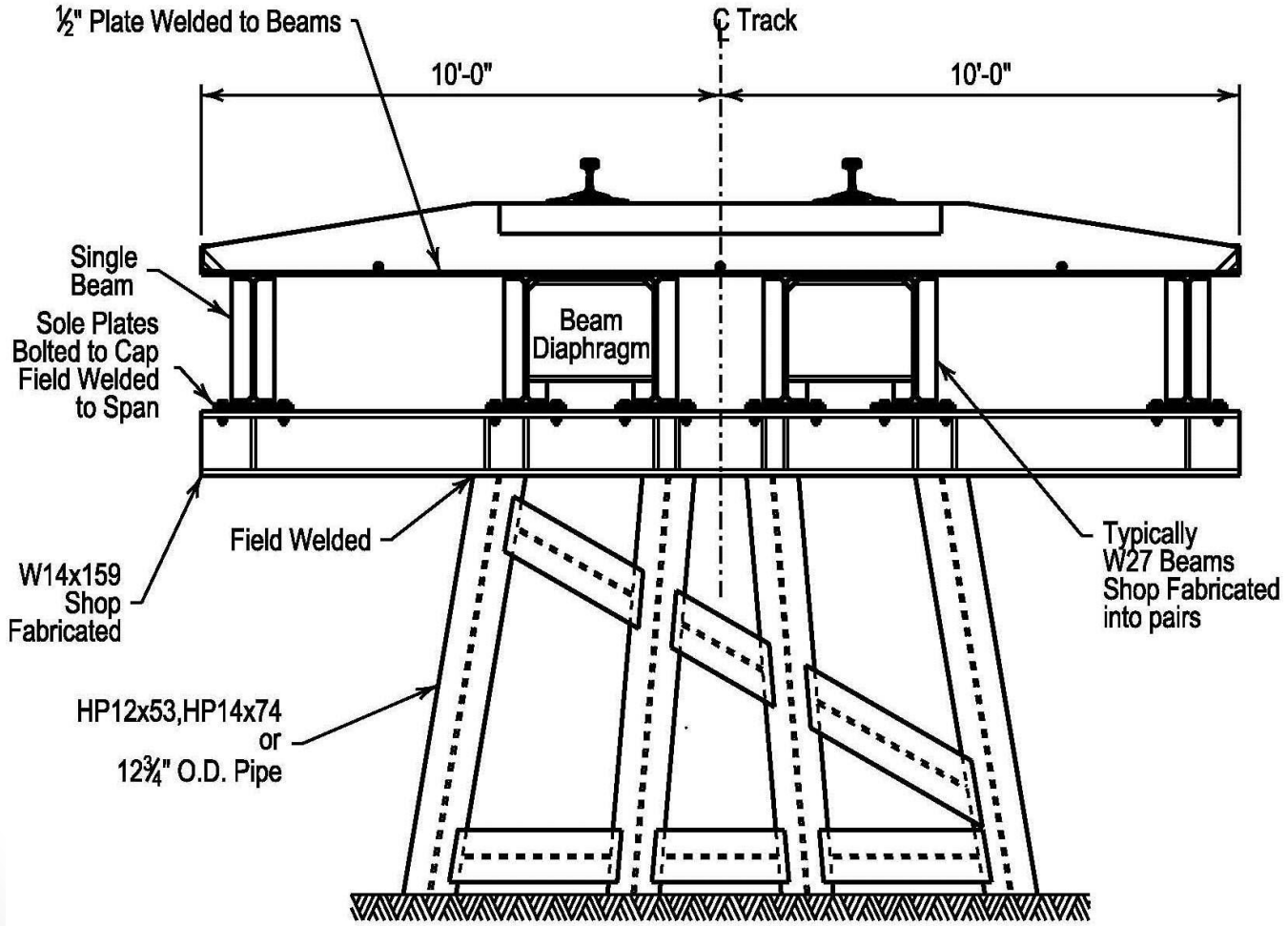
Standard Steel Open Deck Trestle

Section of Steel Open Deck Trestle



Standard Steel Ballast Deck Trestle

Section of Steel Ballast Deck Trestle



Steel Trestle - Disadvantages

- Steel needs to be coated
- Steel piling rusts
- Open Deck
  - Bridge ties have to be replaced on a regular basis with non-mechanized forces
  - Track surface issues at the ends of the bridge
- Ballast Deck
  - Steel deck plates rust
  - Steel deck plates leak

Pile Reduction

Corrosion

Open Deck Bridge in a Hole

Prestressed Concrete Spans

Advantages

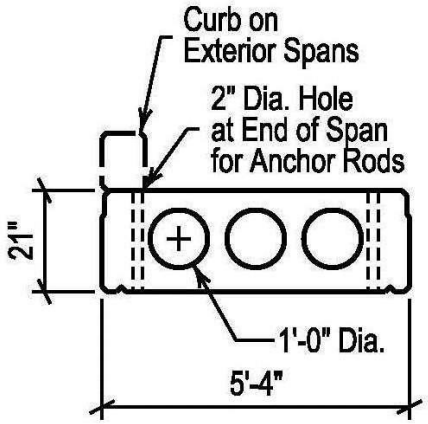
- Long lasting material that does not need coating
- Can be economical if produced in large quantities
- Spans can be designed to handle expected loads

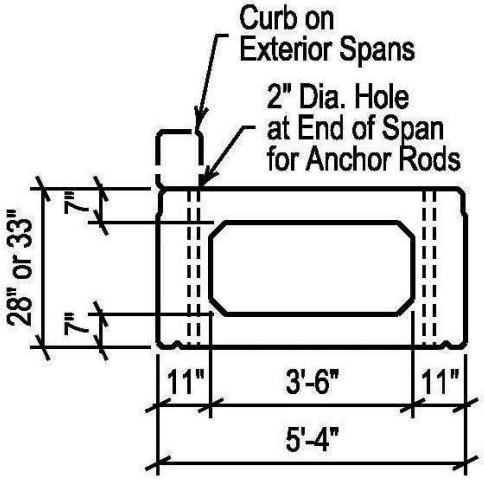
Disadvantages

- Precast components are heavy
- Concrete Piling difficult to splice
- Cast-in-place concrete difficulties in remote locations

Span Design Considerations

- Spans have to be uniform over many bridges and span lengths
- Span has to be stable when not in the bridge
- Deck has to be ready for track soon after span is set





Stability and Quick Installation

Cap and Piling Considerations

Cap and Backwalls

- Connections that can be made under field conditions
- Weight limitations
- Fabrication Considerations

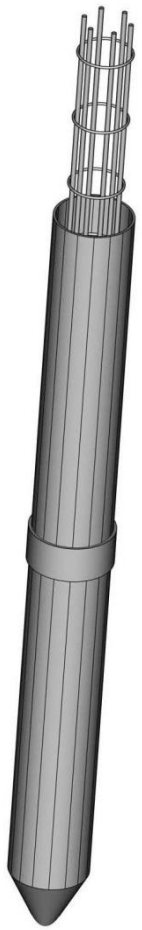
Piling

- Long Life
- Installation between trains
- Installation in remote areas

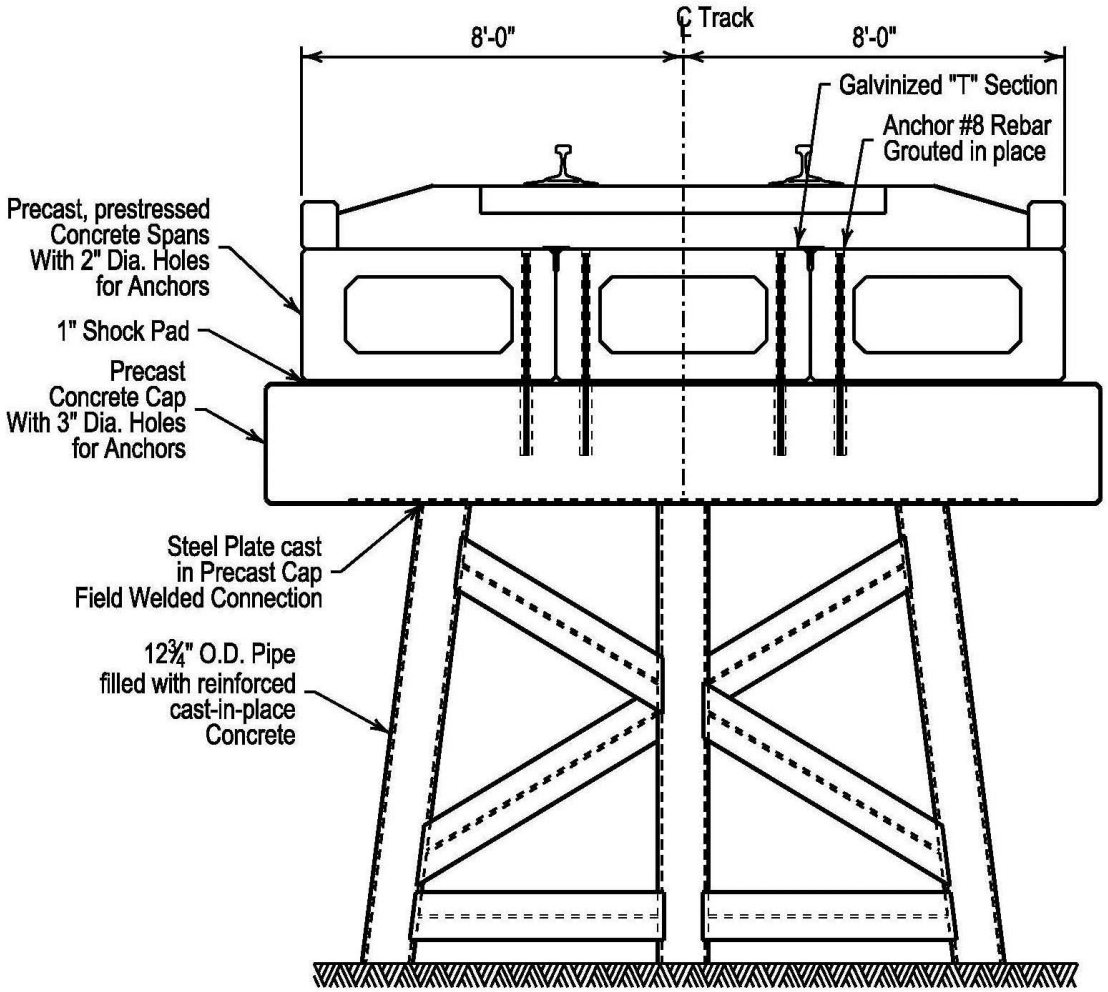
Precast Concrete Caps and Backwalls

Concrete Filled Pipe Pile

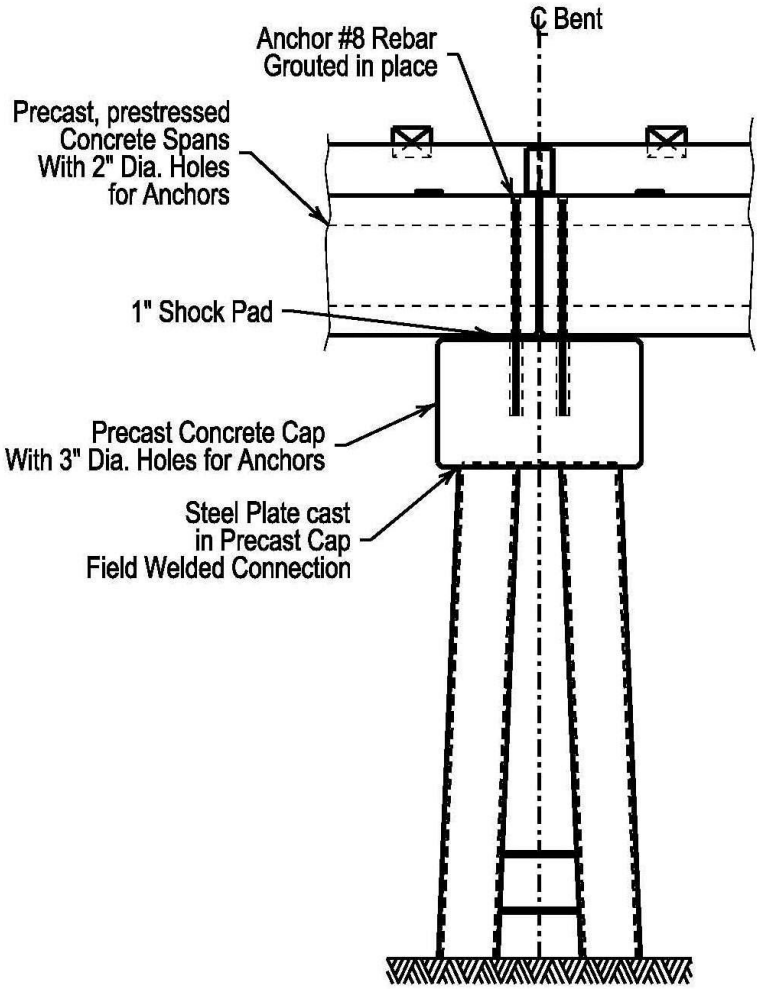
- 6 - #6 rebar with #3 hoops, rebar cage extends 5’ below ground line
- 12 ¾“ outside diameter steel pipe pile
- Compression splice ring
- Conical tip



Typical Section



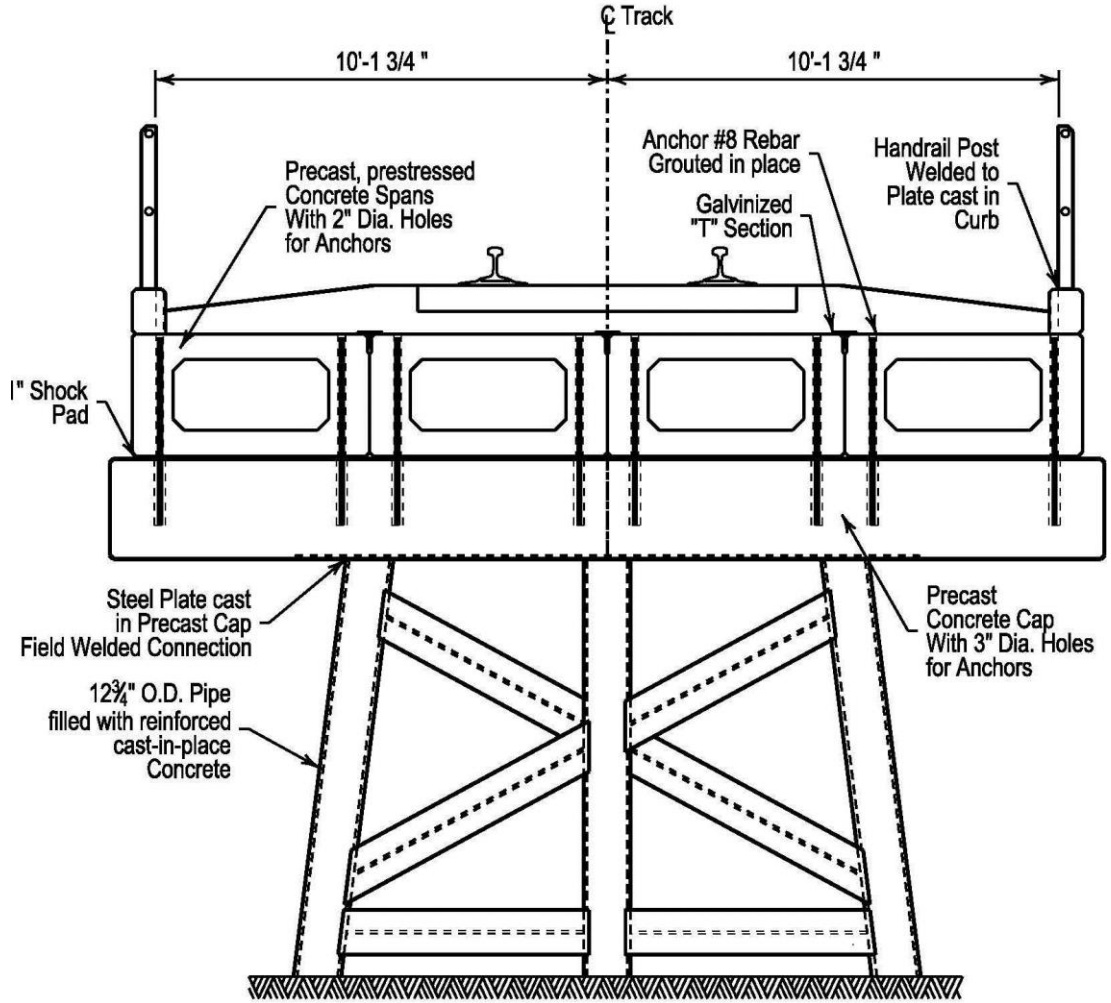
Typical Profile



Current Generation

- New Concerns
  - Walkways for trainmen have to be attached to the outside of the bridge
  - Ballast gets stuck in grating
  - Curbs too close to track to allow for mechanized replacement of ties
- New Solution
  - Widen deck to four boxes
  - Add handrail

Section of Current Generation



Current Generation

Additional Concerns

Ugly Bridge Statement

- Bridges shown in this presentation that show distress have either been repaired or replaced
- Most of them have been put out of their misery

Questions