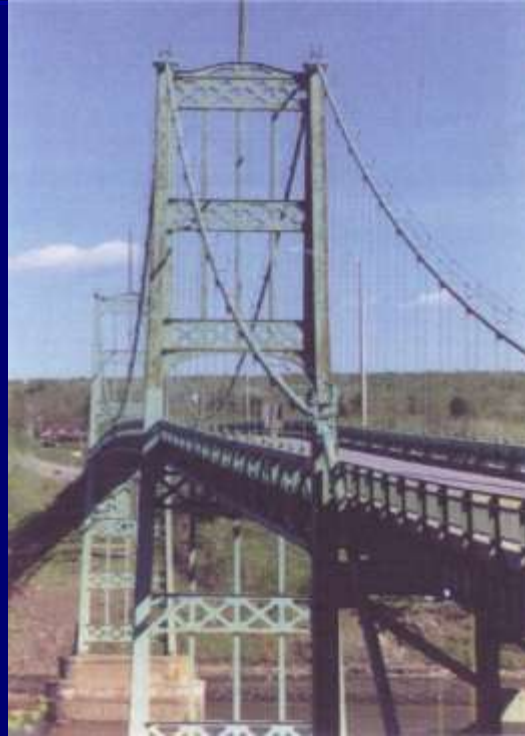


Bridge College



Bridge Rail

Topics Covered Today:

- Types of Rail
- Rail Repairs
- Rail Replacement
- Test Levels (TL) 1-6

Types of Rail:

- Vehicular
 - Several Designs
- Pedestrian
- Bicycle

Test Levels:

- Test Levels range from 1-6
 - Test Levels refer to the ability to contain or redirect vehicles.
 - These standards were set by the Federal Highway Administration (FHA).
 - For example: Test Level 4 has the capability of containing or redirecting a small car or pickup at 60mph.

Designs of Vehicular Rail:

- **Metal Rail**
 - Elliptical/Aluminum
 - Pipe Rail
 - W Rail
 - Thrie Rail
 - Channel Rail
 - Tubular Rail
- **Wood Rail**
 - Laminate
 - Beam
 - Plank
- **Concrete Rail**
 - Maine Rail
 - Rail & Post
 - Concrete & Steel



Metal Rail:

■ Elliptical Rail



2 Bar Elliptical Rail



4 Bar Elliptical with Pales

Damages to Rail:

- Typical Examples:



Damages to Rail:

- More Typical Examples:



Damage & Repair:



Damage to Rail



Rail Repair

Damage & Repair:



Damage to Rail



Repair Process



← Finished Product

Metal Rail:

- Pipe Rail Aluminum



Damages to Rail:

- Typical Examples:



Metal Rail:

- W Beam



Damages to Rail:

- Typical Examples:



Damage & Repair to Rail:



Damaged Rail



Rebar & Curb Form



Concrete Placement
w/ Anchor Bolts
spaced in place

New Construction of W Beam:



Stub Post during
Construction



Example of Safety
Rail being used



← Finished Product

Metal Rail:

- Channel Rail



Damages to Rail:

- Typical Example:



Metal Rail:

- Tubular Rail (Galvanized):



Deterioration of Rail:

- Typical Examples:



Rail Maintenance:



Metal Rail Overview:

- A splice bar is used to connect two pieces of elliptical rail.
- When repairing elliptical rail, make sure to always bring extra bolts and rail clips to aid in the repair.
- Advantages of elliptical rail: pleasing to the eye, cost effective to retrofit to older concrete railing, and it has a high strength to weight ratio.
- Stub post should be placed every 3 feet 1.5 inches on a bridge curb.
- A safety rail should be at a top height of 42 inches nominal.

Wood Rail:

- Laminate Rail



Damages to Rail:

- Typical Examples:



Wood Rail:

■ Beam Rail



Damages to Rail:

- Typical Examples:



Wood Rail:

■ Plank Rail



2 x 8 plank rail

Damage & Repair to Rail:



Damage



Repair



← Rail & Post Repair

If All Else Fails...



Wood Rail Overview:

- Laminate, beam, and plank rail are the common forms of wood rail.
- Common types of anchoring wood rail would be carriage bolts, lag bolts, timber locks, or wood screws.

Concrete Rail:

■ Maine Rail



Damages to Rail:

- Typical Examples:



As you can see, there is very little damage.

Concrete Rail:

- Rail & Post



Damages & Repair:



Damage



Repair

Repair:



Back Side of Repair

Damage to Rail:

- Typical Examples:



Repair to Rail:



Concrete Rail:

- Concrete & Steel



Damages to Rail:

- Typical Examples:



Adding Steel Rail to Concrete:



Concrete Overview:

- A Michigan Shoe attachment is used when connecting beam rail to a concrete end post.
- A backer plate should be used in conjunction with Michigan Shoe when feasible.
- When placing L-Anchors in concrete curb for attachment of a stub post, a plate should be used in the concrete to strengthen post attachment.

General Overview:

- Use of fall protection or a rail 38" to 42" is required when working above 6 feet.
- Bridge rail is constructed of concrete, steel or aluminum, or wood.
- Prior to working on any bridge rail you should determine the extent of repair and supplies needed, determine what signs and traffic control are needed, complete a JSA to identify safety issues and corrections, and if closing the bridge to one lane, notify the radio room.

