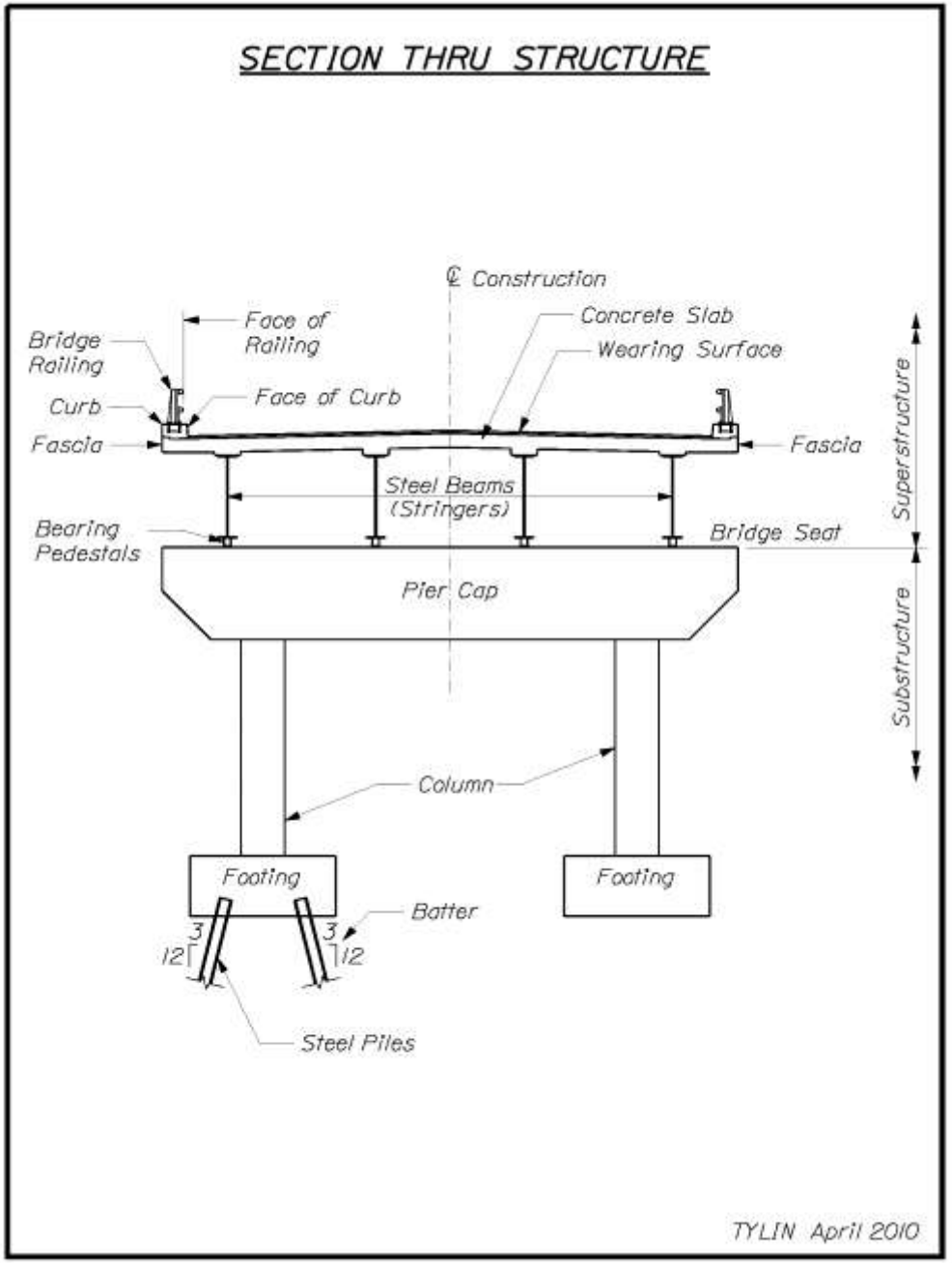
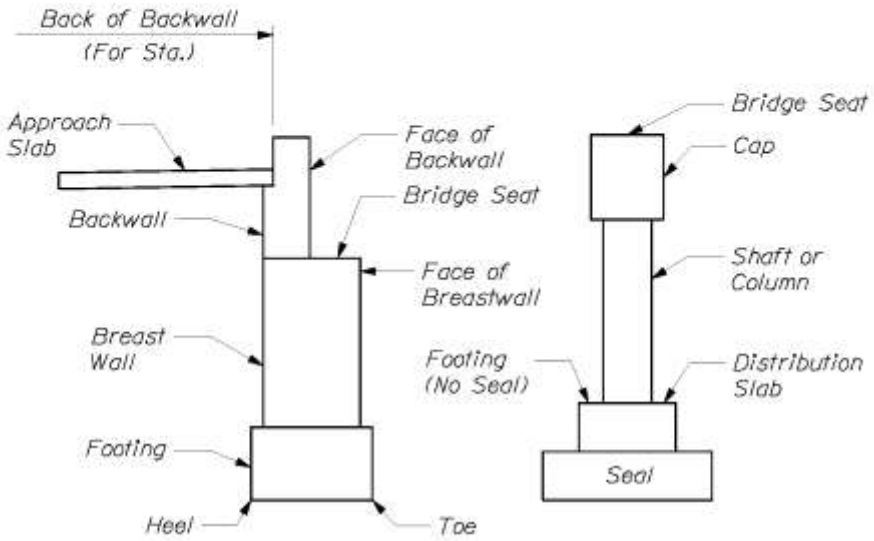
Bearings and Beam Ends

Jeff Naum
Maine DOT

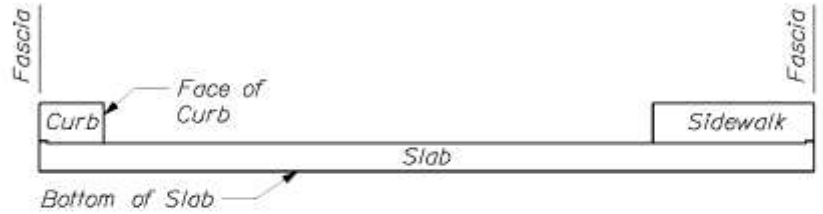
Bridge Nomenclature


SECTION THRU STRUCTURE
℄ Construction
Face of Railing
Concrete Slab
Bridge Railing
Wearing Surface
Curb
Face of Curb
Fascia
Fascia
Steel Beams (Stringers)
Superstructure
Bearing Pedestals
Bridge Seat
Pier Cap
Substructure
Column
Footing
Footing
Batter
3
12
3
12
Steel Piles
TYLIN April 2010

TYPICAL STRUCTURE



ABUTMENTS PIERS



SUPERSTRUCTURE

TYLIN April 2010

Bearings

- BEARINGS
  - Components that transfer weight from beams to abutments and piers
- BEAM ENDS
  - Ends of beams and girders often over a bearing

Bearings at Abutments

At Abutments and Piers

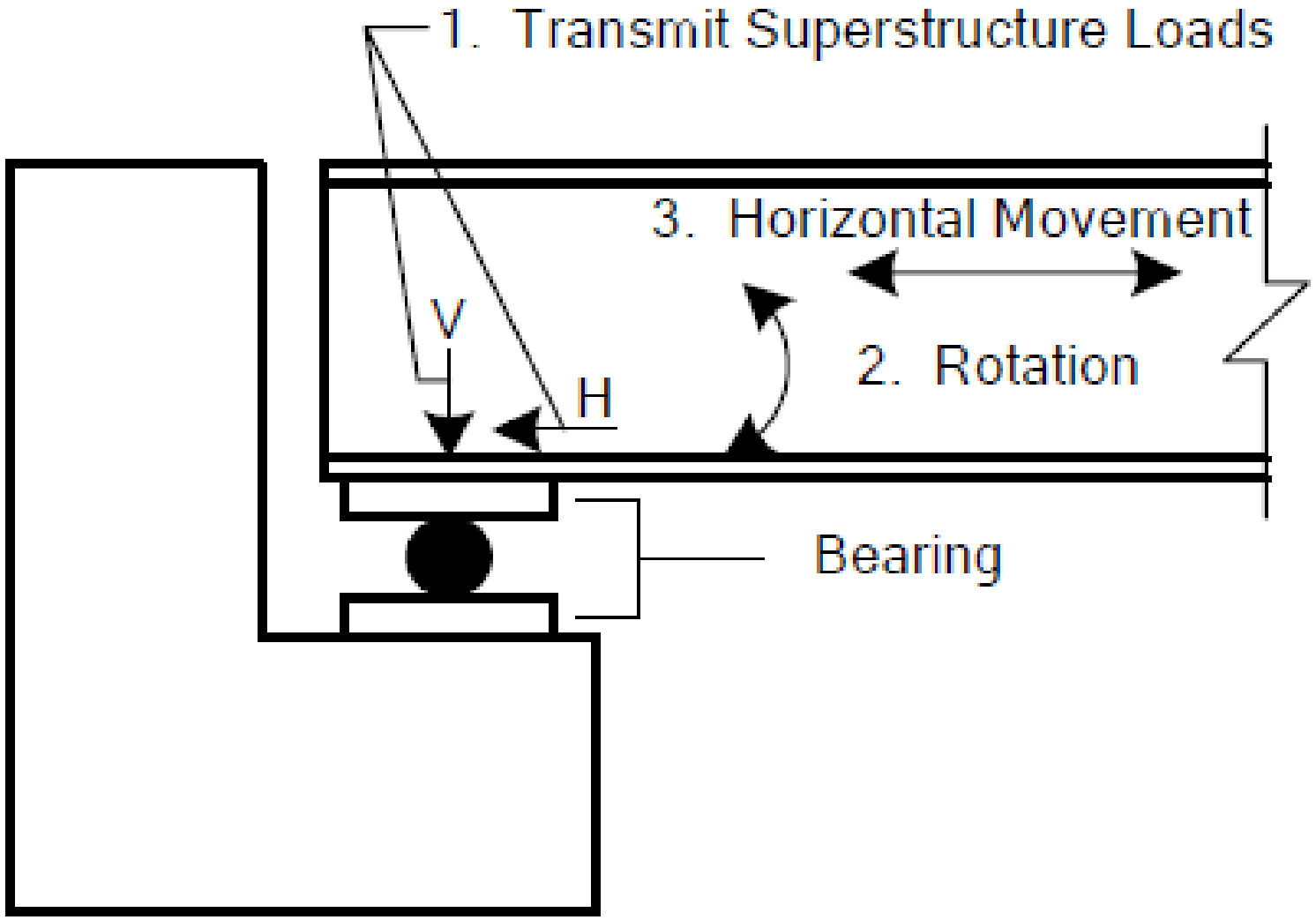
One Row of Bearings

Two Rows of Bearings

Bearings – Functions

- Transmit loads from superstructure to substructure
- Allow rotation caused by loading
- Allow movements caused by thermal expansion and contraction

Bearings – Functions



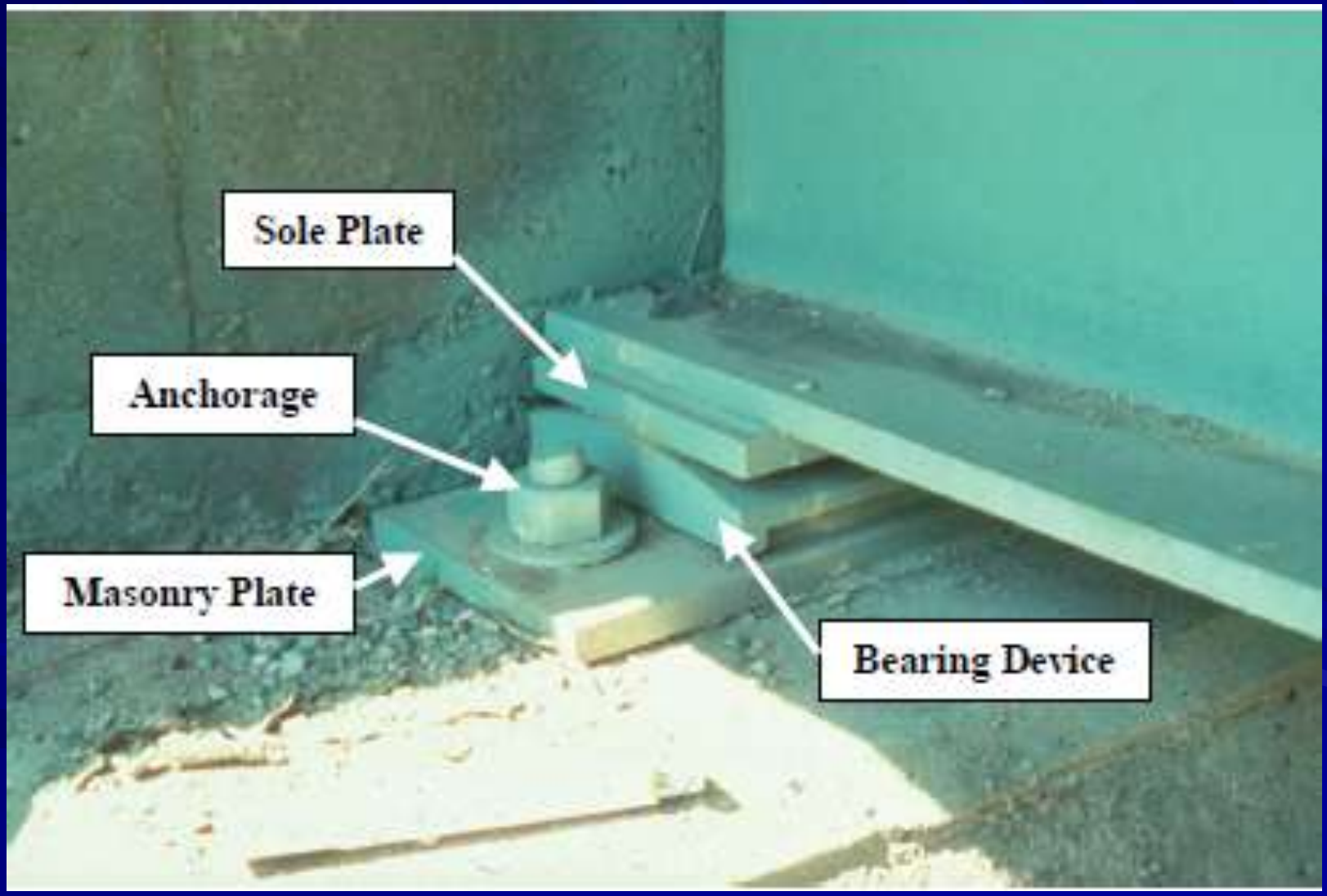
Main Categories

- Expansion Bearings
  - Allow thermal movements
  - Steel Bridges = 1 ¼” per 100 ft
  - Concrete Bridges = 1” per 100 ft
- Fixed Bearings
  - Restrains movements

Fixed Bearing

Expansion Bearing

Bearing Components



Types of Bearings

- Chosen based on:
  - Length of span
  - Skew
  - Cost

Sliding Plate Bearings

Rocker Bearing

Elastomeric Bearings

Pot Bearings

Damage and Deterioration

- Caused by leaking joint from above
- Reduced by preservative actions
- Rate of Deterioration increased if not cleaned

Pin Wear

Anchor Bolt

Beam End Corrosion

Beam End Corrosion

Pedestal Damage

Repairs

- May be necessary if capacity is compromised
- Costly
- Have other tasks that could be doing

Block Up

Refurbish Bearings

Jacking Up Bearings

Jacking Up Bearings

New Sharon – Sandy River

New Sharon – Sandy River

Structural Rehabilitation

Old Town – Stillwater #2

Old Town – Stillwater #2

Preservation

- Essential in getting the most life out of bridges
- Easy to do
- Relatively inexpensive
- Starts with sealing the joint

Bridge Cleaning and Washing

Fluid Film

Paint


Joey

West Gardiner - Tappan

West Gardiner - Tappan

Paint Weathering Steel