Gusset Plate Retrofit in Texas
Corpus Christi Harbor Bridge

- Built in 1959
- 5,819’ Total Length
- Two 272’ Simple Span Approach Deck Truss
- 1244’ Cantilever/Suspended Main Span Unit
- Carries 6 Lanes of Traffic
Project Specifics

- Inspection and Report - 12/2008 to 1/2009
- Repair/Paint Project Let - 1/2010
- Inspection and Load Rating - $1,002,898
- PSE Package Preparation - $717,133
- Structural Repair Bid - $4,781,830
- Painting Bid - $18,383,880
Gusset Plate Evaluation - Method

- HS-20 Truck and Lane Loads
- Vertical Loads Determined Using 2-D
- Truss Members Were Evaluated as Pinned
- 3-D Methods Used to Determine Member Forces
- Spreadsheets Used to Generate Load Ratings
- FWHA Guidance Document Used
- Deteriorated and Like-New Condition Evaluated
Gusset Plate Evaluation - Areas

- Rivet/Bolt Shear and Bearing
- Tension Yielding on Gross Section
- Tension Fracture on Net Section
- Block Shear
- Compression Buckling
- Shear Yielding on Gross Section
- Shear Fracture on Net Section
- Edge B/T Buckling Requirements
## Project Repair Items

- **Truss Gussets:** 37 (EA)
- **Sway Gussets:** 82 (EA)
- **Lateral Gussets:** 37 (EA)
- **Truss Members:** 7 (EA)
- **Lateral Members:** 19 (EA)
- **Knife Edging:** 3693 (LF) & 43 (EA)
- **Pack Rust:** 5952 (LF) & 423 (EA)
- **Rivet Replacement:** 168 (EA)
Rivet Replacement Detail

- Existing Gusset Plate
- 2" Dia Hole in Fill Plate
- Existing Truss
- New Heavy Hex Nut
- New Washer
- New Heavy Hex Nut
- New 3/4" or 1" Cover Plate
- New 7/8" Dia HS Bolt in New or Existing Hole with New Washer Under Bolt Head
- Existing Hole
- New 1 1/4" Fill Plate
Section Loss in Gusset Plate

Truss Top Chord

Section Loss in Gusset Plate

Truss Vertical
Top Chord Gusset Plate

Replace Existing 7/8" Rivets with New 1/4" Dia HS Bolt (Typ)
See Rivet Replacement Detail (See Note 4)

See Shop Drawing 1028C for PP U2 Bolt Pattern,
See Shop Drawing 301BC for PP U4 Bolt Pattern.

Existing Top Chord

New 3/4" Inside Cover Plate

Existing Top Chord

Drill 1/4" Dia Hole for New 1/4" Dia HS Bolt (Typ)
Existing Tie Plate (Typ)
New 3/4" Cover Plate & 1/4" Fill Plate

Existing Truss Vertical

Existing Tie Plate (Typ)

Existing Truss Vertical

2010 AASHTO Technical Committee for Bridge Management, Evaluation and Rehabilitation - Sacramento
Main Gusset Plate

1. Edge Distance for Bolt Holes at Member U12-M13 Reduced to 1/4" to Provide Clearance for Truss Member U12-M13 Repair Splice Plate (See Note 4). All Other Minimum Bolt Edge Distances are 1/2" Unless Noted.

Sway Frame Gusset Plate

- Drill 1 1/8" Dia Holes for New 5/8" Dia HS Bolts (Typ)
- New 3/4" Cover Plate & 1/4" Fill Plate (NS & FS)
- Replace Existing 7/8" Rivets with New 5/8" Dia HS Bolts (Typ)
  See Rivet Replacement Detail (See Note 3)
- Existing Gusset Bend Line
- Existing 3/8" Bent Gusset to Remain (NS & FS)
- Existing Sway Frame Bottom Strut
- PP0 to PP3 & PP5 to PP7

Existing Sway Frame Vertical
Existing Sway Frame Diagonal (Typ)
Questions????

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