BRIDGE PROTECTIVE BEAM WRAP

TxDOT Bridge Presentations Webinar
Amy Smith, P.E.
TYPICAL BRIDGE ELEVATION

1. -6" min, 2'-0" max
2. First layer - place 2' wide carbon fiber fabric sheets longitudinally on beam girder, with fiber orientation parallel to beam/girder centerline. Locate sheets on section corners of beam/girder as shown. Fabric sheets may be overlapped to minimum in the longitudinal direction to achieve full protection length.
3. Second layer - place carbon fiber fabric sheets transversely on beam/girder, with fiber orientation perpendicular to beam/girder centerline. Wrap sheets around beam/girder, with both face wraps in the longitudinal direction to achieve full protection length.

SECTION A-A

SHOWING TYPICAL BEAM SECTIONS

CONSTRUCTION NOTES
1. Beam or girders are spaced closely together. Install CFRP wrap prior to beam/girder erection.
2. All bonded beam/girders. Tighten tie-downs to maintain alignment with beam/girder. Bonding surface must be smooth, free of roughness and oil to match beam/girder concrete. Final bond is achieved prior to coating.
3. Painted beams/girders. Paint approved CFRP system and apply the protection system giving appropriate finish as specified.
4. POPROOF system will produce uniform finish, as specified elsewhere.

GENERAL NOTES
1. The slope of the final CFRP system, including protective coating, is approximately 4:1. (Refer to Item 422.) Carbon fiber is bonded parallel for strengthening concurrent beam/girder members. Install CFRP wrap to beam/girder shown on the sheet. See the location for the ‘Wire Wrap’ shown in the location described in the ‘Wire’ for the Bridge Protective Beam Wrap is shown on the sheet. Quantity is measured by the square foot of beam/girder surface area covered.

BRIDGE PROTECTIVE BEAM WRAP

Texas Department of Transportation

Bridge Division Standards

Bridge Protective Beam Wrap

BPBW

 typical beam sections.
BPBW Standard

- Bridge Protective Beam Wrap (BPBW) standard
- New standard posted July 2013

- Replaces Bridge Protective Assembly (BPA) standard
  - The BPA was not effective
  - Often caused more damage
  - Can be a debris hazard itself
BPBW Standard

- A BPA that didn’t work
BPBW Standard
BPBW Standard

- A BPA that didn’t work
BPBW Standard

TYPICAL BRIDGE ELEVATION

See Bridge Layout for overall length

See Bridge Layout for location

Roadway Width along beam Not including Shoulders

See Bridge Layout for location

Carbon Fiber Reinforced Polymer (CFRP) Wrap
BPBW Standard

- 24” wide sheets of CFRP
- Placed in two layers – longitudinal and transverse

**SECTION A-A**
Showing typical beam sections.
BPBW Standard

- Beam hit with CFRP installed
Minimal damage on exterior beam
BPBW Standard

- Benefits of the BPBW
  - Reduces total damage to beams
  - Concentrates the damage
  - Captures debris

- When to use the BPBW
  - High probability of over-height hits

- Payment per Item 4191, SF
  - $22/SF in 12mo avg.
  - For 24” rdwy Tx54

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\text{30 ft x 5.9 sf/ft x $22/sf = $3,894 per girder}
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Questions

- Have more questions?

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