**Project Details**

Year: 2008  
Span: 28'-10"  
Rise: 7'-6"  
Width: 45'  
Skew: 5°  
Arches: 23 carbon fiber tubes  
2'-0" spacing  
12" diameter  
Headwall: composite sheet pile with  
geo-grid mechanically stabilized earth

**Highlight**

The Neal Bridge was the first bridge in the world constructed using concrete filled fiber reinforced polymer (FRP) arches. This pilot project was a result of the cooperation of the MaineDOT and the University of Maine’s AEWC Advanced Structures and Composites Center, culminating years of research and laboratory structural testing.
**Project Details**

Year: 2009  
Span: 27'-7"  
Rise: 4'-5"  
Width: 25'  
Skew: 15°  
Arches: 9 carbon fiber tubes  
3'-0" spacing  
12" diameter  
Headwall: corrugated composite panels with geo-grid mechanically stabilized earth

Owner: Town of Anson, Maine  
Engineer: Advanced Infrastructure Technologies  
Orono, ME  
Contractor: Gardner Construction Enterprises, Inc.  
Bangor, ME

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**Highlight**

The town of Anson required that the bridge be completed prior to the beginning of the school year so buses could avoid lengthy rerouting. Even though the beginning of construction was delayed until mid-August the bridge was replaced start to finish in **twelve working days** and open to traffic by the first day of school.
Royal River Bridge
Auburn, Maine

Project Details

Year: 2010
Span: 38'-0"
Rise: 9'-6"
Width: 38'
Skew: 15°
Arches: 13 carbon fiber tubes
3'-1" spacing
12" diameter
Headwall: cast-in-place concrete and precast modular gravity wall

Owner: MaineDOT
Engineer: Kleinfelder • SEA
Augusta, ME
Contractor: Wyman & Simpson, Inc.
Richmond, ME

Highlight

This project was selected as a national 2011 Engineering Excellence Grand Award winner by the American Council of Engineering Companies (ACEC).
Project Details

Year: 2010
Span: 28'-6"
Rise: 6'-0"
Width: 34'
Skew: 19°
Arches: 12 carbon fiber tubes
        2'-11" spacing
        12" diameter
Headwall: composite panels with through ties

Owner: MaineDOT
Engineer: Kleinfelder•SEA
         Augusta, ME
Contractor: Wyman & Simpson, Inc
           Richmond, ME

Highlights

- The Jenkins Bridge utilized an innovative composite headwall design that allowed the voided composite headwall panels to be installed rapidly and provide a corrosion resistant means of soil retention.
- The first year in service an ice floe completely dammed up this bridge opening, however the bridge withstood the extreme hydraulic forces with no negative results.
Tom Frost Bridge
Hermon, Maine

Project Details

Year: 2010
Span: 44’-6”
Rise: 6’-10”
Width: 12’
Skew: 0°
Arches: 3 carbon fiber tubes
      5’-6” spacing
      12” diameter
Headwall: not applicable

Owner: Penobscot Snowmobile Club
       Hermon, ME
Engineer: Advanced Infrastructure
          Technologies
         Orono, ME
Contractor: Gardner Construction
           Enterprises
            Bangor, ME

Highlights

- When a car drove off the road and struck a nearby snowmobile bridge in Hermon the Penobscot Snowmobile Club chose to replace the former wooden structure with a composite arch bridge. Designed for snowmobile groomer and snow loads this solution proved an economical and durable option for the snowmobile club.
- The bridge was constructed in four working days.
- The deck is an 8” roughened reinforced concrete slab.
Project Details

Year: 2010
Span: 47'-7"
Rise: 11'-0"
Width: 45'
Skew: 0°
Arches: 16 carbon fiber tubes
2'-11" spacing
15" diameter
Headwall: cast-in-place concrete and precast modular gravity walls

Owner: MaineDOT
Engineer: Kleinfelder•SEA
   Augusta, ME
Contractor: Stetson & Watson
   Pittsfield, ME

Highlights

- Perkins Bridge was the first bridge constructed with 15" diameter tubes. With only 25% more carbon fiber than their 12" alternatives these arches provide twice the bending strength.
- Each pre-filled arch weighed about 250 pounds.
- All sixteen arches were delivered to the jobsite in three packaged units and quickly unloaded with a lightweight boom truck and nylon lifting straps.
Project Details

Year: 2011
Span: 54'-2"
Rise: 12'-0"
Width: 55'
Skew: 30°
Arches: 22 carbon fiber tubes
2'-8" spacing
15" diameter
Headwall: mechanically stabilized earth retaining wall with inextensible reinforcement straps and precast concrete facing panels

Owner: MaineDOT
Engineer: Kleinfelder•SEA
Augusta, ME
Contractor: CPM Constructors
Freeport, ME

Highlights

- First new-construction design with these arches
- Largest in the world composite arch bridge
- First roadway overpass utilizing composite arch tubes
- This bridge allows farm equipment and local traffic to pass beneath the highway instead of crossing the road greatly increasing the safety of the 55mph roadway.
Scott Reservoir Outlet
Fitchburg, Massachusetts

Project Details

Year: 2011
Span: 37'-7"
Rise: 5'-7"
Width: 36'
Skew: 30°
Arches: 15 carbon fiber tubes
2'-6" spacing
12" diameter
Headwall: mechanically stabilized earth retaining wall with geo-grid reinforcement and composite facing panels

Owner: MassDOT
Engineer: Greenman-Pedersen, Inc.
Stoneham, MA
Contractor: R.Bates & Sons, Inc.
Clinton, MA

Highlights

- MassDOT elected to use the composite arch bridge system as part of the Accelerated Bridge Program for the replacement of the Scott Reservoir Outlet bridge.
- Gov. Patrick Deval visited the construction project to publically support the first use of this technology in the state of Massachusetts.
- Composite headwall components were prefabricated off site and shipped to the jobsite in four pieces.
**Project Details**

- **Year:** 2011
- **Span:** 23'-8"
- **Rise:** 6'-0"
- **Width:** 26'
- **Skew:** 0°
- **Arches:** 6 carbon fiber tubes
  - 4'-9" spacing
  - 12" diameter
- **Headwall:** composite sheet pile with through ties

**Highlights**

- Constructed at the base of Mt. Washington, the highest peak in the Northeast, the NHDOT bridge to a maintenance lot is exposed to **extreme conditions** including flash flooding and huge snow fall levels.
- This design spaced arches at the greatest distance to date requiring **only six tubes** for the 26' wide bridge.
- NHDOT elected to internally design and construct the **composite sheet pile headwall**.

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**Owner:** NHDOT  
**Engineer:** NHDOT  
**Contractor:** NHDOT Bridge Maintenance