



FIVE STAR

Five Star® Special Grout 400

Advantages:

- Air release technology per ACI 351.1 R
- Pumpable fluid grout for very tight clearances
- Non-bleeding
- Permanent filling of voids
- Extended working time
- Pumpable up to 2 hours at 90°F (32° C)
- Nonshrink from the time of placement
- Does not contain aluminum

Applications:

- Provides corrosion protection of bridge cables
- Nonshrink grouting between precast panels, walls and beams
- Pressure placement into tendon ducts



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Penobscot Narrows Bridge

Corrosion Protection of Post-tensioned Cables

Five Star® Special Grout 400

Bucksport, Maine

The Penobscot Narrows Bridge is a cable-stay bridge over the Penobscot River near Bucksport, Maine. It utilizes a number of unique and innovative designs to defend against steel corrosion, including the use of nitrogen gas and carbon fiber strands for cable stays.

With a 420-foot high observation tower, and a deck span of 2,120 feet (646 meters), it is the first of its kind in the United States. It is one of two bridges in the U.S. constructed recently to utilize a cradle system.

The Penobscot Bridge is considered one of the most advanced superstructure designs of our modern day and includes some of the most rigorously tested and innovative products currently developed. The Penobscot Narrows Bridge incorporates the use of Five Star Special Grout 400 for corrosion protection of post-tensioned cables.

Over 6000 bags of Five Star Special Grout 400 were used on this project and were selected for use based upon outstanding field mock-up test results as compared to competitive materials. The field testing involved pumping grout



Penobscot Narrows job site—Maine

through a 150 foot section of clear pipe containing steel strands to evaluate shrinkage and encapsulation rates around the strands.

Five Star Special Grout 400 compressive strength, bleed and flow were also measured during the test to ensure a truly high performance grout was utilized on this project.

Support for this project was provided by a Five Star team that included the Five Star Regional Manager who provided on-site technical assistance, the Five Star Customer Service group which ensured timely product delivery for this fast-track project, the Five Star Technical Center, and the Five Star local distributor.

Five Star Special Grout 400 is a vital component of the Penobscot Narrows Bridge and is engineered to protect and provide a corrosion-free environment for post-tensioning issues that face modern bridge builders today.



Flow cone test



Field testing of Five Star® Special Grout 400