

## **Bridge of Flowers & Light Enosburg, Vermont**

**Award:** ACEC Year 2000 Grand Award,  
Category B ("Transportation")

**Owner:** Village of Enosburg Falls

**Services Provided:** Surveying and civil,  
geotechnical and structural engineering.  
Construction services included resident  
inspection and materials testing.



**Pre-Construction Condition (1996)**



**Forming for Downstream Sidewall**

**Problem:** The landmark structure featured in the Village logo of Enosburg Falls has long been the old Route 108 bridge. When Route 108 was relocated in the 1960's, the old arch bridge was abandoned in-place. By the 1990's the arch bridge was in serious disrepair. The Village was faced with 3 options: 1) let the bridge deteriorate and collapse into the Mississquoi River, 2) remove the landmark structure, or 3) restore the bridge.

**Stabilization:** The first element of the engineering portion of work was the design and implementation of structural shoring for the existing bridge. During this pre-design phase, structural and geotechnical investigations were performed to assess the condition of the existing concrete and foundations. As originally expected, the main concrete arch was in good condition, but the sidewalls were distressed. The downstream sidewall required total replacement; the upstream sidewall was out-of-plumb and required re-attachment to the main arch and a new concrete railing. The south abutment required stabilization due to voids in the old stone foundation.



**Reinforcing for Arch Below the  
Downstream Sidewall**

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**Setting Brick Pavers**

**Design Approach:** The design concept required specific sequencing in the construction so as to minimize the chance for structural damage. In general, the construction sequence would be: 1) stabilize the sidewalls, 2) carefully remove the soil overburden so as to minimize unbalanced arch loading, 3) reinforce the main arch and re-attach the upstream sidewall by means of a 6"-8" thick concrete arch cap, 4) stabilize the foundations, 5) Color match the new concrete, 6) remove and re-build the downstream sidewall, 7) replace the fill over the arch with crushed stone, 8) patch and repair spalled concrete, 9) construct the concrete railings and planters, and 10) install the brick pavers, granite benches, lights and landscaping.

**Construction:** During the construction, numerous voids (requiring grouting) were encountered in the field stone foundation along with additional concrete railings in need of repair or replacement. Despite these extra work items, the construction was completed within the 6% contingency. After one year of construction, the old Route 108 bridge was re-opened and dedicated as the "Bridge of Flowers and Light".



**Dedication Ceremony (1999)**



**Brick Surface and Concrete Planters**

**Committed to Excellence in Engineering and Construction Services**