

# Bennington Battle Monument



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Bennington Battle Day and DAR Marker Dedication, August 2024

# Bennington Battle Monument

## *Second Tallest Unreinforced Masonry Building in United States*

**1876:** A second Bennington Battle Monument Association was incorporated by the Vermont Legislature and \$15,000 was appropriated for the project. The country's centennial provided additional stimulus to move the effort forward.

**1878:** Fundraising for monument project began.

**1881:** Congress passed bill, sponsored by Vermont Senator Justin S. Morrill, to appropriate matching funds for the erection of the Bennington Battle Monument.

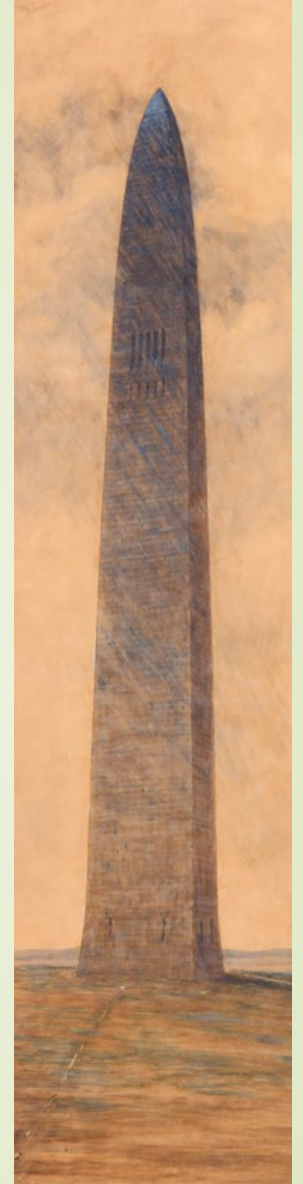
**1885:** The Bennington Historical Society approved J. Phillip Rinn's design for the monument.

**1887:** Construction on the Bennington Battle Monument began in June; the cornerstone was dedicated on August 16, the 110th anniversary of the battle.

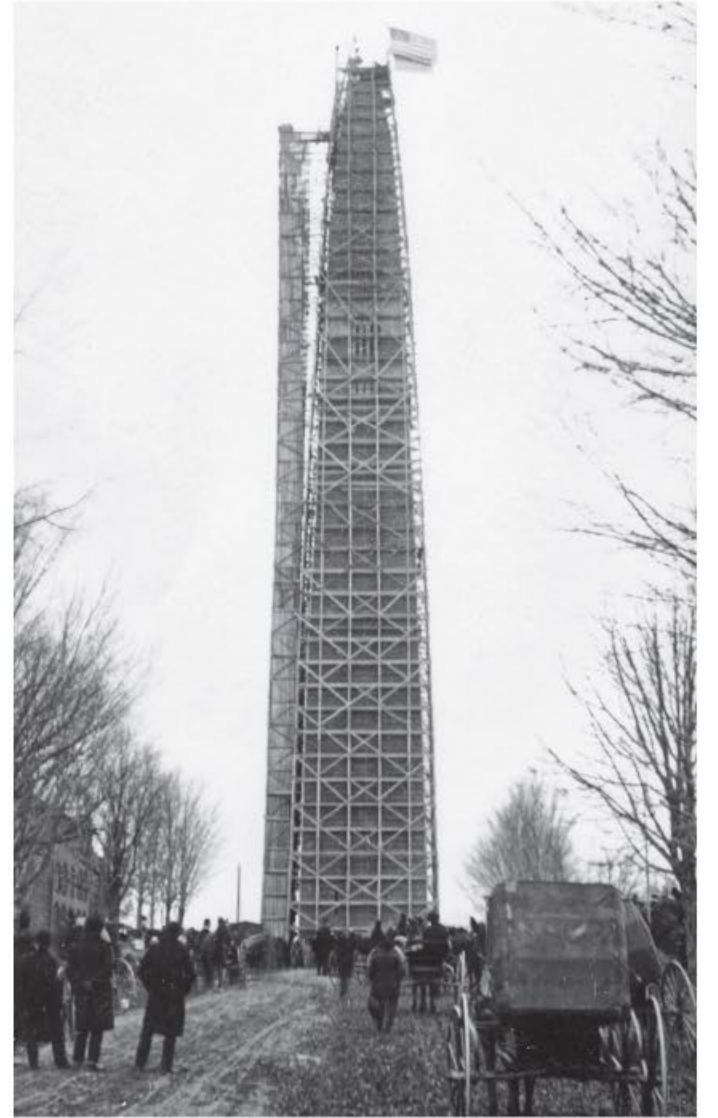
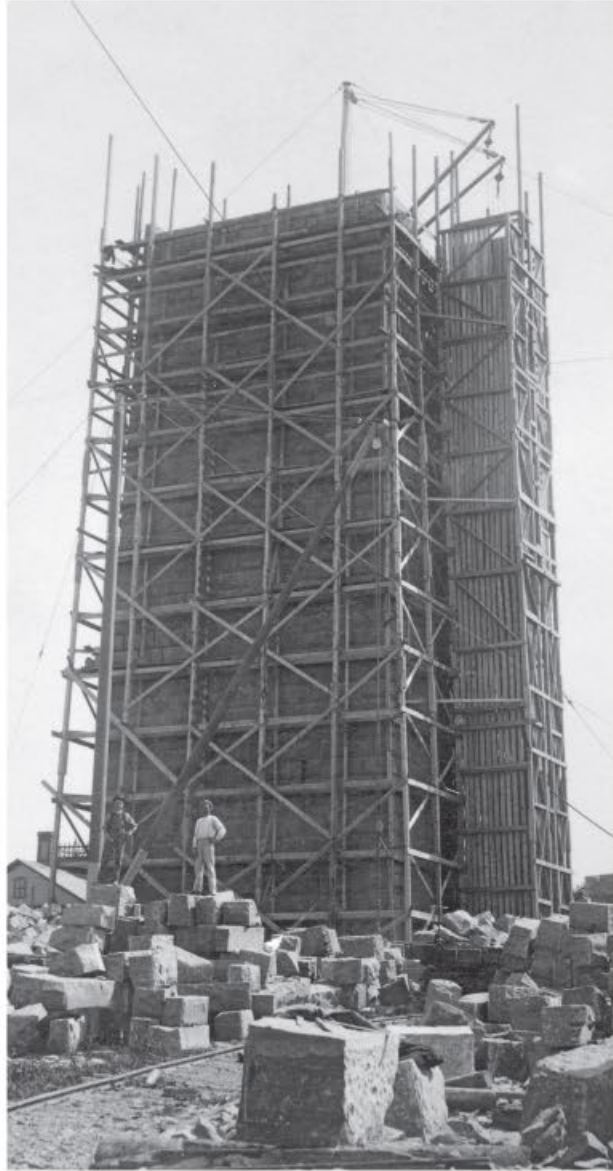
**1889:** The 306-foot structure was completed, and the capstone was set, although work on the interior continued.

**1891:** On August 19, the Monument was dedicated and opened to the public as part of celebrations marking the centennial of Vermont's statehood.

**2024 Visitation: 39,931 Revenue: \$276,211**



J. Phillip Rinn design for Bennington Battle Monument





Monument Interior Conditions  
1.12.2018



Bennington Battle Monument Observation Deck and Ground Level February 2024



# Bennington Battle Monument

## STEP One: what is happening

- ▶ 2022-2024 Study and Planning Efforts
  - ▶ Issue: Excessive Moisture
  - ▶ Structurally sound

## STEP TWO: how to solve

- ▶ 3 years Dry Out Monument & Prepare Infrastructure and Schematic Design
- ▶ Explore Fund Opportunities

## STEP THREE+: fix the issues

- ▶ Multi-year restoration and repair
- ▶ Establish long-term cyclical maintenance plan

## ANNUAL STEP: ensuring the monument can open

- ▶ Safety maintenance monitoring

# Study and Planning Efforts

## 2022-2023 Study and Planning Efforts:

Architectural & Engineering Survey (year-long)

Research & Documentation

Field Inspections

3-D laser scan (inside/outside)

Baseline Documentation – high resolution working drawings

Installation of Monitoring equipment (moisture/cracking)

High-Ropes Access/Visual Field Inspection with Instrumentation

Discussion of Interim Procedures for Elevator

Elevator - analysis w/ proposed scope for ongoing elevator maintenance and service until restoration complete

## 2023-2024 Study and Planning Efforts Amendments:

Masonry Conservation Study

Hygrothermal Review and Geotechnical Investigation

Mechanical and Structural Engineering

Water Infiltration Testing

Preservation Analysis and Masonry Testing

Schematics and Costs

Lightening Protection

Petrography Testing

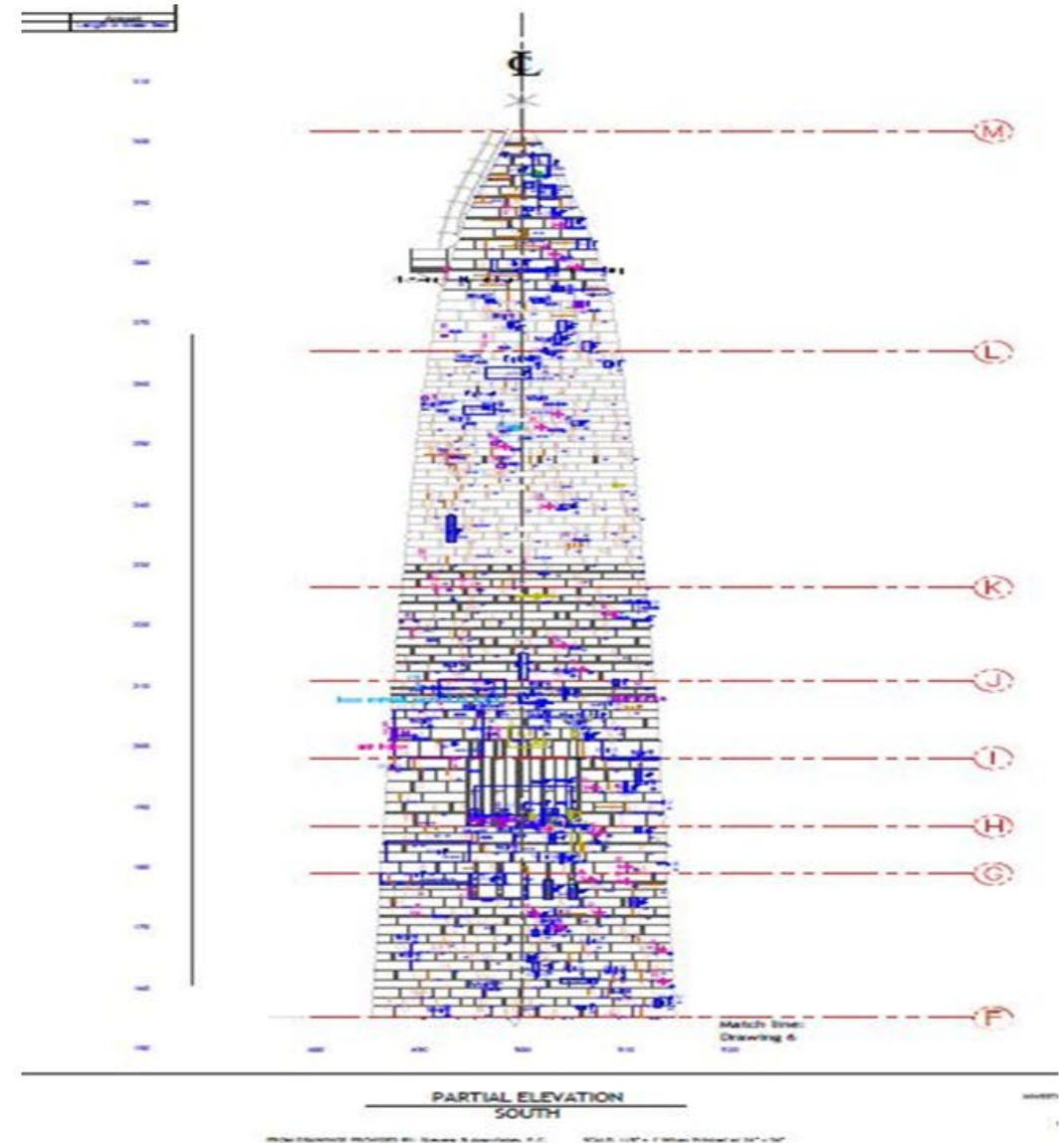
Elevator Improvements

**Phase 1 & 2 - Total Study Effort to date: \$988,868**



J. Phillip Rinn's Interior Plan for Bennington Battle Monument

| Block                | Condition               | Sum of Amount | Block Count | Sum of Severity |
|----------------------|-------------------------|---------------|-------------|-----------------|
| ArchMetal_Connection | Fastener failed         | 1             | 1           | 0               |
| ArchMetal_Note       | Misc photo              | 0             | 1           | 0               |
| ArchMetal_SoilStain  | Guano                   | 3.096         | 1           | 0               |
| ArchMetal_Unsecured  | Loose                   | 1.694         | 2           | 0               |
| Glass_Crack          | Cracked pane            | 1.062         | 3           | 5.8             |
| Stone_Crack          | Repair failed           | 4821.984      | 295         | 98.5            |
|                      | Repair removed          | 2.72          | 4           | 2               |
|                      | Repair sound            | 8.181         | 5           | 0               |
|                      | Single unit             | 111.131       | 63          | 41.75           |
|                      | System joints           | 4.717         | 1           | 1               |
|                      | System units and joints | 54.196        | 10          | 2               |
| Stone_Embedment      | Copper Embedment        | 1698.861      | 154         | 23.5            |
|                      | Ferrous Embedment       | 0             | 5           | 0               |
|                      | Other Embedment         | 0             | 4           | 0               |
| Stone_Joints         | Other Embedment         | 0             | 18          | 0               |
|                      | Mortar Caulked          | 12            | 1           | 0               |
|                      | Mortar Failed           | 1303.651      | 46          | 750             |
|                      | Mortar Missing          | 417.62        | 201         | 129             |
|                      | Mortar Removed          | 25.919        | 24          | 0               |
| Stone_Note           | Sealant Failed          | 67.968        | 11          | 50              |
|                      | Misc photo              | 0             | 62          | 0               |
|                      | Photo-general           | 0             | 40          | 0               |
|                      | Dutchman Failed         | 18            | 1           | 0               |
| Stone_Repair         | Patch Failed            | 3116          | 26          | 0               |
|                      | Patch Removed           | 214           | 6           | 0               |
|                      | Patch Sound             | 1363          | 6           | 0               |
|                      | Atmospheric             | 8.575         | 1           | 0               |
| Stone_SoilStain      | Biological              | 120.974       | 5           | 0               |
|                      | Bituminous              | 11.884        | 1           | 0               |
|                      | Efflorescence           | 22.603        | 10          | 0               |
|                      | Guano                   | 17.929        | 2           | 0               |
|                      | Leached Salts           | 169.851       | 10          | 0               |
|                      | Bonded                  | 0             | 4           | 38              |
| Stone_Spall          | Incipient               | 0             | 3           | 18              |
|                      | Missing                 | 0             | 15          | 249             |
|                      | Removed                 | 0             | 12          | 129             |
|                      | Exfoliated              | 4.757         | 4           | 6               |
| Stone_SurfLoss       | Exfoliation             | 14.87         | 3           | 3               |
|                      | Friable                 | 1.898         | 1           | 2               |
|                      | Borescope               | 0             | 3           | 0               |
| Test_Location        | Sampl                   | 0             | 1           | 0               |
|                      | Sample                  | 0             | 2           | 0               |
|                      | Totals:                 | --            | 13620.141   | 1068            |







## Summary of What was learned:

- Building has over 100% humidity
- Drying out the stone, interior and exterior, is a priority prior to any repairs
- Building is structurally sound and is not in danger of falling

# Current Recommendations for Moving Forward:

## PHASE 1A

### Dry out the Monument

1. Design and erect a 100% water-tight Monument Enclosure System
2. Geotechnical Engineering, Site Preparation Design & Site Improvements
3. Preparation of Monument Enclosure Bidding Documents & Procurement

Steps 1-3 =\$500,000

4. Erection of the Monument Enclosure

Step 4 =\$5.0M to \$10M

## PHASE 1B

### Infrastructure & Schematic Design

1. Mechanical & Electrical Engineering Improvements Design & Installation + Drying Period
2. Architectural (Design & Preservation) & Structural Engineering Schematic Design
3. Exterior Preservation Mock-ups for Restoration Scope of Work & Cost Estimate

=\$2.0M to 2.24M



# Annual Maintenance for Opening

Delay of full restoration project requires annual public safety measures including removal of loose exterior materials and hazards via industrial rope access, customized elevator service, monitoring of stairs, elevator, fire safety, and structural cracking acceleration.

Safety Measures taken to date: **\$80,000**

- Install temporary perimeter Fencing (purchased)
- Install temporary covered walkway from perimeter fence to Monument entrance (rental)

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## Annual Hazard Maintenance of Monument

- Industrial Ropes Inspection and Material Removals **\$75,000**
- Fencing & Protected Walkway Inspection **\$ 1,500**
- Monitoring **\$25,000 set-up (\$12,000/yr)**

## Annual Costs for Special Conditions

- Elevator Maintenance – specialty scope developed to be proactive with Elevator maintenance until full restoration of building envelope

**\$7,000**

**TOTAL PER FY \$158,500**