



**Parks**

# **Soldiers & Sailors Monument Restoration**

## **Project M071-323M**

Located at Riverside Drive & W89<sup>th</sup> Street  
in the Borough of Manhattan

### **Public Design Commission Review**

October 2024

WXY architecture + urban design

LERA Consulting Structural Engineers

NYC Parks

**Total Budget:** \$62.3M (Mayoral)  
FY 2023

**Project Size:** 25,000SF

# Project Goals

The restoration of the Soldiers & Sailors Monument, its surrounding terraces, and all associated structures.



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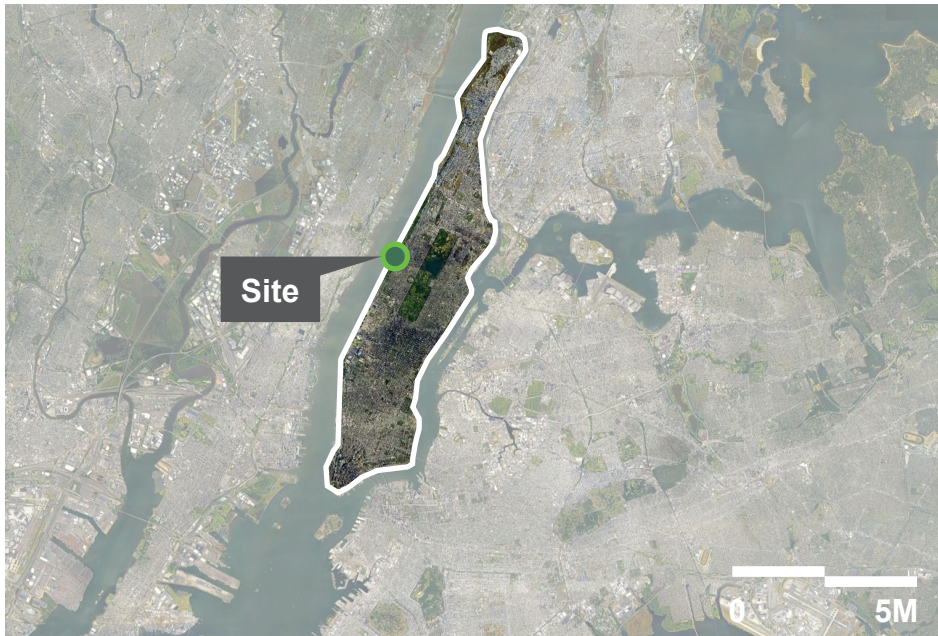
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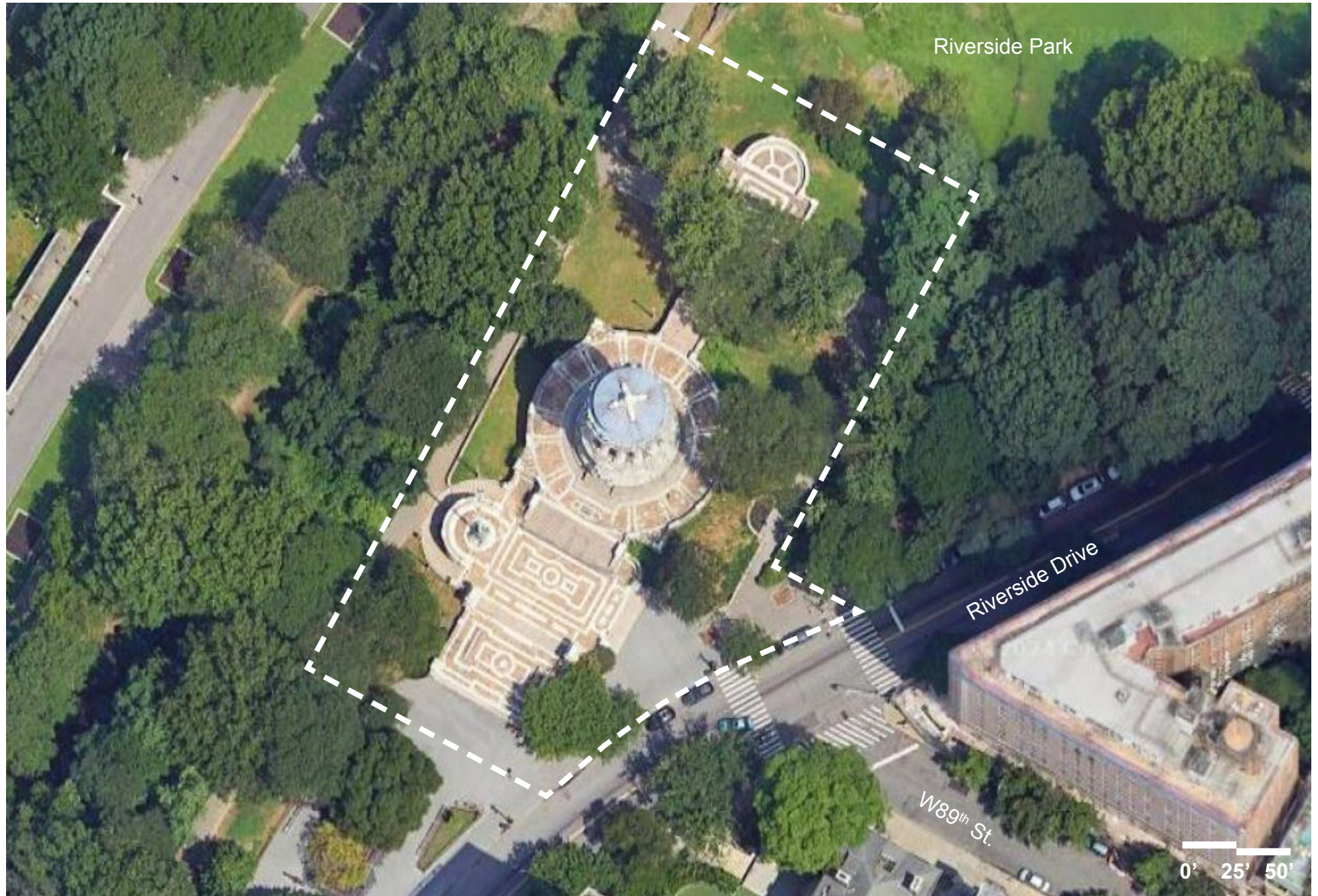
**Soldiers & Sailors Monument Restoration**  
**Riverside Park | Project Goals**



Borough: Manhattan



Neighborhood: Upper West Side | CB7



Site: Riverside Park



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**Soldiers & Sailors Monument Restoration**  
**Riverside Park | Project Location**





1— Aerial view from west, c. 1934

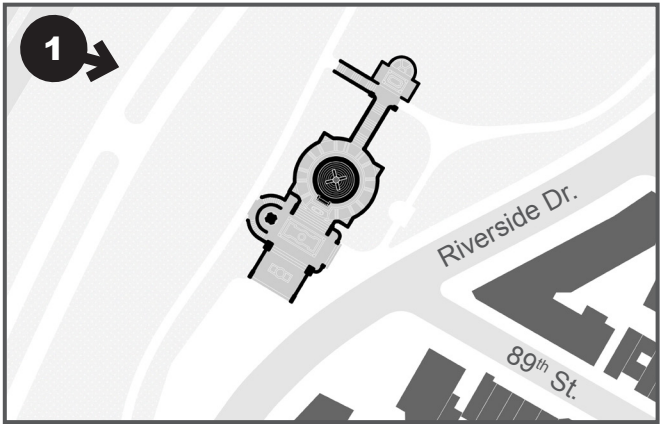


Photo Key



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**Soldiers & Sailors Monument Restoration**  
Riverside Park | Historical View





1— View from the South Plaza, 1911



2— View from South Plaza, 2024

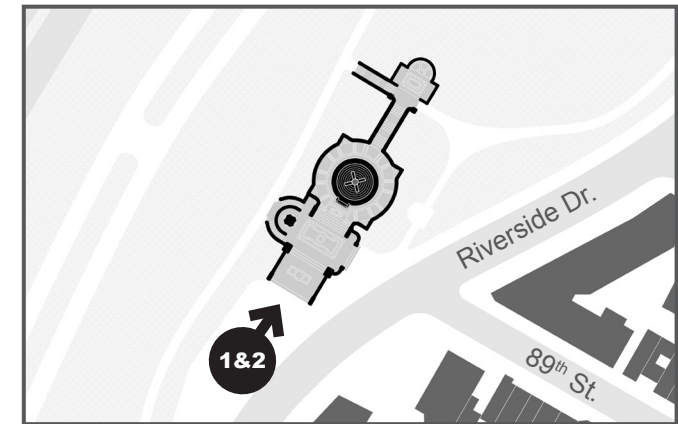


Photo Key



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**Soldiers & Sailors Monument Restoration**  
Riverside Park | Site Photos: Historic & Existing

**1869**

NY State Legislature authorizes the creation of a Soldiers & Sailors Monument.



**1897**

Stoughton & Stoughton win design competition held by Board of Commissioners.



**1899**

NY Governor Theodore Roosevelt lays the cornerstone.



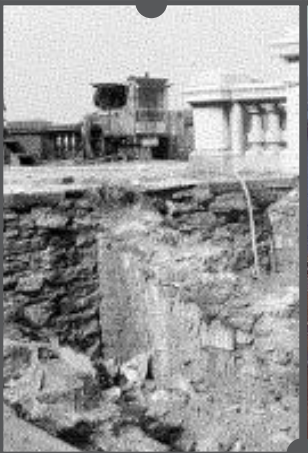
**1907**

First reports of localized failure.



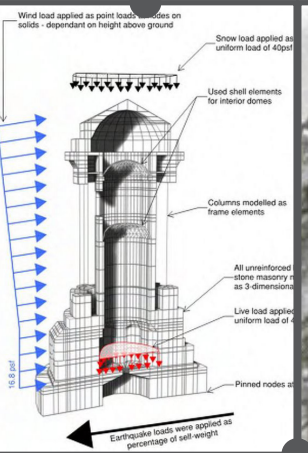
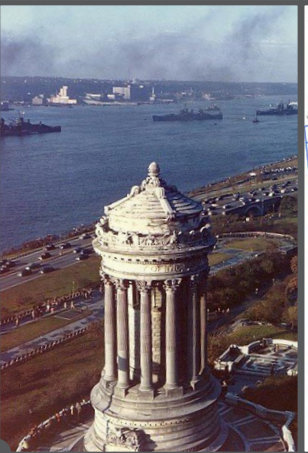
**1959-1962**

The City undertakes a comprehensive restoration of the monument.



**2017**

Soldiers & Sailors Monument: Conditions Survey and Restoration Treatment Study.



**1899**

The site in Riverside Park at 89<sup>th</sup> Street is chosen.

**1902**

Construction is completed and the Monument is unveiled.

**1930s**

The monument is coated with paraffin and brick pavers are replaced with concrete.

**1976**

The Landmarks Preservation Commission, with the support of the DPR, designates the monument a Historical Landmark.

**2024**

Current restoration & accessibility project.



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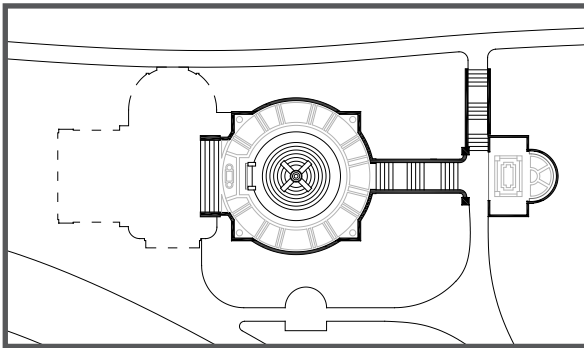
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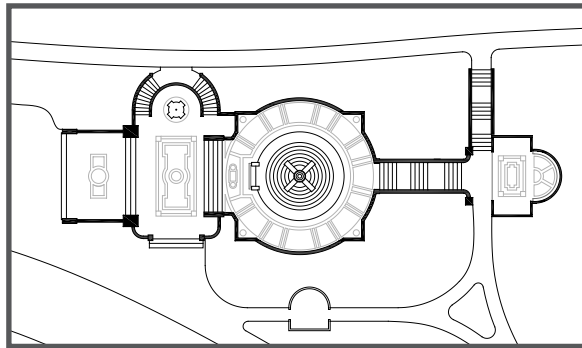
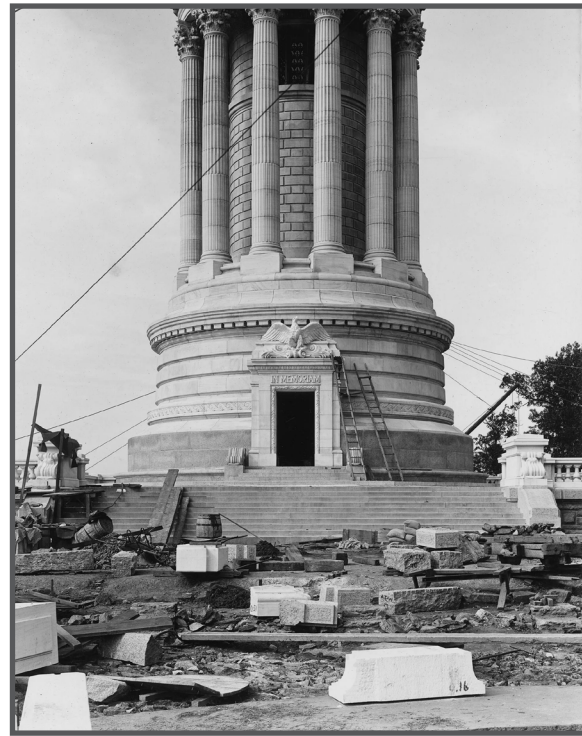
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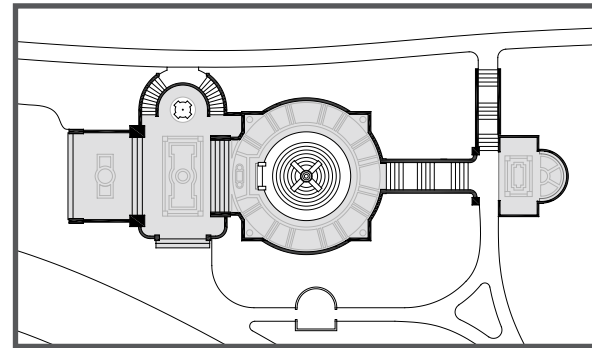
## Soldiers & Sailors Monument Restoration Riverside Park | Monument Treatment History



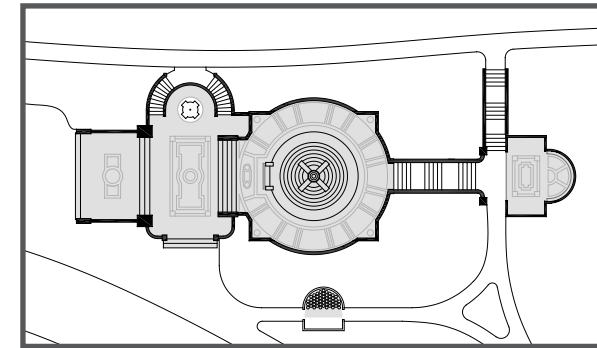
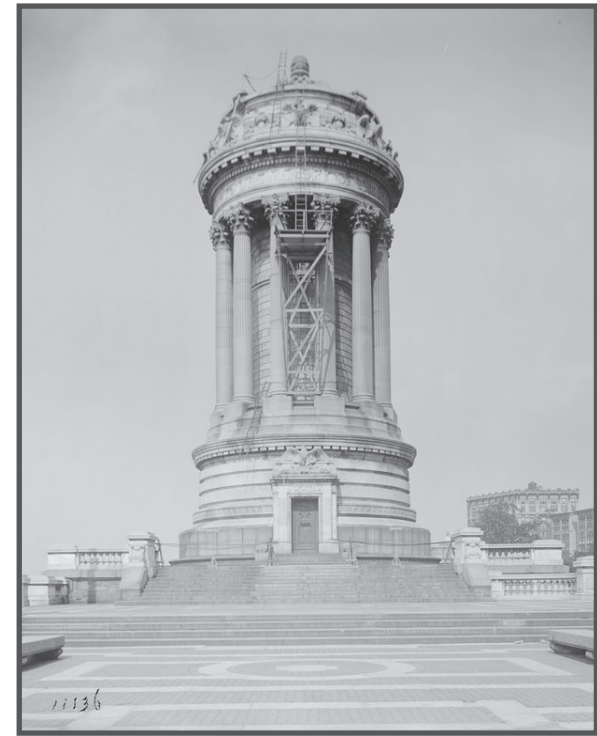
**1902**  
The Monument opens shortly before the Upper & Lower Terraces are completed.



**1902**  
The Upper & Lower Terraces are completed.



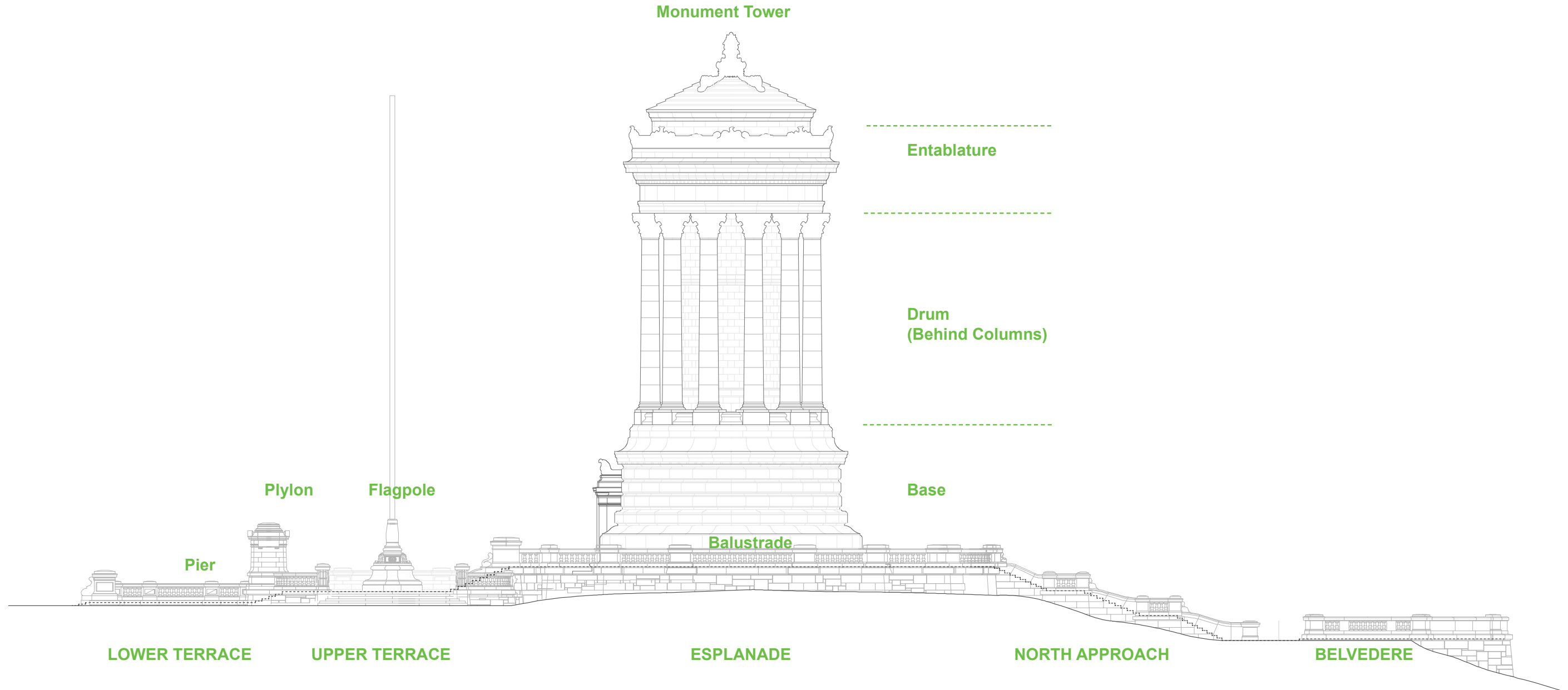
**ca. 1930**  
Original brick pavers, set within marble banding, are replaced with concrete.



**1959-1962**  
Last major restoration campaign—the terraces are repaved with Crab Orchard sandstone, marble balustrades are replaced with Indiana Limestone, cannon balls are relocated, the site is regraded, and the flagpole is replaced.



**Soldiers & Sailors Monument Restoration**  
Riverside Park | Monument Evolution



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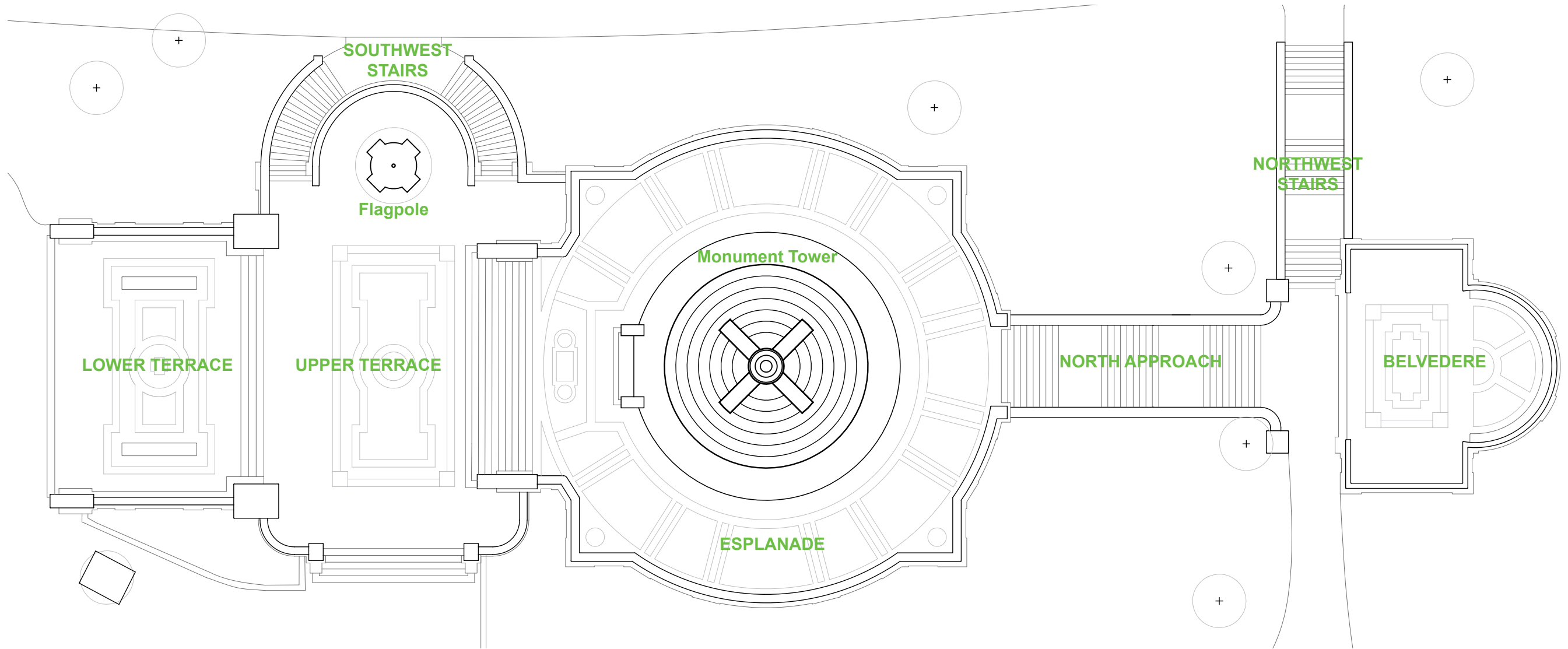
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**Soldiers & Sailors Monument Restoration**  
**Riverside Park | Monument Elements Nomenclature**



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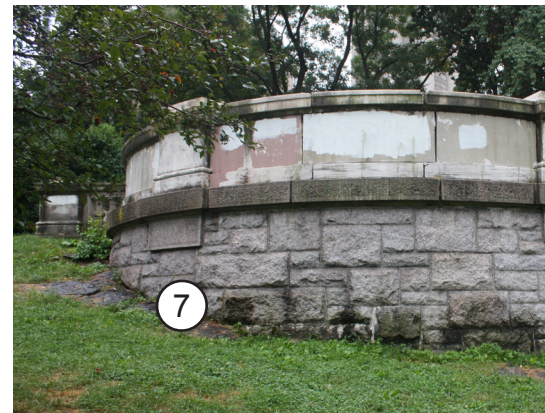
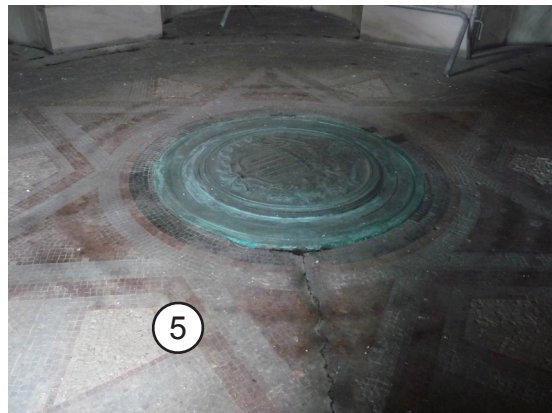
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**Soldiers & Sailors Monument Restoration**  
**Riverside Park | Monument Elements Nomenclature**



- 1 The existing marble, c. 1902, is to be restored.
- 2 The existing limestone balustrade, c. 1962, is to be restored.
- 3 The existing granite, c. 1902, is to be restored.
- 4 The existing bronze elements are to be preserved and maintained.
- 5 The existing mosaic tile floor finish of the monument interior to be restored.
- 6 The existing lead-coated copper roofing from 1960s to be replaced.
- 7 The existing Ashlar Foundation to be restored.
- 8 The existing crab orchard sandstone, c. 1962, is proposed to be replaced with custom brick pavers as per the original Stoughton & Stoughton design.



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## Soldiers & Sailors Monument Restoration Riverside Park | Restoration Palette



## 1 Danby Marble from Dorset, Vt

Preserved where possible. Missing or extremely deteriorated elements will be selectively patched or replaced to match the original configuration and marble.



## 2 Indiana Limestone

Marble balustrades at the plazas were replaced with Indiana Limestone during the early 1960s restoration campaign. Limestone balustrade shall be preserved and restored where possible. Severely cracked units to be replaced with balusters salvaged from localized removal to accommodate the new ADA entrance to the site.



## 3 Granite

The Monument's granite steps and base were quarried from the Lacasse Quarry located in Derby, Vermont. Milford Pink Granite (MA) was used on the north approach stair. Where replacement is needed, a granite will be selected to match.



## 4 Bronze

Bronze is featured at the flag post, the tablets, the monument entrance door and the interior cover to the vault. On Monument Drum, Bronze is also used as a window grille screen detail. Bronze to be restored.



## 5 Mosaic Tile Floor

The floor finish of the Monument interior is comprised of patterned stone mosaic tesserae which has been damaged related to long-term water infiltration issues. The floor exhibits cracking and substantial loss and erosion of individual mosaic units. The damaged and missing stone tesserae are to be replaced in kind and set in compatible concrete setting bed.



## 6 Sheet Metal Roofing

Lead-coated copper roofing dates from the 1960s restoration. It is located at the top of the Monument, at the Entablature, and the base of the Drum. The sheet metal roofing is at the end of its service life and shall be replaced in-kind. The sheet metal roofing at base of drum to be replaced with Kemper. (Not visible to the public.)



## 7 Ashlar Foundation (Retaining Wall)

The exposed ashlar foundation stone is locally quarried schist. All joints shall be repointed and any loose or deteriorated units reset.



## 8 Pavers

During the 1959-62 campaign, extensive work was conducted on the plazas. The original brick, previously replaced with concrete in the 1930s, was replaced with the brownish-colored Crab Orchard sandstone. Marble to be restored, sandstone to be replaced with brick.





### Danby Marble from Dorset, Vt

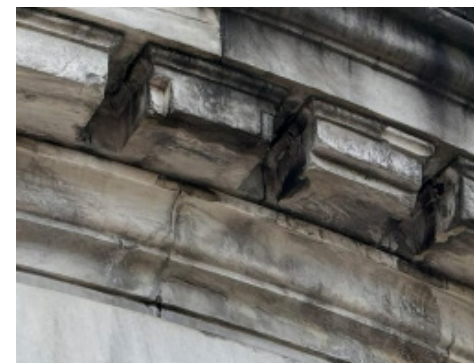
(Monument, Piers, Pylons, Pavers)

Preserved where possible. Missing or extremely deteriorated elements will be selectively patched or replaced to match the original configuration and marble.



### Recarve Missing Elements

Recarve and replace missing beak and wing tip of eagle over the front entrance.



### Marble Dutchman (and missing Spalls)

Install new Dutchman for previously failed and missing Dutchman, and all severely deteriorated projecting elements (most significantly at modillions and dentils at the Entablature level).



### Marble Cracks

Depending depth and width, typically clean and fill with range of lime-based, natural cement-based and acrylic-based grouts. Add stainless steel pins at projecting or over overhanging elements to eliminate gravity stress.



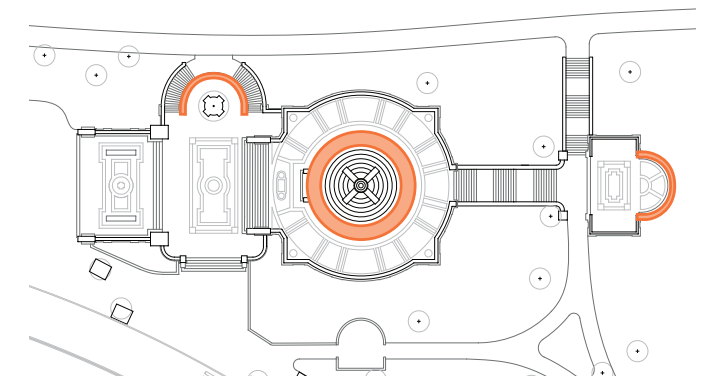
### Marble Cleaning

Microabrasion cleaning anticipated for most soiling types, incl. paint and heavy atmospheric soiling. Microbiological growth to be treated with D2 biocide. Limited use of pH neutral paint strippers and water washing is anticipated.

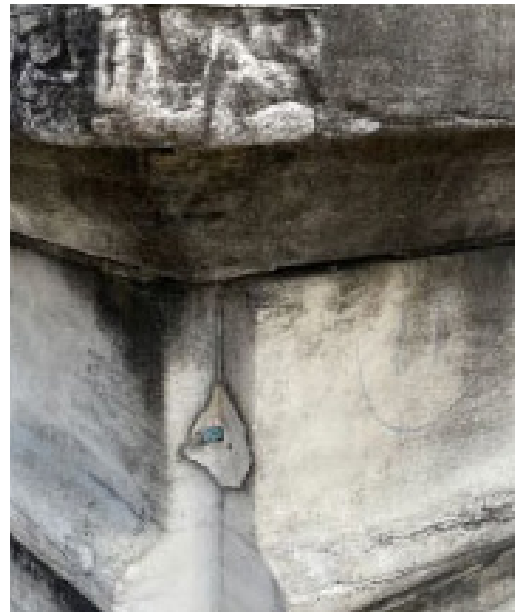


### Reset Displaced Marble

Remove, salvage and reset displaced marble at west flagpole surround and north Belvedere hemi-circular areas.



# 1 Marble

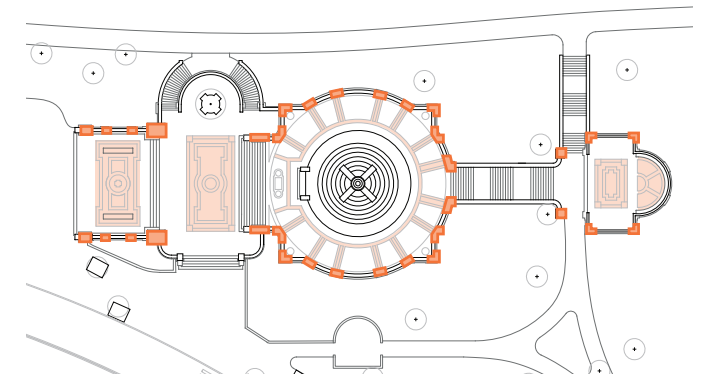


## Plazas: Pylons and Piers

- Marble surface suffers from atmospheric soiling, staining, graffiti and overpainting - - cleaning and paint removal is needed. Micro-abrasive cleaning, supplemented with limited ph-neutral paint stripping is anticipated (dependent on successful results of field mockups during Construction).
- Most 1960s Dutchman repairs are missing or damaged, requiring replacement with new.

## Plazas: Marble Paving

In coordination with new drainage scope, marble pavers to be removed and salvaged for reuse. Any units too damaged for paving reuse to be salvaged for Dutchman elsewhere. Any new units to match size and properties of the original.



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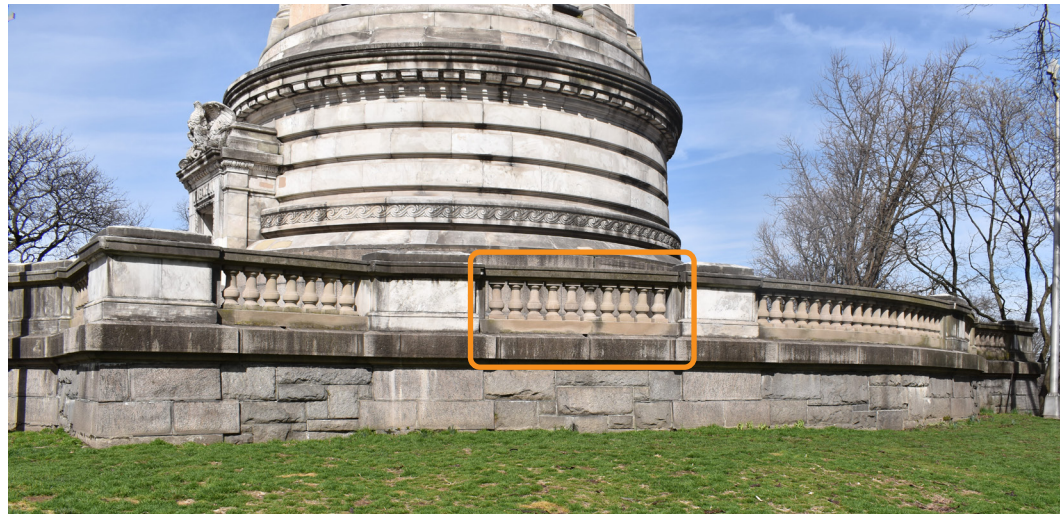
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**Soldiers & Sailors Monument Restoration**

**Riverside Park | Marble Condition and Treatment at Plazas**

# 2 Limestone



**Esplanade and Upper Plaza Limestone Units to be removed for new ADA entrance and to be Salvaged to Replace Damaged Elsewhere**



## **Indiana Limestone: Site History and Scope**

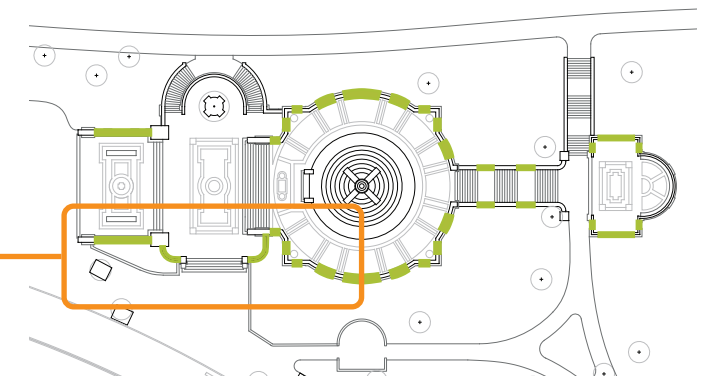
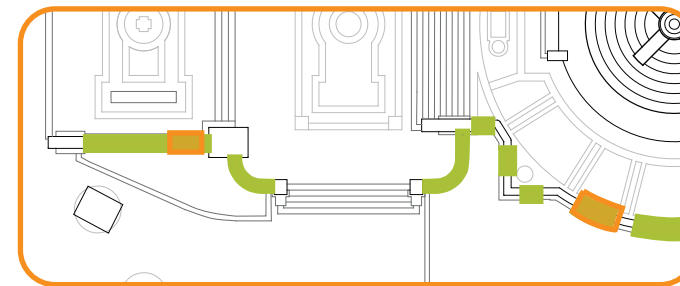
- Marble balustrades at the plazas were replaced with Indiana Limestone during the 1960s restoration campaign.
- Any balusters cracked horizontally through the neck or near the base will be replaced with matching balusters salvaged from openings created for the new ADA access points to the site.
- Remaining limestone balustrade is in overall good condition and shall be cleaned and preserved. Micro-abrasive cleaning is anticipated. All joints to be re-pointed with compatible mortar based on results of testing.



**Full Unit Limestone Crack**



**Full Unit Limestone Crack**



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## **Soldiers & Sailors Monument Restoration**

### **Riverside Park | Indiana Limestone Condition & Treatment**



### Milford Pink Granite, Mass.

Milford Pink Granite is found on the north approach stair assembly and is in good condition it will be preserved.

- Any spalls shall be replaced with matching Dutchman repairs.
- All joints to be 100% repointed.



Northwest stairs and cheekwalls



### Vermont Granite

Primarily from Lacasse Quarry located in Derby, Vt. (Steps, Monument Base).

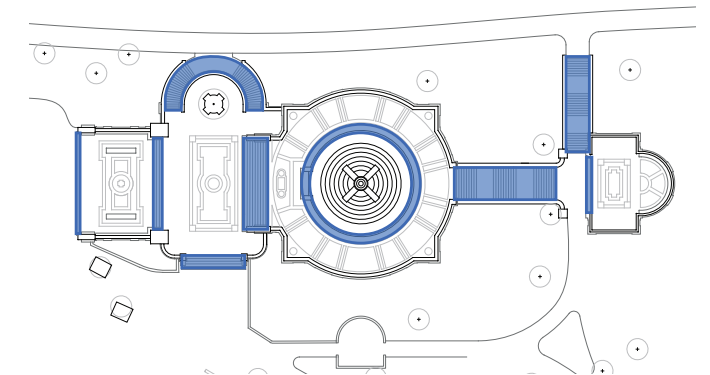
- Any spalls shall be replaced with matching Dutchman repairs.
- All joints to be 100% repointed. Contractor is responsible to update mortar testing for replacement mortar at each distinct masonry material. Final approvals shall be dependent on approved samples and successful field mockups during construction.



Plaza stairs

### Granite: Scope

- Overall, granite is in good condition exhibiting selective areas of loss, which will be replaced with matching Dutchman repairs.
- Joints will be 100% repointed with compatible mortar based on testing.
- Dimensional stair treads exhibit displacement, cracks and selective cementitious patches.
- Steps to be removed and reset, coordinated with plaza drainage system. Severely deteriorated stair treads to be replaced with matching granite.



# 4 Bronze



Flagpole Shaft Base



Window Grille on Drum



Monument Base Commemorative Plaque



Esplanade Plaza Plaques



Interior Vault Manhole Cover

## Bronze Elements: Restoration Treatments

### Flagpole Shaft Base

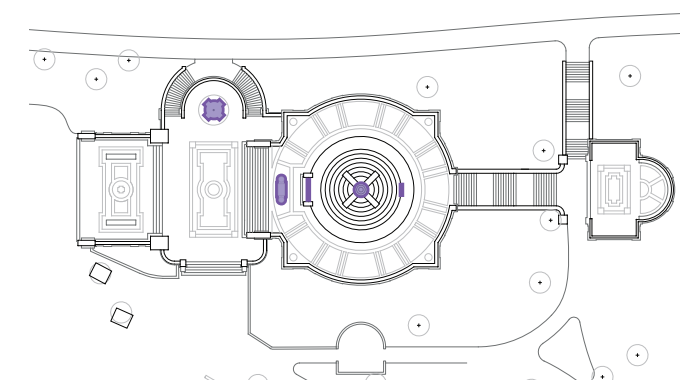
Clean with high-pressure water, hot-waxed, with cold wax top coat. No stripping of patina and no chemical patina.

### Window Grille

Clean with medium-pressure water and lacquer as is. No stripping of patina and no chemical patina. Install bird screening at interior face of grille.

### Plaques and Manhole Cover

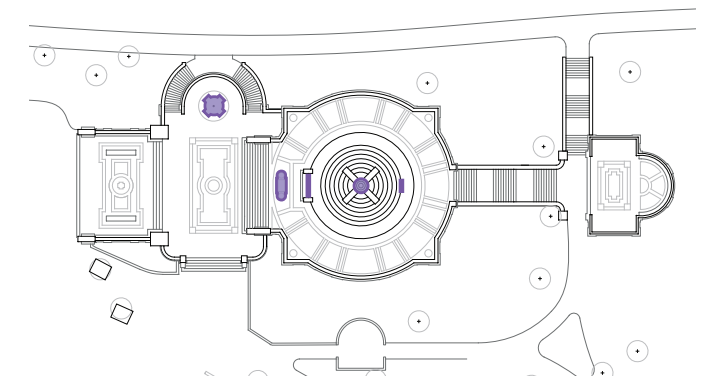
Strip all coatings with abrasive methods and patinate to an antique/statuary bronze finish (conditional of approved mockup samples) and hot-waxed with a cold wax coating.



# 4 Bronze

## Bronze Door Repair Summary

- Remove door to off-site facility by qualified Contractor.
- Reset threshold.
- Strip all coatings with abrasive methods and patinate to an antique/statuary bronze finish (conditional of approved mockup samples) and hot-waxed with a cold wax coating
- Repair door hinge mechanism.
- Cast and re-install missing trim and rosettes.
- Replace non-historic steel plate with louvered assembly based on historic drawings.
- Install missing glazing (accessible by unscrewing interior trim)



Exterior and Interior Views of Door Window.



Threshold and Steel Plate



Extant and Missing Rosette.



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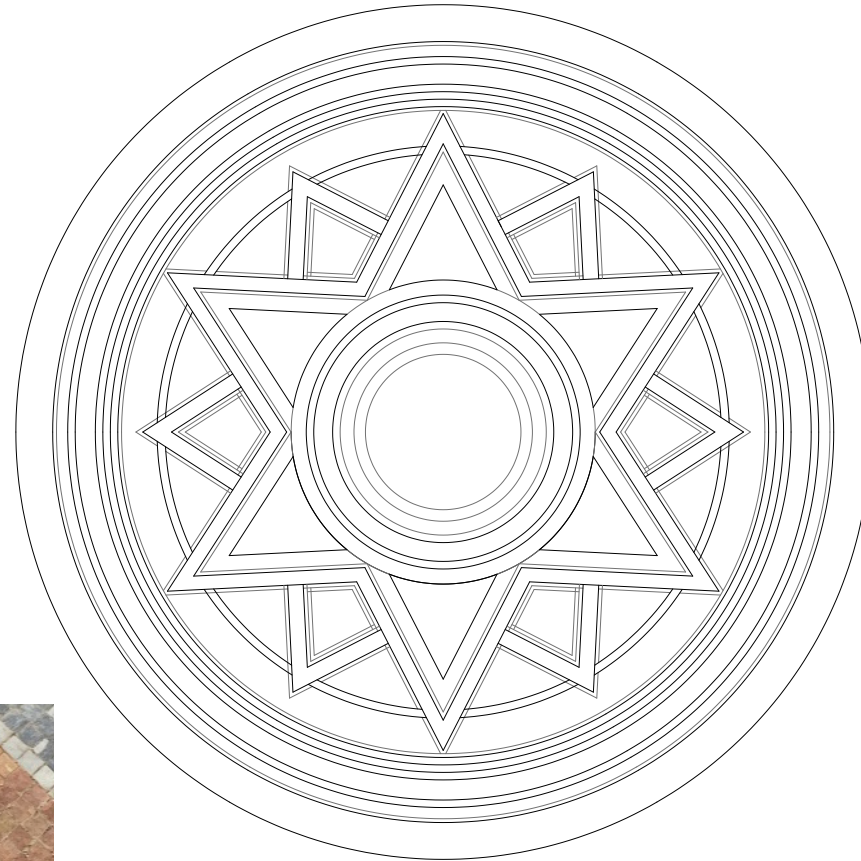
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**Soldiers & Sailors Monument Restoration**

**Riverside Park | Bronze Condition and Treatment**



**Documentation of Existing Condition**



**Mosaic Tiles: Restoration Treatments**

The floor finish of the Monument interior is comprised of patterned stone mosaic tesserae which has been damaged related to long-term water infiltration issues. The floor exhibits cracking and substantial loss and erosion of individual mosaic units. The damaged and missing stone tesserae are to be replaced in kind and set in compatible concrete setting bed.

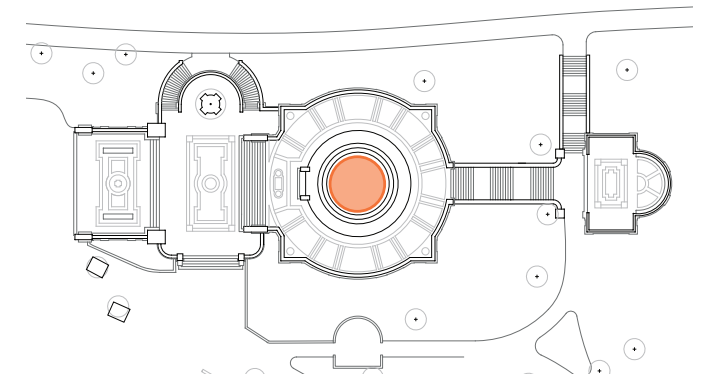
Prior to replacement, Contractor shall submit samples for review and approval, to be followed by field mockups.



**The range of Different Tesserae**



**Floor Crack and Material Lost**

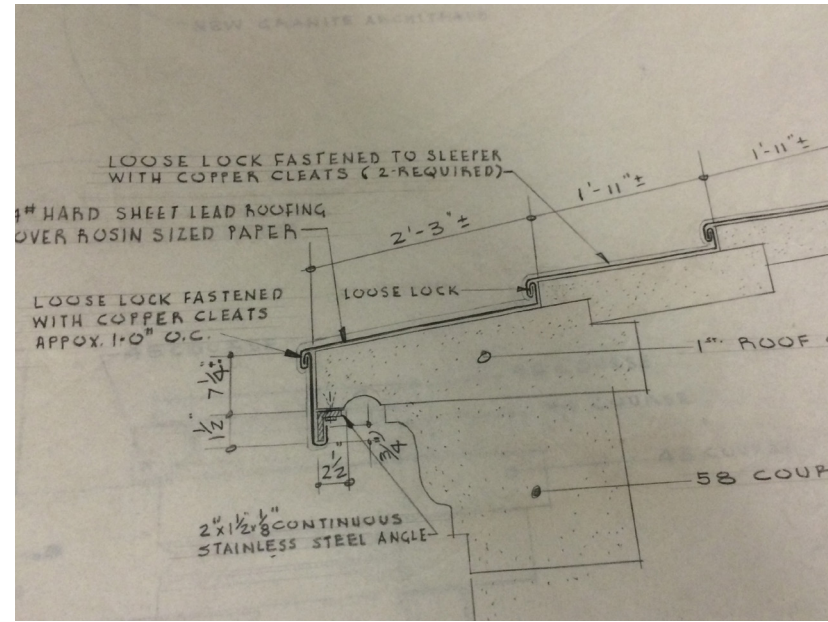




Main Roof and the Entablature



Loose Seams



Repair Detail

### Lead Roofing: Condition and Scope

#### Condition:

The sheet metal roofing was installed during the 1960s restoration campaign. It is located at the top of the Monument, at the Entablature and the base of the Drum. The sheet metal is at the end of its useful service life and exhibits:

- Loose and failed solder joints, typ.
- Corrosion pin holes and loss of surface material.
- Vandalism tears at base of Drum.

#### Scope:

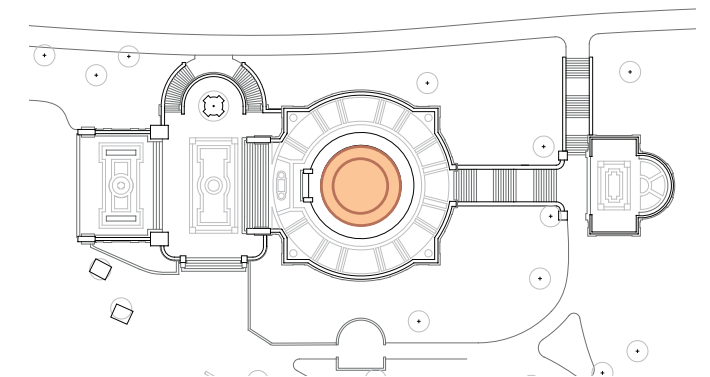
Remove and replace lead roofing assemblies in-kind. Base of drum (concealed from public view) to be treated with Kemper.



Base of Drum



Open Seam





West Elevation



North Elevation



Biological Growth



Biological Growth and Displacement

### Exposed Ashlar Foundation: Condition and Scope

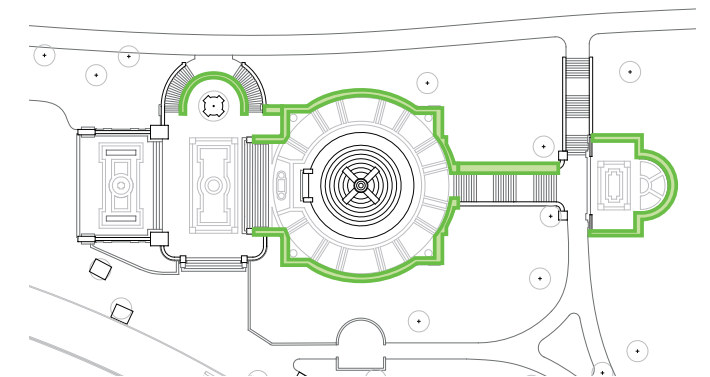
#### Condition

The exposed ashlar foundation stone is locally quarried schist. Overall the stones themselves are in good condition. Deterioration relates to drainage and biological growth.

- Mortar joints are 100% deteriorated.
- Biological growth in joints is typical.
- Localized displacement

#### Scope:

- Remove all biological growth from joints and face of stones.
- Repoint with compatible mortar based on testing.
- Reset loose and displaced stones.



# 8 Pavers

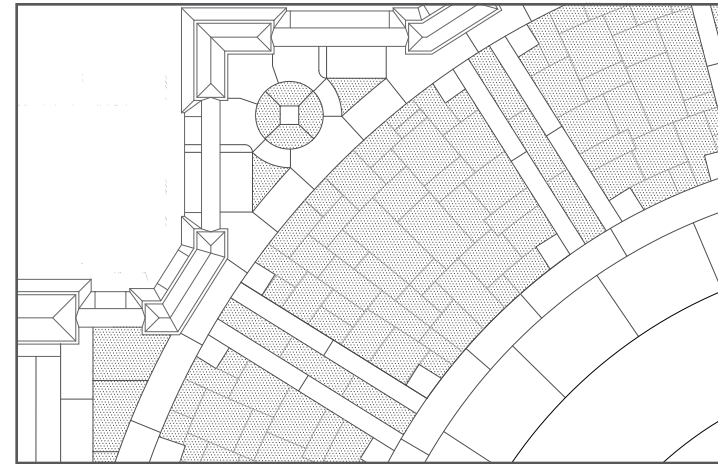
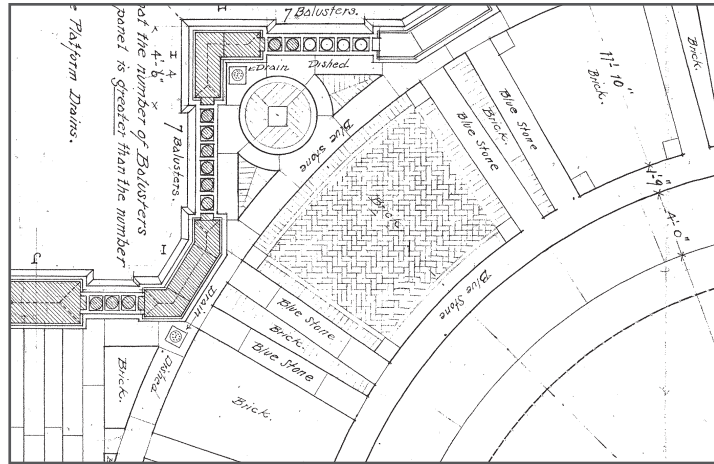
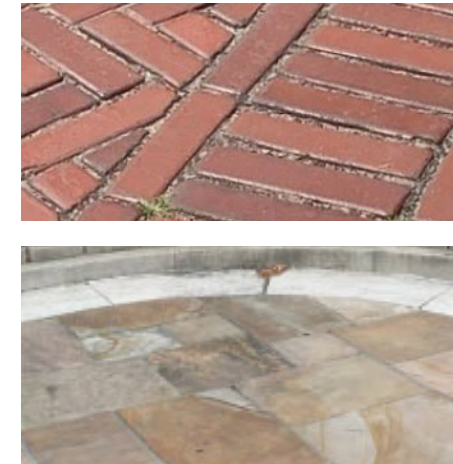
## Pavers: History and Scope

### Condition:

During the 1959-62 campaign, extensive work was conducted on the plazas. The original brick, previously replaced with concrete in the 1930s, was replaced with the existing brownish-colored Crab Orchard sandstone. The sandstone has not withstood the environmental conditions and is in overall poor condition. Surface loss, cracking and displacement is typical.

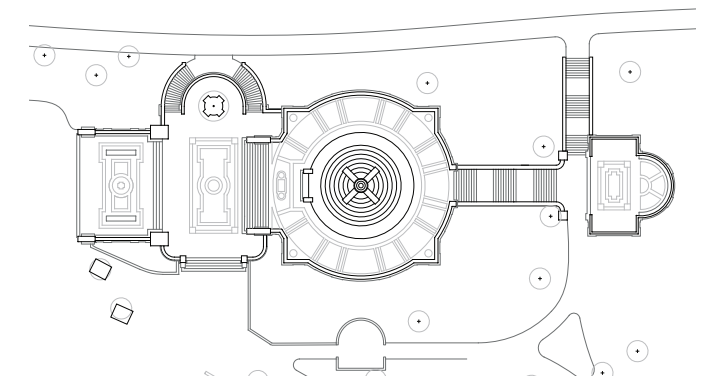
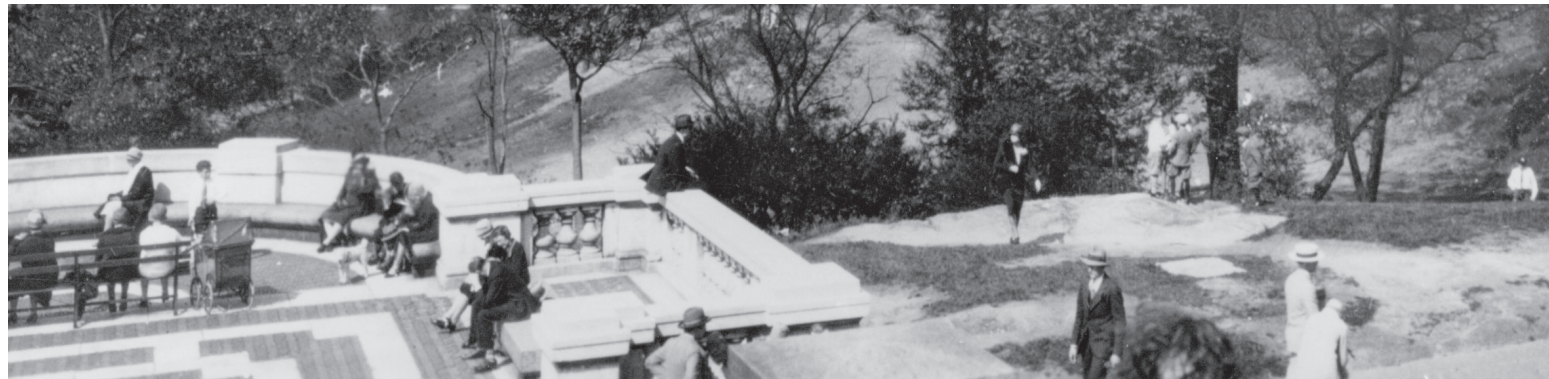
### Scope:

In coordination with necessary drainage and sub-surface upgrades, the deteriorated sandstone pavers shall be removed and replaced with new brick pavers, set within salvaged historic marble banding. The design of the brick pattern shall be based on information available from original design drawings and period photos before the 1930s.



**1902**  
Terraces are completed in herringbone brick pavers.

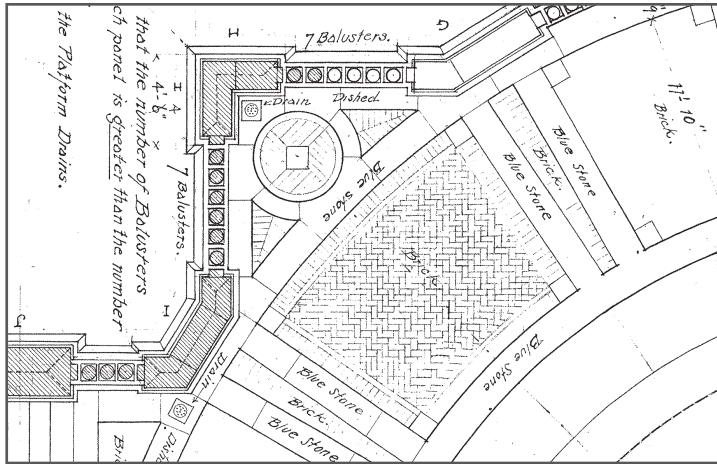
**1962**  
Last major restoration campaign—the terraces are repaved with Crab Orchard sandstone.



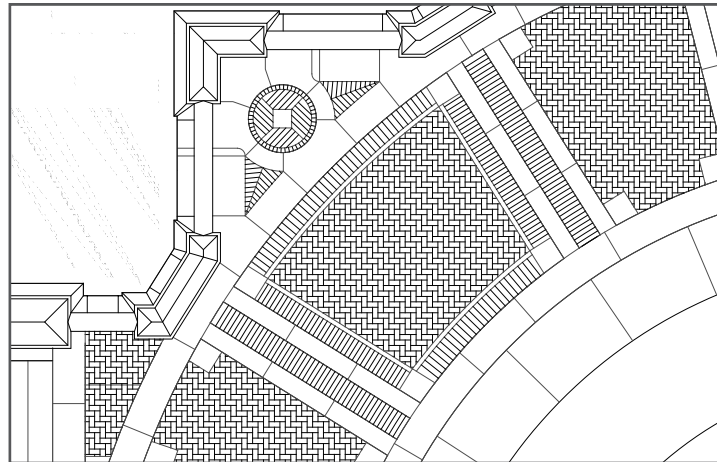
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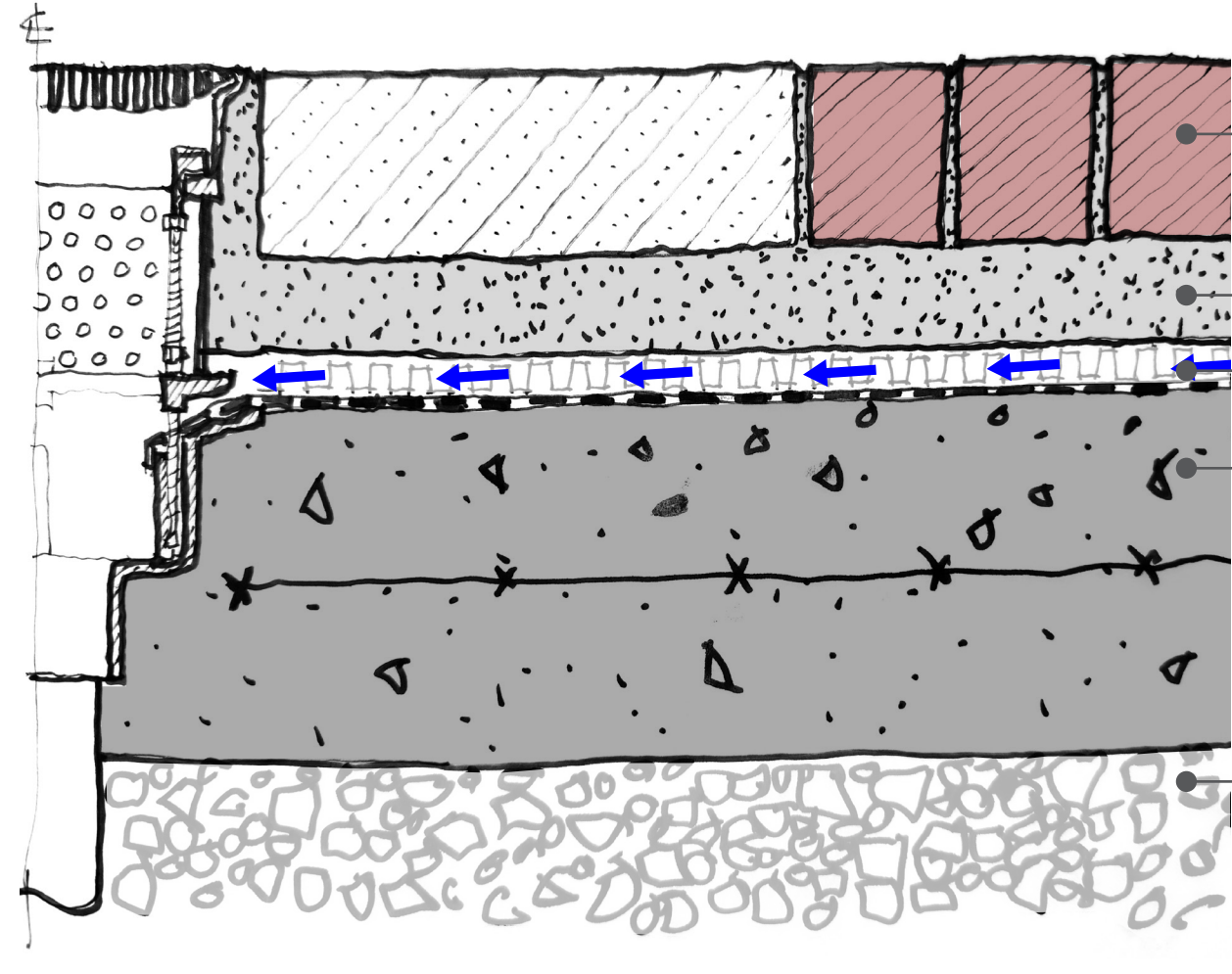
## Soldiers & Sailors Monument Restoration Riverside Park | Paver Condition & Replacement



**1902**  
Terraces are completed in herringbone brick pavers.



**Proposed**  
Restore original:  
New brick w/ salvaged and new marble



**Proposed Terrace Paving Section**

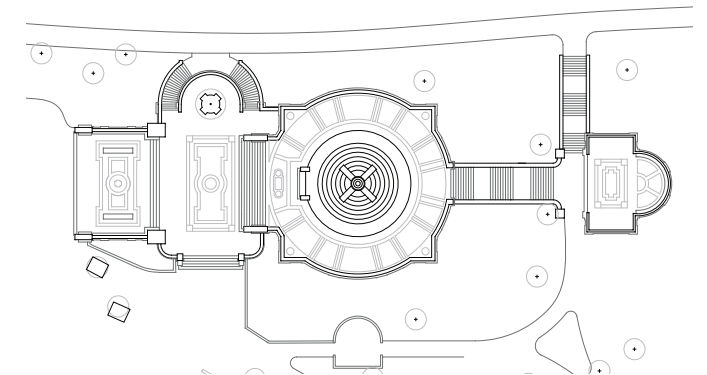
PAVERS:  
RESTORED MARBLE & CUSTOM BRICK PAVERS

SETTING MORTAR BED

DRAINAGE CORE OVER KEMPER MEMBRANE

NEW CONCRETE SLAB ON GRADE

NEW COMPACTED STONE BASE



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**Soldiers & Sailors Monument Restoration**  
Riverside Park | Paver Installation Materials



### Danby Marble

Salvaged where possible. Where needed, will be replaced to match the original marble which was quarried from Dorset, Vermont.



### Indiana Limestone

Limestone balustrade shall be preserved and restored where possible. Severely cracked units to be replaced with balusters salvaged from localized removal to accommodate the new ADA entrance to the site.



### Milford Pink Granite

Milford Pink Granite was only used on the north approach stair. It will be salvaged where possible. Where needed, will be replaced to match.



### Red Brick Pavers

Originally, the plazas featured a pattern of white marble banding with a brick field. In 1935 the brick was replaced by concrete.



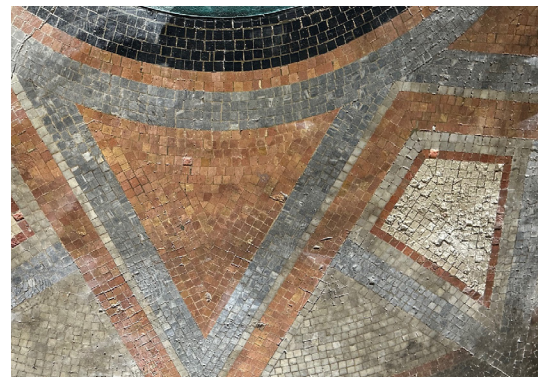
### Granite

Reportedly quarried from the Lacasse Quarry located at Derby, Orleans County, Vermont. Where replacement is needed, a granite will be selected to match.



### Bronze

Bronze is featured at the flag post, the tablets, the door itself and the interior cover to the vault. On the drum, Bronze is also used as a screen detail.



### Mosaic

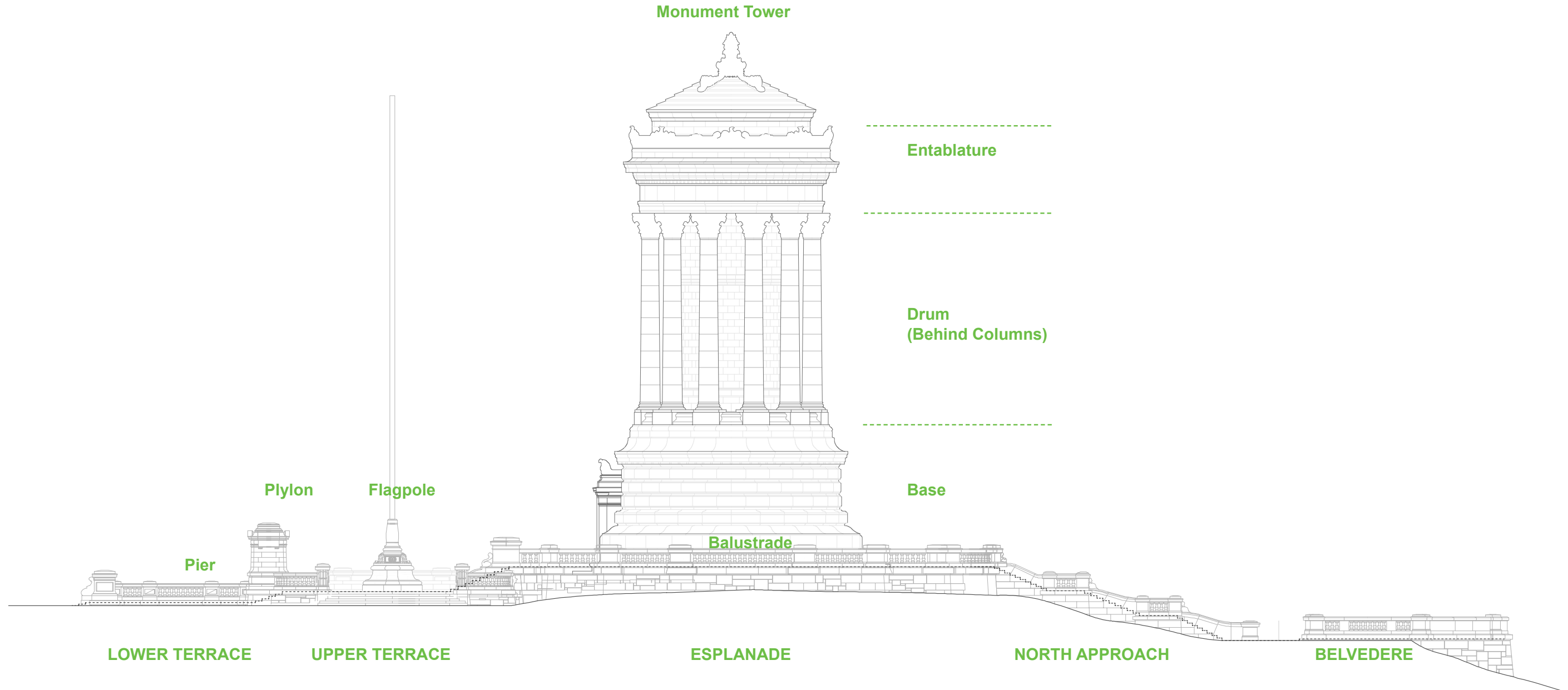
The floor finish of the Monument interior is comprised of patterned stone mosaic tesserae. The damaged and missing units to be replaced in kind and set in compatible concrete setting bed.



During the 1959—62 restoration campaign, extensive work was conducted on the plazas. Additionally, the deteriorated original brick paving, most of which had already been replaced with concrete (as shown in period photographs), was replaced with the brownish-colored Crab Orchard sandstone.

The design proposes a return to the Herringbone Red Brick Pavers.





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**Soldiers & Sailors Monument Restoration**  
**Riverside Park | Monument Elements Nomenclature**