



Information Presentation

Commission Meeting: April 6, 2017

PROJECT

Building Exterior, Vestibules and Site Improvements at the National Air and Space Museum Mall Building - Exterior Cladding Options

National Air and Space Museum
Independence Avenue at 6th Street, SW
Washington, DC

NCPC FILE NUMBER

7585

NCPC MAP FILE NUMBER

1.41(38.00)44516

REVIEW AUTHORITY

Approval
per 40 U.S.C. § 8722(b)(1) and (d)

SUBMITTED BY

Smithsonian Institution

PRESENTER

Smithsonian Institution

The Smithsonian Institution (SI) will provide an information presentation on the building exterior and site walls cladding options for the National Air and Space Museum (NASM) revitalization project. The SI will also present a large on-site mockup to the Commission prior to the meeting to evaluate how the four proposed cladding options and the associated terrace paving fit within the setting of the National Mall. The NASM is located on Independence Avenue at Sixth Street in Southwest, Washington, DC, and occupies three city blocks. The site is bounded by Jefferson Drive to the north, Fourth Street to the east, Independence Avenue to the south, and Seventh Street to the west. Constructed in 1976 for the United States Bicentennial, and to memorialize the national development of aviation and space flight, the NASM has become one of the world's most visited museums with an annual visitation of approximately seven million people. The NASM is a contributing building to the National Mall Historic District, which is listed in the National Register of Historic Places.

Designed by lead architect Gyo Obata, from Hellmuth Obata and Kassabaum (HOK), the NASM design responds to the surrounding context. The West Building of the National Gallery of Art, located to the north, across the National Mall and built in 1941, informed the NASM massing, height, exterior cladding, and entrance axis. The simple design of the NASM consists of four monumental blocks clad in Tennessee Pink marble (limestone) panels separated by three recessed glass bays on the north side, and alternating large and small marble clad blocks on the south side separated by smaller bays of recessed glass. The alteration of solids and voids on the north side correspond to projections and recesses of the National Gallery of Art West Building, which is also clad in Tennessee Pink marble, similar to the East Building, built in 1978. The Tennessee Pink marble continues into the NASM interior atriums on the stone clad volumes of the building. The existing marble panels on the interior are in good condition and will remain, while the existing exterior Tennessee Pink marble cladding is experiencing significant warping, and needs to be replaced.

The recladding is part of a larger project, which entails the revitalization of the existing NASM building and museum grounds to address deficiencies related to the building systems and envelope. Specific components of the project include: 1) revitalization of the 112,000 gross-square-foot terrace surrounding the building; 2) replacement of the building envelope including 160,600 gross-square-foot of stone cladding façade, a 40,000 gross-square-foot curtain wall, a 52,000 gross-square-foot skylight and a 70,000 gross-square-foot roof; 3) addition of a combined 4,800 gross-square-foot security vestibules at the north and south entrances and 4) incorporation of photovoltaics. The project also proposes to replace heating, ventilation and air conditioning (HVAC) systems which have reached the end of their usable life span, and will be designed to maximize energy efficiency according to Leadership in Energy and Environmental Design (LEED) Gold standards.

The Commission provided comments on the concept design for the project in July 2016, noting that the existing exterior stone cladding needed to be completely replaced due to extensive deterioration caused by the original wall system design. At the time, the cladding selection was not included in the concept submission. The Commission provided comments on the terrace improvement alternatives, perimeter security, streetscape amenities, circulation and visitor experience, landscape, west terrace, and security vestibules.

NCPC, in collaboration with the SI, prepared a draft Environmental Assessment (EA) to meet the requirements of the National Environmental Policy Act. The EA analyzes a no action alternative and three action alternatives for the stone cladding replacement. The alternatives under consideration include 1) Tennessee Pink marble in kind replacement; 2) alternate natural stone with similar appearance to original cladding, including Echo Lake granite and Saint Claire limestone; and 3) a manufactured material, such as ultra-high performance concrete (UHPC). SI is conducting a risk assessment of the procurement of Tennessee Pink marble, which is the original and existing material, relative to an alternate material to determine the capacity, availability, and cost. The determination of a preferred alternate is pending based on an extensive performance criteria, that takes into account aesthetics, availability and risk analysis. Based on the results of the risk analysis, the SI will select a preferred alternative.

During this information presentation, the applicant seeks input on the cladding alternatives based on historic preservation and aesthetic considerations. In addition to presenting a high-level overview of the project, the applicant will discuss the coordination of the NEPA and Section 106 of the National Historic Preservation Act (NHPA) review processes, its continuing community engagement, and project timeline.

ATTACHED:



Mockup of the four cladding options under consideration constructed on the northeast corner of the NASM terrace, showing from left to right Ultra High Performance Concrete (UHPC), Echo Lake granite, Tennessee Pink marble and Saint Claire limestone.

PROJECT TIMELINE

| | |
|---|--|
| Previous actions | July 7, 2016 – Approval of comments on the overall concept design for the Building Exterior, Vestibules and Site Improvements at the Smithsonian National Air and Space Museum (NASM), National Mall Building. The cladding selection was not included in the concept submission. |
| Remaining actions (anticipated) | <ul style="list-style-type: none">– Approval of preliminary site and building plans– Approval of final site and building plans |

National Air and Space Museum

Major Systems / Exterior Envelope Revitalization Project

CLADDING EVALUATION – Information Presentation - NCPC

**Replace-in-kind Option: 3" Thick Tennessee Pink Marble
in lieu of existing 1 ¼" (formal name is Holston Limestone)**



National Museum of American History (1964)
Holston Limestone ("Tennessee pink marble")



National Gallery of Art
West Building (1937-1941); East Building (1978)
Holston Limestone ("Tennessee pink marble")



National Air and Space Museum (1976)
Holston Limestone ("Tennessee pink marble")

Pros:

- Matches existing exterior cladding in kind (warm color tone and fine linear veining pattern modulates scale of monolithic façade) and intended to match NGA West Building
- Matches existing interior wall cladding that will remain
- High density limestone meets durability requirements with thickness at 3" and properly detailed wall section
- Stone has 100+ year longevity

Cons:

- Requires additional quarry start-up
- Significant wastage in fabrication of large, thick panels due to nature of stone beds

National Air and Space Museum

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CLADDING EVALUATION – Information Presentation - NCPC



ST CLAIR LIMESTONE

Pros:

- Fine, linear veining pattern comparable to TN Pink
- High density, durable limestone (100+ year stone longevity)

Cons:

- Light gray color tone does not match existing pink tone

*Other limestone considered (Silver Shadow)
found to be too soft for use at building base*



ECHO LAKE GRANITE

Pros:

- Pink tone (when dry) comparable to TN Pink
- High density, durable granite (100+ year stone longevity)

Cons:

- Fine, linear veining pattern not present (very busy swirling texture that is less compatible with interior Tennessee Pink)
- Darkens considerably when wet



**ULTRA HIGH PERFORMANCE
CONCRETE (UHPC)**

Pros:

- Color and tone customizable
- High density and durable
- Can incorporate recycled aggregate salvaged from existing cladding

Cons:

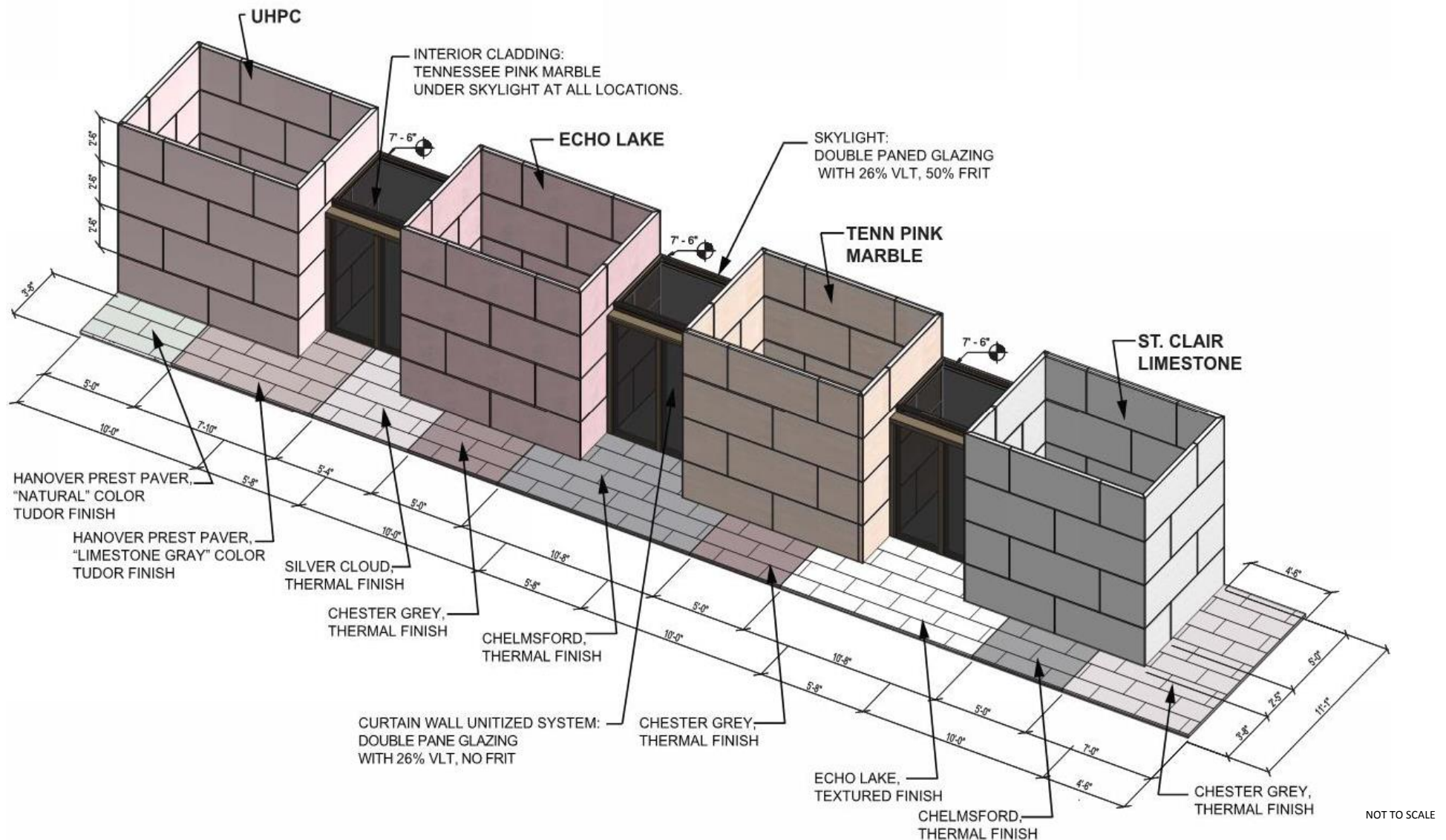
- Manufactured material relatively new – longevity promising but as yet unproven
- Man-made appearance may not be compatible with monumental, iconic buildings on the National Mall

*Other man-made materials considered:
Engineered (sintered) stone; metals such as
titanium. Longevity of these newer materials
as yet unproven.*

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CLADDING EVALUATION – Information Presentation - NCPC

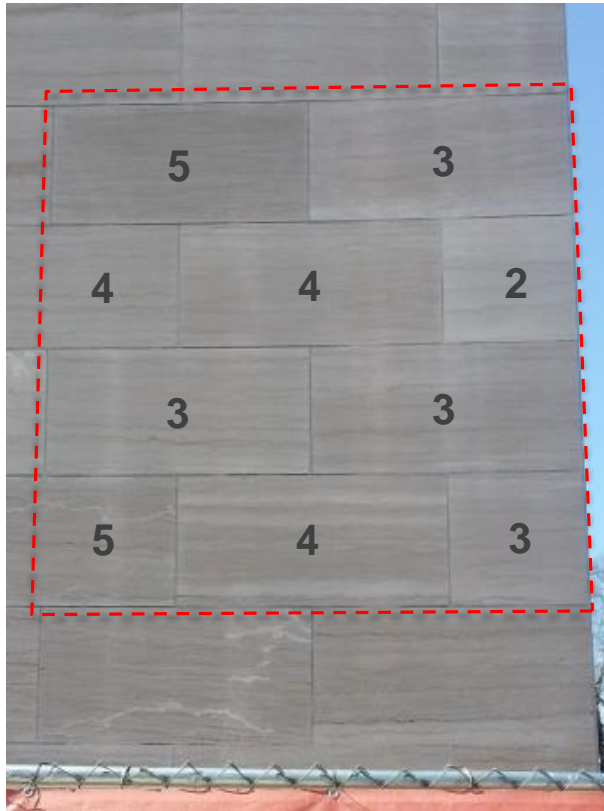


National Air and Space Museum

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CLADDING EVALUATION – Information Presentation - NCPC

**Existing TN Marble
East Elevation**



**TN Marble Mockup
North & East Elevations**



**TN Marble Mockup
South & West Elevations**



TENNESSE MARBLE COLOR RANGE KEY

1. Light Pink

2. Medium Pink

3. Dark Pink

4. Light Cedar

5. Medium Cedar

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CLADDING EVALUATION – Information Presentation - NCPC



1976 Photo from Southeast illustrating original variation of Tennessee Pink

National Air and Space Museum

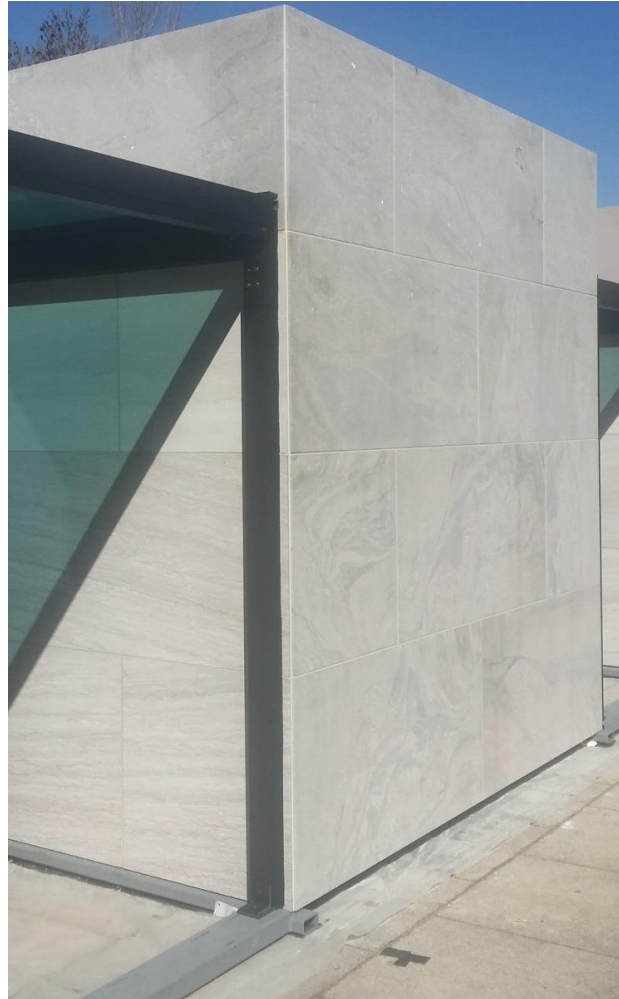
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CLADDING EVALUATION – Information Presentation - NCPC

**St Clair Mockup
South & East Elevations**



**Echo Lake Mockup
South & West Elevations**



**UHPC Mockup
South & West Elevations**

