Executive Director's Recommendation

Commission Meeting: July 7, 2016

PROJECT
Building Exterior, Vestibules and Site Improvements
National Air and Space Museum
The National Mall
Washington, DC

SUBMITTED BY
Smithsonian Institution

REVIEW AUTHORITY
Federal Projects in the District
per 40 U.S.C. § 8722(b)(1) and (d)

NCPC FILE NUMBER
7585

NCPC MAP FILE NUMBER
1.41(38.00)44186

APPLICANT'S REQUEST
Approval of comments on concept design

PROPOSED ACTION
Approve comments as requested

ACTION ITEM TYPE
Staff Presentation

PROJECT SUMMARY

The Smithsonian Institution (SI) has submitted concept plans for the *National Air and Space Museum* (NASM) building exterior, vestibules and site improvements located on Independence Avenue at Sixth Street in Southwest Washington, DC. The NASM lies on a ten-acre site on the southeast corner of the National Mall. 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. To the north of the project site, is the National Mall, and beyond is the West Building of the National Gallery of Art. The Department of Transportation and the future Eisenhower Memorial are located to the south. The National Museum of the American Indian is located to the east and, the Hirshhorn Museum and Sculpture Garden are located to the west. Primary visitor entrances to the museum are located on the north and south sides of the building, and the nearest metro is the L'Enfant Plaza station. The restaurant pavilion and garage entrance are located on the east side; and a sculptural element, memorial tree grove, and an additional garage entrance are located to the west.

Designed by lead architect Gyo Obata, from Hellmuth Obata and Kassabaum (HOK), the NASM design responds to the surrounding context, in particular the National Mall. The height, exterior cladding, and entrance axis were informed by the National Gallery of Art, while also pursuing modern architectural principles and a simple design. 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 purpose of the project is to:

- Enhance the visitor experience with greater accessibility and amenities;

- Replace failing building envelope systems with durable components to endure a 100-year cycle, including exterior stone cladding, glazing curtain wall, skylights, building roof and terraces; and
- Improve sustainability, stormwater management and energy performance.

The scope of the project entails the renovation and restoration of the existing 687,000 gross-square-foot NASM building and museum grounds. Specific components of the project include: 1) revitalization of the 112,000 gross-square-foot terrace; 2) replacement of building envelope including 160,600 gross-square-foot stone cladding façade, 40,000 gross-square-foot curtain wall, 52,000 gross-square-foot skylight and 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.

KEY INFORMATION

- The Smithsonian's NASM maintains the world's largest and most significant collection of aviation and space artifacts. It is one of the world's most visited museums and the largest of the Smithsonian's 19 museums. More than eight million people a year visit the Museum's two locations, making it the most visited museum complex in the country. Since it opened, the museum has welcomed 311 million visitors. The average visitation to NASM Mall Building is 19,039 people per day for 2015.
- The NASM is a contributing building to the National Mall Historic District. Although not currently listed individually on the National Register of Historic Places or the District of Columbia Inventory of Historic Sites, the forty-year old building is potentially eligible.
- The museum structure occupies a three-city-block site, with overall building dimensions of 685 feet in length, 225 feet in width, and 83 feet in height. The building includes three stories plus one level of underground parking. The first and mezzanine levels house 21 exhibit halls while the third houses offices, an aerospace library, and staff dining area. The only major addition since 1976 consists of the two story steel and glass structure, added to the east end in 1988 to house a restaurant facility.
- The current submission focuses on terrace improvements and provides two options for landscape and perimeter security solutions at the four museum corners and at the north and south entrances. Scheme A introduces a ground plane landscape approach, while scheme B follows the existing architectural language with raised planters. Although similar in plan view, the schemes address two different planting bed expressions that vary in height and scale of the associated trees that can be accommodated. These, in turn impact the amount of shade, pedestrian circulation, and the character of the building setting.
- The U.S. Commission of Fine Arts (CFA) reviewed and approved the revised concept design on June 16, 2016. Of the two terrace improvements options, CFA supported Scheme A "*Ground Plane*," and commented that it provided a better public space, while Scheme B "*Planter*," did not support landscape or human comfort. Similarly, CFA supported the

vestibules' elegant design and requested final documentation on the stone cladding and project phasing.

- The Smithsonian is conducting a risk assessment of the procurement of Tennessee Pink Marble, which is the original and existing material, relative to an alternate stone. The determination of a preferred alternate is pending based on a feasibility study and performance criteria, including aesthetics, production and risk analysis. The cladding selection is not included in this concept submission and will be submitted to the Commission during preliminary review. The applicant plans to present large mockups on-site to the Commission at a later date.
- The project is scheduled to be constructed beginning in 2018, with an estimated six-year construction period. Public access to the museum will be maintained but restricted during construction.
- On February 5, 2004, the Commission approved an overall Mall-Wide Perimeter Security concept, which included all of Smithsonian museum buildings on the Mall, except for the National Museum of the American Indian, which plans were approved separately. The concept incorporated the Commission's *National Capital Urban Design and Security Plan Objectives and Policies.*
- The existing perimeter security elements at the NASM site were previously reviewed and approved by the Commission. On September 9, 2004, NCPC approved preliminary and final site development plans for perimeter security around the NASM, except for the exhibit plinths on the north entry which were approved in 2006.
- The existing perimeter security at the NASM consist of 30-inch high free-standing walls with breaks at the west terrace to allow access to the lawn area; hardened raised terrace planters; custom bollards and plinths at building entrances and site access locations; guard booths and retractable bollards.
- The museum grounds include three significant sculptures installed at key locations: Delta Solar located at the west portion of the site, installed in 1977. Ad Astra located at the north entrance, and Continuum located at the south entrance were both installed in 1976. The existing Continuum sculpture needs to be relocated to allow for the construction of the south security vestibule.

RECOMMENDATION

Comments favorably 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 Commission suggests the following comments on the project:

Building Envelope

Notes that the existing exterior stone cladding must be completely replaced due to extensive deterioration caused by the original wall system design.

Recommends that the applicant continue to work closely with NCPC, the U.S. Commission of Fine Arts, and the District of Columbia State Historic Preservation Office to identify an appropriate cladding material that meets the performance criteria. If Tennessee Pink Marble, the original stone, is determined to be infeasible, consider ways to achieve a seamless transition between the exterior cladding and the interior stone treatment, and to avoid, minimize, or mitigate adverse effects on the National Air and Space Museum Building and the National Mall Historic District.

Terrace Improvements Alternatives

Notes that the Smithsonian has submitted two alternatives to improve the terraces.

Supports *Scheme A: Ground Plane* option (Smithsonian Preferred Alternative), because this scheme better achieves the terrace improvement design objectives, in addition:

- Creates a welcoming, and inviting public space for people.
- Provides a balanced transition between building massing, landscape and human scale.
- Minimizes solid walls by eliminating planters and providing ground level planting beds which improves public safety and visibility.
- Accommodates wider walkways, which enhances circulation and creates a sense of openness.
- Provides shade canopy trees by accommodating adequate soil volume and extended root zones.
- Enhances view corridors between the museum grounds and the National Mall.

Does not support *Scheme B: Planter* option, which proposes a raised planter system that follows the "building sitting on a plinth" architectural vocabulary because the design:

- Creates narrower walkways, with taller planters which obstructs visibility and affects circulation.
- Provides less shade by limiting soil volume which constrains plant selection to smaller species.

Perimeter Security

Recommends the applicant address the following comments to improve "*Scheme A – Ground Plane*" perimeter security:

- Minimize the use of bollards and explore integrated perimeter security elements that also function as a public amenity, such as seating, decorative light poles, signage, trash receptacles, bike racks, public art and other streetscape elements.
- Remove or adjust proposed bollards within planting bed areas at corner conditions to achieve a better transition between different security elements, avoid conflicts with landscape and ease maintenance.
- Further refine the design and material of the proposed perimeter security walls to complement the architectural character of the NASM and landscape approach.

- Ensure that the proposed perimeter security is consistent with the existing *Mall-Wide Perimeter Security* plan previously approved by the Commission and is compatible with the placement of security barriers for other buildings along the National Mall.
- Evaluate placement and alignment of existing bollards at the south entrance along Independence Avenue, SW to improve pedestrian circulation and reduce visual clutter. Particularly, near pedestrian cross walks and bus stops to allow safe pedestrian waiting and drop off areas.

Streetscape Amenities

- Further evaluate the relocation of the existing Continuum sculpture on the museum grounds in collaboration with NCPC, the U.S. Commission of Fine Arts, and the District of Columbia State Historic Preservation Office. The proposed sculpture location along 4th Street, SW on the east terrace is preferable, as it establishes a focal point along the urban corridor and reinforce the building east-west axis. Viewshed studies should be prepared for each of the proposed locations to analyze visual impacts.
- Confirm exterior lighting will not detract from the setting of the National Mall and respects the hierarchy of monuments, important civic buildings and spaces in the nation's capital, with the U.S. Capitol and Washington Monument the most prominent features in the nighttime skyline.
- Explore opportunities to better accommodate existing street vendor venues into the streetscape design to activate the museum grounds and consider locations with high levels of pedestrian activity. Ensure that vendor facilities do not detract from accessibility or aesthetics of the museum while maintaining a pleasant environment.

Circulation and Visitor Experience

- Provide seating and shade in proximity to existing bus stops, where possible.
- Improve bicycle facilities, provide additional bike rack locations around the site, in particular along 7th Street, SW, and consider future Capital Bikeshare stations as a way to encourage sustainable transportation alternatives.

Landscape

- Maximize landscape and planting areas in lieu of additional hardscape where possible, specifically at the northwest corner of the building along Jefferson Drive and on the west side of the large exhibit driveway curb cut along Independence Avenue.
- Preserve mature trees to the maximum extent possible, and when tree removal is necessary, replace trees on-site to prevent a net tree loss to the project area in accordance to the District of Columbia tree canopy protection regulations.

West Terrace

- Provide seating opportunities, considering orientation and placement, to enjoy views towards the existing sculpture and water feature.
- Preserve the natural character of the existing memorial tree grove located on the west portion of the site. This green space is the portal to the park-like setting of the National Mall and reinforces the symbolic connection along 7th Street.
- Further explore the proposed perimeter security treatment along the 7th Street frontage to ensure a graceful transition between the existing perimeter security walls along the west lawn and the proposed fountain and avoid introducing bollards adjacent to the fountain and near the existing bus stop.
- Align existing bollards with other perimeter security elements if possible, particularly at the large exhibit driveway curb cut along Independence Avenue, SW.

Security Vestibules

- Protect the significant vista along Independence Avenue by ensuring that the proposed south vestibule does not project into this L'Enfant Plan right-of-way.
- Provide a viewshed study along Independence Avenue to determine potential visual impacts on the L'Enfant right-of-way and evaluate if the proposed south vestibule scale and massing is compatible with the existing context.
- Examine whether and how the proposed north vestibule will impact reciprocal viewsheds between the NASM and significant buildings, including the National Gallery of Art West Building, the U.S. Capitol, and the Washington Monument.

PROJECT REVIEW TIMELINE

Previous actions	**1972** –Approval of final site and building plans for the NASM on the Mall. **1994** –Approval of revised final site and building plans for the Window Wall and Skylight Replacement and the North and South Vestibule Additions at the NASM. **1997** –Approval of revised final site and building plans for the Window Wall and Skylight Replacement and the North and South Vestibule Additions at the NASM. **February 2004** – Approval of concept for the overall Mall-Wide Perimeter Security plan, which included all of Smithsonian museum buildings on the Mall, except for the National Museum of the American Indian, plans for which were approved separately. The concept incorporated the guidelines of the *National Capital Urban Design and Security Plan*. **September 2004** – Approval of preliminary and final site development plans for perimeter security at the NASM, the Mall, 4th Street and

	Independence Avenue, SW, except for the design of the exhibit plinths on the north side of the museum. The NASM was the first museum perimeter security proposal to be submitted to NCPC since the overall Mall-Wide Perimeter Security concept approval. **September 2006** – Executive Director approval of the final design of the perimeter security - north entrance exhibit plinths for the Smithsonian Institution, NASM. **December 2008** – Approval of the preliminary and final building plans for a Public Telescope and Observatory Temporary Exhibition for a period not to exceed two years. **January 2013** – Approval of the preliminary and final building plans for a Public Telescope and Observatory Temporary Exhibition Renewal. **July 2014** – Information Presentation for the NASM Comprehensive Facilities Master Plan, the current submission is the first project being implemented from the master plan.
Remaining actions (anticipated)	– Approval of preliminary site and building plans – Approval of final site and building plans

PROJECT ANALYSIS

Executive Summary

The Smithsonian NASM Building Exterior, Vestibules and Site Improvements will enhance the visitors experience with greater accessibility and amenities. The proposal is consistent with the SI vision to transform the NASM for the future into a model for sustainable design and revitalize its facilities to better engage, educate and inspire the public about planetary science and the history of aviation and spaceflight. The terrace improvements will not only beautify the NASM grounds, but also the National Mall and the Southwest Rectangle, by creating a welcoming and warm open space that the public can enjoy. Although the NASM is best known for its aviation and spaceflight collections, the proposed improvements will also make the architecture and landscape of the NASM a destination. The project is consistent with policies in the *Federal Elements of the Comprehensive Plan for the National Capital*. In particular, the project meets the goals and objectives of the Urban Design, Visitors and Commemoration, Historic Preservation and Federal Environment Elements. Therefore, staff recommends that the Commission **comment favorably 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.**

Analysis

Overall, staff is pleased with the concept design to rehabilitate the NASM exterior building envelope, add two new visitor screening pavilions and improve the museum grounds. The project

will welcome pedestrians, improve circulation, human comfort, address failing building systems, landscape, perimeter security and programmatic design concerns. Over the past year, the proposed concept design has evolved significantly during consultation and is now more sympathetic to the National Mall, and surrounding context.

Building Envelope

The project entails replacing failing building envelope components with durable, and maintainable systems to endure a 100-year life cycle. Elements include stone cladding and glazing, roofing and terraces. The proposed building envelope modernization is consistent with policies included in the *Urban Design Element*. These policies encourage agencies to design and construct buildings with quality, durable materials to protect the public investment and reflect the National Capital Region's image.

Cladding Replacement: The architecture firm Hellmuth Obata and Kassabaum (HOK) designed the building in 1972. According to the *2013 Historic Building and Landscape Report*, the design objectives were to provide a structure that corresponded aesthetically with the surrounding buildings on the Mall, to accommodate the vast collection of aeronautical and space artifacts, and to accommodate up to 50,000 visitors a day, while pursuing modern architectural principles. President Eisenhower authorized the NASM site in 1958, Congress authorized construction in 1966 but deferred funding due to the cost of Vietnam War. Later in 1972 Congress authorized funding for the museum redesign and reduced cost to a $40 million budget for construction by the 1976 Bicentennial.

The building's simple design solution included four large marble cubes, separated by three recessed glass atriums on the north façade. The south façade is composed of the same four large cubes alternating with three cantilevered cubes, creating a rhythm of solids and voids. The height, exterior cladding, and entrance axis responds to the neoclassical West Building of the National Gallery of Art, which sits directly across the Mall to the north. The symmetrical massing of the two buildings was designed to frame the Capitol. The material selection, Tennessee Pink Marble, a type of limestone, was consistent with the National Gallery's facade. The NASM quickly attracted more visitors than anticipated, which has impacted building systems. The existing exterior wall construction – a thin panel of Tennessee Pink Marble - does not provide adequate resistance to water penetration or air infiltration. The spray-foam insulation on the back face of the exterior cladding has caused extensive stone deterioration, warping and structural cracking. Similarly, the HVAC system has reached the end of their usable life. Due to the integration of the exterior cladding with the mechanical air distribution system, it is necessary to undertake these upgrades together.

Staff **notes that the existing exterior stone cladding must be completely replaced due to extensive deterioration caused by the original wall system design**. The SI is conducting a risk assessment to procure Tennessee Pink Marble. The preferred alternate is pending and will be based on extensive performance criteria including aesthetics, production and risk analysis. The design intent is to maintain the existing character of the building and replace the stone cladding with a stone that has similar appearance to the original stone cladding, the selection process includes material testing, and mockup panels. The applicant is evaluating several cladding options that will

be discussed with the Commission during preliminary review, the SI also plans to present large mockups on-site to the Commission, however, the stone cladding selection is not part of this concept review submission. Therefore, staff **recommends that the applicant continue to work closely with NCPC, the U.S. Commission of Fine Arts, and the District of Columbia State Historic Preservation Office to identify an appropriate cladding material that meets the performance criteria, and if Tennessee Pink Marble, the original stone, is determined to be infeasible, consider ways to achieve a seamless transition between the exterior cladding and the interior stone treatment, and to avoid, minimize, or mitigate adverse effects on the National Air and Space Museum Building and the National Mall Historic District.**

Glazing Replacement: Curtain walls and skylights make up a large portion of the exterior envelope of the NASM building, providing a glazed infill between the stone clad pavilions to allow access to daylight and provide views to and from the museum galleries. During construction, plastic skylights were installed in lieu of the originally designed glass skylights to reduce cost. Bronze tinted glass was applied on the façade to protect the exhibits from the damaging rays of the sun while maintaining visibility. The skylights were replaced in 2001 with glass as originally designed and to address performance issues with solar heat gain, leaking, and excessive exposure to ultraviolet (UV) rays. The bronze tint replacement glass for the wall and skylights reduced the visible light transmission (VLT) from 47 percent to 22 percent to protect the interior exhibit pieces from exposure to harmful UV rays. However, the dark appearance of the glazing reduced the views of the gallery interior from the Mall and to the sky.

The 2001 glazing curtain wall and skylight installation remains as the existing conditions, but the glazing still has performance issues and needs to be replaced. The proposed glazing replacement, which includes 26 percent VLT curtain wall and 6 percent VLT skylight, will protect the exhibits from harmful UV rays while making the glass less opaque, which offers clearer views of the Mall and to the sky, consistent with the original design intent as documented in the submission project materials. The proposed glazing will meet blast resistance performance criteria consistent with the policies included in the *Urban Design and Security Element*.

Terrace Improvements Alternatives

The project includes renovations to the terraces to address waterproofing and correct leaks into the lower level. The underground parking extends beyond the main building by about 2/3 of the terrace area. Therefore, portions of the terrace serve as the roof of the parking garage and loading dock below. All paving, soil, and planter systems need be removed to replace the roof waterproof membrane. This offers an opportunity to address significant circulation, landscape, and perimeter security concerns.

The primary objectives for the proposed grounds design include:

1. Provide adequate waterproofing;
2. Improve access and visibility between the museum, the National Mall and surrounding context;
3. Create an accessible, welcoming and comfortable environment for visitors;
4. Provide future programming, and thematic interpretation;
5. Reinforce the scale of the landscape in the overall design;

6. Accommodate increased visitation growth.

In addition, the terrace improvements include the following design parti considerations:

- Preserve the original organizational concept;
- Simplify the terraces;
- Lower the planter walls heights along the back of sidewalk to improve physical and visual access to museum grounds and landscape;
- Open the grounds;
- Strengthen desired viewsheds to and from the museum;
- Improve human comfort and increase tree canopy shade; and
- Create a landscape composition to complement the scale and rhythm of the museum.

Based on the museum grounds objectives and the design overall guiding idea, the SI developed two options for the terrace improvements: *Schemes A-Ground Plane* and *Scheme B-Planter*, they both address the following considerations:

1. Lower and simplify planter layout to improve circulation;
2. Provide universal access at entrances to the grounds and museum entrances by using ascending walkways - all of which are under 5% in slope;
3. Create entrances to the museum grounds at the four arrival corners;
4. Complete circulation within the property;
5. Improve physical and visual approach to plant materials by:
   5.1 Providing shade and small trees that blends with the National Mall setting and creates open view relationships between grounds and the Mall;
   5.2. Adding thematic groundcover planting design to animate entrances and create interpretive opportunity;
6. Integrate the prominent 'Delta Solar' fountain at the southwest corner within its respective public realm:
   6.1 Relocate the fountain as a more highly visible component of the perimeter positioning it as an important arrival 'signifier' along 7th Street corridor;
   6.2 Conserve the west memorial grove of trees, as an accessible, occupiable and integral part of the 'Delta Solar'
7. Build on two key objectives identified in the NASM Master Plan
   7.1. The improvement and integration of museum grounds with the museum mission;
   7.2. The development of a comprehensive landscape approach.

Both options provide landscape and perimeter security solutions at the four museum corners and at the north and south entrances. Although similar in plan view and circulation, the schemes address two distinct planting expressions that vary in three-dimensionality and elevation of the planting beds and the scale of trees that can be accommodated. Therefore, affecting the amount of shade provided and the aesthetic expression.

1. Option 'A' introduces a 'ground plane' approach to planter expression opening up the existing planter massing. Ground level planting beds create soil root volume adequate for shade trees, connecting to continuous soil under walkways.

2. Option 'B' follows a raised 'planter' approach, and continues the existing architectural vocabulary with a raised planter system. Available soil volume is limited, constraining plant selection to smaller species.

The existing NASM grounds are introverted, and isolated. Currently, the four corners of the museum have circulation, wayfinding, and visibility challenges. Due to the building's large basement footprint, the museum terrace composition is similar to a green roof; therefore, there is limited soil depth available to accommodate large shade trees. The lack of shade, expansive pavement, and the building monumental scale make walking around the site unpleasant, especially during summer months. The existing landscape design consists of a series of tiers of horizontal planters with an open lawn to the west of the building. The topography of the NASM site slopes generally from southwest to northeast with the top of curb elevation measuring approximately 21 feet above mean sea level (AMSL) at the corner of 7th Street and Independence Avenue and approximately 9 feet AMSL at the corner of 4th Street and Jefferson Drive. The difference in elevation is achieved via a system of planted terraces connected by ramps and stairways to the adjacent sidewalks. The number of levels of planters varies to adjust for changes in grade.

Since the NASM is one of the most visited museums in the world, it is important that the museum grounds are inviting and welcoming. Therefore, staff analysis focused on views, human comfort, scale and relationship with the context. Both terrace schemes lower the planters to a minimum height required by perimeter security standards (36 inches) on both north and south elevations; open up the four corners of the museum; improve circulation; simplify the three-tier-planter system on the north side; and create wider planting opportunities. Staff finds that while scheme B follows the architectural "building on a plinth" vocabulary and is consistent with the building character, it does not address human comfort, scale or lack of shade.

Views: The museum was designed to provide a visual connection between its interior and the National Mall. The original planting design was developed to support and frame this connection; however, the design was altered, and these views are now heavily screened. The proposed schemes will create different views to the National Mall. Scheme B there will create obstructed views between the National Mall and the atrium due to smaller trees with denser low-level foliage being placed in planters within the visual field of the atrium, similar to the existing condition. While scheme A will open up the views to the Mall by providing large canopy trees and reducing dense low-level vegetation, consistent with the original planting design.

Human Comfort: In Scheme A, the proposed ground level planting beds increase planting soil volume to enable larger shade canopy trees by connecting covered soil areas under adjacent walkways to accommodate tree root growth. In contrast, Scheme B with the raised planter approach does not allow an extended planting soil under adjacent pavement. The tree planting soil area is raised above the paving approximately 36 inches. Since the majority of tree root growth occurs within the top 18 to 24 inches of soil depth, it is standard horticultural practice to only account for the first 3 feet of soil depth when assessing soil volume for trees. The raised planter wall height in Scheme B will constrain tree root growth and can only accommodate small trees. Therefore, Scheme B provides less shade.

Scale: The proposed shade trees included in *Scheme A* will blend with the existing American Elms trees that line the National Mall and provide a scale transition between building massing and human dimension. In contrast, the proposed small trees in *Scheme B* make the building look monumental and overshadows the human scale.

Lastly, *Scheme A* is consistent with policies included in the *Urban Design Element* which encourage the further development of the urban tree canopy to frame street views, reinforce the human scale on broad streets, and provide critical shade and beauty. Therefore, staff offers the following comments:

Notes that the Smithsonian has submitted two alternatives to improve the terraces.

Supports *Scheme A: Ground Plane* option (Smithsonian Preferred Alternative), because this scheme better achieves the terrace improvement design objectives, in addition:

- Creates a welcoming, and inviting public space for people.
- Provides a balanced transition between building massing, landscape and human scale.
- Minimizes solid walls by eliminating planters and providing ground level planting beds which improves public safety and visibility.
- Accommodates wider walkways, which enhances circulation and creates a sense of openness.
- Provides shade canopy trees by accommodating adequate soil volume and extended root zones.
- Enhances view corridors between the museum grounds and the National Mall.

Does not support *Scheme B: Planter* option, which proposes a raised planter system that follows the "building sitting on a plinth" architectural vocabulary because the design:

- Creates narrower walkways, with taller planters which obstructs visibility and affects circulation.
- Provides less shade by limiting soil volume which constrains plant selection to smaller species.

Existing Perimeter Security

The existing perimeter security elements around the museum grounds were previously reviewed and approved by NCPC. At its meeting on February 5, 2004, the Commission approved an overall Mall-Wide Perimeter Security concept, which included all of Smithsonian museum buildings on the Mall, except for the National Museum of the American Indian. The concept incorporated the Commission's *National Capital Urban Design and Security Plan Objectives and Policies*. On September 9, 2004, NCPC approved preliminary and final site development plans for perimeter security around the NASM, the Mall, 4th Street and Independence Avenue, SW, which was the first perimeter security proposal reviewed by the Commission as a result of the overall Mall-Wide Perimeter Security. Lastly, in 2006, NCPC approved the final design of the exhibit plinths on the north side of the NASM.

The existing security elements at the NASM include a family of low free-standing walls, bollards, reinforced terrace planters and guard booths. The west terrace perimeter includes low walls at the property line framing the existing west terrace area with openings to allow pedestrian access to the lawn areas and provide sitting opportunities. Similar free-standing walls with openings can be found at the Museums of American History and Natural History. The north entry perimeter security is defined by a line of custom bollards and plinths set back approximately 13 feet from the curb of Jefferson Drive to allow space for tour bus loading and unloading. Two types of bollards, cylindrical and aerodynamic, are spaced between exhibit plinths and flanking flagpole plinths. The south entry includes a series of cylindrical bollards placed approximately two feet back from the curb at Independence Avenue. The bollards jog around existing streetscape elements such as curb cuts, traffic signals, fire hydrants, and light poles. The existing terrace walls along the south façade are hardened, and retractable bollards are located at the driveway curb cut at the southwestern side of the museum. The perimeter security along the east includes two guard booths integrated within hardened planter walls, adjacent on each side of the garage.

In general, staff considers that the existing perimeter security elements at the NASM are successful because:

- Incorporates security measures into the terraces by hardening the planters,
- Designs perimeter walls and planters to match existing building material which allows visual continuity;
- Provides aeronautical bollard design on the north entrance which thematically relates to the museum and adds visual variety;
- Incorporates exhibit plinth artwork allowing opportunities for visitor interaction;
- Includes openings between free-standing low walls to allow pedestrian access to the west lawn for sitting and passive recreational activities;
- Incorporates guard booths into adjacent terrace walls and building design.

However, there are some issues with the existing perimeter security: the terrace walls are too high, the jogging bollards at the south entry along the Independence Avenue sidewalk clutter the public space, and the location of bollards at the west corners interrupt pedestrian circulation.

Overall, the proposed concept design includes minor changes in the existing perimeter security layout to accommodate the new entry plazas at the four corners. The applicant intends to retain the existing perimeter structural components and integrate the new work whenever possible. However, staff considers that the terrace improvements offers an opportunity to enhance the overall streetscape and pedestrian experience. Therefore, we suggest evaluating the perimeter security around NASM holistically, including previously approved security elements to achieve consistency with the design intent of the Mall-Wide perimeter security plan.

Independence Avenue: The project offers an opportunity to revisit perimeter security elements along Independence Avenue that impede pedestrian circulation and improve the overall streetscape. The existing bollards that jog around streetscape elements create a visual and physical barrier and clutter the sidewalk. In addition, the narrow sidewalk does not allow safe pedestrian waiting areas with sufficient clearance to access to and from bus stops. Currently, there are several

metro bus, commuter, and local city tour routes that frequently stop along Independence Avenue. There are street vendors and parallel parking along the avenue; bike racks and trash cans are not aesthetically integrated into the streetscape. In addition, the building line is not parallel to Independence Avenue. The right-of-way (ROW) along the Independence Avenue frontage varies at its intersection with 6th Street, SW, to the west of 6th Street, the ROW is 112.5 feet and to the east the ROW is 110 feet. Similarly, the sidewalk width along the avenue is not consistent throughout the museum frontage. To the west of 6th Street, the sidewalk is approximately 17.5 feet and narrows to 15 feet to the east side of the entrance, this contributes to spatial constraints and the need to simplify the perimeter security along the museum frontage.

The proposed finish material for planters and walls will be stone clad, the design and finishes will be an extension of the cladding of the building. Final design decisions on planter cladding will be made with decisions on building cladding. In general, the project is consistent with policies included in the *Urban Design Element* that encourage the design of security barriers, including their mass, form, and materials to respond to the architectural and landscape context in which they are located, complement and aesthetically enhance the special character of the associated building and precinct. Therefore, staff **recommends** the applicant address the following comments to improve "*Scheme A – Ground Plane*" perimeter security:

- Minimize the use of bollards and explore integrated perimeter security elements that also function as a public amenity, such as seating, decorative light poles, signage, trash receptacles, bike racks, public art and other streetscape elements.
- Remove or adjust proposed bollards within planting bed areas at corner conditions to achieve a better transition between different security elements, avoid conflicts with landscape and ease maintenance.
- Further refine the design and material of the proposed perimeter security walls to complement the architectural character of the NASM and landscape approach.
- Ensure that the proposed perimeter security is consistent with the existing *Mall-Wide Perimeter Security* plan previously approved by the Commission and is compatible with the placement of security barriers for other buildings along the National Mall.
- Evaluate placement and alignment of existing bollards at the south entrance along Independence Avenue, SW to improve pedestrian circulation and reduce visual clutter. Particularly, near pedestrian cross walks and bus stops to allow safe pedestrian waiting and drop off areas.

Streetscape Amenities
The project includes wider areas for future site furnishing, interpretation, and seasonal street vendor venues. It also includes opportunities for public art and signage to improve way-finding and a contemporary, metal-based palette of site furnishing composed of benches, bike racks, and litter receptacles.

Public Art: There are three outdoor sculptures installed on the NASM grounds since the 1970s that contribute to the museum's overall appearance, one at the north entrance, another at the south entrance, and the third on the southwest corner.

- Ad Astra (Latin for "to the starts") was placed at the museum's north entrance on axis with the National Gallery of Art, facing the National Mall. Ad Astra was commissioned for the museum in 1976 and it rises 115 feet.
- Continuum was placed at the south entry of the museum in 1976. The 14-foot-tall bronze sculpture rest on a 9-foot stone tapered pedestal.
- Delta Solar, a gift from the Venezuelan government to celebrate the U.S. Bicentennial of in 1977, was placed on the west lawn in 1977. It is a kinetic sculpture, designed to interact with wind and sunlight. The sculpture is a 27- by 40-foot delta-shaped piece placed in a rectangular reflecting pool to emphasize its reflective and kinetic qualities; the reflecting pool has not been functional since the 1970s. CFA worked with the artist to orient the sculpture to catch and reflect the afternoon sun.

In order to provide sufficient clearance for the proposed south canopy which has a maximum height of 23 feet, 9 inches, the 23-foot-tall Continuum sculpture, located on the south entry, needs to be relocated to a different location within the museum grounds. As mentioned above, this sculpture was placed on the south entry of the museum since 1976, therefore it contributes to the museum's identity along Independence Avenue.

The design team has identified potential sculpture locations on-site. Staff supports the relocation of the Continuum sculpture on the east terrace along 4th Street, SW to activate the museum grounds, and make better use of this underutilized area. In addition, placing a sculpture element on the east side will and reinforce the east-west axis of the building. 4th Street, SW is a major north-south corridor that provides frontal views to Judiciary Square to the north and connects to the Waterfront to the south. There are several museums along 4th Street with outdoor public art, including the National Museum of American Indian, located directly across the street to the east, and the National Gallery of Art, located to the north. The location of the sculpture along 4th Street will strengthen the cultural character of this corridor and make the pedestrian experience more interesting, staff recommends to ensure that the sculpture does not compete with views of national symbols and offers the following comments:

- Further evaluate the relocation of the existing Continuum sculpture on the museum grounds in collaboration with NCPC, the U.S. Commission of Fine Arts, and the District of Columbia State Historic Preservation Office. The Commission prefers the proposed sculpture location along 4th Street, SW on the east terrace, to establish a focal point along the urban corridor and reinforce the building east-west axis. Provide viewshed studies for each of the proposed potential locations to analyze visual impacts.
- Confirm exterior lighting will not detract from the setting of the National Mall and respects the hierarchy of monuments, important civic buildings and spaces in the nation's capital, with the U.S. Capitol and Washington Monument the most prominent features in the nighttime skyline.
- Explore opportunities to better accommodate existing street vendor venues into the streetscape design to activate the museum grounds and consider locations with high levels of pedestrian activity. Ensure that vendor facilities do not detract from accessibility or aesthetics of the museum while maintaining a pleasant environment.

Circulation and Visitor Experience

The project includes a continuous and paved loop for pedestrian circulation and service utility vehicles access around the museum. Given that the NASM is one the most popular Smithsonian museums, staff recommends to further analyze current circulation patterns throughout the site in order to improve accessibility and encourage sustainable transportation modes. There are only two existing bike racks around the museum, located at each entrance. These bike racks do not complement the streetscape design, and detract from the museum aesthetics.

The site is surrounded by several metro stations and bus stops. Seventh Street, a heavily used corridor for local and commuter buses, crosses the length of the city between the Southwest Waterfront and Maryland. There is a bus shelter near the southwest corner of the site at 7th Street and Independence Avenue. L'Enfant Plaza and Archives metro stations are located along this corridor. Currently tour buses park along Jefferson Drive to load and unload passengers at the ceremonial entrance. Fourth Street connects Anacostia, Navy Yard and the northeast portion of the city, there are is a metro bus stop at 4th Street and Independence Avenue. In addition, there are commuter, local and tour bus stops along Independence Avenue and 6th Street. Despite the number of bus stops around the museum grounds, proximity to metro stations and bicycle storage facilities, the existing streetscape does not encourage sustainable transportation modes and does not allow safe pedestrian waiting areas, particularly along Independence Avenue. Therefore, we offer the following comments:

- Provide seating and shade in proximity to existing bus stops, where possible.
- Improve bicycle facilities, provide additional bike rack locations around the site, in particular along 7th Street, SW, and consider future Capital Bikeshare stations as a way encourage sustainable transportation alternatives.

Landscape

The proposed design aims to create a landscape composition to complement the scale and rhythm of the museum, incorporate a groundcover thematic garden that reflects the museum mission; provide shade and small trees that blend with the National Mall setting and creates open view relationships between grounds and the Mall. Staff supports the landscape concept and provides the following comments:

- Maximize landscape and planting areas in lieu of additional hardscape where possible, specifically at the northwest corner of the building along Jefferson Drive and on the west side of the large exhibit driveway curb cut along Independence Avenue.
- Preserve mature trees to the maximum extent possible, and when tree removal is necessary, replace trees on-site to prevent a net tree loss to the project area in accordance to the District of Columbia tree canopy protection regulations.

West Terrace

The original landscape design consisted of a number of tiers of horizontal planters with open lawns to the east and west ends of the building. In 1988 a restaurant addition was built on the east lawn. Therefore, the west lawn is the only green oasis in this superblock, and it is also part of the existing green space network along 7th Street that leads to the National Mall. The open area to the west of NASM is a grass lawn surrounding the Delta Solar reflection pool, and a grove of shade trees

between the lawn and the ramp to the underground garage along 7th Street. Many of these trees are existing from the original planting campaign and a few were planted to commemorate a person or event. While the intention to make the fountain more accessible in an urban plaza setting with permeable paving surface is desirable, we encourage the design team to maintain the green space character of the west lawn. Staff supports the integration of perimeter security into the sculpture/fountain setting as an innovative and appropriate solution, and the restoration of the Delta Solar setting while maintaining its general location and orientation on the west site to continue reflecting the afternoon sun as originally intended. We offer the following comments:

- Provide seating opportunities, considering orientation and placement, to enjoy views towards the existing sculpture and water feature.
- Preserve the natural character of the existing memorial tree grove located on the west portion of the site. This green space is the portal to the park-like setting of the National Mall and reinforces the symbolic connection along 7th Street.
- Further explore the proposed perimeter security treatment along the 7th Street frontage to ensure a graceful transition between the existing perimeter security walls along the west lawn and the proposed fountain and avoid introducing bollards adjacent to the fountain and near the existing bus stop.
- Align existing bollards with other perimeter security elements if possible, particularly at the large exhibit driveway curb cut along Independence Avenue, SW.

Security Vestibules

The project includes two new visitor screening pavilions on the north and south entrances to meet security programmatic requirements, accommodate screening equipment, queuing space, and shade. In addition, the vestibules will provide a buffer zone between the exterior environment and the interior conditions essential to preserve collections and allow to move security elements out of the main gallery space.

With an average of approximately 7 million visitors per year, the existing visitor screening system cannot keep up with visitor's demand on a typical summer weekend or during the holidays. This leads to extensive queues at the north and south entrances with a 45-minute wait in frequently inclement weather conditions during peak time. The security gates are located only eight to ten feet inside the inner vestibule doors, and detract from the exhibits within the "Milestones of Flight" gallery which houses the museum's most important collections.

The design of the vestibules evokes the images of the early flying machines developed by Leonardo DaVinci and the Wright Brothers as exhibited within the museum by implementing a tensile roof that has the abstract shape of wings. On the north entry, the continuous roof encloses a curtain wall vestibule and provides protection of adjacent exterior queue areas. The design aims to respond to the architectural rhythm of the existing building and its relationship with the building central axis. The organic shape of the roof helps with the visual integration between the landscape and building. The security screening is located within a transitional space of reduced width and lower ceiling height between the canopy and the "*Milestones of Flight*" gallery. On the south entry, the canopy provides shade for exterior queuing space but it is not enclosed. The screening equipment is located in a transitional volume that connects to the existing building. Therefore, the

proposed canopies are independent from the main building. The north entrance enclosed vestibule will be approximately 3,350 square feet, with a total canopy area of 7,200 square feet and a maximum height of 34 feet. The south entrance enclosed vestibule will be approximately 2,000 square feet with a total canopy area of 3,800 square feet and a maximum height of 23'-9".

Overall, staff supports the character of the proposed security vestibules, the organic geometry contrasts the orthogonal building and softens the monumental scale of the museum, the form reflects the museum's mission to commemorate, educate, and inspire by evoking early flying machines. The canopies provide shade, address security program needs and contribute with orientation and way-finding by demarcating the building entrance. The north canopy responds to the monumentality of its context along Jefferson Drive and is more expressive due to the vast scale and generous view shed of the National Mall, while the south canopy is more constrained to respond to Independence Avenue setting.

Independence Avenue is characterized as a monumental street because it is adjacent to the Mall and Smithsonian campus, and connects to the U.S. Capitol. The role it plays is similar to Constitution Avenue on the north side of the Mall. Both orthogonal avenues offer views toward the U.S. Capitol Grounds, the National Mall and Potomac Parks. In addition, the Southwest Federal Center, located south of NASM across Independence Avenue, is a business district that houses many government offices. Many of the buildings in this area are large, monumental structures in a modernist style. Two structures in close proximity to NASM are associated with the Department of Education, while an open parcel of land divided into two triangles by Maryland Avenue is the future site of the Dwight D. Eisenhower Memorial.

According to the viewshed classification system included in the *Urban Design Element*, Independence Avenue is a significant east-west vista within the L'Enfant street network. The *Urban Design Element* includes policies that encourage applicants to enhance and protect the primary vistas within the L'Enfant Plan through appropriately scaled building development, wherever possible. In addition, it contains policies that discourage pedestrian screening security operations conducted in public space. If building additions or renovations are required to accommodate this function, the new construction should be compatible with the existing architecture and should not project into L'Enfant Plan rights-of-way, other public space, or viewsheds. Therefore, we offer the following comments:

- Protect the significant vista along Independence Avenue by ensuring that the proposed south vestibule does not project into this L'Enfant Plan right-of-way.
- Provide a viewshed study along Independence Avenue to determine potential visual impacts on the L'Enfant right-of-way and evaluate if the proposed south vestibule scale and massing is compatible with the existing context.
- Examine whether and how the proposed north vestibule will impact reciprocal viewsheds between the NASM and significant buildings, including the National Gallery of Art West Building, the U.S. Capitol, and the Washington Monument.

Stormwater Management
The site permeability is limited by the extents of the building's basement. Therefore, most of the rainwater will be collected and stored in two underground storage cisterns for greywater re-use. The project will also include on-grade infiltration on planted areas to store rainwater temporarily and direct excess water to the city system. A stormwater management plan, prepared in accordance with the Commission submission guidelines, that addresses compliance with the District Department of Energy and Environment (DOEE) and Section 438 of the Energy Independence and Security Act (EISA) regulations is required for final review.

Photovoltaics
The project includes installation of *Building Integrated Photovoltaics* (BIPs) on the south canopy. The BIP installation will be developed as a flexible thin PV film that adapts to the curvilinear form of the proposed tensile fabric roof. The solar canopy will create a form that protect visitors from the sun while harvesting energy. The project also includes 1,300 solar panels installed on the building 70,000-square-foot flat roof. This solar panel installation can generate approximately seven to ten percent of the electrical building load.

CONFORMANCE TO EXISTING PLANS, POLICIES AND RELATED GUIDANCE

Comprehensive Plan for the National Capital

As noted above, this projects meets basic goals of the Comprehensive Plan.

Monumental Core Framework Plan

The project is located within the Southwest Rectangle precinct of the *Monumental Core Framework Plan*. The proposed project will advance the Framework Plan goals to connect the National Mall to the Southwest Waterfront by improving pedestrian circulation along 7th Street, SW. In particular, the proposed streetscape and landscape improvements will reinforce the cultural character along 7th Street corridor that leads to a series of cultural institutions, sculpture gardens and open spaces, including the National Portrait Gallery, the Navy Memorial, the National Archives, the National Gallery of Art, the Sculpture Garden and the Hirshhorn Museum and Sculpture Garden. Immediately south of the NASM, is the future President Dwight D. Eisenhower Memorial, approved by the Commission in July 2015, which will mark Maryland's Avenue arrival at the National Mall as a significant visitor destination. The Framework Plan proposes to enhance the open space and public realm and restore Maryland Avenue as a grand urban boulevard that links the US Capitol to the Jefferson Memorial while enhancing mobility and environmental quality.

Southwest Ecodistrict Plan

Although the project is across the *SW Ecodistrict Plan* study area boundary along Independence Avenue, the *SW Ecodistrict Plan* includes objectives to strengthen 7th Street as a local transit hub, maximize the ability to accommodate bus, bicycles and vehicles, establish greater connection between all modes of transit, and improve walkability. It also contains strategies to integrate

sustainable building and landscape practices within public space and use as features for interpretive opportunities. Lastly, it includes recommendations to orient buildings and public spaces to focus on Independence Avenue, and preserve and enhance its importance as a significant element of the monumental core.

National Historic Preservation Act

NASM is a contributing element of the National Register of Historic Places-listed National Mall Historic District. The NASM is not currently listed on the National Register of Historic Places or the District of Columbia Inventory of Historic Sites; however, it is potentially eligible for individual listing. The building is currently 40 years old.

Both the Smithsonian and NCPC have an independent responsibility to satisfy the requirements of Section 106 of the National Historic Preservation Act (NHPA). NCPC's approval of the plans is an undertaking under Section 106 of the National Historic Preservation Act. The Smithsonian's construction of the project is an undertaking as well. The Smithsonian formally initiated consultation with the District of Columbia State Historic Preservation Officer (DC SHPO) with a letter dated September 3, 2014 that including cladding replacement, and a letter dated September 5, 2014 that included the proposed security pavilions. NCPC and SI held a joint NEPA/Section 106 public meeting on November 2, 2014, and a second consulting's party meeting on February 22, 2016. As part of the Section 106 consultation, the DC SHPO has informally indicated that the overall project components and its cumulative impacts will change the character of the building and likely result in adverse effects. If the project results in adverse effects, the SI and NCPC will seek to execute a Memorandum of Agreement with the DC SHPO.

Additional Section 106 consultation will continue through design development. NCPC staff will continue to participate in the consultation process, which must be completed prior to the Commission's final action.

National Environmental Policy Act

NCPC will serve as the lead and responsible federal agency and work in cooperation with SI to comply with the National Environmental Policy Act (NEPA). NCPC and SI will be preparing an Environmental Assessment (EA) to analyze the environmental impacts of a range of alternatives for this project, in accordance with NEPA. As mentioned above, a public joint NEPA/Section 106 meeting was held on November 12, 2014 to inform the public, interested stakeholders and agencies of the project and solicit feedback on environmental and historic preservation issues. The final determination resulting from the environmental document must be completed and signed by the responsible federal lead agency prior to the submission of the proposal to the Commission for preliminary review.

CONSULTATION

Since the information presentation to the Commission on July 10, 2014, the applicant has continued to engage frequently with CFA, NCPC and SHPO and provided opportunities for the

public and consulting parties to provide input into the project. The applicant held a series of meetings, to provide an opportunity to review the design progress and focus on specific project components.

Consultation Meetings	Date
Agencies / Public Scoping Meeting – Joint NEPA/Section 106	November 12, 2014
Agency Consultation (Cladding, Glazing, Sustainability, Vestibules, Terrace Design Progress)	January 15, 2015 February 10, 2015 May 12, 2015 August 27, 2015
Agency Consultation (Perimeter Security and Landscape Design Progress)	September 8, 2015 March 22, 2016 April 14, 2016
Agency Consultation (Stone Feasibility Study / Stone Cladding Samples on-site Review)	January 12, 2016 February 11, 2016
Prep for Section 106 meeting and NEPA discussion	February 12, 2016
Section 106 Consulting's Party Meeting #2	February 22, 2016
Table 1: Summary of Agency coordination meetings (as of June 20, 2016)	

Coordinating Committee

The Coordinating Committee reviewed the proposal at its June 15, 2016 meeting. The Committee forwarded the proposed concept design to the Commission with the statement that the project has been coordinated with all participating agencies. The participating agencies were: NCPC; the District of Columbia Office of Planning; the General Services Administration; the National Park Service; the Washington Metropolitan Area Transit Authority, the District of Columbia State Historic Preservation Office and the District Department of Transportation. DDOT requested information about the property line to determine the extent of public space and also suggested potential opportunities to minimize visual clutter and improve the streetscape along Independence Avenue.

U.S. Commission of Fine Arts

In its meeting of June 16, 2016, the Commission of Fine Arts (CFA) reviewed and approved the revised concept design for the replacement of the terraces surrounding the NASM and for two new visitor screening pavilions. CFA supported the plan to provide expanded accessibility, maintain perimeter security and increase visitor comfort. CFA strongly favored the SI's preferred Scheme A, which would create an enhanced pedestrian environment with larger shade trees and sequence of public spaces, over Scheme B, which would elaborate on the existing logic of terraces and planter sin the building yard leading to the museum plinth. CFA suggested further refinement of the details of the freestanding barrier walls that line the pedestrian pathways, such as the potentially awkward end conditions of these walls. For the entrance pavilions, they expressed support for their

elegant, curvilinear forms but notes that full review of the design of the structures requires understanding their relationship to the building's new cladding material.

Last summer, CFA reviewed concept plans for the project on June 18, 2015. At the time, CFA approved the concept plan with numerous comments for further consideration as the design was developed. CFA expressed strong support for the proposal to simplify and open up the terraces to accommodate modern requirements of accessibility and security. CFA suggested that the design could go much further in expressing the technology of the museum's subject of flight and space exploration. CFA identified the opportunity in this project to express the use of solar panels in a more comprehensive way in the renovation of the building. Instead of the current proposal to treat the canopies and solar panels as unrelated elements added to the shell of the building, CFA recommended that these pieces be more fully integrated with each other, transforming the existing architecture to convey the role of technology in air and space travel. CFA expressed concerns about the technical feasibility of the Tennessee pink marble, and suggested a bolder exploration of cladding materials to evoke the appearance of flight and mission of the museum.

ONLINE REFERENCE

The following supporting documents for this project are available online:

- Submission Package

Prepared by Vivian Lee
06/30/2016

POWERPOINT (ATTACHED)

National Capital Planning Commission

NCPC File # 7585: Smithsonian National Air and Space Museum Building Exterior, Vestibules and Site Improvements

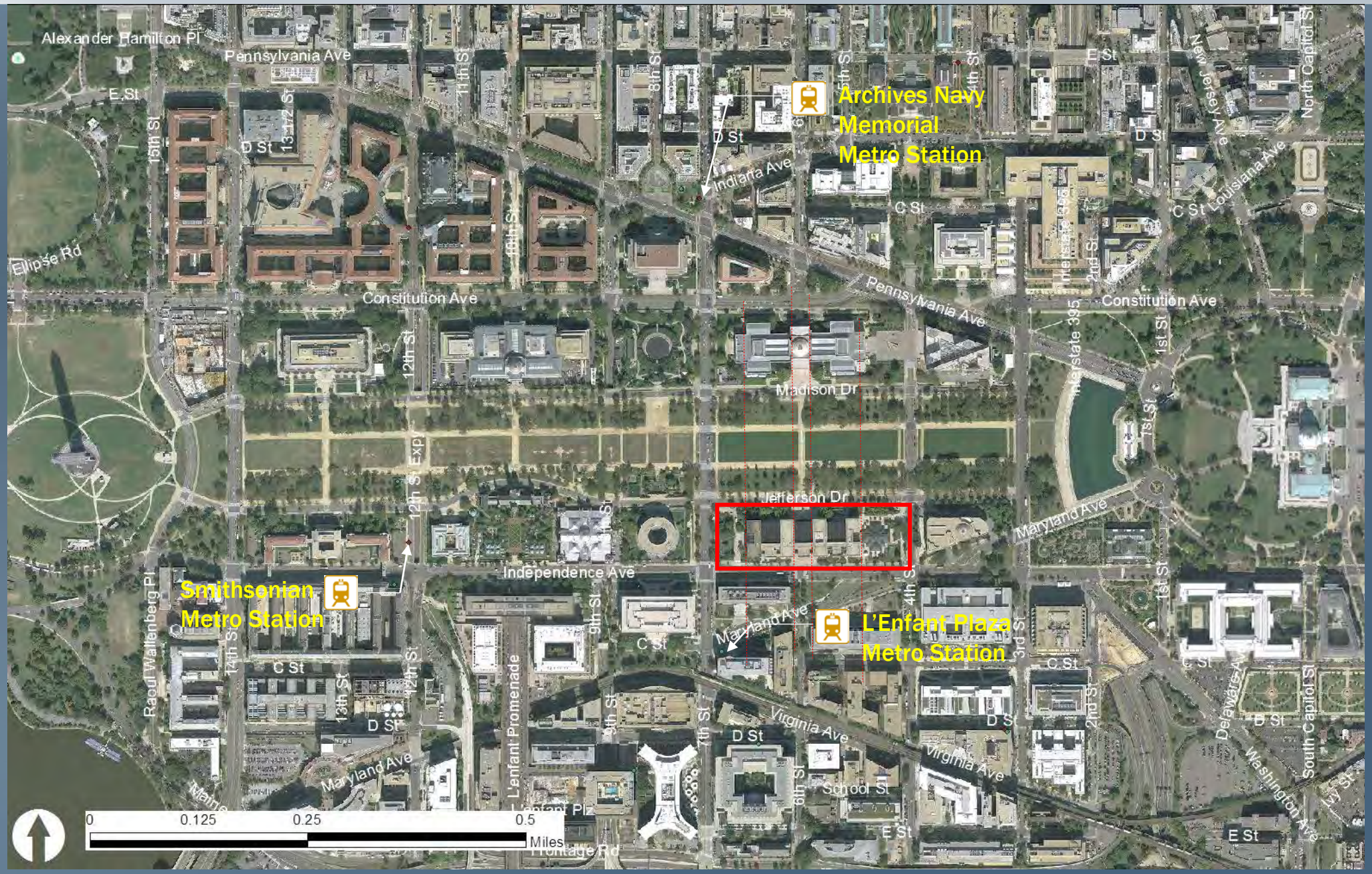
Independence Avenue at 6th Street, SW
Washington, DC 20560

Smithsonian Institution

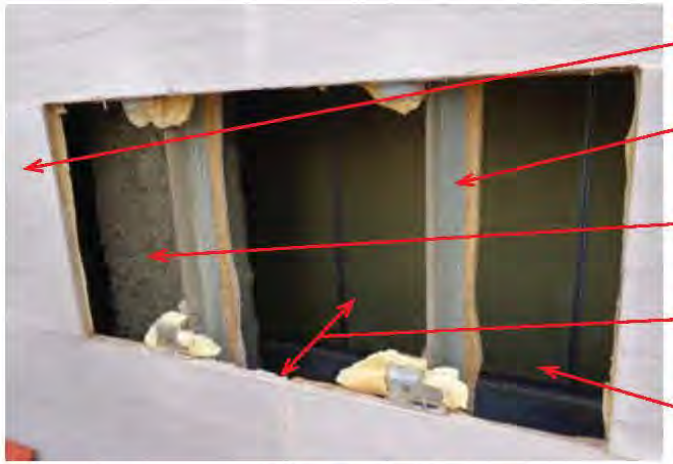
Concept

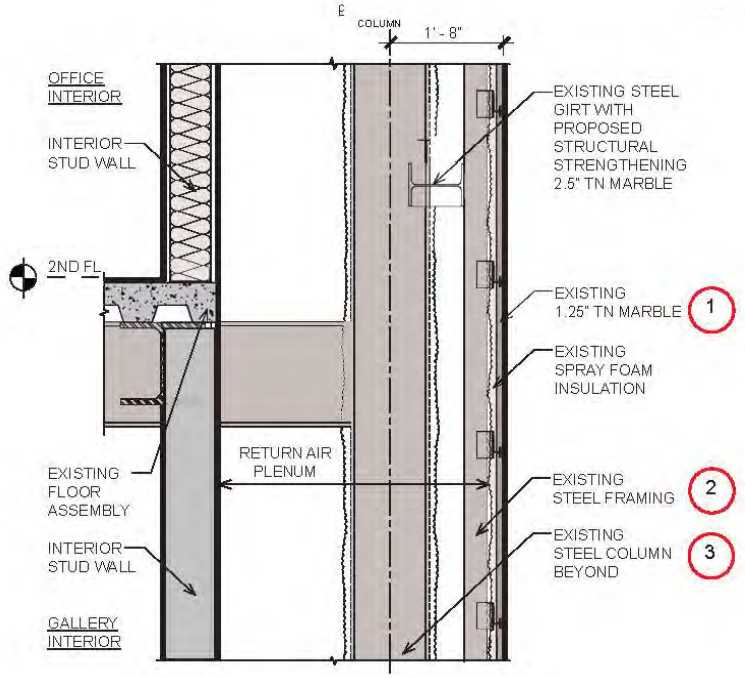
National Capital Planning Commission

Site Location

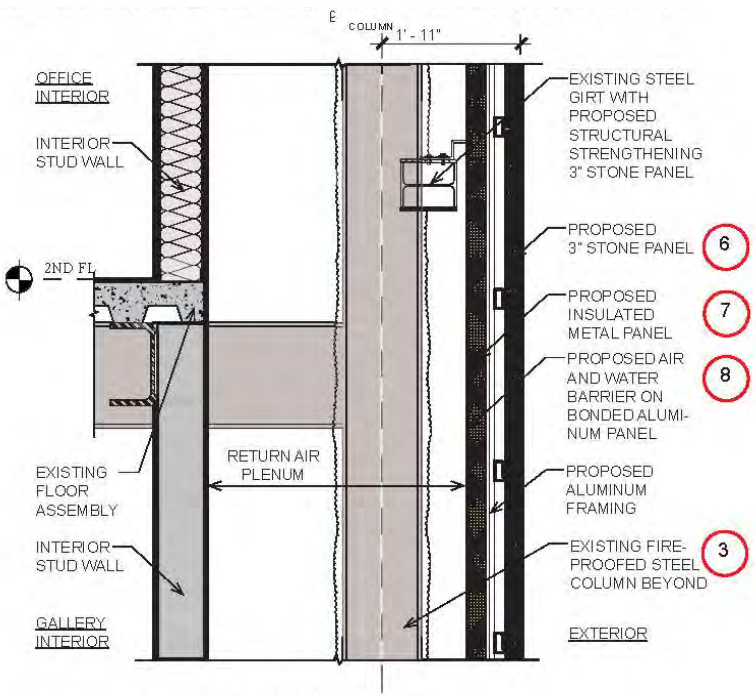


Envelope Replacement: Existing and Proposed Stone Cladding





Existing Wall Section



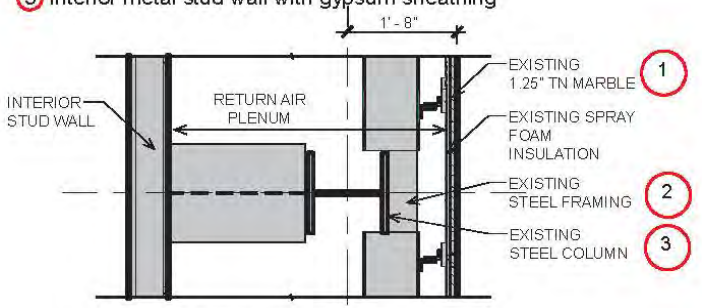
Proposed Wall Section

The typical exterior wall construction consists of the following from exterior to interior:

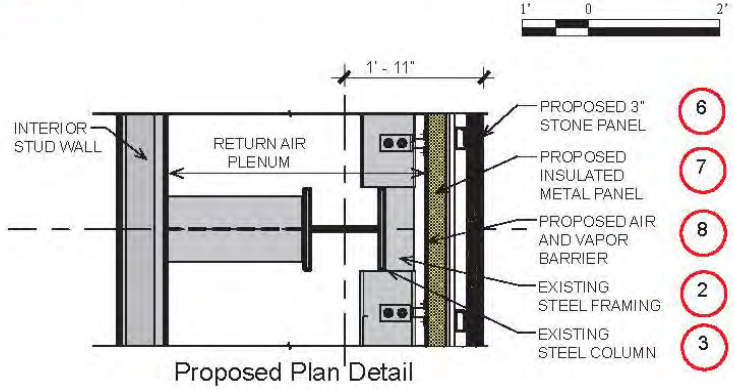
1. 1.25" Tennessee Pink Stone panels with spray foam insulation
2. Steel framing
3. Steel column
4. Air Cavity (Return Air Plenum)
5. Interior metal stud wall with gypsum sheathing

Proposed new wall construction consists of the following upgrades from exterior to interior:

6. Proposed 3" Stone Panel
7. Proposed Insulated Metal Panel
8. Proposed Air and Water Barrier (Rain Screen)



Existing Plan Detail



Proposed Plan Detail

Envelope Replacement: Existing Conditions and Proposed Cladding Alternatives

Warped Stone Panels on North Facade

Warped Stone Panels on West Facade

Tennessee Pink Marble

Alternate Stone Selection TBD

Performance Criteria

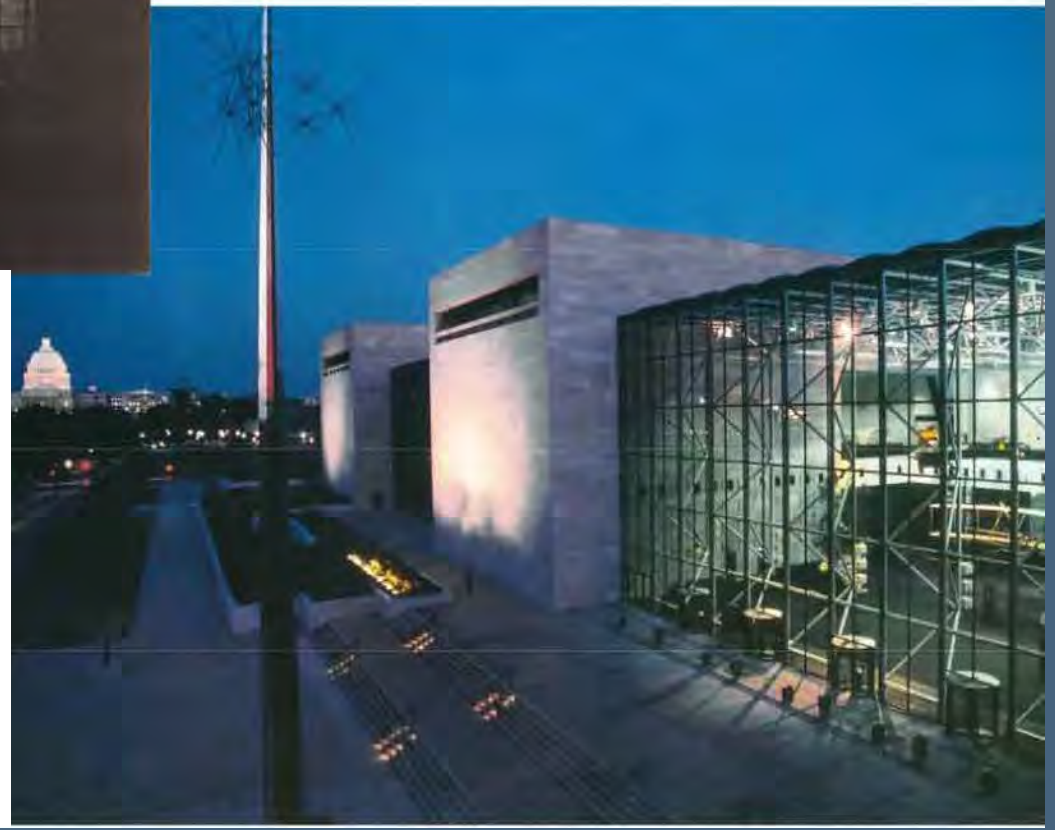
The exterior wall assemblies must meet the following criteria:

- Durability/Strength
- Appearance: scale-giving, not monolithic; color; randomness; size and weight
- Procurement/installation risk
- Transition from interior to exterior
- Adherence to original design concept
- Prevent water infiltration
- Provide a continuous air barrier
- Minimize the potential for moisture accumulation within the exterior wall assembly and condensation, while maintaining interior operating conditions
- Provide thermally broken cladding attachment system to prevent condensation within the wall
- Provide blast resistance and limit fire propagation
- Provide the longest service life possible

Envelope Replacement: Glazing

Domed acrylic skylights were replaced in 2001 due to performance issues with solar heat gain, leaking and excessive exposure to UV rays

Original 1976 Installation

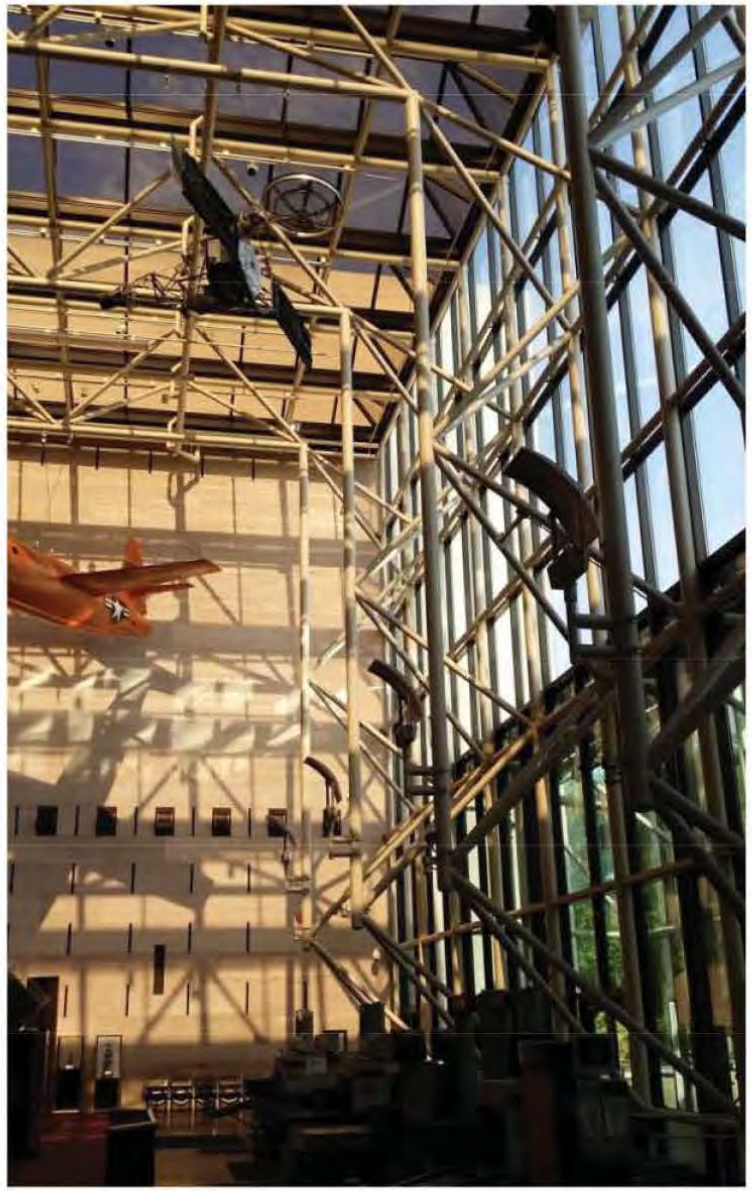


Performance Criteria

The glazing replacement must meet the following criteria:

- blast resistance
- structural capacity for wind and snow loading
- effective resistance to water penetration and air leakage
- thermal barrier
- condensation control to allow the humidification system to be reactivated
- limited exposure to harmful UV rays
- mitigated solar heat gain
- greater visual connection to the gallery interior from the Mall, and to the sky above from within the gallery

Envelope Replacement: Glazing



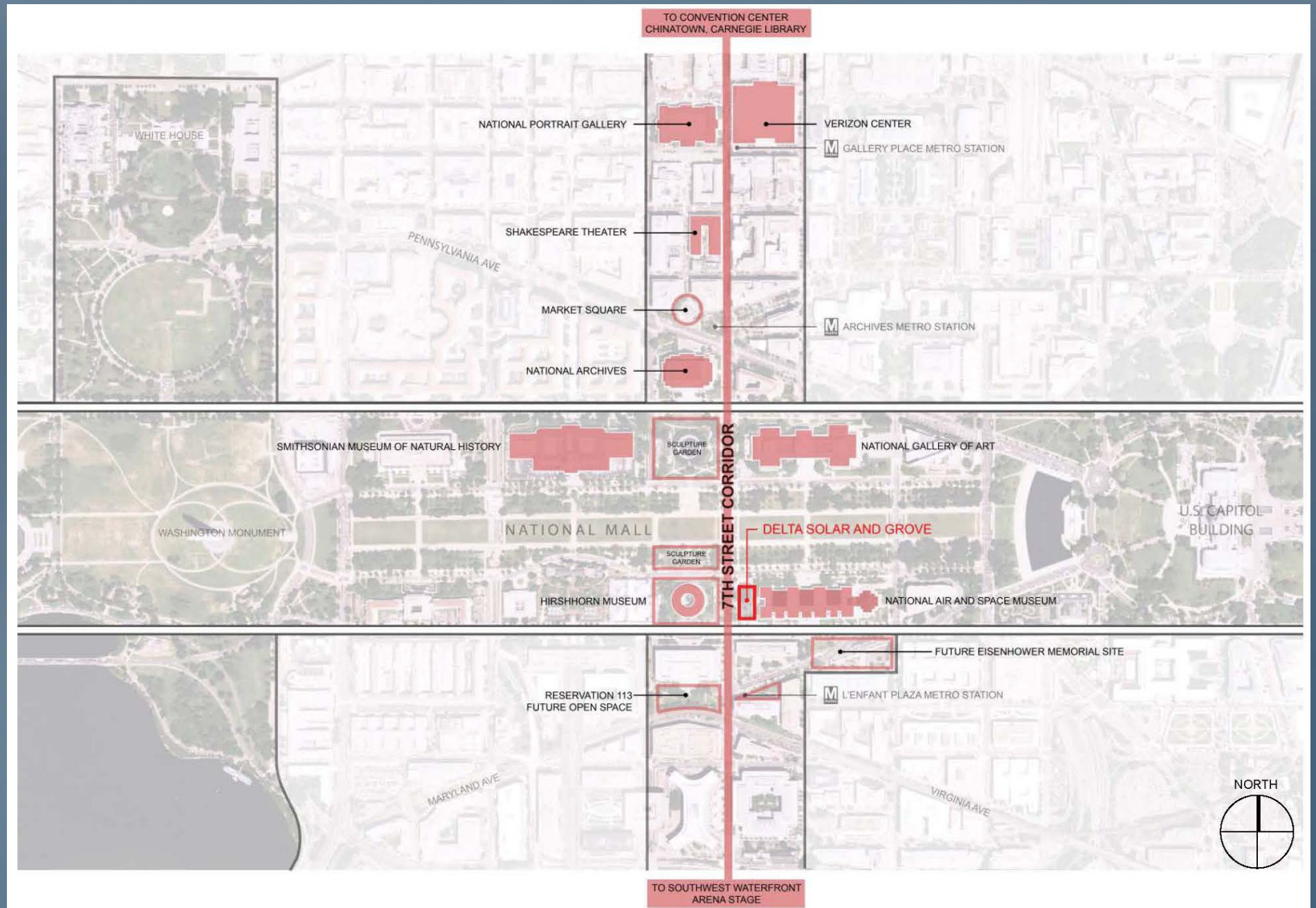
Existing skylight and curtain wall as seen from within a gallery

Existing skylight and curtain wall as seen from within a gallery

2001 curtain wall replacement included a reduction in visible light transmittance from 47% to 22% with the intent to protect the interior exhibit pieces from exposure to harmful UV rays. Since 2001, technology has continued to improve and it is now possible to prevent the sun's harmful effects to an even greater degree. The planned glazing replacement will enable the Museum to house and care for its treasures for years to come in Milestones Hall.

Existing curtain as seen from outside the north entrance

Terrace Improvements: Urban Context – 7th Street and the National Mall



Terrace Improvements: Existing Aerial Photo

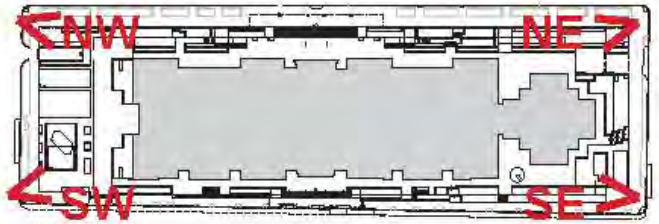
Terrace Improvements: Existing Conditions Site Corners and Entrances

Northwest

Northeast

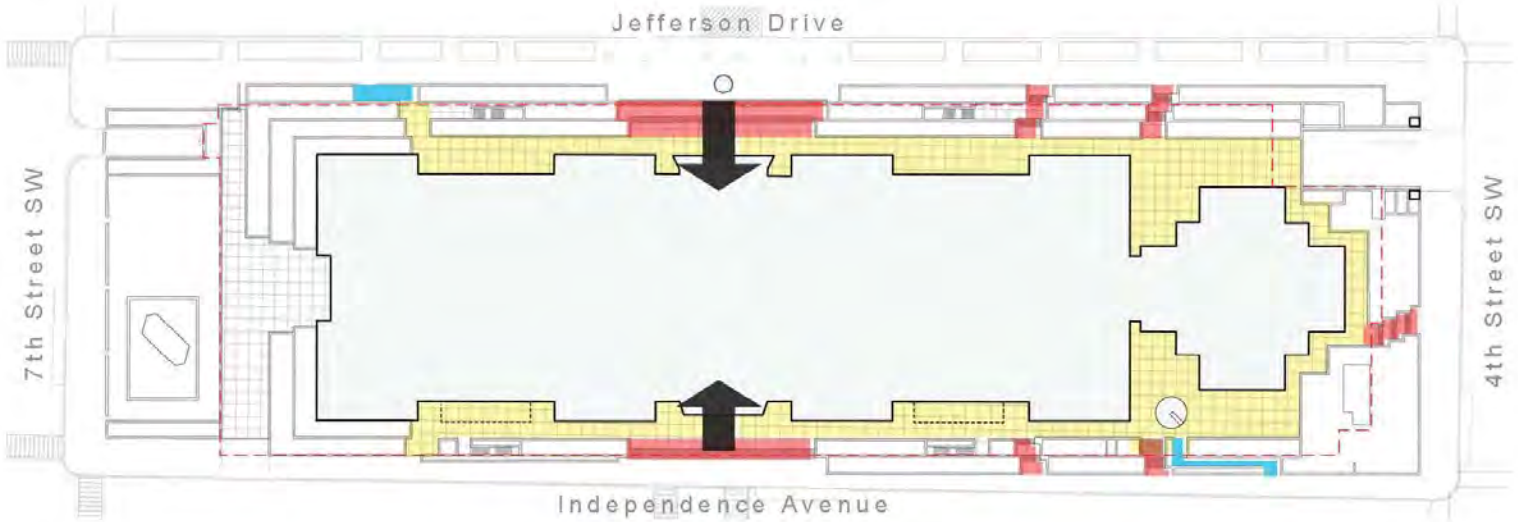
Southwest

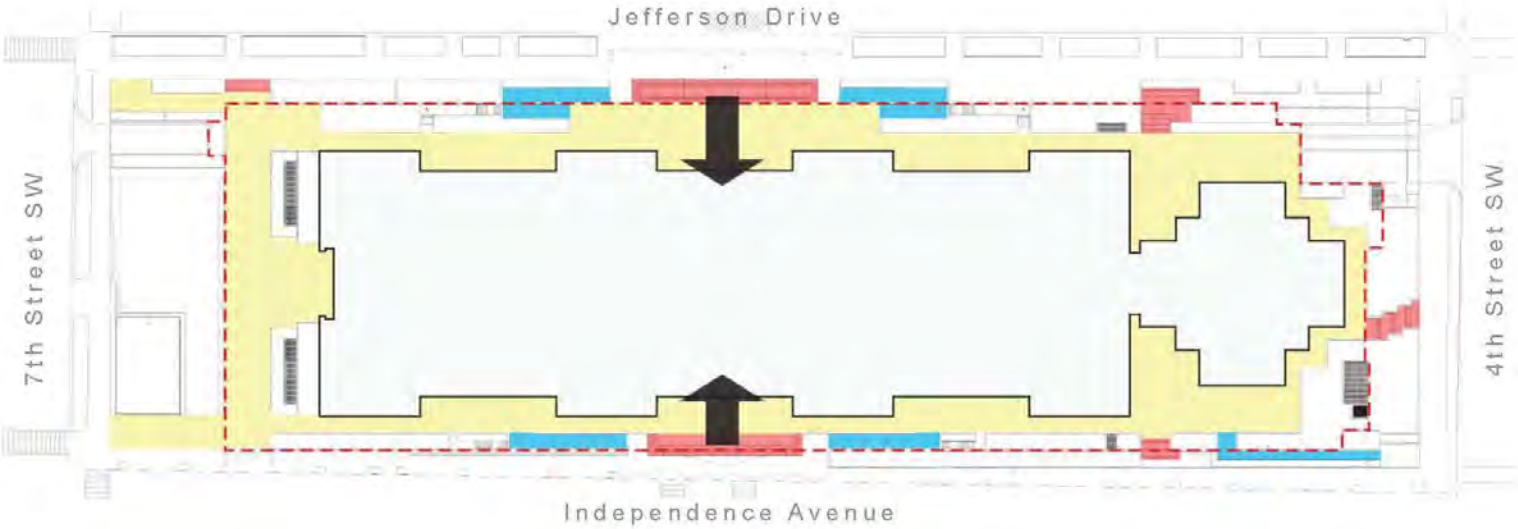
Southeast



North Entrance Visitor Queuing

Terrace Improvements: Visitor Access





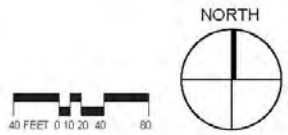
The general scheme continues to create new grounds entrances at all four corners, provide universal access at both north and south entrances, and unify the grounds with connected terrace circulation around the entire building. In all, five new ways into the grounds are proposed.

Existing

- Stairs (7)
- Accessible Walkways (2)
- At Grade Route (1)

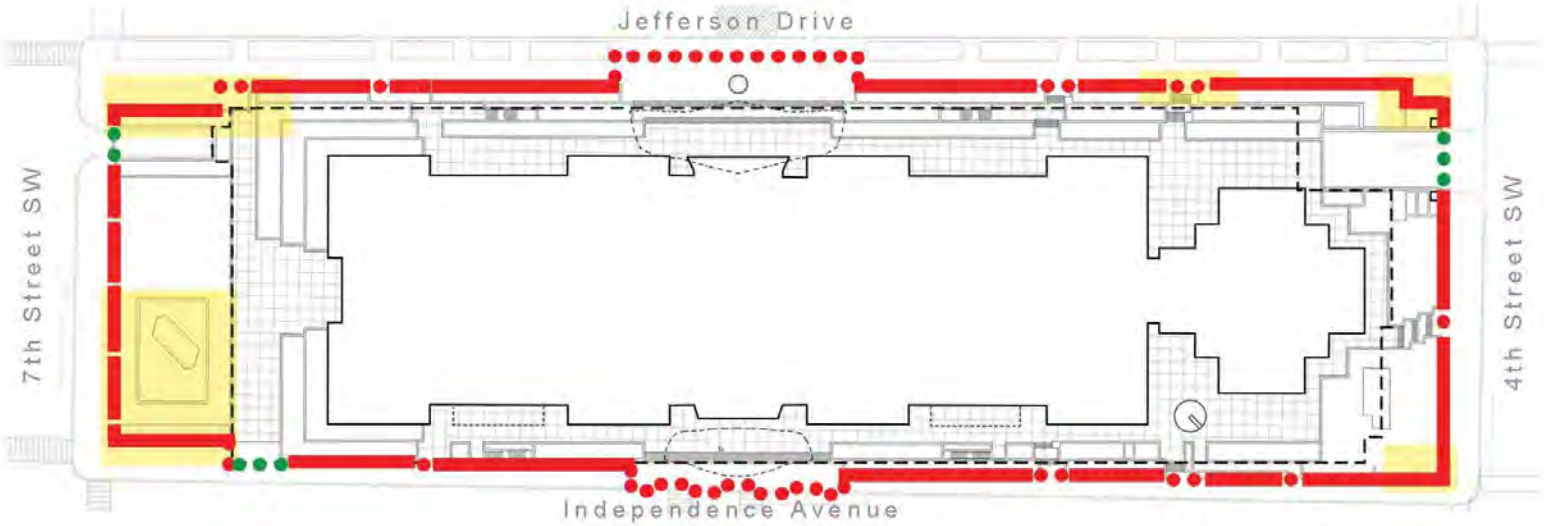
Proposed (Scheme A/B)

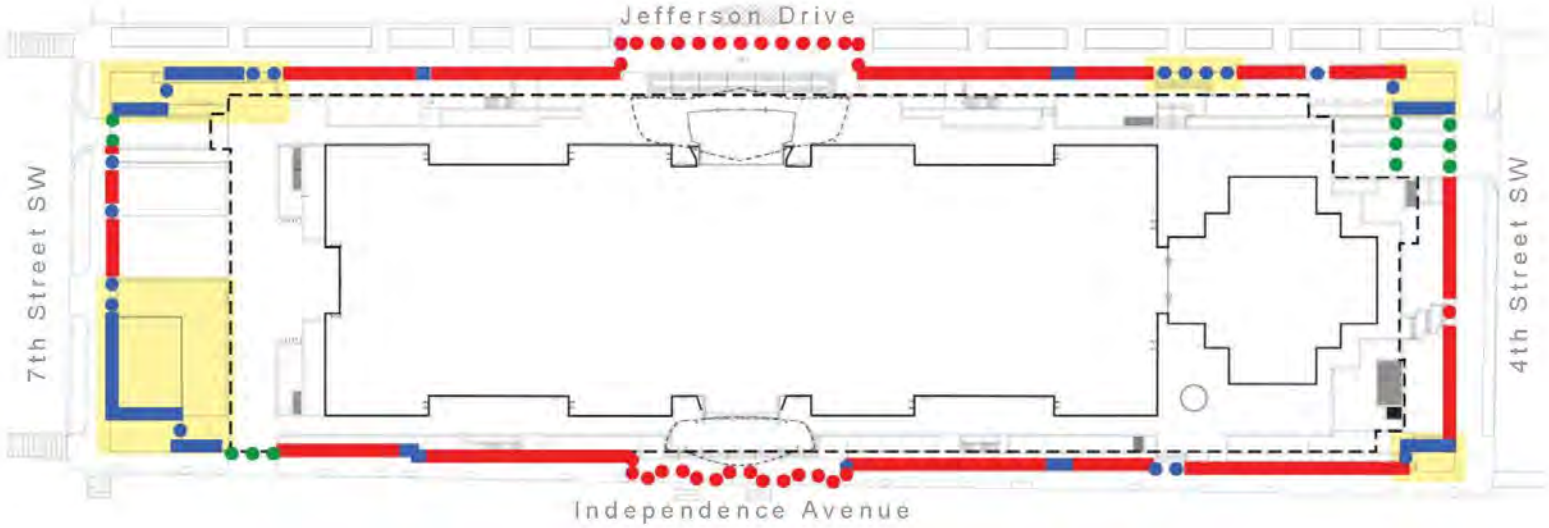
- Stairs (6)
- Accessible Walkways (5)
- At Grade Route (4)



Visitor Access, Comparison between existing condition and Scheme A/B

Terrace Improvements: Perimeter Security





Secure Perimeter

The secure perimeter remains essentially unchanged from existing conditions. Minor adjustments are made to accommodate the new grounds entrances at the four corners.

Existing

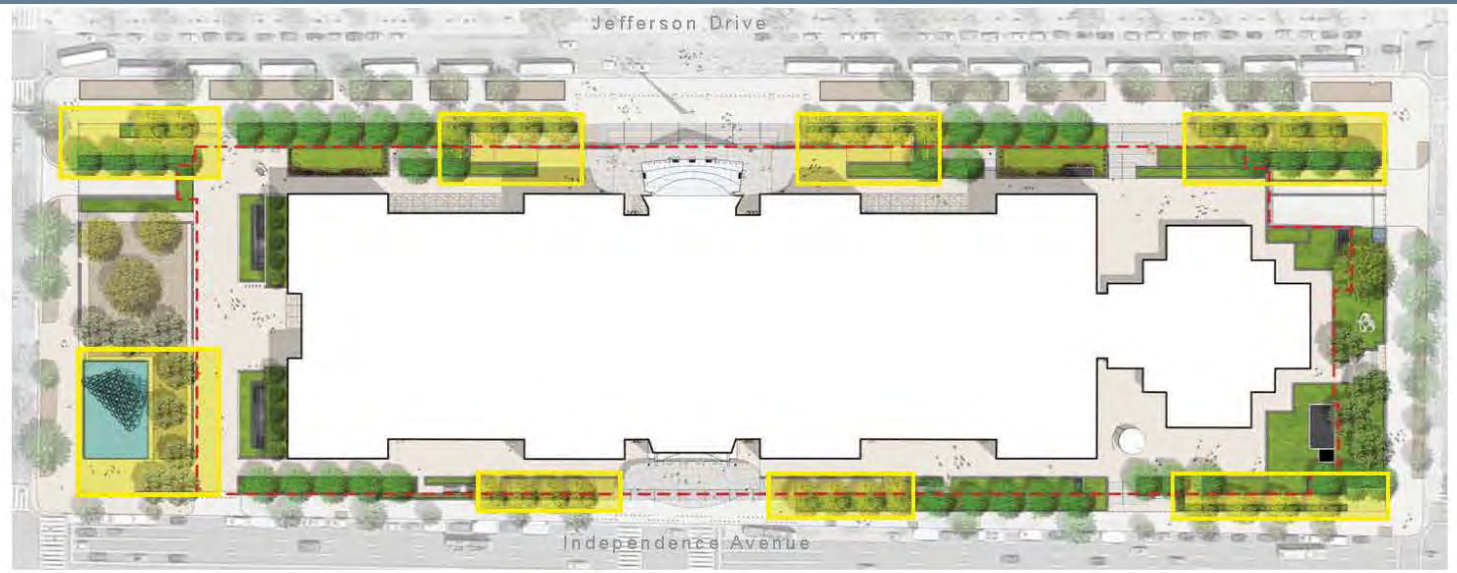
Proposed
(Scheme A/B)

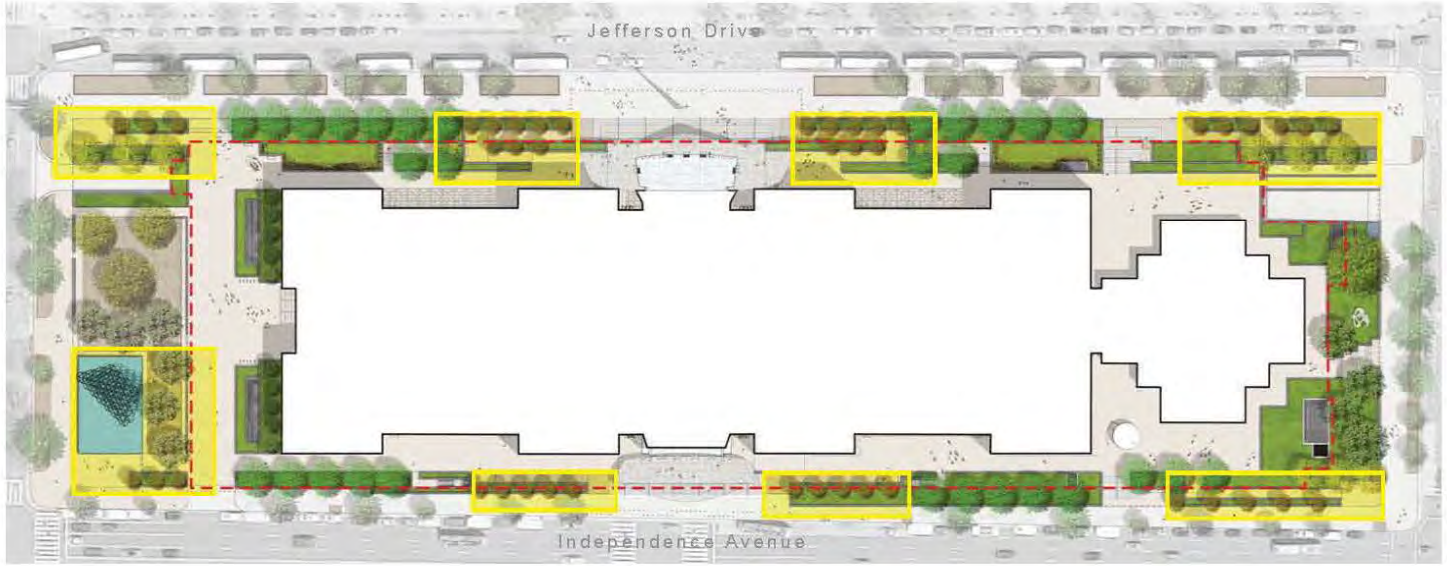
- Existing Secure Wall
- Proposed Secure Wall
- Existing Bollards
- Proposed Bollards
- Operable Bollards
- Areas of Difference

NORTH

40 FEET 0 10 20 40 80

Terrace Improvements: Proposed Site Plan – Scheme A and B





This couplet shows the areas of difference between the two schemes as developed – at the four corners and the north and south entrances. Besides a difference in 'material' expression, the areas differ in the size of trees that can be accommodated, meaning that differing amounts of shade are created, and a different aesthetic expression.

Scheme A

Scheme B

Areas of Difference

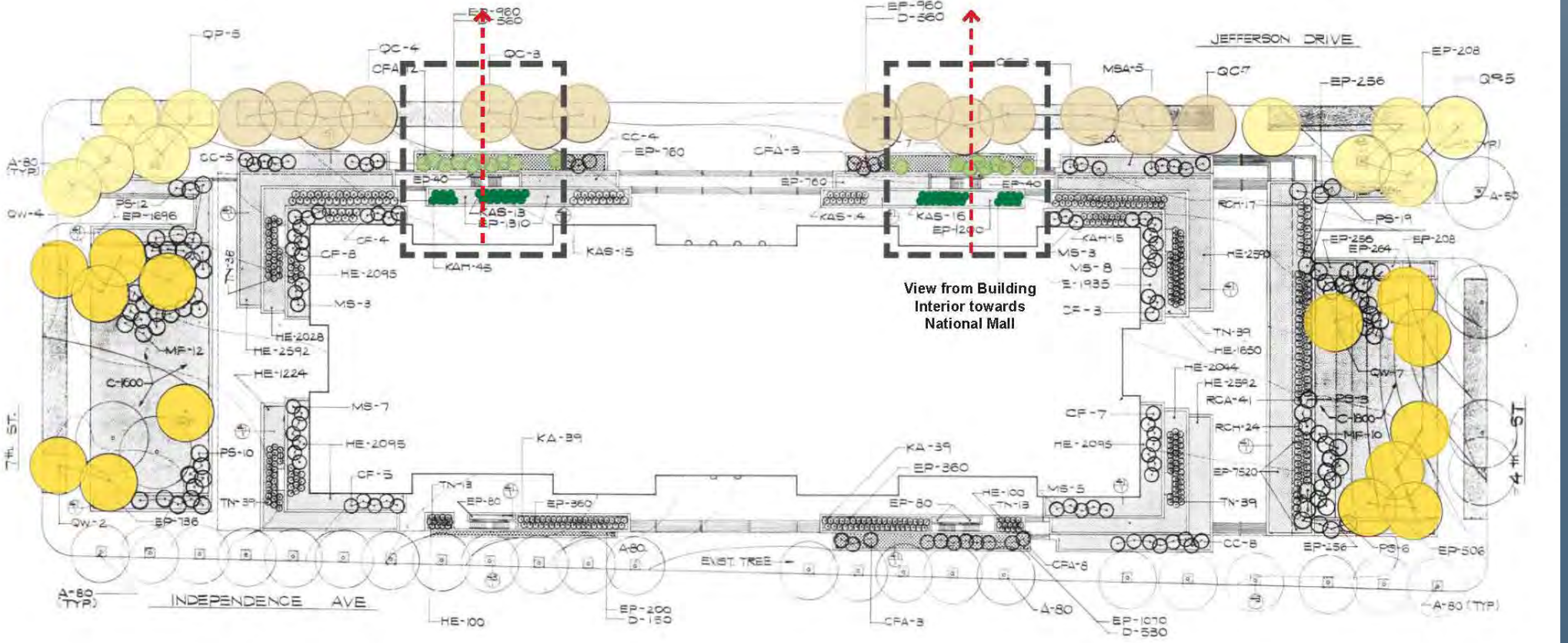
Basement Edge of Structure

NORTH

40 FEET 0 10 20 40 80

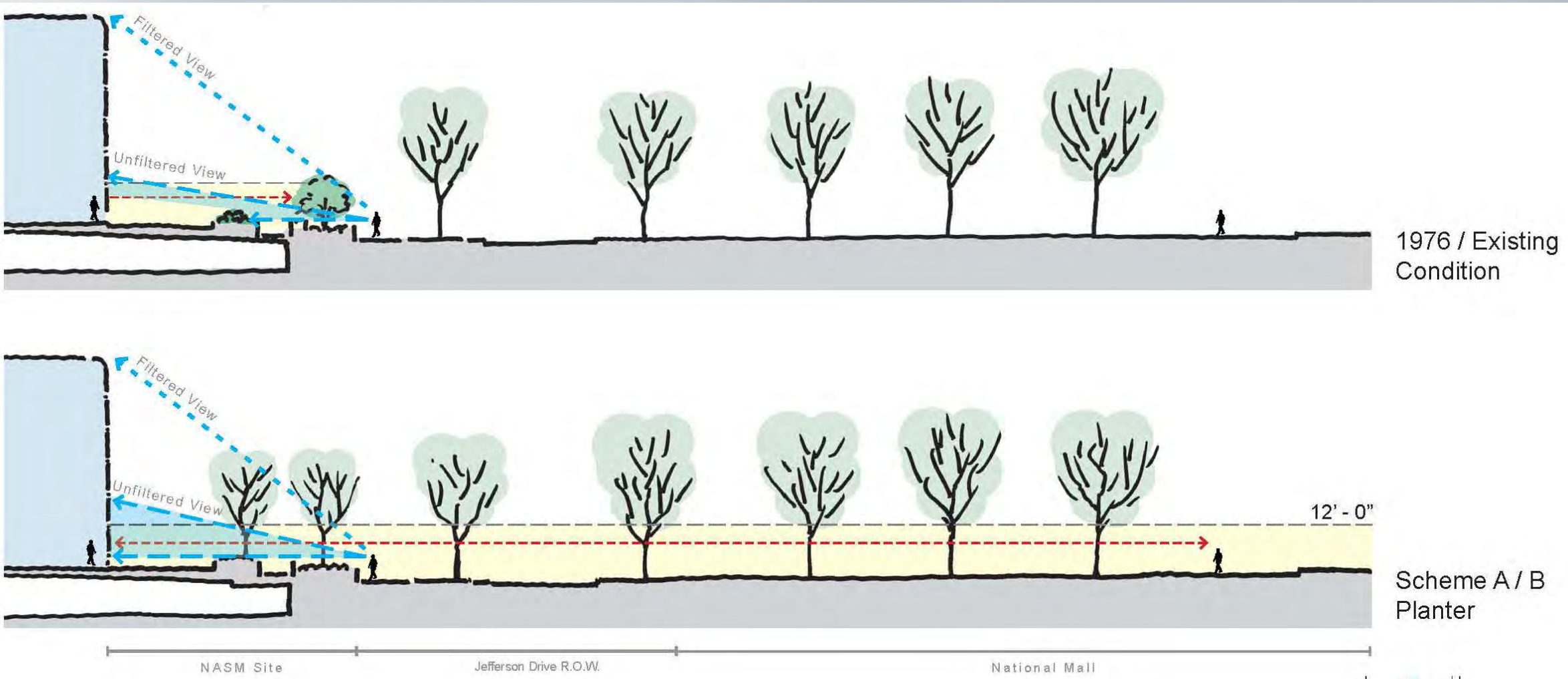
Scheme A, B Site Plan - Areas of Difference

Terrace Improvements: Original Planting Plan 1972



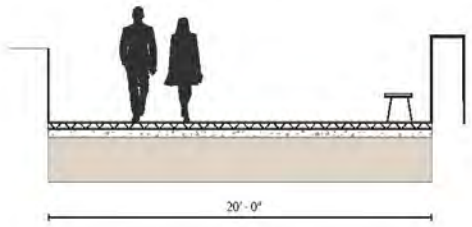
National Capital Planning Commission

Terrace Improvements: Views from Atrium Galleries to the Mall

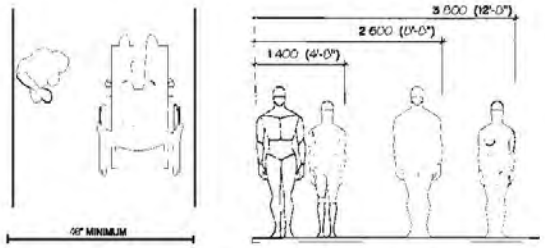


Views from Atrium Galleries to National Mall

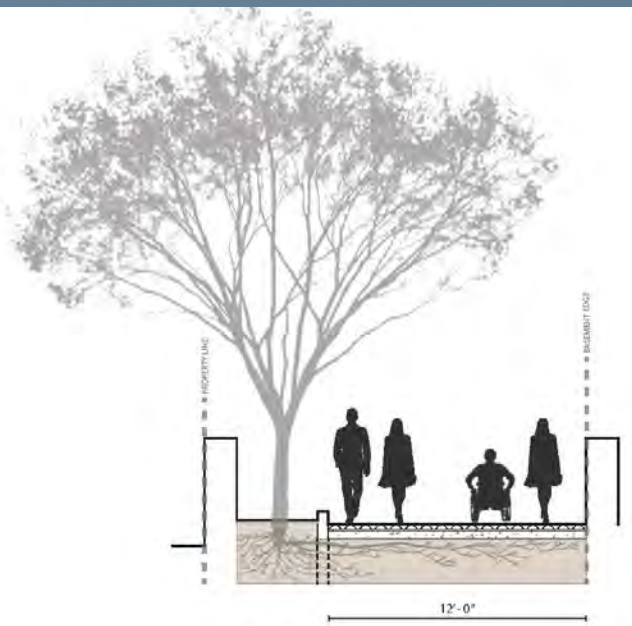
Terrace Improvements: Accessible Walkway Diagram

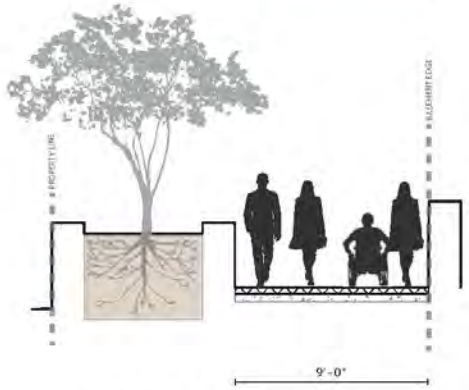


1. Entrance Landing Width,
Typical Scheme A + B

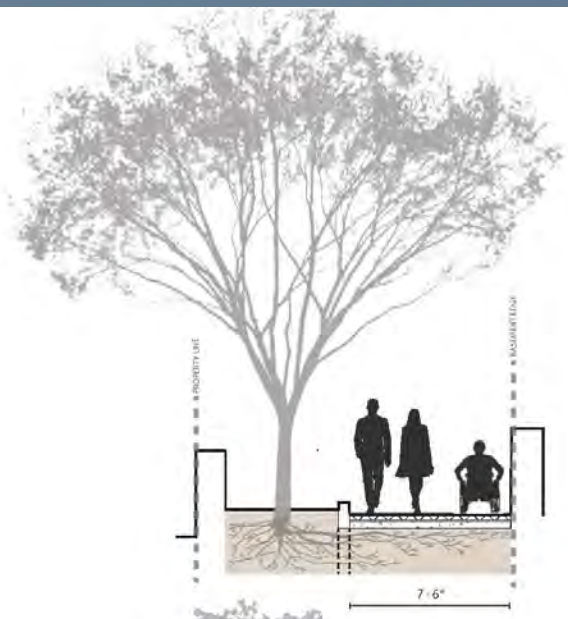


SOURCE: Charles Harris, Nicholas Dines Time-Saver Standards for Landscape Architecture

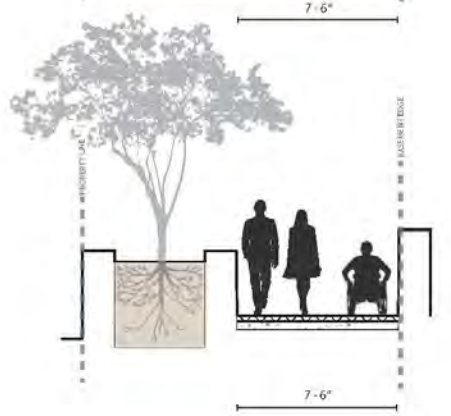




2. N Entrance Sloped Walkway

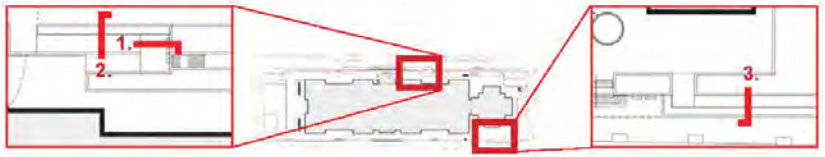


Scheme A



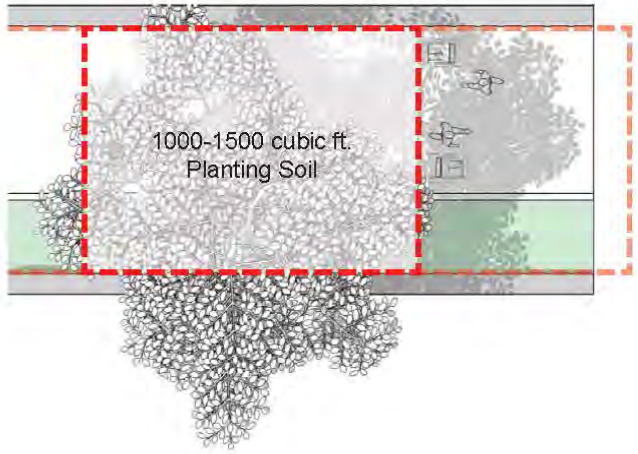
Scheme B

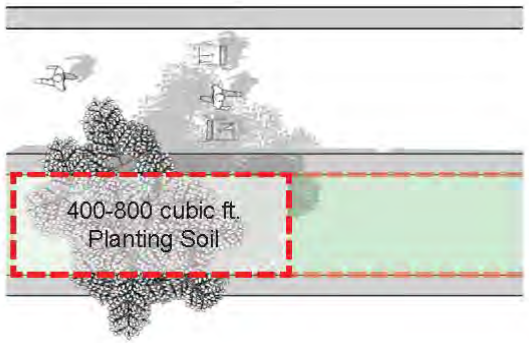
3. SE Sloped Walkway

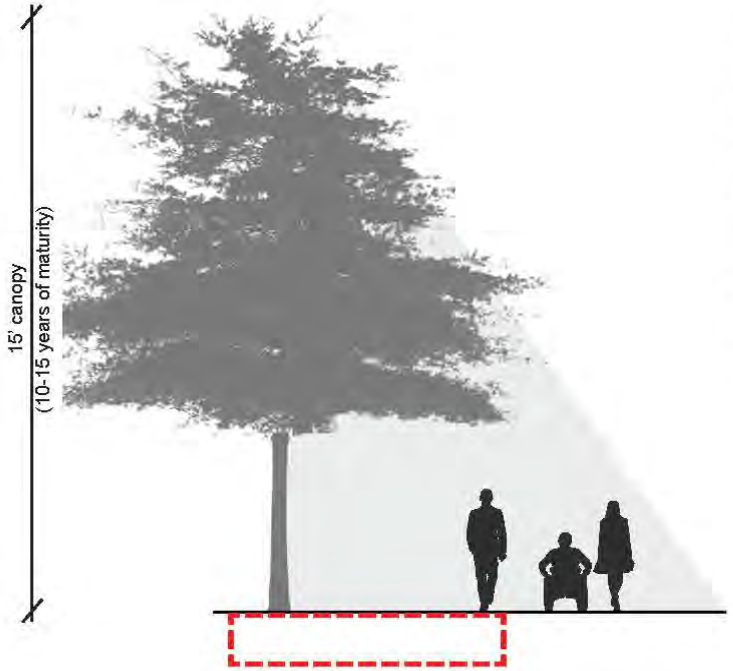


Ascending Walkway Width Diagram,
Typical landing, North Entrance, SE Section

Terrace Improvements: Walkway Diagram







The four corner entrances and the ascending walkways (at the north and south entrances and southeast corner) and their immediate planted environs are affected by the 'lowered (curbed) groundplane' (Scheme A) and 'planter' (Scheme B) approaches. Scheme A permits a wider walkway because the planted surface can be narrower and still accommodate shade canopy trees. This is possible because the root zone can be extended under the walkway with continuous soil panels and irrigation. Scheme B portends a narrower walkway, as in order to accommodate sufficient soil in a raised planter condition – for even a small tree - a wider planter is required.

These conditions are more fully explained in section and plan on the following pages.

Scheme A

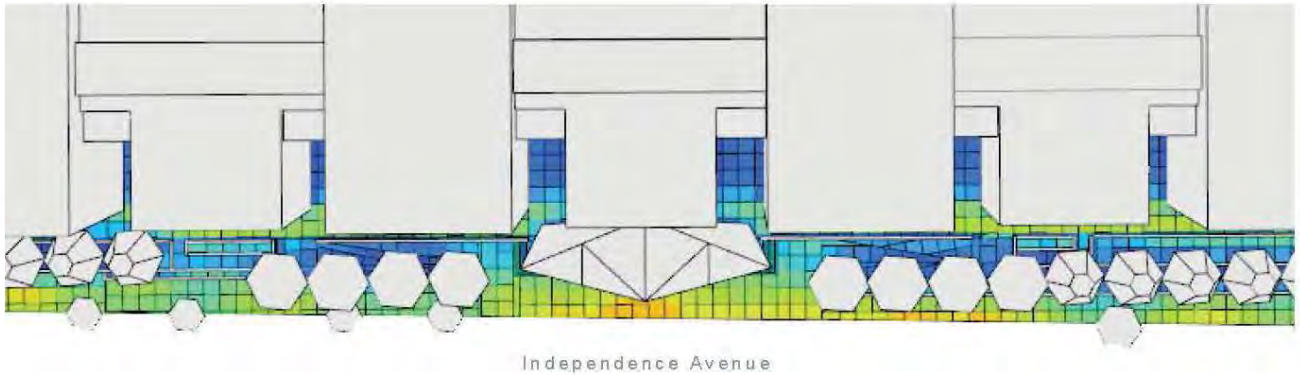
Scheme B

Scheme A+B - Relationship of Soil Volume to Tree Size to Shade

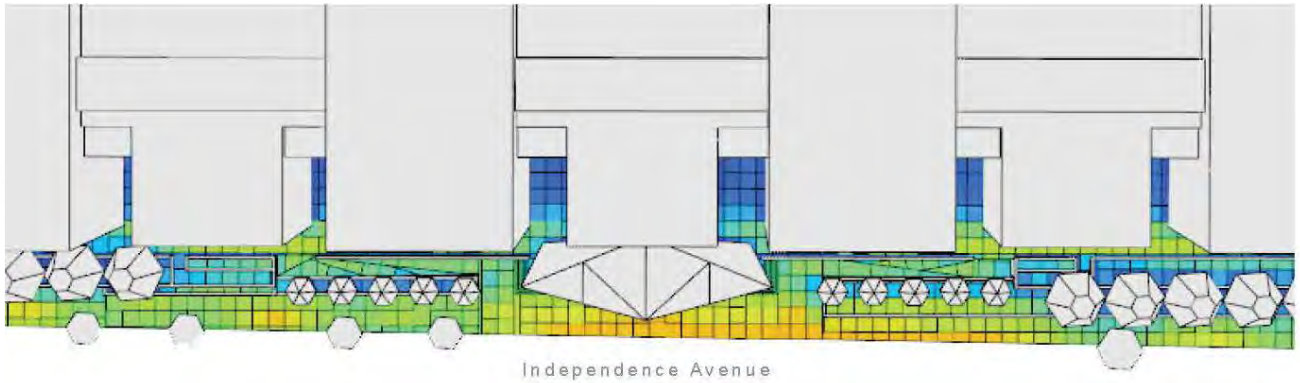
Terrace Improvements: Shade Analysis

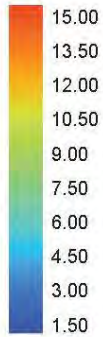
These plan enlargements of the South entrance illustrate the likely hours of solar exposure on the ground given the respective tree layouts on each scheme, on June 15.

Scheme A

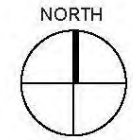


Scheme B



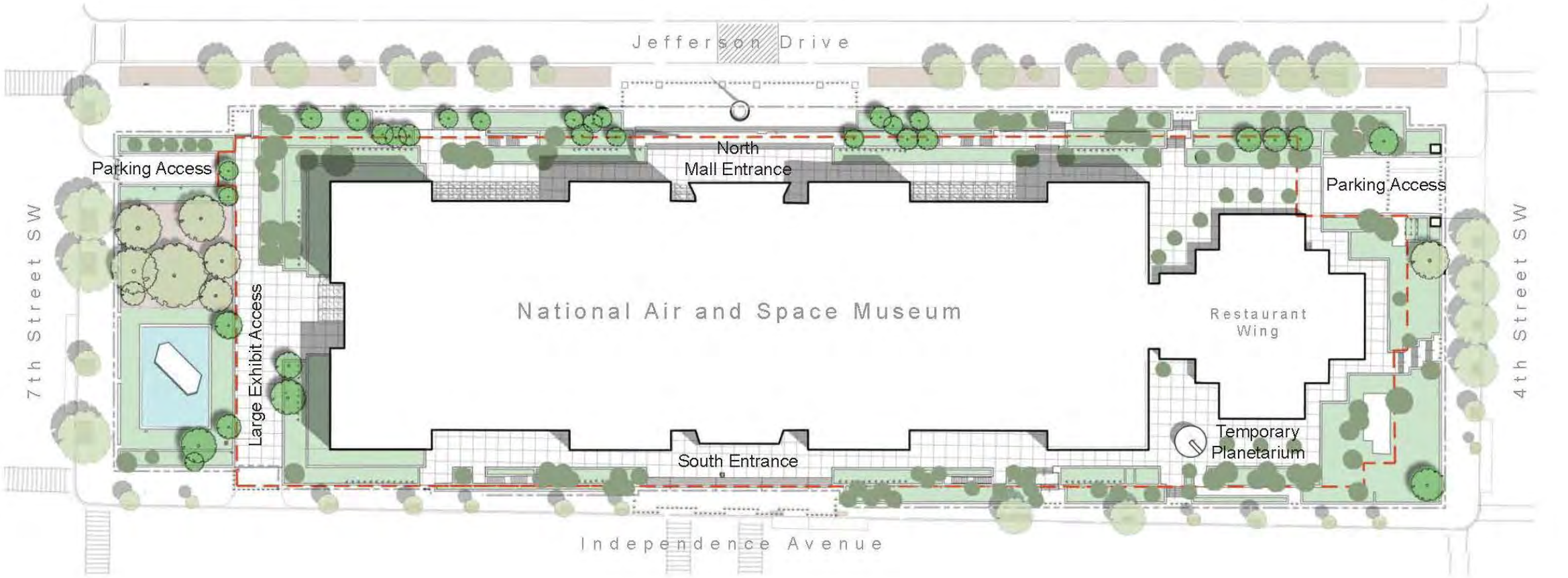


Hours of sunlight on June 15th



Scheme A+B - Shade Analysis (South entrance enlargement)

Terrace Improvements: Existing Conditions



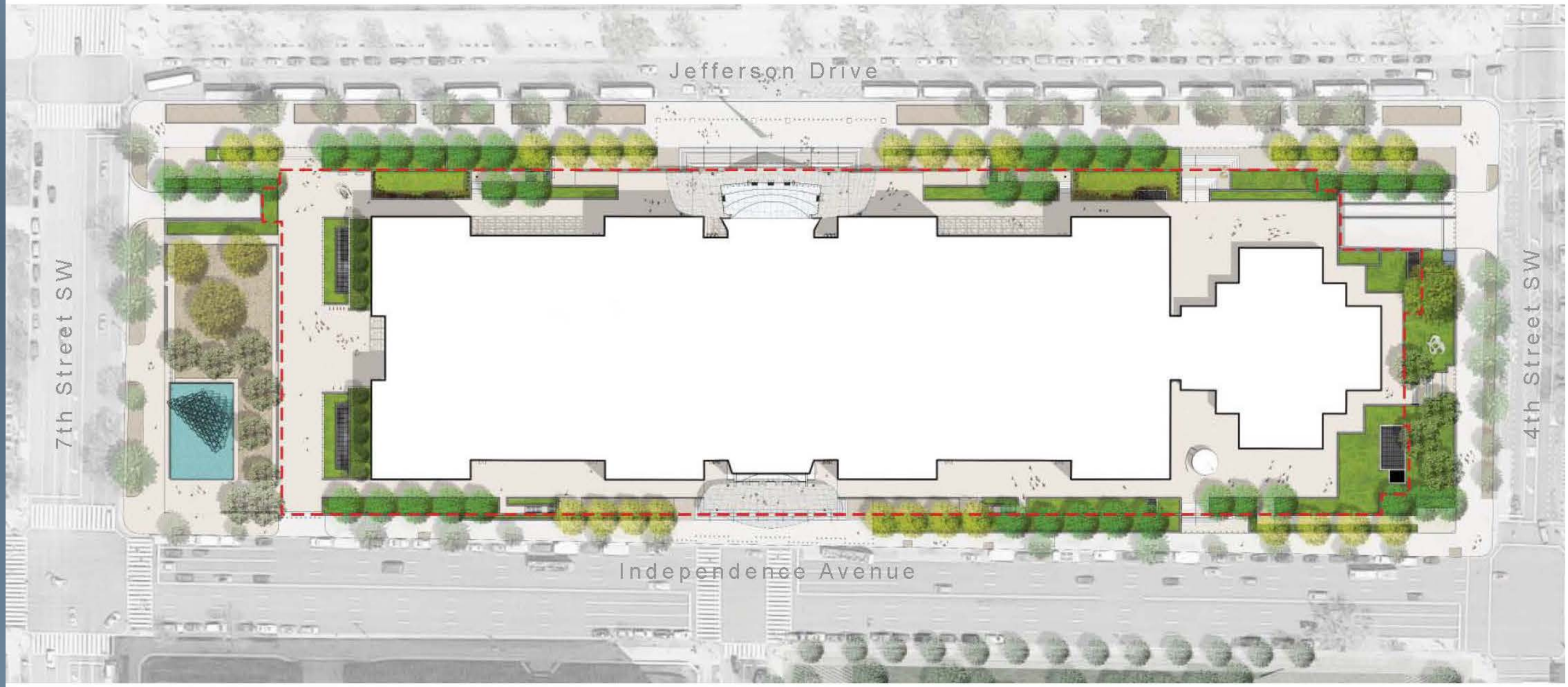
Existing Conditions Site Plan

Terrace Improvements: Proposed Planter Heights

Proposed Planter Heights, Scheme A/B

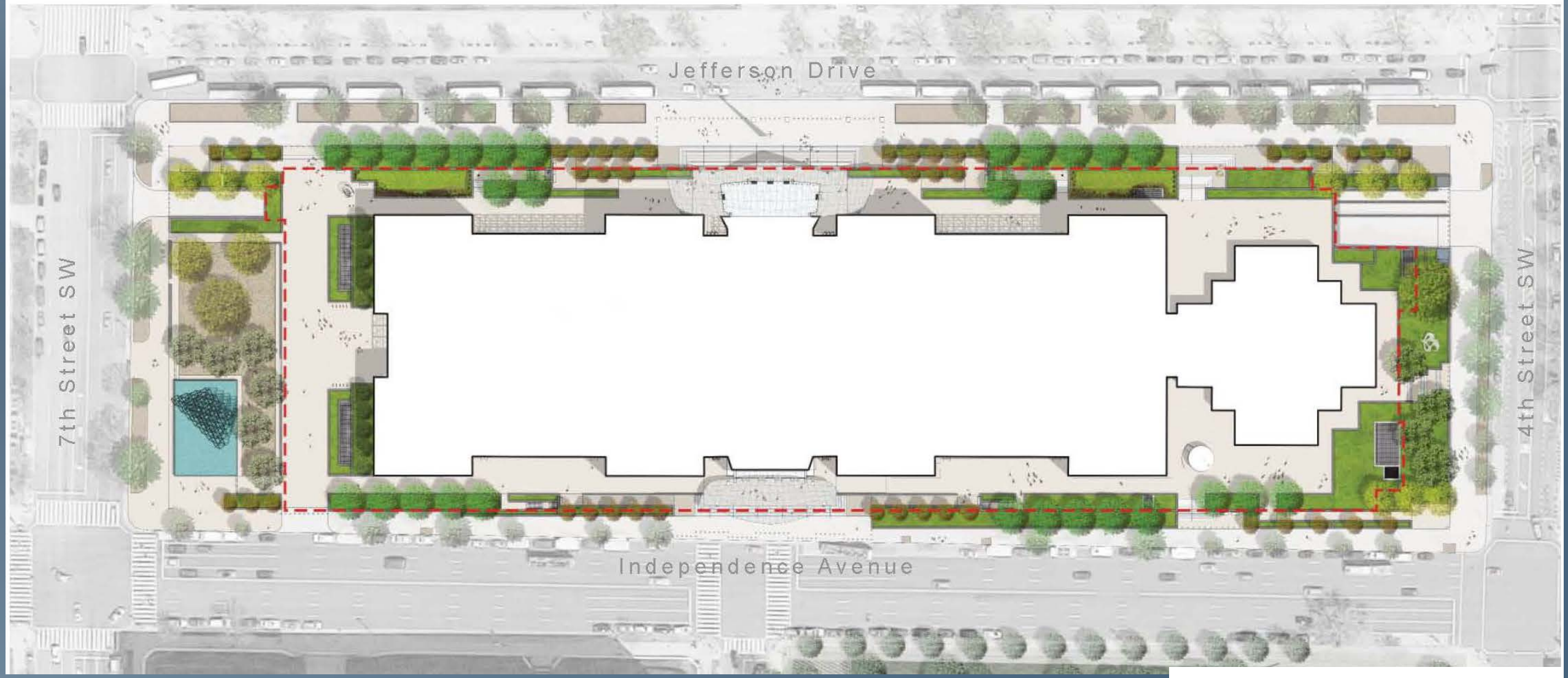
National Capital Planning Commission

Terrace Improvements: Scheme A



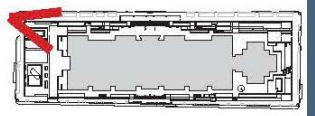
National Capital Planning Commission

Terrace Improvements: Scheme B



National Capital Planning Commission

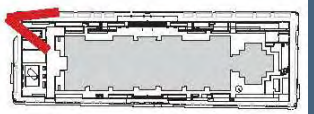
Terrace Improvements: Existing Northwest Corner



Existing - Northwest Corner

National Capital Planning Commission

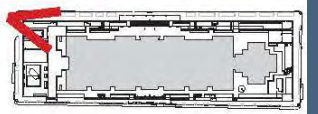
Terrace Improvements: Proposed Northwest Corner – Scheme A



Scheme A - Northwest Corner

National Capital Planning Commission

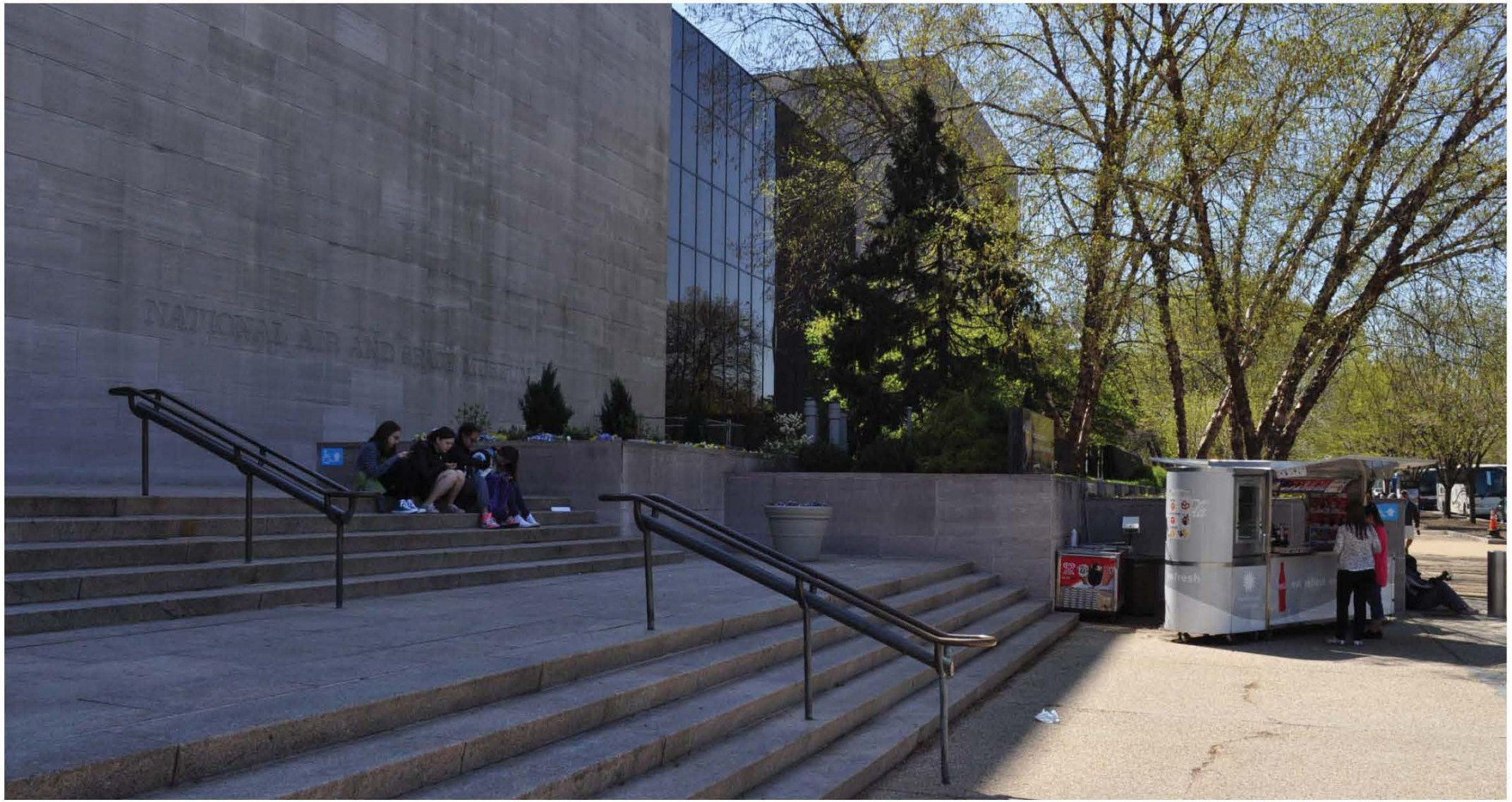
Terrace Improvements: Proposed Northwest Corner – Scheme B

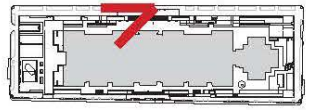


Scheme B - Northwest Corner

National Capital Planning Commission

Terrace Improvements: Existing North Entrance





Existing - North Entrance

Terrace Improvements: Proposed North Entrance – Scheme A

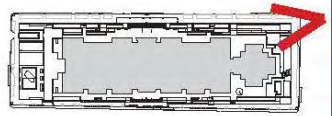
Scheme A - North Entrance

National Capital Planning Commission

Terrace Improvements: Proposed North Entrance – Scheme B

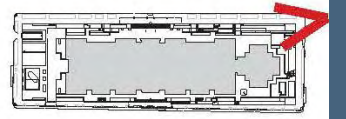
Scheme B - North Entrance

Terrace Improvements: Existing Northeast Corner



Existing - Northeast Corner

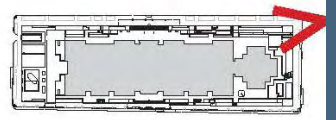
Terrace Improvements: Proposed Northeast Corner – Scheme A



Scheme A - Northeast Corner

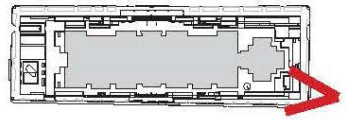
National Capital Planning Commission

Terrace Improvements: Proposed Northeast Corner – Scheme B



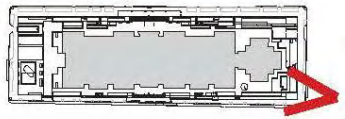
Scheme B - Northeast Corner

Terrace Improvements: Existing Southeast Corner



Existing - Southeast Corner

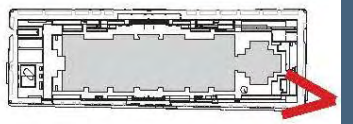
Terrace Improvements: Proposed Southeast Corner – Scheme A



Scheme A - Southeast Corner

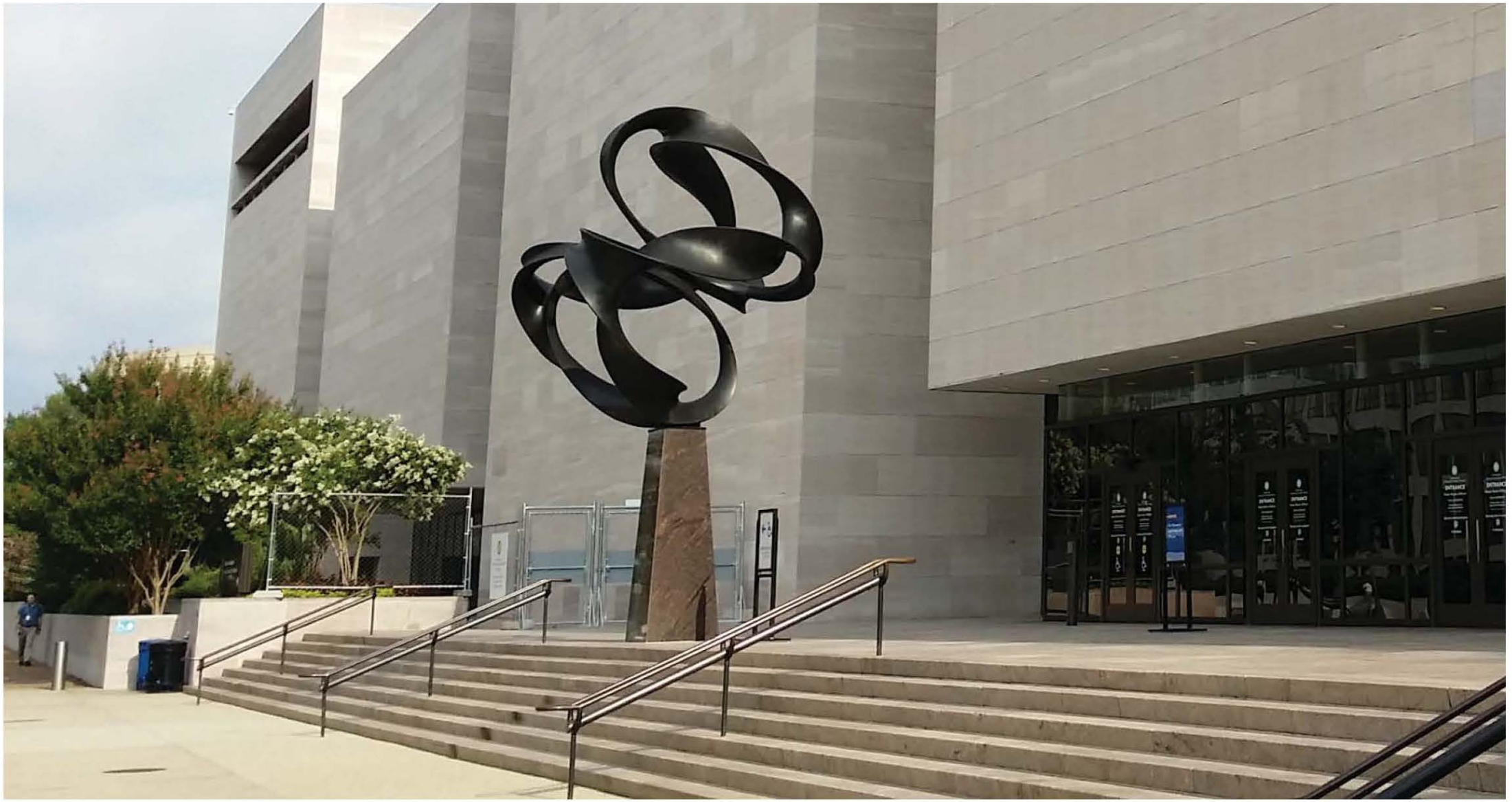
National Capital Planning Commission

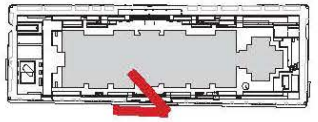
Terrace Improvements: Proposed Southeast Corner – Scheme B



Scheme B - Southeast Corner

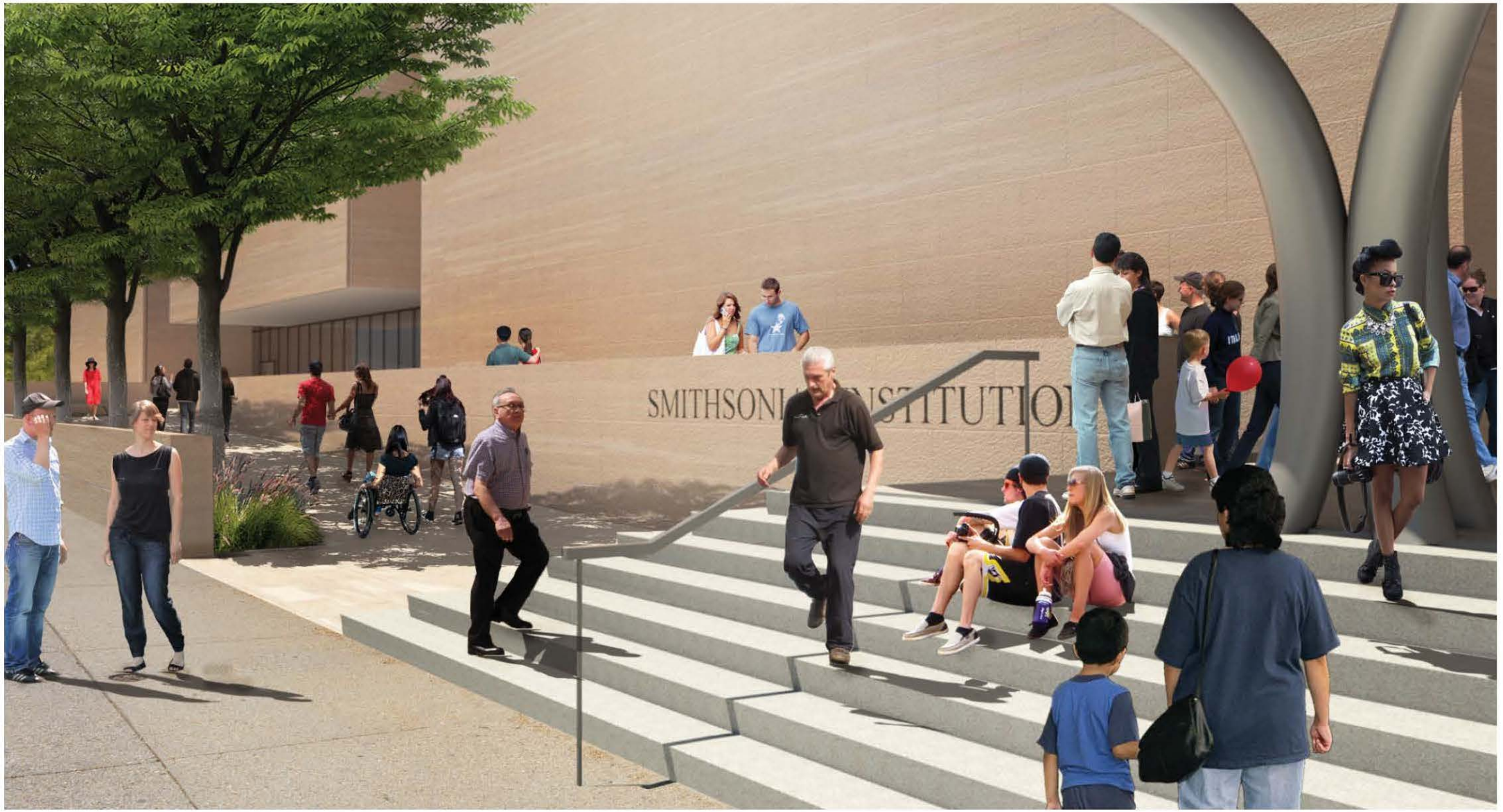
Terrace Improvements: Existing South Entrance

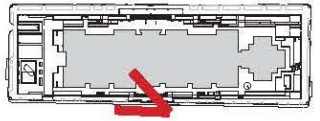




Existing - South Entrance

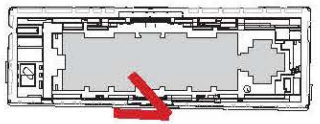
Terrace Improvements: Proposed South Entrance – Scheme A





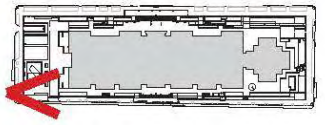
Scheme A - South Entrance

Terrace Improvements: Proposed South Entrance – Scheme B



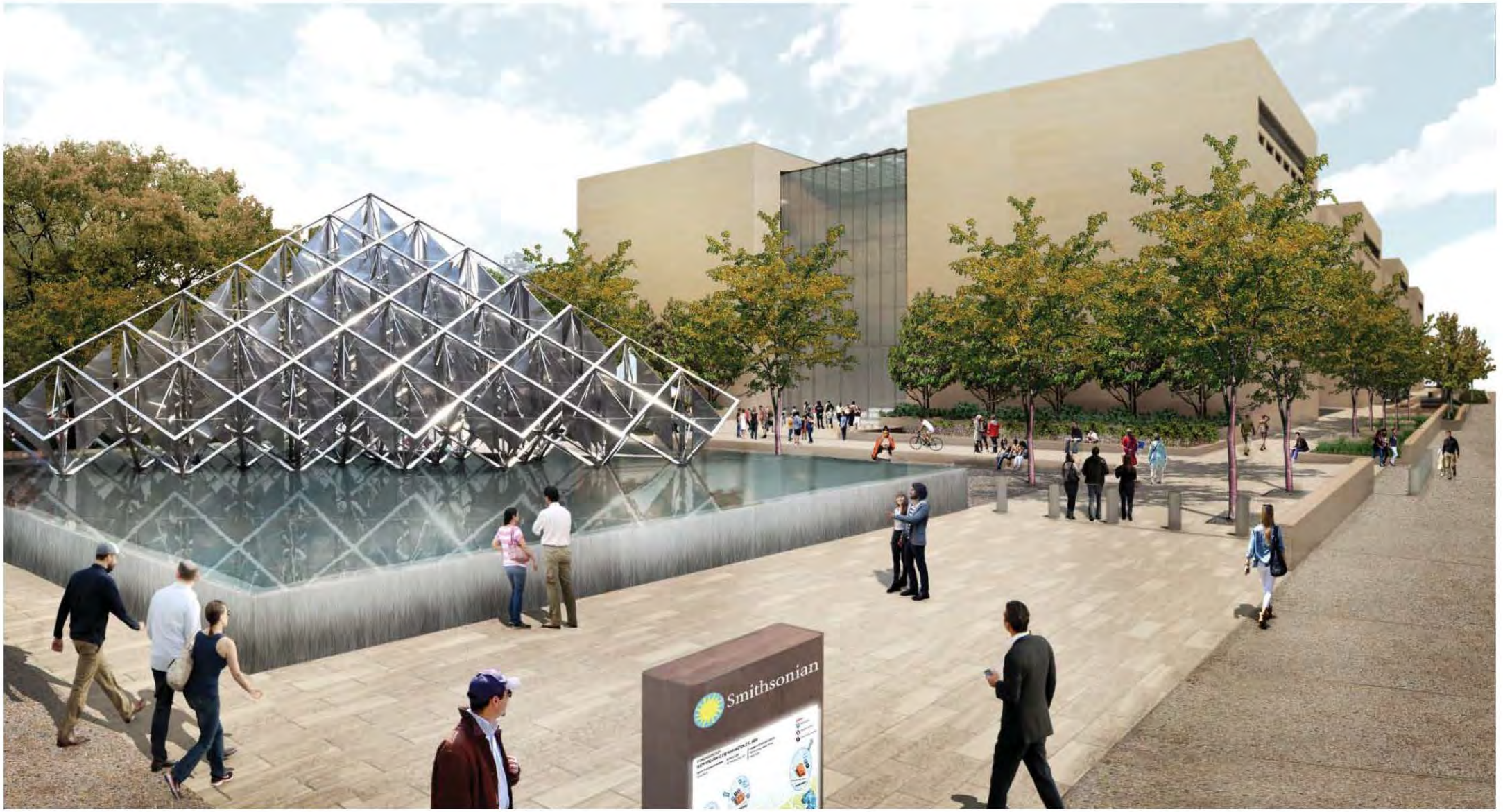
Scheme B - South Entrance

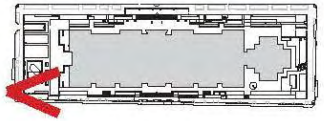
Terrace Improvements: Existing Southwest Corner



Existing - Southwest Corner

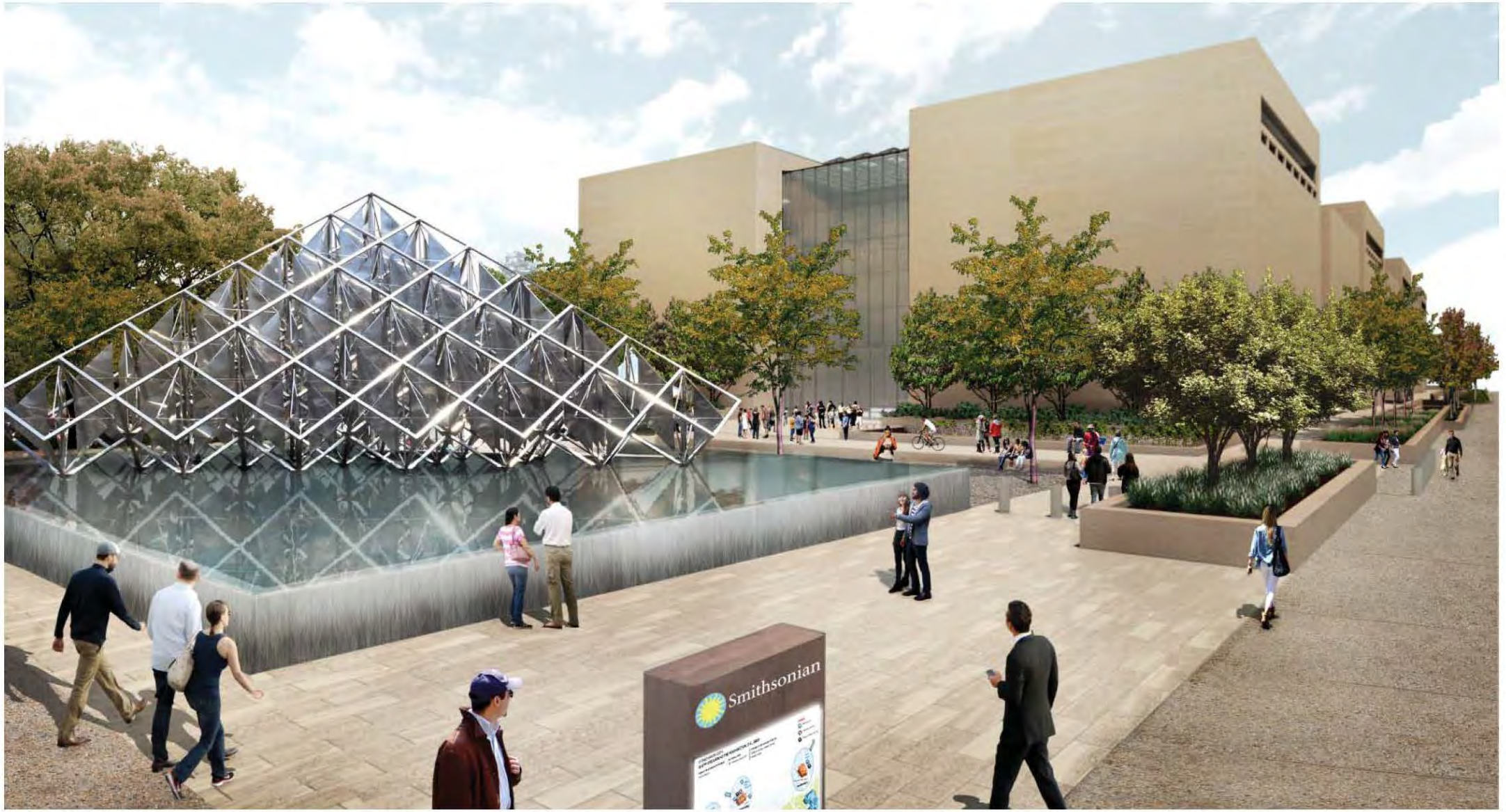
Terrace Improvements: Proposed Southwest Corner – Scheme A

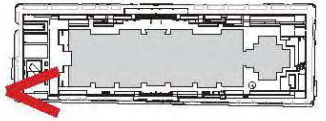




Scheme A - Southwest Corner

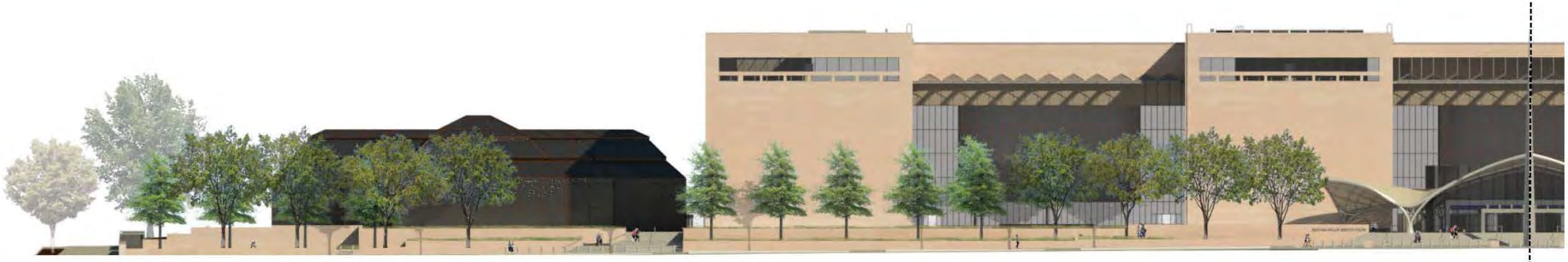
Terrace Improvements: Proposed Southwest Corner – Scheme B





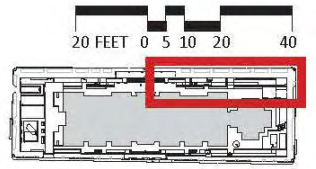
Scheme B - Southwest Corner

Terrace Improvements: North Elevations



Scheme A

Scheme B

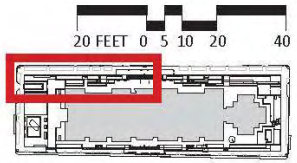


Scheme A+B - North Elevation

Terrace Improvements: North Elevations

Scheme A

Scheme B

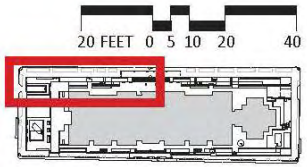


Scheme A+B - North Elevation

Terrace Improvements: South Elevations

Scheme A

Scheme B

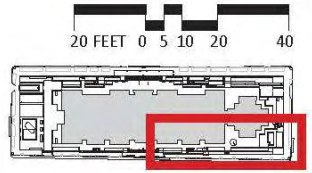


Scheme A+B - South Elevation

Terrace Improvements: South Elevations

Scheme A

Scheme B



Scheme A+B - South Elevation

Terrace Improvements: Tree Canopy Plan

Scheme A

- Pyramidal Canopy Tree
- Vase-shaped Canopy Tree
- Small Tree
- Evergreen Small Tree
- Existing Canopy Tree to remain
- Existing Sidewalk Tree
- Basement Edge of Structure

Scheme B

NORTH

40 FEET 0 10 20 40 80

'PRINCETON' AMERICAN ELM
Ulmus americana 'Princeton'

'HIGHTOWER' WILLOW OAK
Quercus phellos 'Hightower'

RED OAK
Quercus rubra

SWAMP WHITE OAK
Quercus bicolor

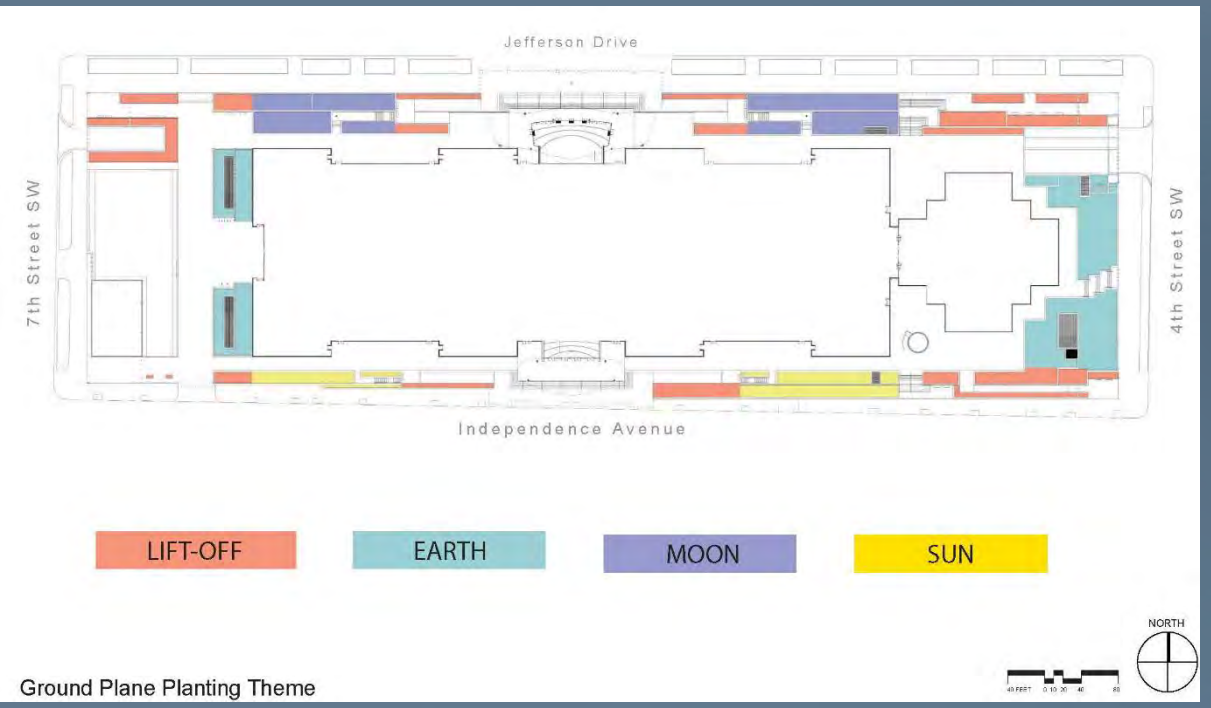
SERVICEBERRY
Amelanchier canadensis

IRONWOOD
Carpinus caroliniana

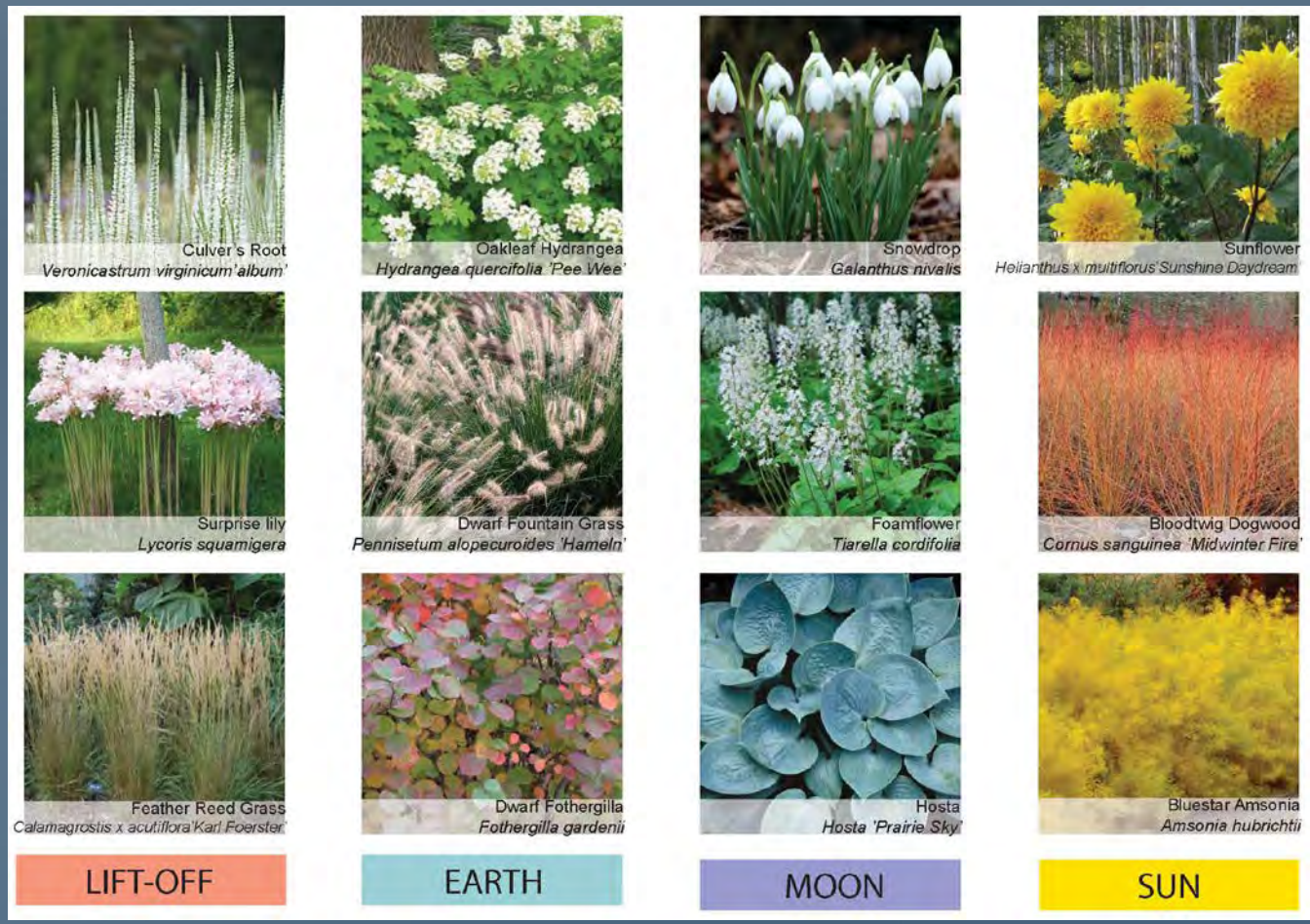
AMERICAN HOPHORNBEA
Ostrya virginia

Scheme A + B - Tree Canopy Plan

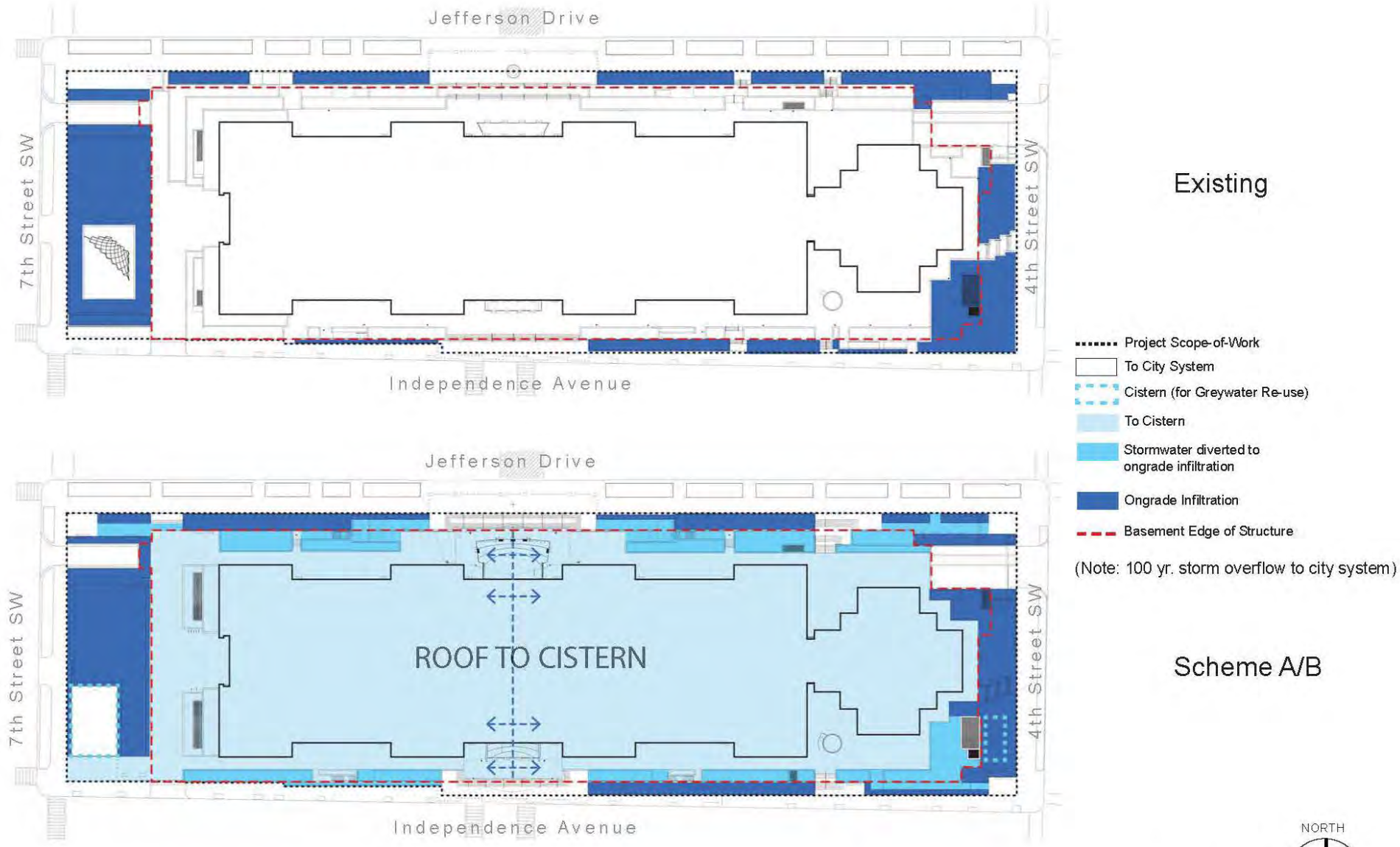
Terrace Improvements: Ground Plane Planting Theme



Ground Plane Planting Theme

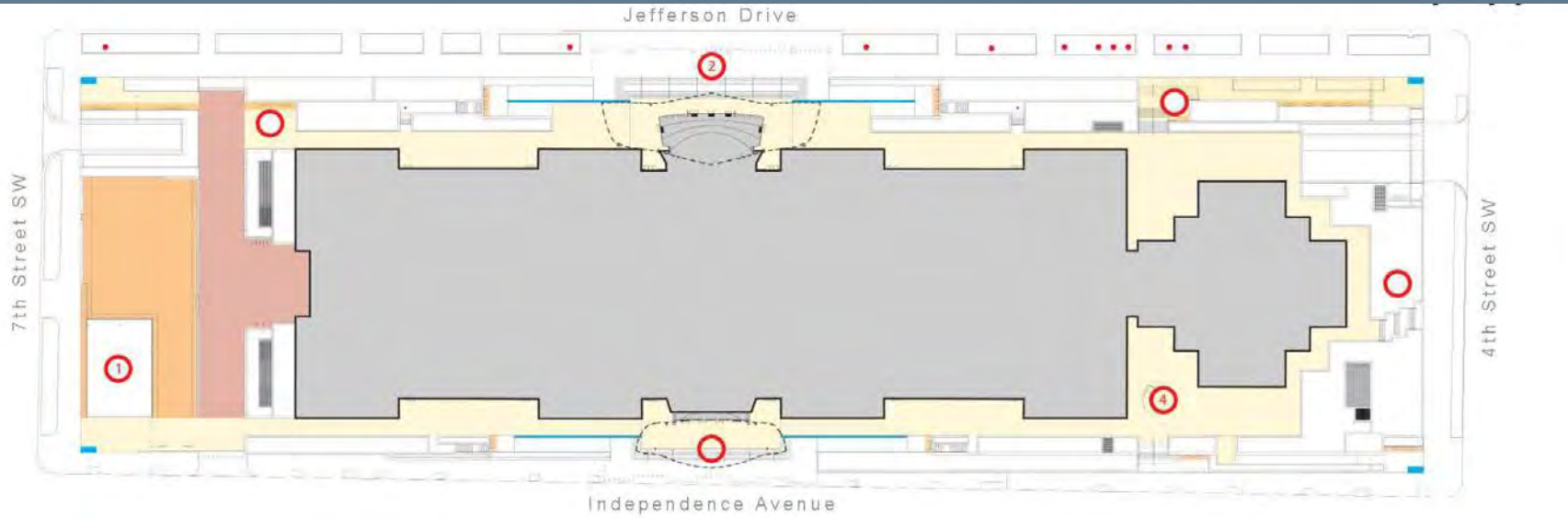


Terrace Improvements: Stormwater



Stormwater Management Strategy

Terrace Improvements: Sculptures and Site Amenities



Sculptures and Site Amenities:

1. Delta Solar
2. Ad Astra
3. Continuum (location to be determined)
4. Haas Observatory
- Potential Future Sculpture Location
- 'Voyage' Exhibition

- Circulation/Potential Seating and Exhibition
- Seating Area/Potential Interpretation
- Flexible Exhibition Area
- Signage

NORTH

1 Delta Solar

2 Ad Astra

3 Continuum

4 Haas Observatory

National Capital Planning Commission

Vestibules: Security / Visitor Experience

Visitors waiting in line to enter the museum at the north entrance

Entrance queue within north vestibule

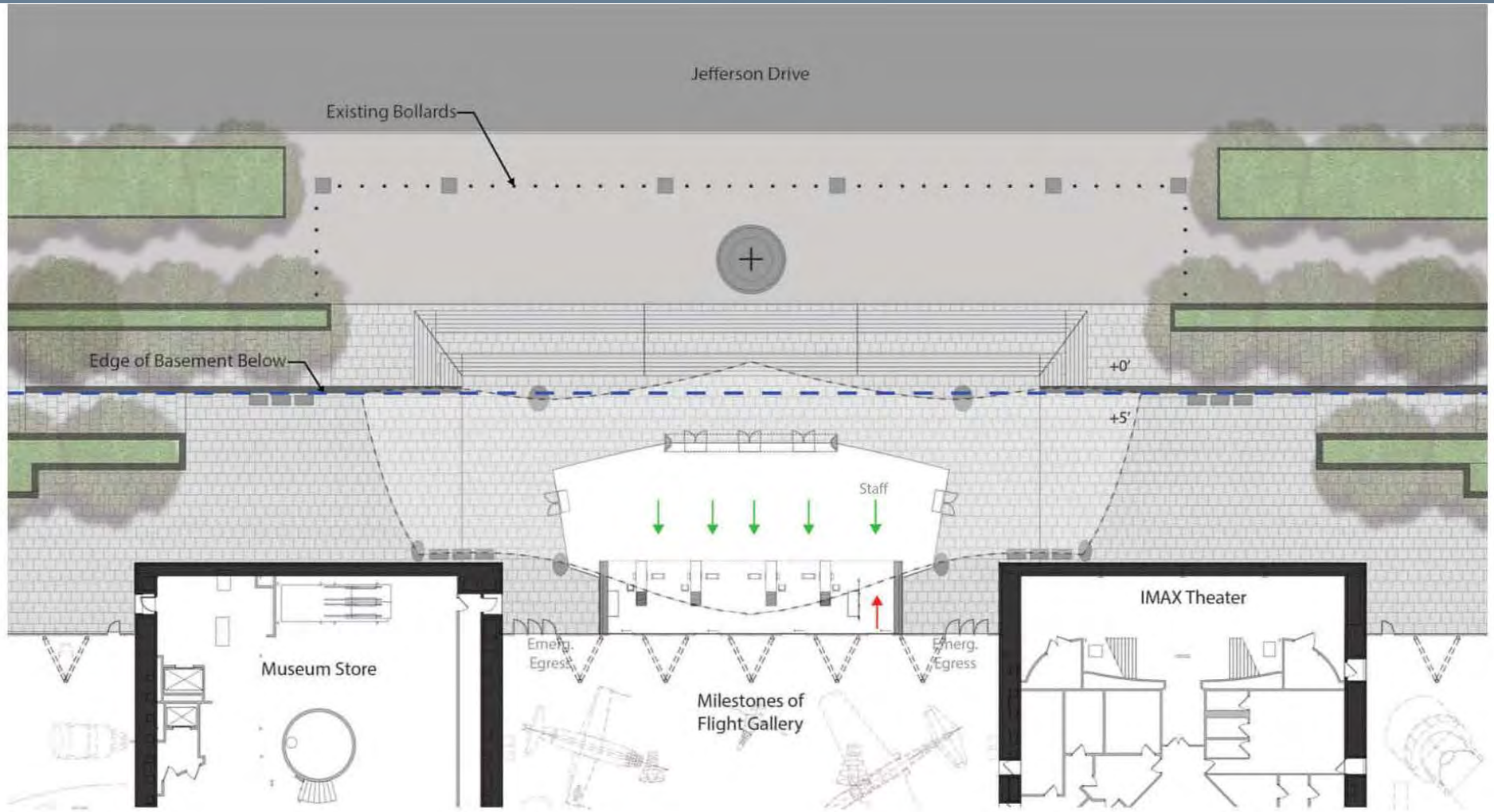
Security screening inside the north entrance

Visitors waiting in line to enter the museum at the south entrance

Entrance queue at south entrance

Security screening inside south entrance

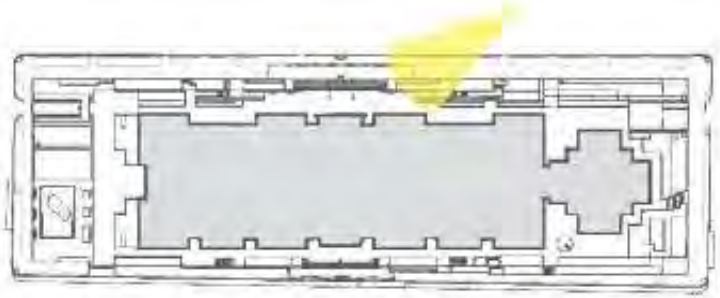
Vestibules: North Vestibule Proposal - Floor Plan



North Vestibule Proposal: Floor Plan

National Capital Planning Commission

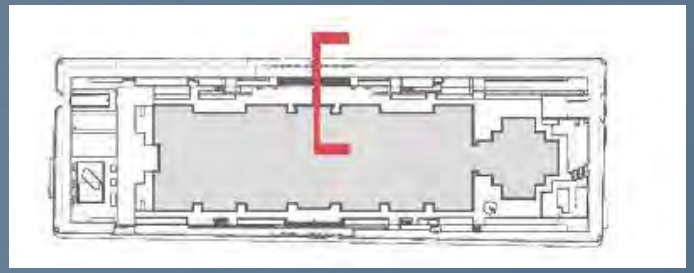
Vestibules: North Vestibule Proposal

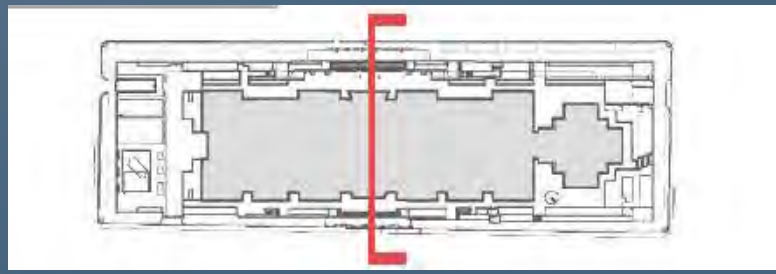


North Vestibule Proposal: Full and Partial North Elevation

National Capital Planning Commission

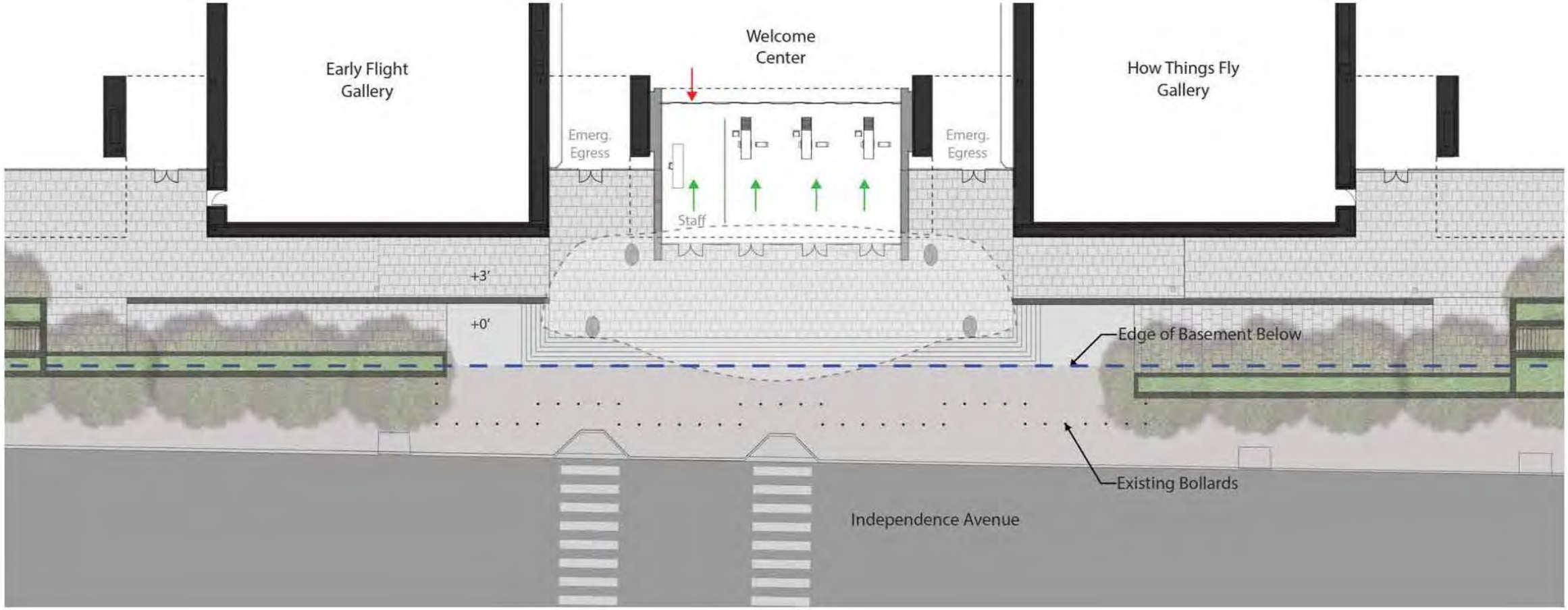
Vestibules: North Vestibule Proposal - Section





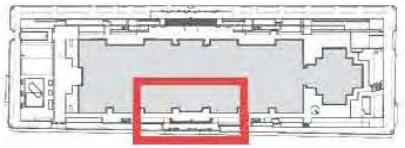
National Capital Planning Commission

Vestibules: South Vestibule Proposal – Floor Plan



South Vestibule Proposal: Floor Plan

0' 8' 16' 48'



NORTH

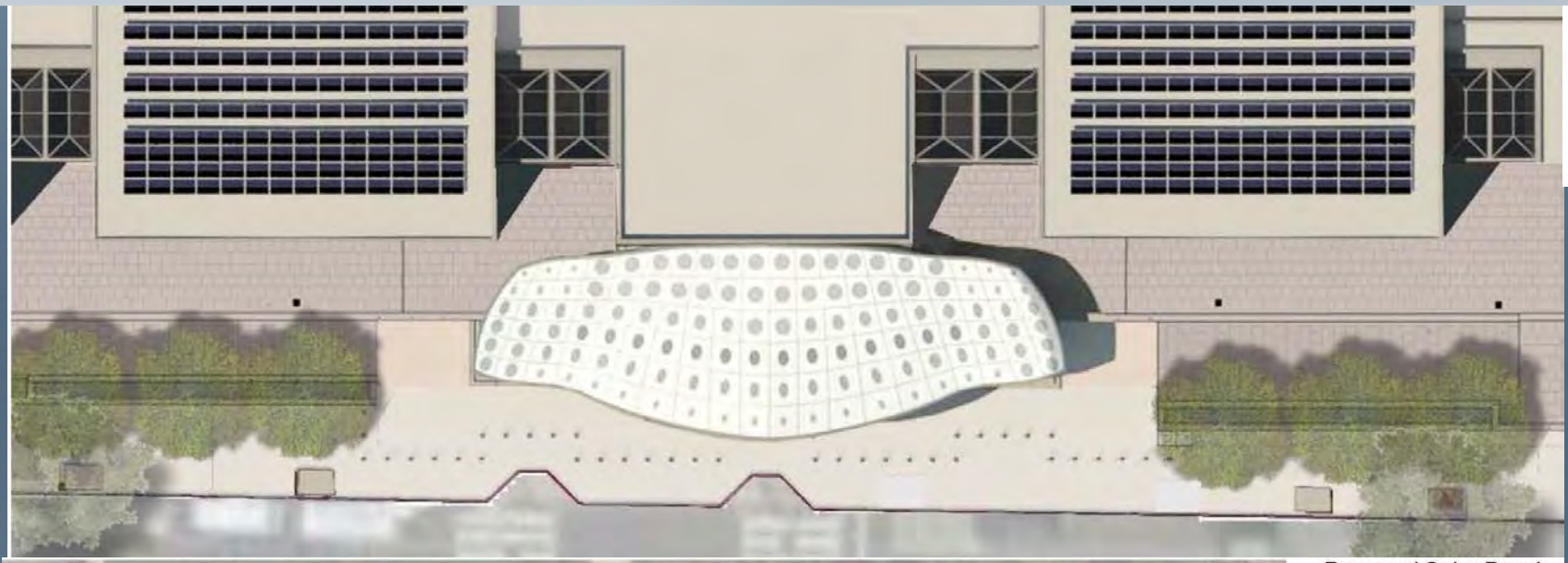
National Capital Planning Commission

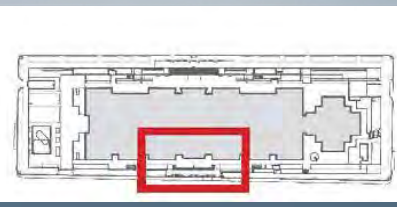
Vestibules: South Vestibule Proposal – Floor Plan

South Vestibule Proposal: Full and Partial South Perspective Elevations

National Capital Planning Commission

Photovoltaics: Proposed Roof PV Array Plan

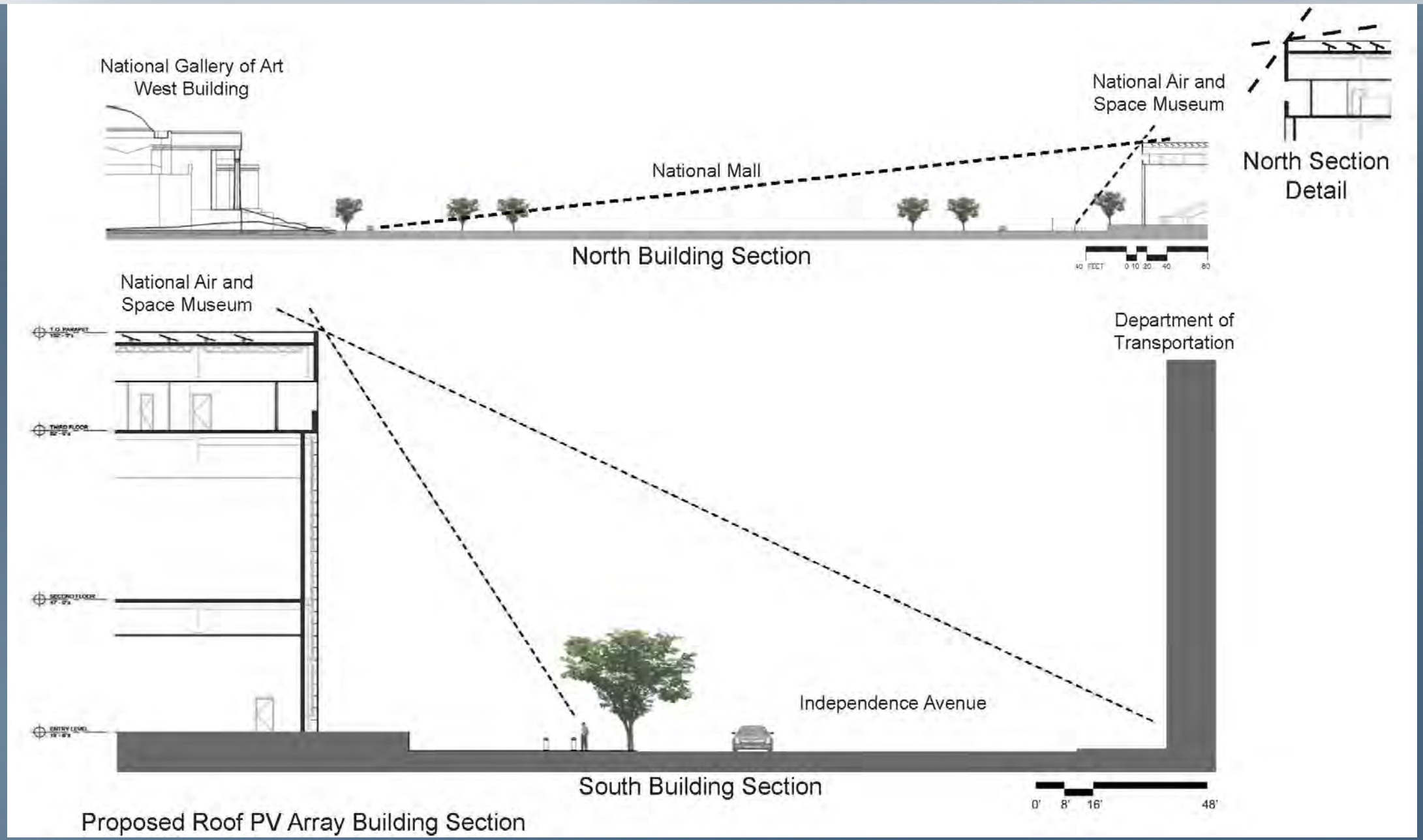




Proposed Solar Panel Roof Installation:

- 70,000sf (6,503m²) roof area
- 1,300 PV panels
- 21.5% efficient
- 345-watt each
- Could generate approximately 630,000 KWh/yr
- Equivalent of roughly 7% to 10% of electrical load of revitalized building

Photovoltaics: Proposed Roof PV Array Section



Proposed Roof PV Array Building Section

National Capital Planning Commission

Photovoltaics: Roof PV Array View from the Washington Monument