



Executive Director's Recommendation

Commission Meeting: April 5, 2018

PROJECT Building Exterior, Vestibules, and Site Improvements National Air and Space Museum Independence Avenue at 6th Street, SW Washington, DC	NCPC FILE NUMBER 7585
SUBMITTED BY Smithsonian Institution	NCPC MAP FILE NUMBER 1.41(38.00)44713
REVIEW AUTHORITY Federal Projects in the District per 40 U.S.C. § 8722(b)(1) and (d)	APPLICANT'S REQUEST Approval of preliminary and final site and building plans
	PROPOSED ACTION Approve preliminary and final site and building plans
	ACTION ITEM TYPE Staff Presentation

PROJECT SUMMARY

The Smithsonian Institution (SI) has submitted preliminary and final site and building plans for the revitalization of the National Air and Space Museum (NASM). The NASM is located in Southwest Washington, DC on the National Mall. The museum lies on a ten-acre site, bound by Jefferson Drive to the north, 4th Street to the east, 7th Street to the west, and Independence Avenue to the south. Designed by Gyo Obata, of Hellmuth Obata & Kassabaum (HOK) in a modern architectural style, the NASM opened in 1976 for the United States Bicentennial celebration. The NASM is a contributing building to the National Mall Historic District.

The purpose of the project is to improve the visitor experience, protect museum collections, and allow the museum to better perform the mission for which it was created: "to commemorate the national development of aviation and spaceflight, educate and inspire the nation." In order to address specific deficiencies caused by the value engineering strategies implemented during the original building construction, the SI is proposing to replace the building exterior envelope, including wall assembly, stone cladding, curtain walls, skylights roof systems; and major building systems (mechanical, electrical, plumbing, fire protection, life safety, information technology and security). In addition, the project includes revitalizing the landscape surrounding the building; and improving universal accessibility and building entrances. The project also entails the addition of a 3,200 square feet security screening pavilion at the north entrance.

Over the last four years, the Commission has provided comments on separate project components during five occasions, including two information presentations and three concept design reviews. The Commission has also conducted three site visits to the museum grounds. The current submission brings together all project components (building exterior, vestibules and site improvements) and addresses previous comments from the Commission and other review agencies. The SI has developed further design details associated with landscape, terrace paving,

stormwater management, the west end plaza, and the north security pavilion canopy. Since the last Commission review in November 2017, the SI has made the following six revisions:

1. Bringing back the previously proposed water feature on the plinth of the Delta Solar sculpture, which had been eliminated during the November 2017 revised concept submission;
2. Integrating the existing large exhibit access way into the Delta Solar Plaza composition by providing breaks between the proposed seat walls and adding movable tables and chairs;
3. Refining the tree planting plan to balance shade for visitors and sunlight requirements for ground plane plantings;
4. Using five by ten feet (5'-0" by 10'-0") exposed aggregate concrete panels throughout the paved areas of the museum grounds, and limiting the use of granite pavers for the stairs and the apron around the Delta Solar plinth;
5. Retaining the proposed south canopy at the Independence Avenue entrance as a construction option should funding become available in the future;
6. Maintaining the current asymmetrical placement of the Continuum sculpture.

KEY INFORMATION

- In November 2017, the Commission reviewed the revised concept design for the terraces, landscape and vestibules at the NASM. At the time, the Commission recommendation focused on urban design considerations for the west end of the site, and the overall site. The Commission also included comments related to perimeter security, the Delta Solar sculpture fountain, streetscape amenities, the Ad Astra sculpture base, and landscape design.
- In July 2017, the Commission reviewed a revised concept design for the building exterior cladding replacement alternatives. The Commission supported *Colonial Rose Granite* as the preferred cladding alternative for the building exterior facade, terraces and site walls. With its comments, the Commission encouraged the SI to increase the percentage of stone panels with color variation and horizontal pattern to avoid a monolithic facade. The Commission supported the sandblasted finish and requested that the Smithsonian continue to consult with NCPC staff on any future cladding mockup to test different combinations of color pattern and veining, as well as the glazing mockup.
- The Commission is the lead agency for compliance with the National Environmental Policy Act (NEPA). NCPC issued a Finding of No Significant Impact (FONSI), which was available on NCPC's website for public comment on March 27, 2018.
- The Smithsonian Institution (SI) is the lead agency for compliance with the National Historic Preservation Act. On December 28, 2017 SI executed a memorandum of agreement with NCPC, the District of Columbia State Historic Preservation Office, and the Advisory Council on Historic Preservation to resolve the adverse effects of the project.

RECOMMENDATION

The Commission:

Approves the preliminary and final site and building plans for the Building Exterior, Vestibules, and Site Improvements at the National Air and Space Museum, located at Independence Avenue at 6th Street, SW Washington, DC.

Finds the Smithsonian has addressed all of the Commission's comments from the previous revised concept review and that the preliminary and final design includes:

- An infinity-edge water feature on the proposed plinth of the Delta Solar sculpture to create a welcoming entry to the museum and the National Mall along Seventh Street, and preserve the integrity of the sculpture.
- Site amenities, such as benches, movable tables and chairs; and the integration of the adjacent large exhibit access area into the west plaza composition.
- Bicycle facilities, and improved lighting. The Smithsonian has committed to work with the District Department of Transportation to identify a suitable location for a Capital Bikeshare station on the museum grounds after the terrace construction is complete.
- A reduction in the base of the Ad Astra sculpture to avoid impacting pedestrian circulation and provide sufficient clearance for bus drop off and pick up areas.
- A landscape plan that addresses tree replacement to prevent net loss of tree canopy in accordance with the *Comprehensive Plan for the National Capital*.

Notes that the only changes to the existing perimeter security on the museum grounds focus on the southwest corner of the site. The final design includes a new Delta Solar fountain integrated into perimeter security, a solid wall and bollards.

Requests that the Smithsonian continue to work with staff from NCPC and the U.S. Commission of Fine Arts (CFA) to find an alternative design solution for the three bollards proposed within the planter near the corner of Independence Avenue and Seventh Street, SW, such that the design is consistent with the building vocabulary and perimeter security throughout the site.

Notes that as requested by the Commission, the applicant has retained the proposed canopy at the south entrance as a construction option if future funding permits. If the Continuum sculpture needs to be relocated in the future to allow room for the canopy, the Smithsonian should consult with NCPC, CFA, and the District of Columbia State Historic Preservation Office (DC SHPO) to find an appropriate location for the sculpture on-site.

Notes that the applicant will provide exterior mockups of the proposed concrete paving panels, Colonial Rose Granite building cladding, and glazing curtain wall for NCPC, CFA, DC SHPO and the Advisory Council on Historic Preservation (ACHP) staff review prior to construction.

PROJECT REVIEW TIMELINE

Previous actions	<p>July 10, 2014 – Information presentation for the Smithsonian National Air and Space Museum (NASM) Comprehensive Facilities Master Plan.</p> <p>July 7, 2016 – Approval of comments on two concept design alternatives for the terrace, and landscape improvements. The Commission conducted a site visit to the museum grounds.</p> <p>April 6, 2017 – Information presentation on the NASM exterior cladding options. The Commission conducted a site visit to review four cladding options and paving aesthetic mockups on-site.</p> <p>July 13, 2017 – Approval of comments on the revised concept design for the building exterior cladding replacement alternatives. The Commission conducted a site visit to review a fifth cladding option, Colonial Rose granite.</p> <p>November 2, 2017 – Approval of comments on the revised concept design for the terrace, landscape, and vestibules.</p>
Remaining actions (anticipated)	None

PROJECT ANALYSIS

Executive Summary

The revitalization of the NASM will address the deteriorating exterior building envelope, terrace, and major building systems to better express its mission to commemorate, educate, and inspire. The proposed site improvements will enhance the setting around the most visited museum in the country and allow the museum to provide a better facility to present its programs, and educational activities. The project will enhance the pedestrian experience for the residents and visitors of the District of Columbia. The Delta Solar Plaza will improve the visual connection along 7th Street between the National Mall, and the southwest waterfront.

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 of the *Urban Design Element* which encourages federal agencies to create welcoming and vibrant spaces that enhance the user experience and foster local uses, and ensure that landscape elements in the settings of federal buildings complement the building's programmatic elements and design. Other policies encourage agencies to improve walkability and access to key destinations within the monumental core by enhancing the pedestrian quality of Special Streets, such as 7th Street. The project is also consistent with policies in the *Federal Environment Element*, which encourage federal agencies to develop

stormwater management plans that meet federal and local requirements. The landscape plan is consistent with policies related to tree canopy and vegetation, which indicate that when tree removal is necessary, trees should be replaced to prevent a net tree loss to the project area. Lastly, the project aligns with policies included in the *Historic Preservation Element*, which encourage agencies to maintain a sense of historic continuity and evolution by preserving federal buildings representative of different eras and styles, and ensure the continued preservation of federal historic properties through ongoing maintenance.

Since the Commission's review of the revised concept plans, SI has refined the project plans in response to the Commission's comments. Therefore, based on the Smithsonian's response to the Commission's comments regarding the west end of the site, and the overall site, staff is recommending the Commission **approve the preliminary and final site and building plans for the Building Exterior, Vestibules, and Site Improvements at the National Air and Space Museum.**

Analysis

The staff analysis evaluates how the preliminary and final design addresses the Commission's comments from the November 2, 2017 revised concept design for the terrace, landscape, and vestibules at the NASM, as well as the comments from the July 13, 2017 revised concept design for the building exterior cladding replacement alternatives.

Revised Concept Review (November 2017) - Site Improvements

The previous comments were organized into two main topic areas including west end of the site and overall site. With respect to the west end of the site, the Commission provided two key findings:

1. This area contributes to the series of public spaces located along Seventh Street that connect the National Mall, the Southwest Waterfront and downtown; and
2. The reflection of the Delta Solar sculpture in the water is an integral part to the sculpture composition, and the sculpture and its associated water feature contribute to the historic character of the museum and the National Mall.

The Commission also noted that the Delta Solar sculpture was originally installed in a shallow reflecting pool on the west end of the site in 1977 (a year after the museum opened), and that the pool had not been operational for the last 23 years (since 1995); however, the sculpture maintains its original configuration. In addition, the Commission noted that the July 2016 concept design included the relocation of the Delta Solar sculpture closer to the corner of Independence Avenue and Seventh Street. The proposal included the replacement of the shallow pool with a plinth that had a similar proportion to the original pool. The plinth functioned as a water feature and an integrated perimeter security measure for the base of the sculpture.

The Commission did not support the revised configuration of the Delta Solar consisting of a dry plinth without a water feature as the sculpture base, because it did not create a welcoming entry to the museum and the National Mall, and negatively impacted the integrity of the sculpture. The Commission recommended that the Smithsonian consider how this portion of the site could

reinforce the network of active gathering spaces along 7th Street. The Commission requested a revised design for the west end plaza that incorporated a water feature, flexible areas to accommodate congregating and place-making activities, benches, movable tables and chairs, low impact paths, permeable pavers, and an integrated space that incorporated the adjacent exhibit access area as part of the plaza composition. The Commission also requested night views of the southwest corner to understand the plaza lighting approach, and interpretive signage to highlight the history and design intent of the Delta Solar. Lastly, the Commission recommended that the Smithsonian evaluate the perimeter security along 7th Street to allow greater accessibility and visibility into the plaza, and consider opportunities to integrate perimeter security elements that also function as public amenities, such as benches, bike racks, landscape and other streetscape elements.

With respect to the overall site, the Commission requested a streetscape plan that incorporates benches and bicycle facilities, and recommended that the Smithsonian work with the National Park Service (NPS) to improve the streetscape surrounding the museum consistent with the *National Mall Streetscape Manual*. The Commission recommended that the Smithsonian ensure that the relocation of the "Ad Astra" sculpture did not disrupt pedestrian flow and provided sufficient clearance for bus drop off and pick up areas. The Commission requested that the Smithsonian submit landscape plans that include tree replacement to prevent net loss of tree canopy in accordance with the procedures established in the policies related to Tree Canopy and Vegetation in the *Comprehensive Plan for the National Capital*. Lastly, the Commission requested that the Smithsonian retain the south entrance canopy as a desirable option if future funding permits.

The applicant has responded to the Commission's suggested plan modifications made during revised concept review as summarized below:

West End of the Site

Last November, the Commission requested that the Smithsonian submit a revised design for the west end plaza that incorporates the following eight elements:

1. A water feature that operates year-round and maintains the relationship with the Delta Solar sculpture in a creative and sustainable manner.
2. Programming for outdoor cultural events, gatherings, celebrations, and passive recreation. Flexible areas to accommodate congregating and place-making activities.
3. Site amenities, including benches that take into account views toward the sculpture.
4. Food vendors and its associated signage, as well as movable tables and chairs for casual seating areas.
5. Low impact paths within the existing grove of trees to allow visitors to experience the park and permeable pavers on the plaza.
6. An integrated space that incorporates the adjacent exhibit access area as part of the plaza composition.
7. Night views of the southwest corner, depicting the lighting approach for the plaza elements, including the water feature, sculpture and benches.
8. Interpretive signage to inform the public regarding the history and design intent of the Delta Solar.

Water Feature: The final design incorporates an animated water wall on all four sides of the Delta Solar plinth, emanating from a shallow reflecting pool that slopes toward the center. The fountain will be operational for the majority of the year. During the coldest weather the fountain will be turned off to prevent the thin film of water from freezing.

The plinth vertical panels are composed of a horizontally-ribbed stone which will animate a thin film of water flowing over the surface of the plinth. The water supply will be located under the stone panels in an inlet trench access panel in the center of the plinth which is designed to create a minimum-depth surface of water over its top. The water will flow over a continuous stainless steel “infinity edge” down the walls of the plinth. The plinth will be clad in dark “Mesabi Black” granite panels with Diamond 8 finish (honed finish). The dark granite will highlight the visibility of the flowing water film. The rectangular stone paver panels on the fountain plinth will be 15 by 30 inches, resembling the proportion of the building cladding, which individual panels measure 5 feet wide by 2.5 feet tall. The same granite stone pavers will be provided on the apron around the fountain, but with a thermal finish for slip resistance, which is a different finish from the plinth. A continuous trench drain will surround the base of the fountain.

The plinth height will vary due to the existing grading. The plinth will have a minimum height of three feet (3'-0") at the southwest corner for perimeter security purposes. The maximum height will be five feet eight inches (5'-8") at the northeast corner. The higher elevation of the east side of the plinth responds to the topography but also will provide a respite from the noise of the adjacent intersection of Independence Avenue and 7th Street SW, while preserving the required horizontal plane for the sculpture base. The proposed plinth will be approximately 84 feet long by 52 feet wide, similar to the existing shallow pool dimensions.

Flexible Plaza Layout: The final plaza design provides a flexible layout to accommodate congregating and place-making activities, programming for outdoor cultural events, gatherings, celebrations, and passive recreation. The plaza is organized around the Delta Solar sculpture. The plaza consist of a sunny area to allow the stainless panels of the kinetic Delta Solar sculpture to rotate with the wind, and also a shaded area with benches to allow for contemplation. The 40-foot wide large exhibit access way will provide a flexible venue for public events to extend the mission of the museum outdoors. The applicant has provided breaks on the continuous seat wall separating the plaza and the adjacent large exhibit access to connect these spaces into a larger public space. By moving slightly the Delta Solar fountain to the southwest corner of the site, there is more room to accommodate a more usable and efficient plaza layout, and also to provide a more visible and prominent location for the sculpture. The kinetic sculpture will maintain the west orientation to best relate to the afternoon sun, as originally intended.

Site Amenities: The plaza includes five benches clad with Colonial Rose Granite, which is the same proposed cladding material for the building façade, site walls and terraces. The stone benches are located parallel to the fountain to allow direct views toward the sculpture. The benches help organize and unify the service access way into the plaza composition.

Food Vendors and Movable Furniture: The plans do not include any information regarding the placement of the NASM's food carts and their associated signage. There is an existing fast-food

food cart (McDonalds cart) located on the north side of the access way toward Jefferson Drive, as well as three smaller snack carts on the museum grounds. One cart is located at the northeast corner, another cart is located at the northwest corner, and the other one at the north entrance.

The access way, adjacent to the plaza, includes movable tables and chairs for casual seating areas. The movable furniture and umbrellas provide a more welcoming environment for visitors and local residents and provide a place to enjoy lunch and fresh air.

Low Impact Paths and Permeable Pavers: The applicant has indicated that due to soil issues and in order to protect the existing willow oak trees, providing low impact paths within the existing grove of trees is not feasible. In addition, permeable pavers on the plaza will not be included due to maintenance issues. In lieu of permeable pavers and low impact paths, the applicant has included two underground cisterns to harvest rainwater for irrigation, and flushing toilets. One cistern will be located in the east end of the site toward 4th Street, and the other one will be located on the west end of the site, below the plaza.

Exhibit Access Area and Plaza: The design achieves an integrated space that incorporates the adjacent exhibit access area as part of the plaza composition. The stone benches, movable furniture and landscape contribute to the plaza organization and unify the service access way into the plaza. The design removes the continuous seating wall that divided the two spaces, and provides openings to connect the plaza and access way. The access way will accommodate flexible seating areas.

Lighting: The Smithsonian has provided night views of the southwest corner, depicting the lighting approach for the plaza elements, including the water feature, sculpture and benches. The proposed exterior lighting will not detract from the setting of the National Mall and respects the hierarchy of important civic buildings in the nation's capital, with the U.S. Capitol and Washington Monument the most prominent features in the nighttime skyline. The proposed lighting plan consist of façade upright to highlight the solid cubes of the building, linear canopy upright for the north security pavilion, illuminated handrails along ADA ramps and stairs, linear LED lighting along the seat walls, garage access lighting, and existing street lights.

Interpretive signage: The Commission requested that the Smithsonian provide interpretive signage to inform the public regarding the history and design intent of the Delta Solar. The construction documents provide information regarding existing signage and interpretive elements on the museum grounds. The existing Delta Solar inscription located on the shallow pool coping will be salvaged for reference. The proposed plinth paving layout plan includes seven stone pavers with inscriptions on the west side of the apron surrounding the fountain. The proposed inscription location is consistent with the existing Delta Solar inscription.

Ad Astra Sculpture: The Commission recommended that the Smithsonian coordinate with the National Park Service regarding the relocation of the "Ad Astra" sculpture to the sidewalk space along Jefferson Drive, and ensure that the placement of the sculpture does not disrupt pedestrian flow and provides sufficient clearance for bus drop off and pick up areas. As a result, the Ad Astra sculpture stone base has been reduced in diameter from the existing 16 feet to 10 feet in order to better accommodate pedestrian flow at this critical sidewalk location.

Landscape Design

As part of the November 2017 revised concept design, the Commission noted that all paving, soil, and planter systems needed to be removed to replace the terrace roof waterproof membrane. Therefore, 97 percent of the existing trees would be removed from the museum grounds. The Commission requested that the Smithsonian submit landscape plans at preliminary review that include tree replacement to prevent net loss of tree canopy in accordance with the procedures established in the policies related to *Tree Canopy and Vegetation* in the *Comprehensive Plan for the National Capital*.

59 percent of the museum grounds are over structure. Therefore, the landscape design must balance soil volume site constraints, shade for visitors, and sunlight requirements for ground plane plantings.

As shown in Table 1, the landscape plan has not significantly changed since the November 2017 revised concept review; however, the applicant has provided additional information to justify the proposed number of trees and tree spacing criteria. Since the November 2017 meeting, the applicant has included one additional understory tree. There are 151 existing trees on site, 147 will be removed and four will be preserved. The landscape plan proposes a total of 117 trees. The number of proposed and preserved trees (121 trees) is lower than the number of existing trees. After construction the site will have 30 trees less than existing conditions. However, the amount of shade trees will almost double.

Tree Types	Existing Trees	Trees to remain	Trees to be removed	Proposed Trees (November 2017)	Proposed Trees (March 2017)
Shade trees	30	4	26	56	56
Conifers	13	0	13	0	0
Broadleaf Semi-evergreen (Magnolia)	36		36	10	10
Understory	72	0	72	50	51
Total (Quantities and Caliper)	151 (1,600")	4 (121.5")	147 (1,478.5")	116	117 (1,538")

Table 1: Existing, Preserved and Proposed Trees

Tree Palette: The landscape design includes tree species selected for their urban hardiness and climate change adaptation resilience. The tree planting design follows the building architecture, and develops a varied palette of tree species. Oak species are used as the backbone of the scheme, due to their upright vertical habit and contrast to the Mall elms, as well as their high ecological services in support of pollinators (birds and insects).

The plan maintains a consistent rhythm on the north and south sides of grounds. Different palettes are applied on the north and south sides to address solar orientation. Black gum is used in planters

not over structure on the north side, where they will be highly visible and have deep rooting opportunities.

Smaller understory trees will be located closer to the building to highlight its flowering characteristics against the backdrop of the building masonry. The design develops the east end grove as a diverse native setting, providing thematic and ecological services. At the west end, the landscape plan will preserve three existing willow oaks, and provide minor modifications to drainage, soil and renewal of the ground plane planting to improve tree health.

Species diversity is designed to create a rhythm to reflect the building massing; provide wider ecological services, and support the museum "flight" theme. Species characteristics emphasize particular aspects. For example: trees at the four corners of the site are open, welcoming and have a pyramidal shape, while trees at the north and south entrances are broad, with a rounded canopy, and large darker foliage.

Tree Layout: The proposed layout includes minor offsets in the east-west tree planting to prevent the monotony of a single row, and follow the rhythm of the museum's massing. Trees mark the architectural premise of the building and provide human comfort for museum's visitors.

Tree Caliper: Based on tree inventory (refer to Table 1), the total existing tree caliper today is approximately 1,600 inch caliper. The total estimated proposed and preserved tree caliper in 25-30 years will be 1,659 inch caliper. Therefore, the proposed tree caliper will eventually exceed the existing conditions. The number of large shade trees in the proposed scheme (56) exceeds the number of shade trees currently on the grounds (30).

Tree Spacing: Trees are spaced on an average 45 feet on center, depending on the length of the planter and available soil volume. The proposed tree spacing optimizes both tree and ground plane planting. Tree spacing is based on the following criteria:

- Sufficient room above ground for trees to grow and spread their canopy over a lifetime;
- Sufficient soil volume available for healthy root growth (1,100 cubic feet per canopy tree, 600 cubic feet per understory tree);
- Sufficient annual growing period insolation for sunlight to reach ground plane planting;
- Reasonable spacing so that root systems can connect and communicate.

During the design process, the design team analyzed the 30-foot tree spacing with an annual solar analysis. The designers found insufficient insolation to support the ground plane planting. According to the submission materials 30-foot spacing is not typical of street tree spacing in confined environments. At 45 feet spacing sufficient sunlight reaches the ground plane over the growing season to reasonably maintain sun/shade tolerant plants.

Solar access to the ground plane is vital to creating a strong visual and tactile landscape environment to reflect the flight theme of the museum. Plant selection of canopy tree species and ground plane materials has been carefully calibrated to anticipate expansion of shade qualities over time as the tree canopy expands. A variety of herbaceous materials creates a lively and powerful counterpoint to the building massing and planter architecture. The contrast is meant to be inviting and thought-provoking. The planting concept is based on plant selection for their flight characteristics and attraction to pollinators.

Soil Volume: All shade trees are planted over ground, not over basement structure. Therefore, the tree lifespan is not limited to the basement building systems repair or replacement or the roof membrane. Planters create a more constrained growing environment than typical urban street tree conditions (less total root expansion potential, more thermal variation due to planter wall exposure). The proposed soil volumes meet or exceed *Casey Trees* recommendations for Washington DC. Providing additional soil volume mitigates the effects of thermal variability across the seasons.

Soil volumes are extended under paving when the associated planter is below the recommendations provided by *Casey Trees*. Structural soil under paving is supported by grade beams to provide additional root growth volume. Soils in planters are designed for the planter environments, and to enhance water retention. Overall, the landscape plan takes into account soil design, tree and ground cover planting selection, and irrigation to mitigate the site constraints and provide a robust growing environment.

Maintenance: With respect to ground plane planting maintenance, the Smithsonian Gardens (SG) supports the ground plane planting design approach because it develops a strong sense of place at the NASM. The SI endorses the ground plane approach as an economical, ecologically sensitive and supportable way to ensure their commitment to inspire visitors with exceptional horticultural displays. SG has a staff of over 50 professional horticulturists, gardeners, biological technicians, landscape architects, arborists, entomologists, irrigation specialists and living collections management specialists who care for over 180 acres of landscaped public areas surrounding the museums throughout the District of Columbia, four major support facilities in the District of Columbia and Suitland, Maryland, interior spaces throughout the museums, and the SG Greenhouse facility.

Based on responses to the Commission previous comments, **staff finds the Smithsonian has addressed all of the Commission's comments from the previous revised concept review and that the preliminary and final design includes:**

- **An infinity-edge water feature on the proposed plinth of the Delta Solar sculpture to create a welcoming entry to the museum and the National Mall along Seventh Street, and preserve the integrity of the sculpture.**
- **Site amenities, such as benches, movable tables and chairs; and the integration of the adjacent large exhibit access area into the west plaza composition.**
- **Bicycle facilities, and improved lighting. The Smithsonian has committed to work with the District Department of Transportation to identify a location for a Capital Bikeshare station on the museum grounds after the terrace construction is complete.**
- **A reduction in the base of the Ad Astra sculpture to avoid impacting pedestrian circulation and provide sufficient clearance for bus drop off and pick up areas.**
- **A landscape plan that addresses tree replacement to prevent net loss of tree canopy in accordance with the *Comprehensive Plan for the National Capital*.**

Perimeter Security: During the November 2017 revised concept review, the Commission recommended that the Smithsonian evaluate the perimeter security along 7th Street to allow greater accessibility and visibility into the plaza. The applicant should also consider opportunities to integrate perimeter security elements that also function as public amenities, such as benches, bike racks, landscape and other streetscape elements.

The applicant noted that the final design maintains most of the site's existing perimeter security. The changes focus on the southwest corner of the site and entrances. Perimeter security walls at the north and south entrances have been lowered to increase visibility into the site. The relocation of the Delta Solar sculpture closer to the corner of Independence Avenue and 7th Street, and the integration of the fountain plinth into the perimeter security will improve the sculpture visibility and provide a public amenity. The design also includes retractable and fixed bollards to connect the existing perimeter security walls on the west lawn with the fountain.

In an effort to minimize the number of bollards, the design team balanced pedestrian circulation and security requirements. For example, SI reduced the width of the walkway to the north of the plinth in order to remove a bollard in an area that is expected to have less pedestrian circulation. The design implements the maximum bollard spacing approved by SI security standards (5'-0" on center spacing – which translates into 4'-0" clearance). The final design places bollards strategically to provide the greatest amount of clearance for circulation. The spacing has been adjusted slightly to accommodate alignment constraints from existing site conditions.

Staff notes that the only changes to the existing perimeter security on the museum grounds focus on the southwest corner of the site. The final design includes a new Delta Solar fountain plinth integrated into perimeter security, a solid wall and bollards.

The final plans include a line of six bollards that align with the eastern edge of the fountain, and are perpendicular to the solid perimeter wall along Independence Avenue. Three bollards are located within the planting area. Staff is concerned that the bollards footing will prevent the roots of the proposed trees to connect. In addition, bollards within planters create an unusual condition that is not consistent with the rest of perimeter security elements on the museum grounds or the National Mall. Staff understands the desire to maintain an open and inviting corner, and recommends SI explore other more creative alternatives that provide a public amenity for visitors instead of using bollards at this special corner. Therefore, staff recommends that the Commission **request that the Smithsonian continue to work with staff from NCPC and the U.S. Commission of Fine Arts (CFA) to find an alternative design solution for the three bollards proposed within the planter near the corner of Independence Avenue and Seventh Street, SW, such that the design is consistent with the building vocabulary and perimeter security throughout the site.**

Overall Site

The Commission requested that the Smithsonian provide a streetscape plan that incorporates the following amenities:

- Benches located near bus stops, building entrances, and terrace corners at the sidewalk and terrace levels.
- Bicycle facilities such as bicycle racks and a Capital Bikeshare station near the museum entrances and in proximity to guard booths.

The final plans include 1,700 linear feet of seat wall between the heights of 14-24 inches around the museum terrace. The plans provide new shaded seat wall benches around the Delta Solar fountain. The design envisions future movable seating along the large exhibit access way. Two additional benches are included near the north entrance, one on each side of the north security vestibule, near the canopy columns. The submission materials include two bicycle facilities, one set of bike racks along 4th Street near the existing guard booths and another one along 7th Street, near the Delta Solar Plaza.

According to the applicant, locations of racks for Capital Bikeshare or dockless bicycles will be finalized after the terrace construction is complete. If using lanes of Independence Avenue is not feasible in the future, then it is likely that SI would locate the bike racks on 4th Street, due to greater capacity and less pedestrian traffic. In approximately six years, when construction is complete, SI and DDOT will have more data and feedback on use of owned bikes, Capital Bikeshares and dockless bikes. SI plans to balance the types of bike accommodations provided to best support visitors by replacing car trips with bike trips as well as supporting expansion of the museum audiences.

The Commission recommended that the Smithsonian work with the National Park Service to improve the streetscape surrounding the museum consistent with the *National Mall Streetscape Manual*, where applicable. The submission package indicates that the streetscape is outside the project scope. According to the Section 106 MOA, under the Public Space Improvements mitigation measure, any proposed improvements in the sidewalk zones will be designed in accordance with the current version of the *District of Columbia's Public Space Regulations* included in DDOT's *Public Realm Design Manual*; and the current version of the *Mall Streetscape Manual* construction details and specifications. Public space improvements in the sidewalk zones will be planned and implemented after the terrace reconstruction is complete and the construction trailers are removed.

South Canopy

The Commission requested that the Smithsonian retain the south entrance canopy as a desirable option if future funding permits. The construction documents show the proposed south canopy at the Independence Avenue entrance as an option. Staff **notes that as requested by the Commission, the applicant has retained the proposed canopy at the south entrance as a construction option if future funding permits. If the Continuum sculpture needs to be relocated in the future to allow room for the canopy, the Smithsonian should consult with NCPC, CFA, and DC SHPO to find an appropriate location for the sculpture on-site.**

Stormwater Management

As part of the construction documents, the applicant has provided stormwater management calculations that address compliance with the District Department of the Environment (DDOE) *2013 Stormwater Management Rule* and the federal stormwater regulations included in *Section 438 of the Energy Independence and Security Act*. The project includes rainwater harvesting, tree preservation, and tree planting to meet the stormwater retention volume on-site.

The proposed stormwater management plan includes six preserved trees, 47 planted trees, and two cast-in place cisterns to meet the required stormwater retention volume for the project site. The total DDOE stormwater retention volume requirement for the project is 21,456 cubic feet (160,491 gallons). The total on-site retention volume achieved is 21,967 cubic feet (164,325 gallons). Site roof stormwater runoff will be directed to the cisterns for treatment and will be used for irrigation and flushing toilets. The west cistern will have a storage volume capacity of 11,908 cubic feet, and the east cistern will have 14,501 cubic feet.

The project meets 97 percent of the requirement for stormwater storage capacity on-site with two cisterns. The remainder of the requirement is met via tree preservation, tree planting, and the use of stormwater treatment products such as Baysavers. The Baysavers, which treat stormwater by separating debris and trapping pollutants before they enter the local waterways, are required to provide required storage for individual drainage areas within the portion of the site that is in a Municipal Separate Storm Sewer System (MS4) area. The rainfall depth used for calculation of stormwater volume is based upon the 95th percentile rainfall depth (1.7 inches).

Revised Concept Review (July 2017) – Exterior Cladding Replacement

With regards to the building stone cladding, in July 2017 the Commission supported Colonial Rose Granite as the preferred cladding alternative and strongly encouraged the Smithsonian to increase the percentage of stone panels with color variation and horizontal pattern in the design specifications to avoid a monolithic facade. If uniform panels must be used, the Commission recommended to disperse and minimize its use, increase tonal variation and avoid juxtaposing similar panels to achieve the randomness of the original façade.

The Commission supported the sandblasted finish because it provided a timeless effect similar to the existing building. Lastly, they requested that the Smithsonian continue to consult with NCPC staff on any future mockup of Colonial Rose Granite to test different combinations of color pattern and veining, as well as the glazing mockup.

SI has indicated that a performance cladding mockup is being constructed in York, PA. The mockup will include approximately 180 stone panels and will enable the design team to refine the stone selection and façade composition process, as well as test the wall assembly's performance under simulated weather conditions. The SI anticipates to make adjustments to the layout of stone panels that create the facade based on review of the mockup with agency staff and Commissioners, if they wish to join the mockup review. The Colonial Rose Granite supplier will create a dry lay horizontal layout of the entire mockup façade in their fabrication shop. This will inform the specification of the placement of the stone panels on the mockup, and ultimately on the building

barring further modifications per the mockup review, to help ensure that each large area of stone has an appropriate level of variation in color and linear pattern.

The specifications call for the percentage of panels with linear pattern to be optimized at approximately 40% in order to establish a horizontal orientation of the granite markings based on the availability of this natural material. SI has provided additional drawings of the performance mockup, and photographs of the Colonial Rose Granite stone panel dry lay as part of the submission package.

- The selected finish for the granite is sandblasted. The sandblasted finish is comparable to the existing façade's finish. However, the sandblasted finish does not create the risk of leaving deposits that are prone to rust per the original finishing method as installed on the building. SI believes that the selected relatively flat finish will avoid a shiny commercial feel while enhancing the texture and color of the granite sufficiently to provide the variation sought. This will be evaluated as part of the review of the performance mockup in York, PA and if necessary, adjustments would be made.
- As noted above, SI will invite NCPC staff to view the mockup in York, PA this summer. The mockup will not show different approaches of color pattern and veining, but rather represent the approach the SI believe will work best given the inherent characteristics of the stone.

In response to previous comments from the Commission, **staff notes that the applicant will provide exterior mockups of the proposed concrete paving panels, Colonial Rose Granite building cladding, and glazing curtain wall for NCPC, CFA, DC SHPO and the Advisory Council on Historic Preservation (ACHP) staff review prior to construction.**

CONFORMANCE TO EXISTING PLANS, POLICIES AND RELATED GUIDANCE

Comprehensive Plan for the National Capital

As noted above, this project meets basic goals of the *Comprehensive Plan for the National Capital*. In particular, the project is consistent with the Urban Design; Federal Environment; and Historic Preservation Elements.

National Historic Preservation Act

Both the Smithsonian and NCPC have an independent responsibility to satisfy the requirements of Section 106 of the National Historic Preservation Act (NHPA). NCPC has approval authority over federal projects located within the District of Columbia pursuant to the National Capital Planning Act. NCPC has designated SI as the lead federal agency to fulfill their collective Section 106 responsibility. The Smithsonian initiated consultation with the District of Columbia State Historic

Preservation Officer (DC SHPO) on September 3, 2014. SI conducted Section 106 consulting party meetings on November 12, 2014; February 22, 2016; April 7, 2017; June 8, 2017; and October 24, 2017.

The SI, NCPC, and the DC SHPO determined that the undertaking will have an adverse effect on the NASM and the National Mall Historic District. Cumulative adverse effects will result from altering the exterior stone cladding, which is one of the most notable character defining features of the museum and an element that establishes a strong visual connection to the similarly clad National Gallery of Art. In addition, adverse effects will result from changing several other features of the property's setting that contribute to its historic significance, including alteration to terraces, relocating sculptures and introducing new vestibules.

To resolve the adverse effects and conclude the Section 106 process, the SI, NCPC, DC SHPO and the Advisory Council on Historic Preservation (ACHP) executed a Memorandum of Agreement (MOA) on December 28, 2017. The MOA includes stipulations including ongoing design consultation as well as specific minimization and mitigation measures. Mitigation measures include: Historic American Building Survey Documentation; NASM Determination of Eligibility; National Register Nomination for the National Museum of Natural History; Landscape Planting Plan; Oral History of the NASM Building; Retention and Rehabilitation of Historic Fabric at the NASM Interior; Exhibits Regarding the NASM Building; Public Space Improvements; Restoration of the Smithsonian Institution Building's Rose Windows; and Establishment of a Preservation Forum.

National Environmental Policy Act

NCPC is the lead agency for compliance with the National Environmental Policy Act. NCPC has an independent NEPA obligation resulting from its approval authority over the project. The SI, a trust instrumentality of the United States, is the project owner. NCPC, in cooperation with SI, prepared an Environmental Assessment (EA) to analyze a range of alternatives, including a no action alternative (Alternative A), and three action alternatives for the project. The scoping meeting was conducted on November 12, 2014.

The cladding alternatives under consideration included Alternative B: Tennessee Pink Marble in-kind replacement; Alternative C: other natural stones with similar appearance to original cladding such as granite and limestone; and Alternative D: a manufactured material, such as ultra-high performance concrete (UHPC). The EA analyzed the 15 topic areas: historic resources; visual resources; visitor experience; circulation; planning policies; sustainability; air quality; noise levels; vegetation; stormwater management; floodplains; topography; solid waste; hazardous materials and wastes; and climate change and carbon footprint.

NCPC solicited public input on the EA by way of a public meeting on April 7, 2017 and its website. The EA was available for public comment from March 31 until May 1, 2017. Following the Commission final approval action, NCPC's Executive Director will execute a Finding of No Significant Impact (FONSI) for Alternative C: Replacement Cladding with a Natural Stone with

Similar Appearance to the Original Cladding, and Vestibule Design Option A: Flight. The specific stone that is being used is Colonial Rose granite.

Relevant Federal Facility Master Plan

The project is consistent with the Mall-Wide Perimeter Security plans that were approved by the Commission at its September 2004 meeting. The perimeter security design preserves a portion of the existing freestanding walls with openings to allow pedestrian access to the west lawn area at the NASM and also provide seating areas. The final plans incorporate the security line into the sculpture/fountain design as recommended by the Commission in the February 2004 Mall –Wide Perimeter Security concept design review.

CONSULTATION

Coordinating Committee

The Coordinating Committee reviewed the proposal at its March 14, 2018 meeting. Without objection, the Committee forwarded the proposed preliminary and final site and building plans to the Commission with the statement that the proposal has been coordinated with all participating agencies. The participating agencies were: NCPC; the District of Columbia Office of Planning; the State Historic Preservation Officer; the District of Columbia Department of Transportation; the District Department of Energy and Environment; the General Services Administration; and the Washington Metropolitan Area Transit Authority.

U.S. Commission of Fine Arts

At its meeting on March 15, 2018, the Commission of Fine Arts (CFA) reviewed and approved the final design for a new visitor screening pavilion and alterations to the terraces surrounding the NASM, part of the comprehensive final design submission for the renovation of the museum building and its grounds. CFA recommended further study of the configuration of the bollards and planters at the south side of the installation.

In conjunction with its June 2017 approval of the stone cladding material for the museum, CFA anticipates the review of exterior mockups. CFA recommended consulting with the staff when resolving the final details of the design, including the configuration of security elements near the Delta Solar installation.

ONLINE REFERENCE

The following supporting documents for this project are available online:

- Submission Package
- NCPC Finding of Significant Impact

Prepared by Vivian Lee
03/29/2018

POWERPOINT (ATTACHED)

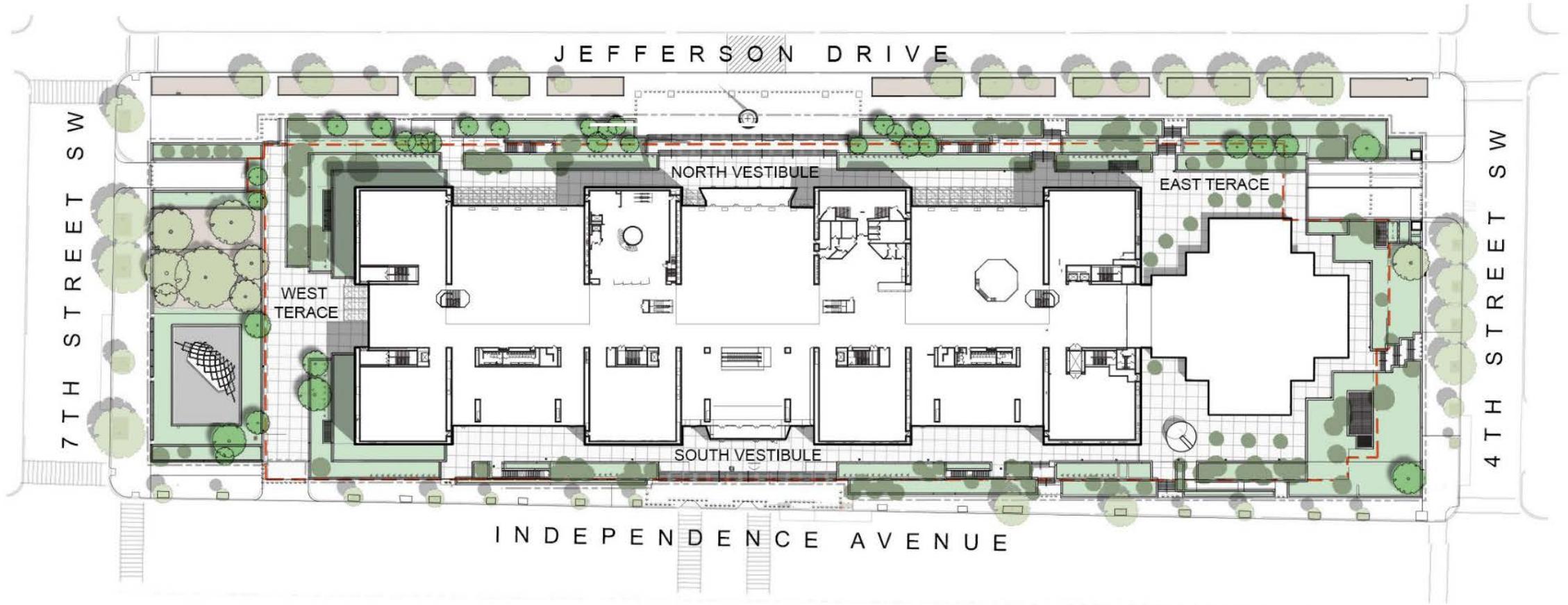
NCPC File # 7585

Building Exterior, Vestibules, and Site Improvements

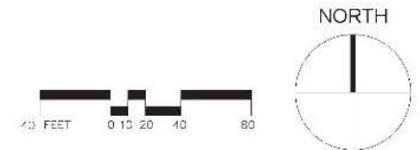
National Air and Space Museum
Independence Avenue at 6th Street, NW

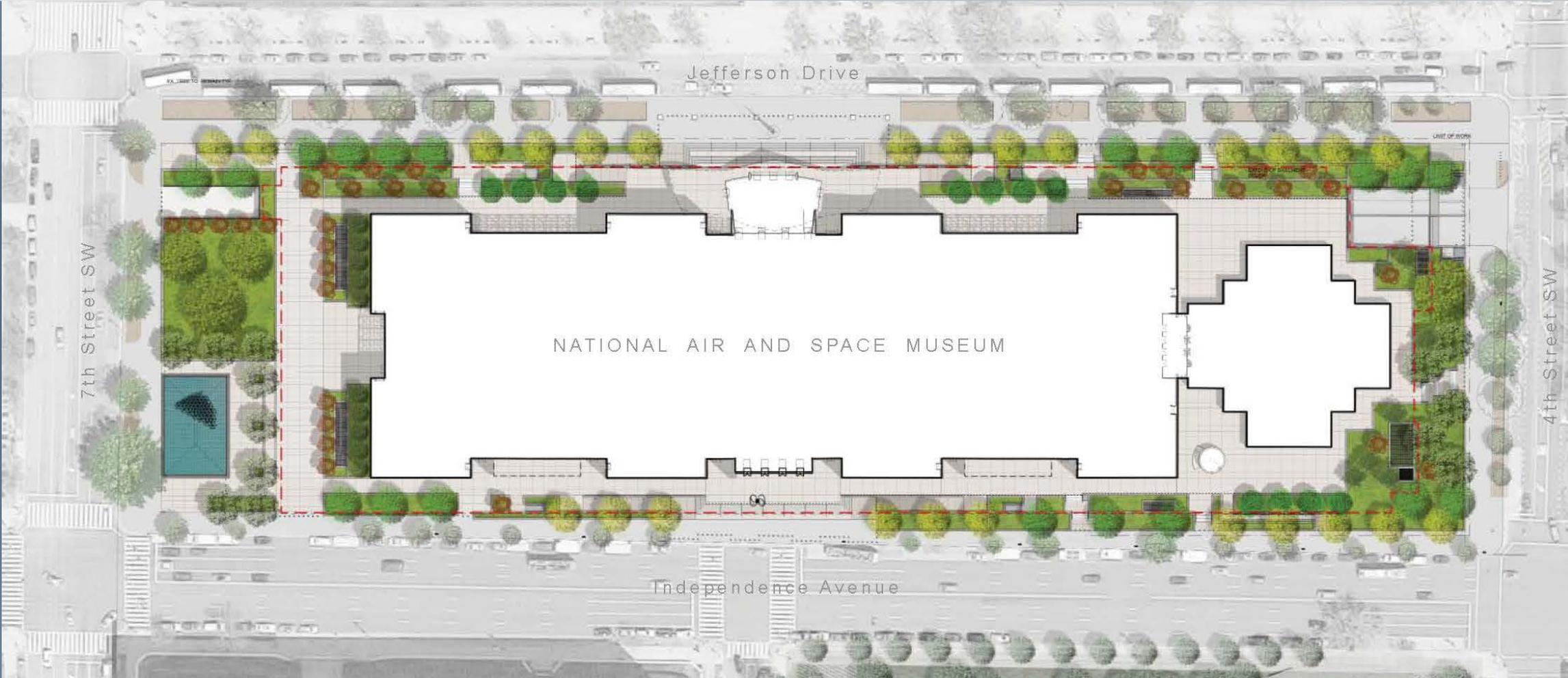
Smithsonian Institution

Preliminary and Final



Existing Site Plan and First Floor Plan





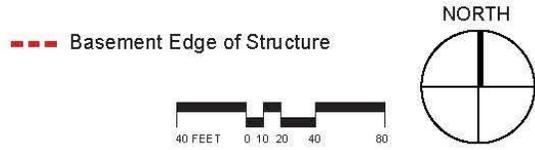
Rehabilitation of the existing 687,000 square feet building, including:

- 112,000 square feet of terrace
- 160,000 square feet of stone façade replacement
- 40,000 sf of curtain wall
- 52,000 sf of skylight
- 70,000 sf of roof

Addition of a 3,200 sf security pavilion at the north entrance

Overall site acre 448,530 sf (10 acres)

Illustrative Plan - Final Design



Southwest Corner: Existing and Proposed Conditions



Entrance Perspective - Southwest Corner - Existing Condition



Entrance Perspective - Southwest Corner - Final Design



Southwest Corner: Existing and Proposed Conditions



Southwest Corner: Existing and Proposed Conditions

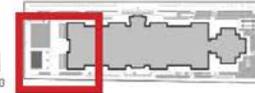
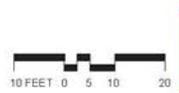


Ground Plane Plan



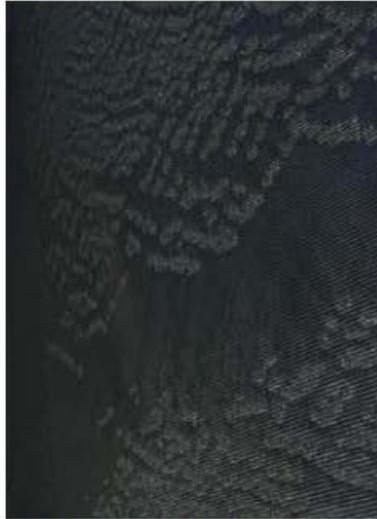
Tree Canopy Plan

Enlargement Plan - Southwest Corner - Final Design





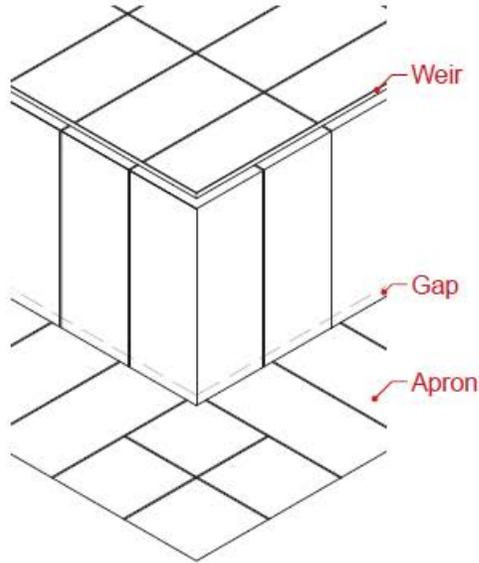
Horizontally Ribbed Stone, Detail



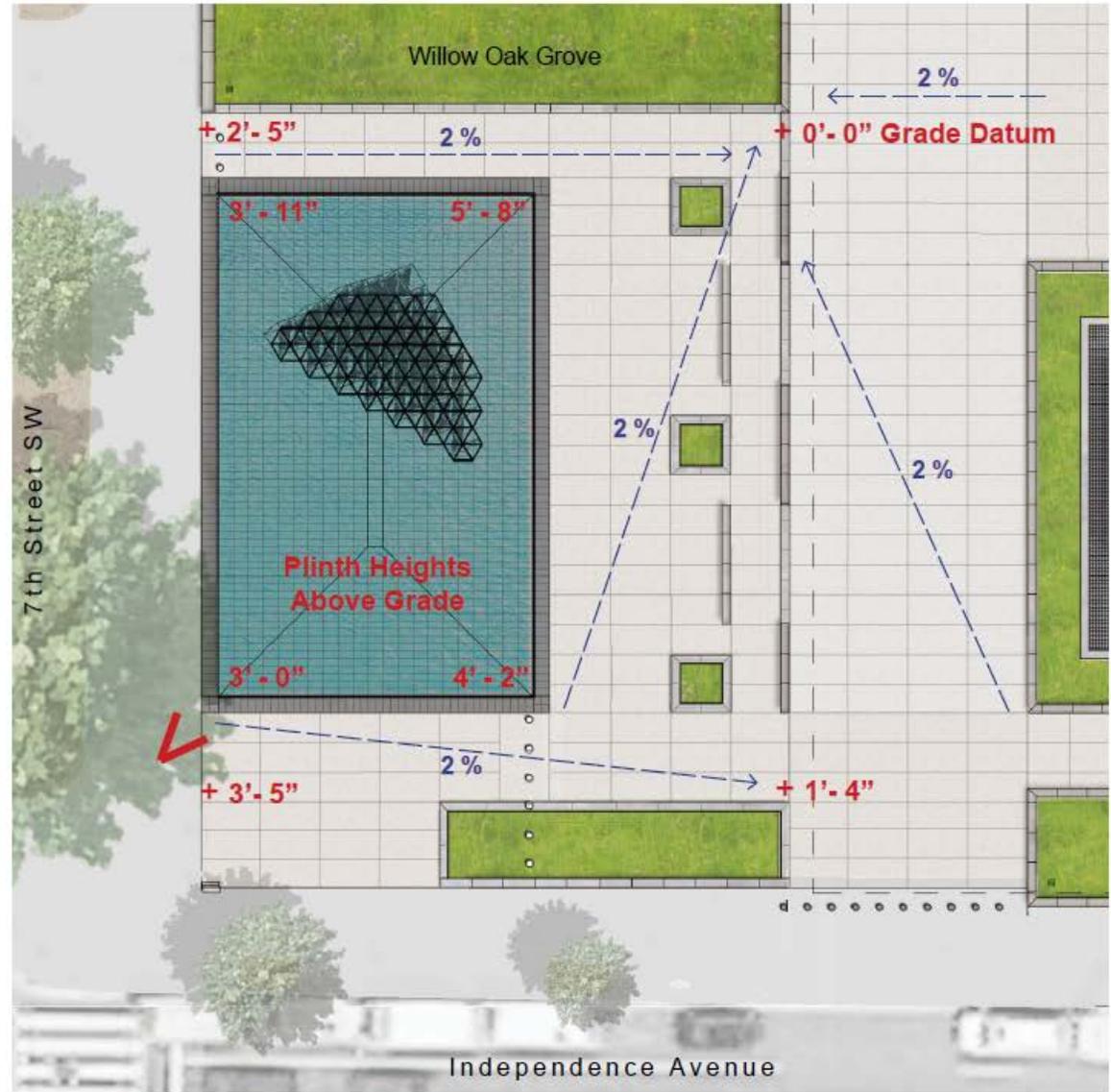
'Roll Wave' Effect, Detail



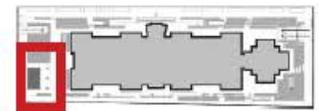
Stainless Steel Weir, Detail

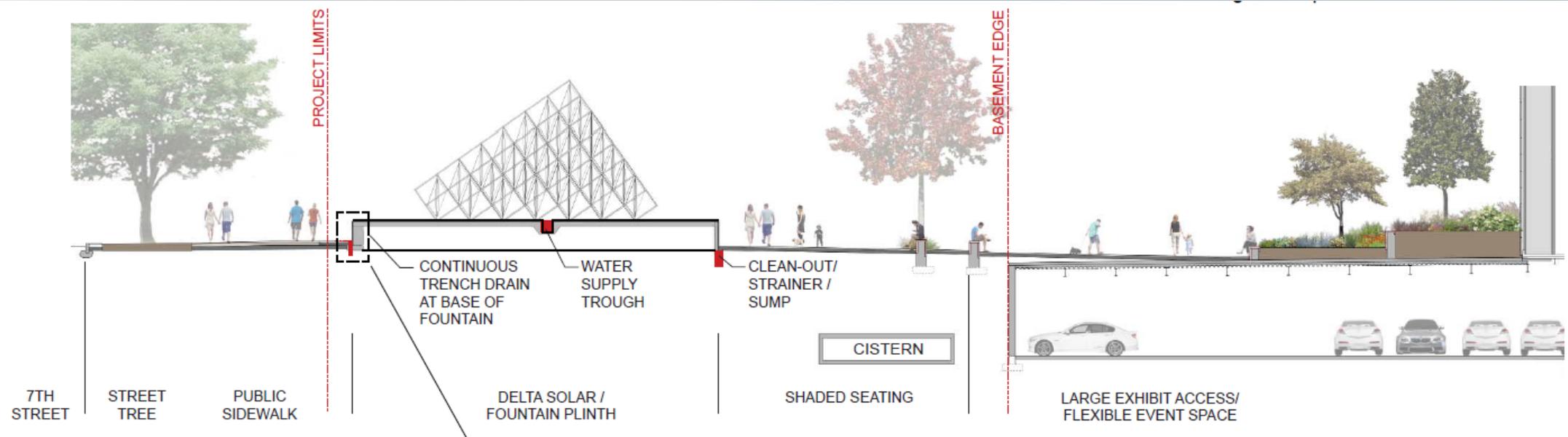


Axon - Plinth Corner Stone Layout

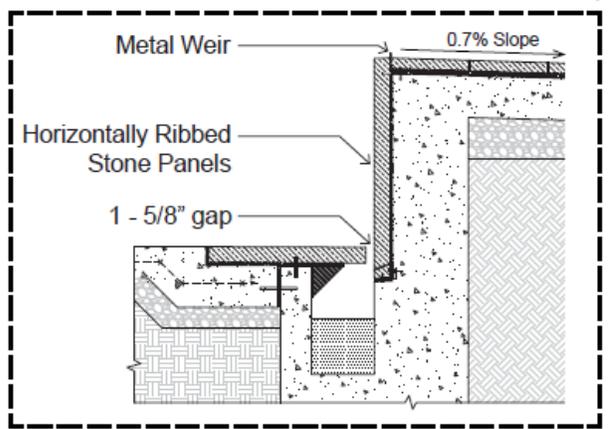


Plan - Fountain Plaza Layout

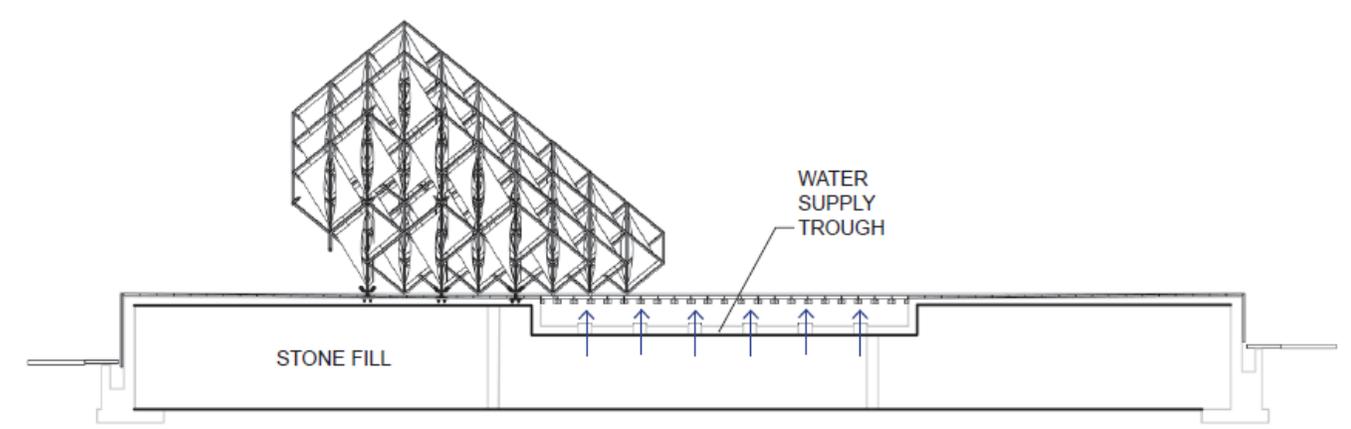




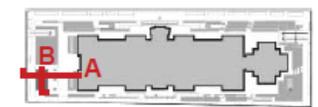
Section A - West/East (NTS)



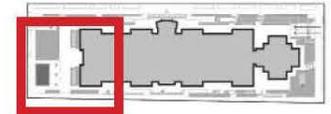
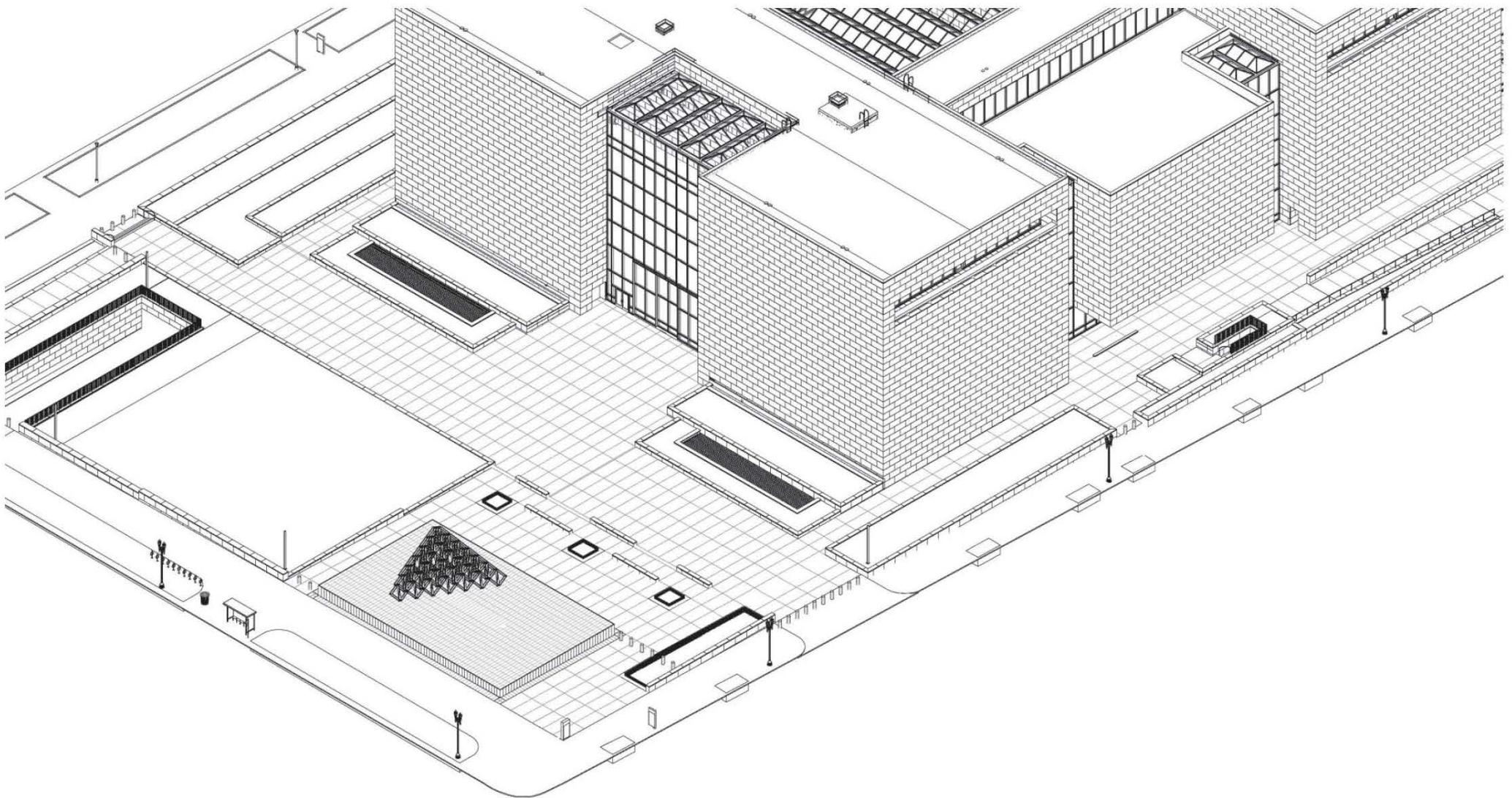
Continuous Trench at Base of Fountain Detail (NTS)



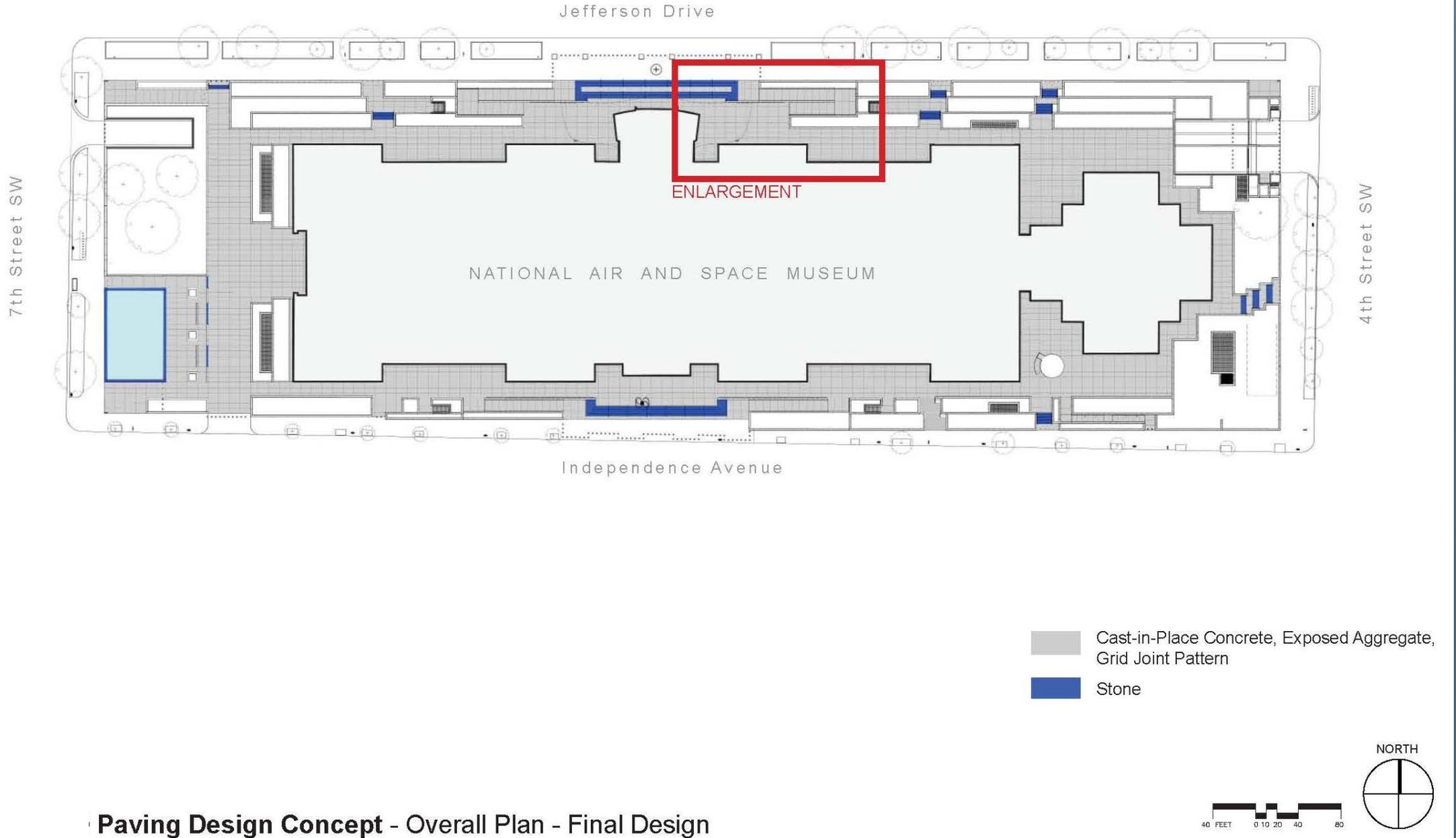
Section B - North/South (NTS)



③ Southwest Corner Delta Solar Fountain - Sections - Final Design

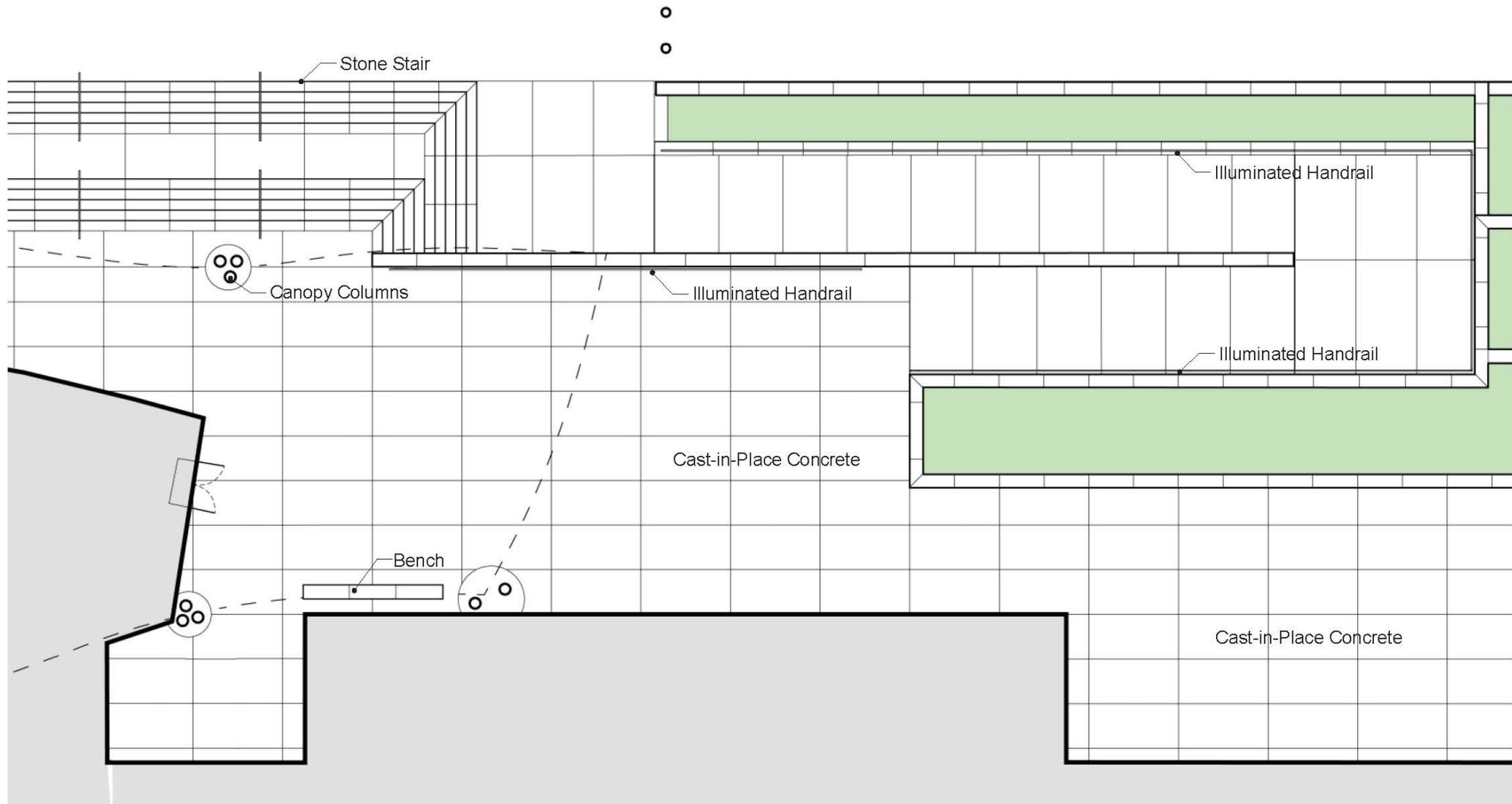


Axonometric Drawing - Southwest Corner - Final Design

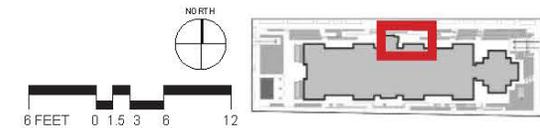


Paving Design Concept - Overall Plan - Final Design

Paving Design Concept: North Entrance Enlargement

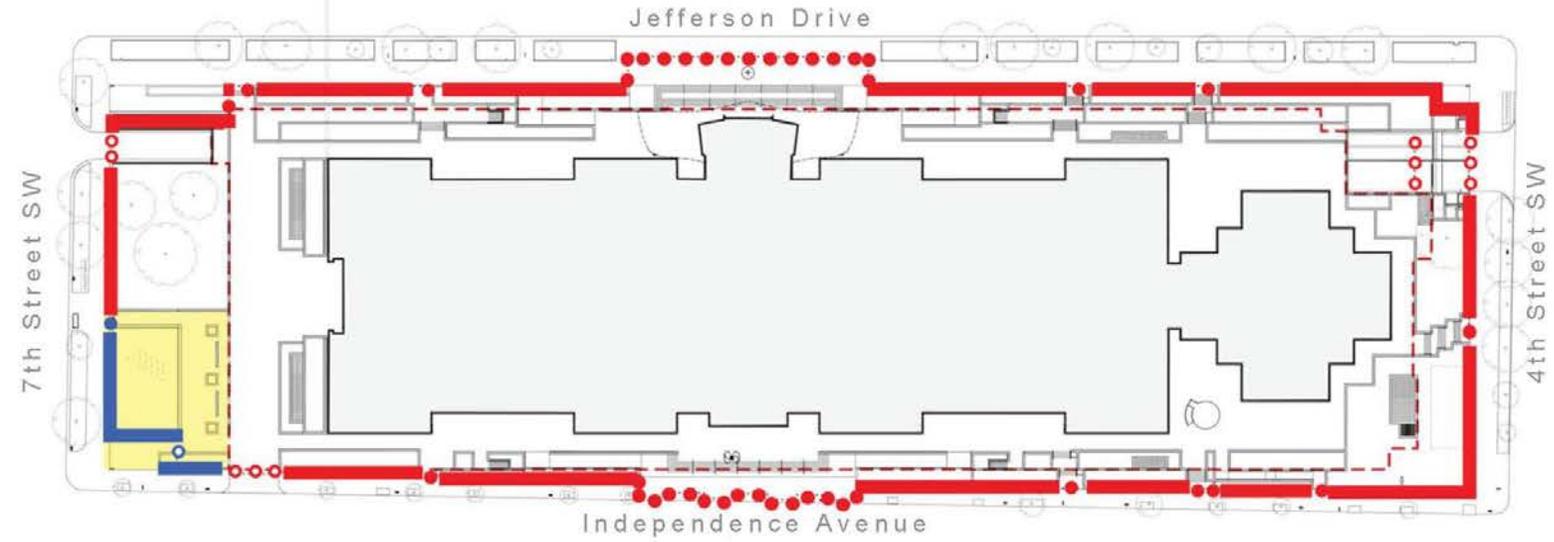


Paving Design Concept - North Entrance Enlargement Plan - Final Design



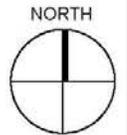


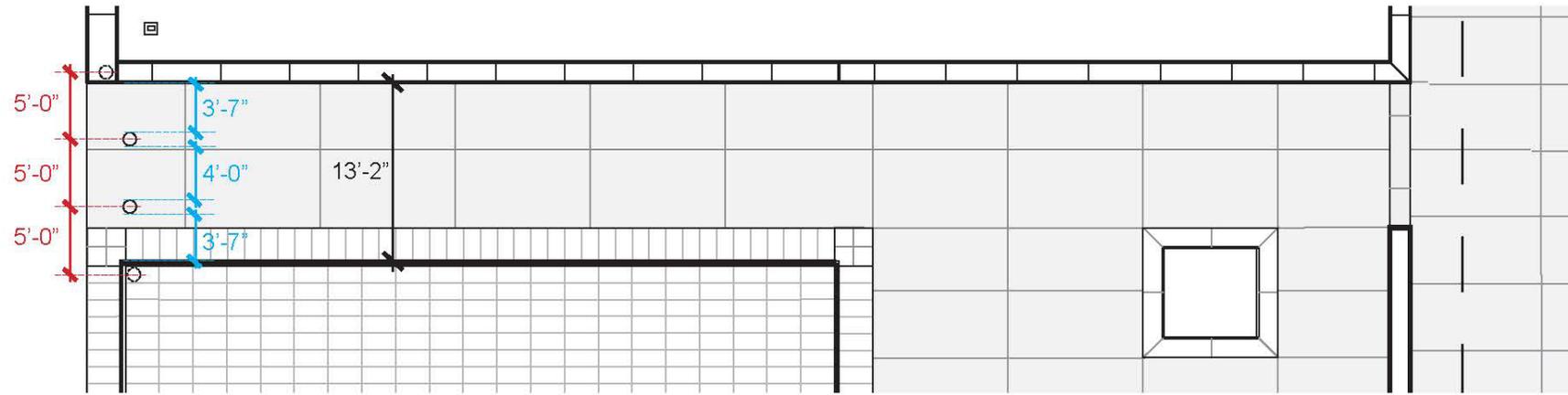
Existing Conditions



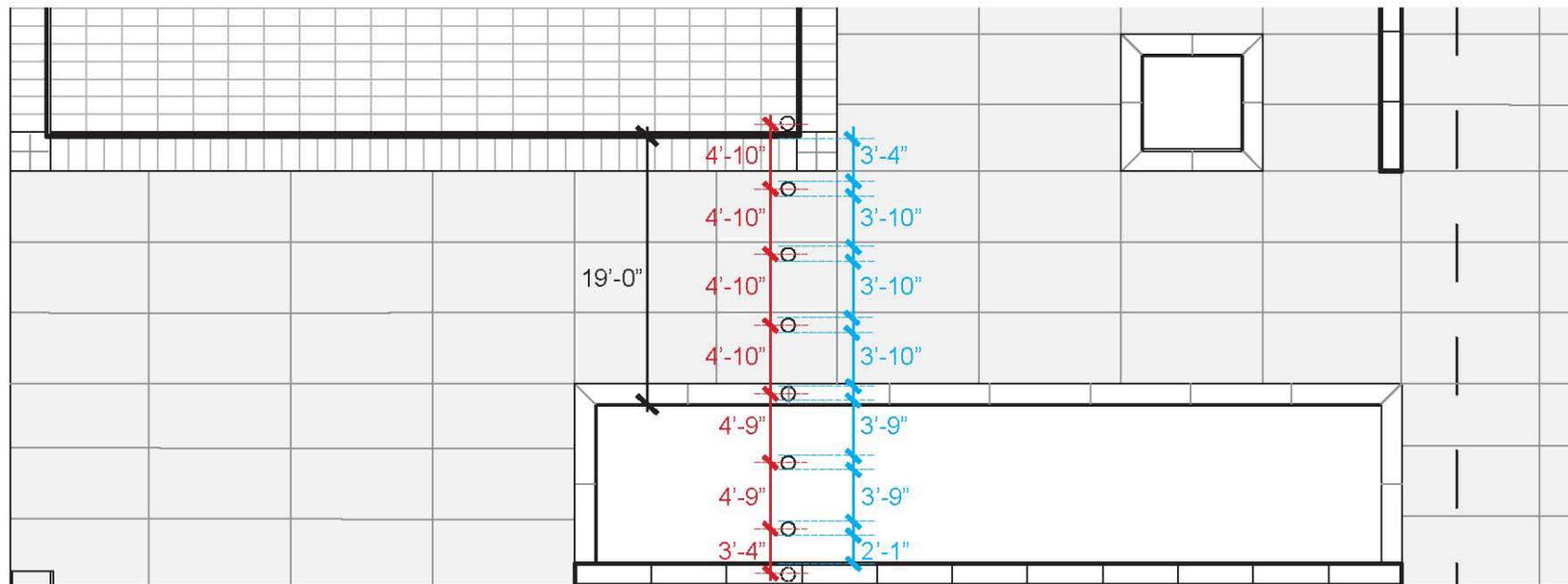
Final Design

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





A

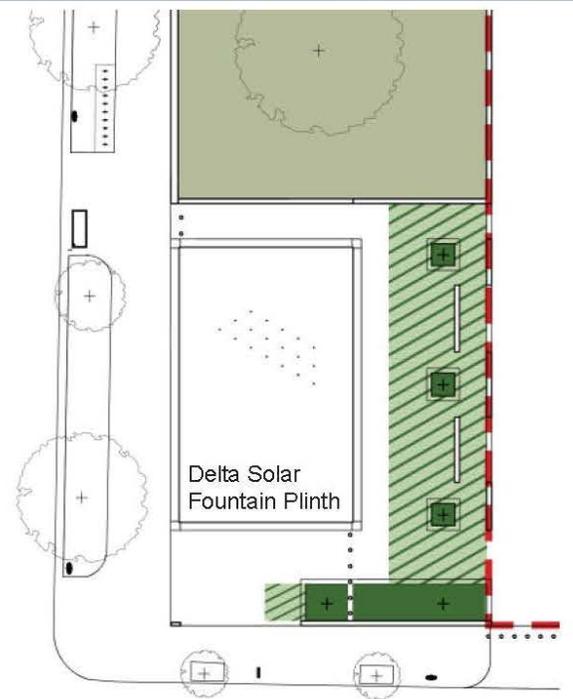
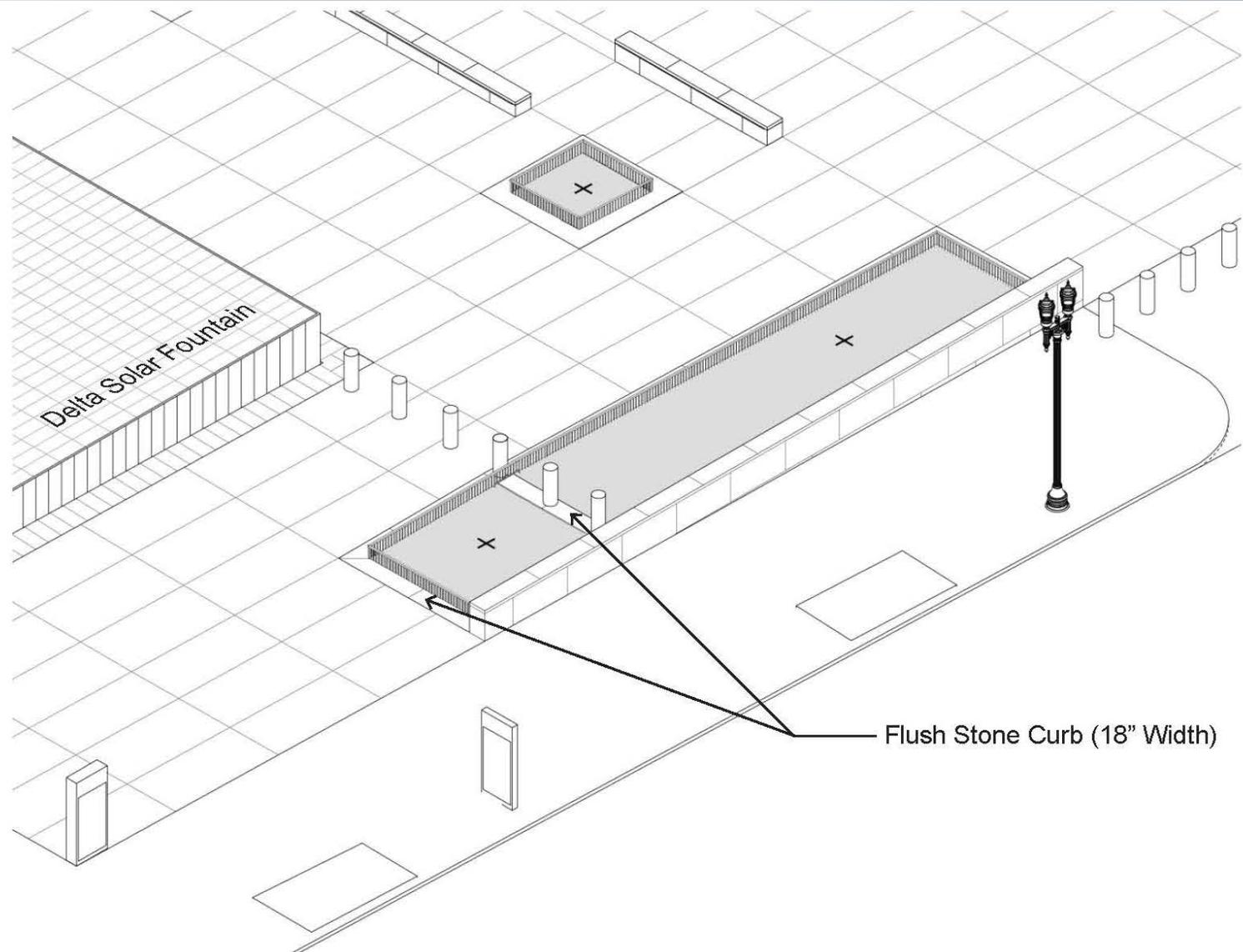


B

0'-0" On Center Dimension
0'-0" Clearance Dimension



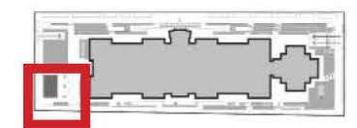
Southwest Corner Entry Bollard Enlargement - Dimensioned Plan - Final Design



Soil Depth Plan (SW corner enlargement)

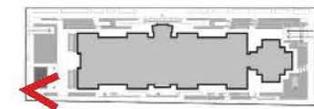
- Planting Soil
- Planting Soil for Existing Trees
- Structural Soil Under Pavement
- Basement Edge of Structure

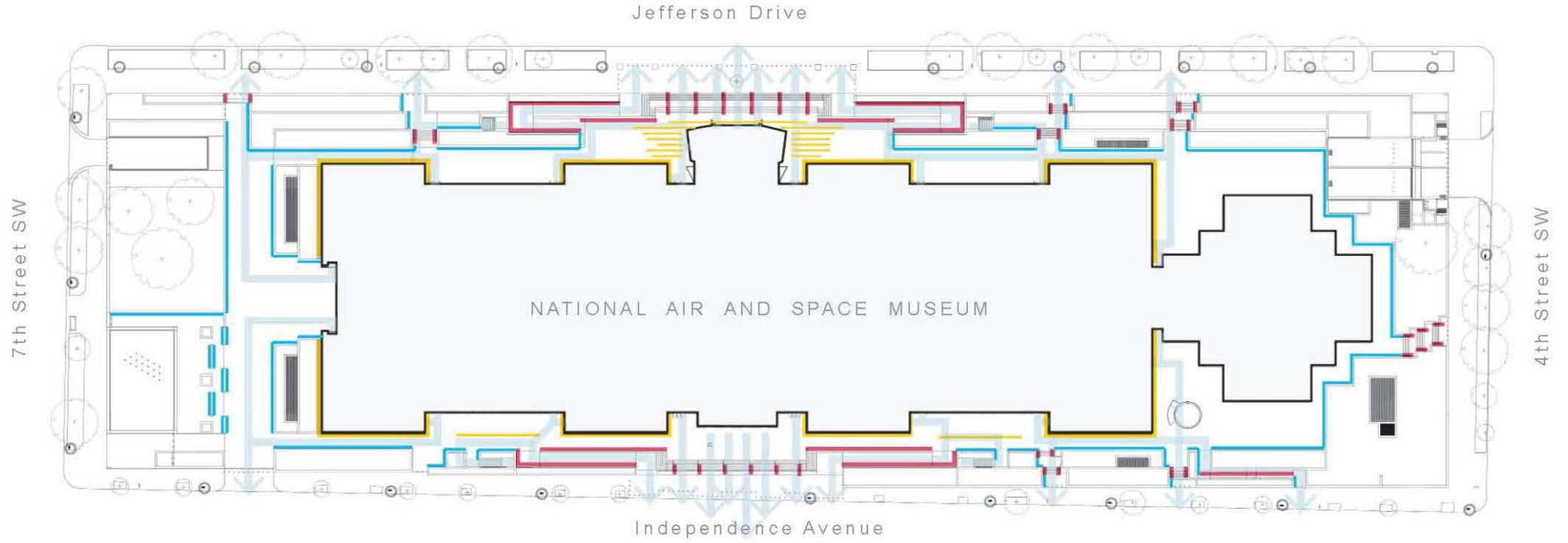
Southwest Corner Entry Enlargement - Axonometric Drawing - Final Design



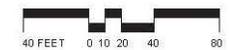
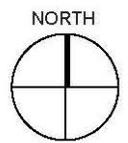


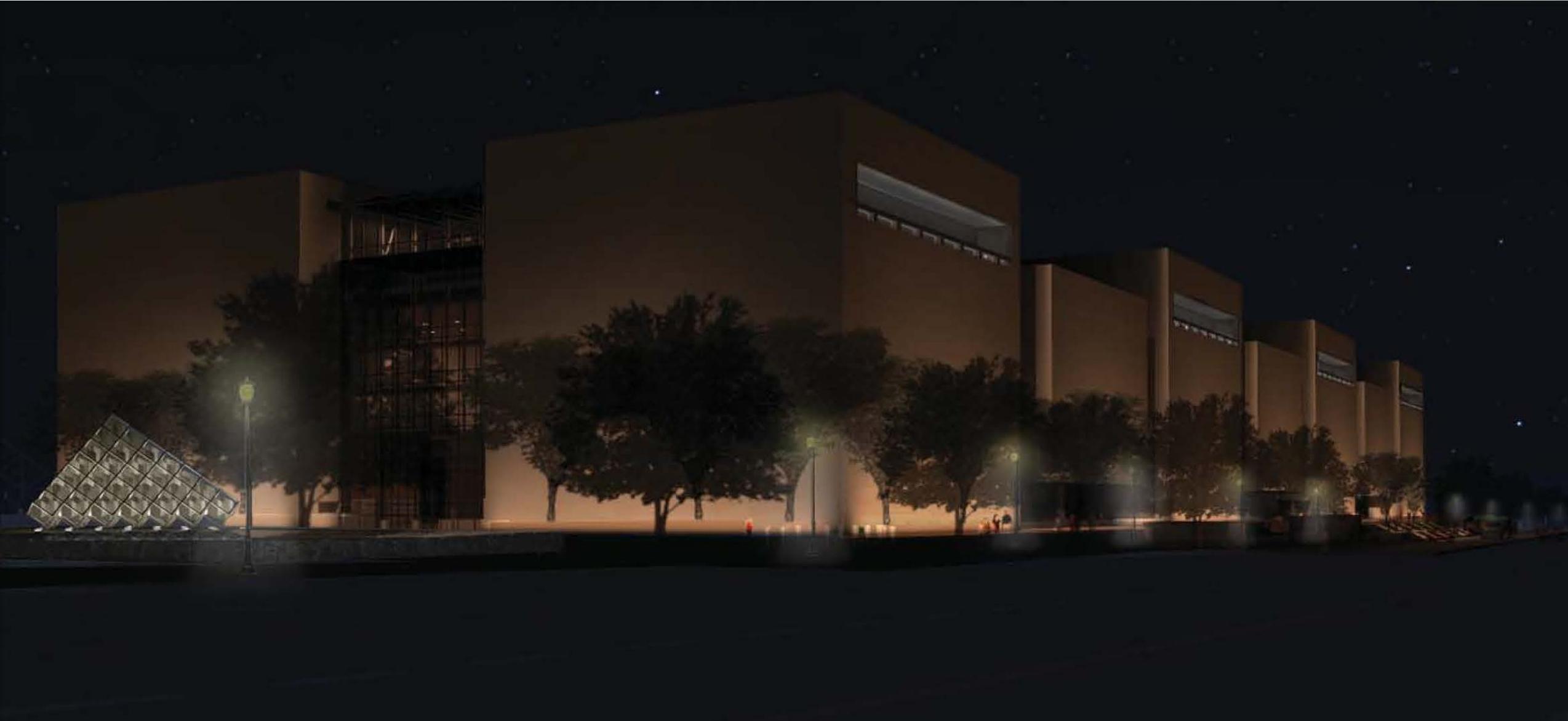
Southwest Corner Entry - Perspective Drawing - Final Design





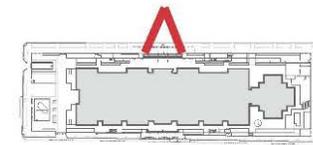
-  EGRESS path
-  Feature Uplight
-  Facade Uplight
-  Linear Canopy Uplight
-  Pedestrian Postlight
-  Illuminated Handrail
-  Linear Seatwall Detail
-  Garage Access Lighting
-  Existing Street Light





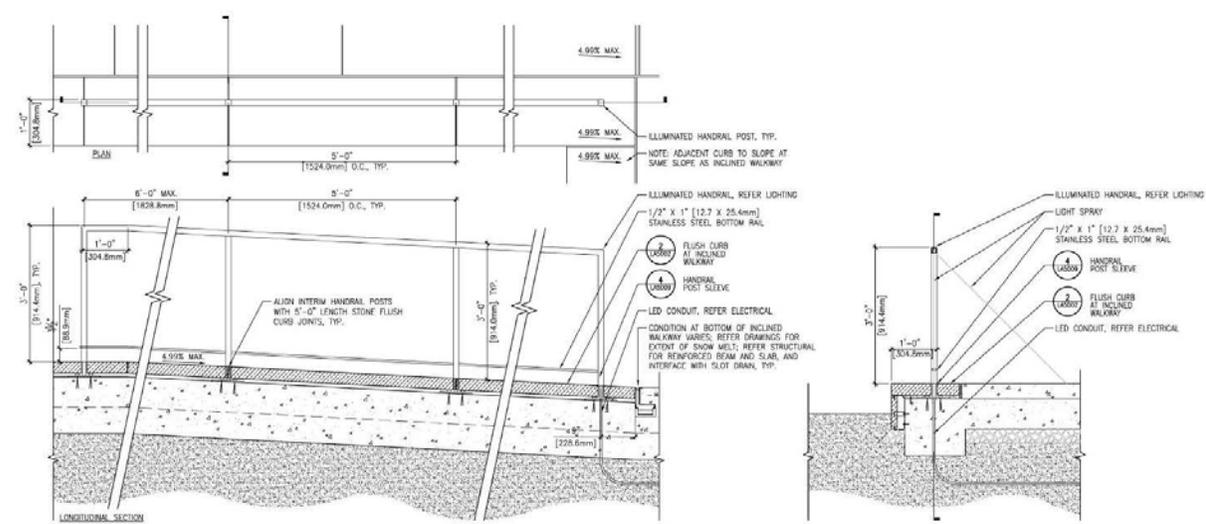


North Vestibule Final Design - Gary Steffy Lighting Design Facade Concept

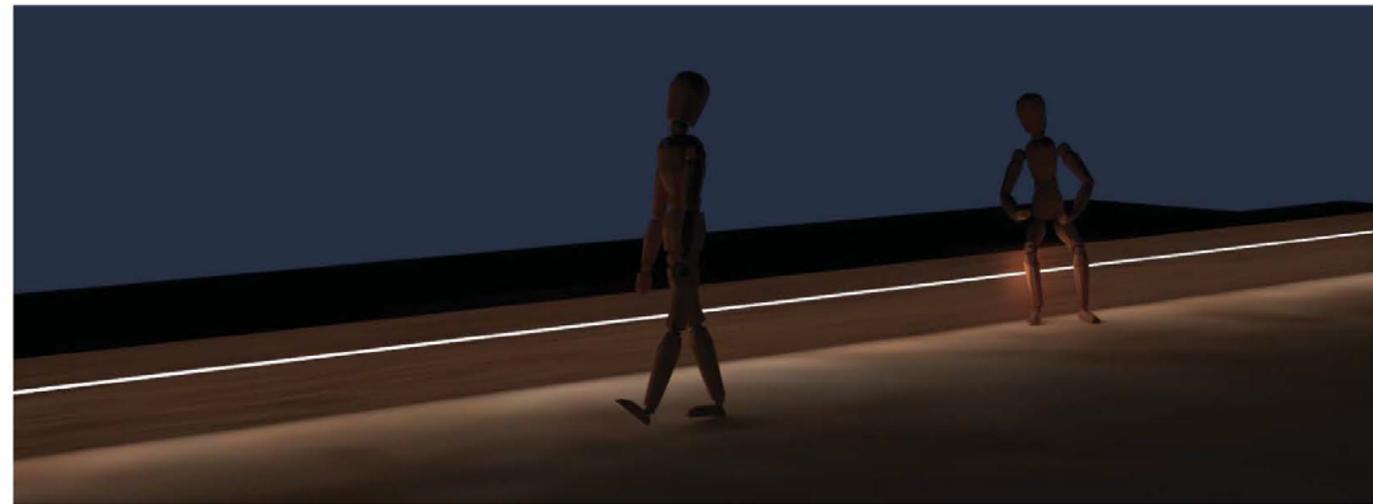
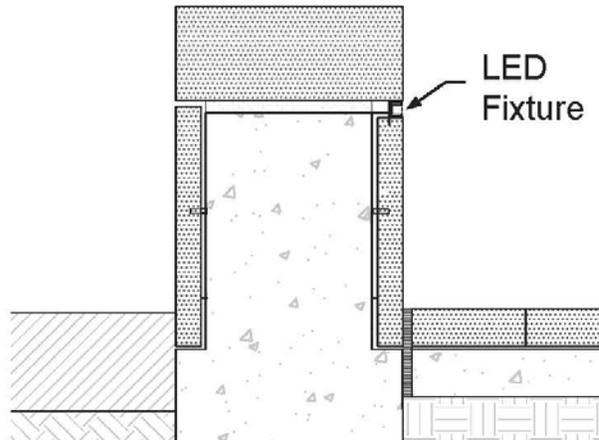




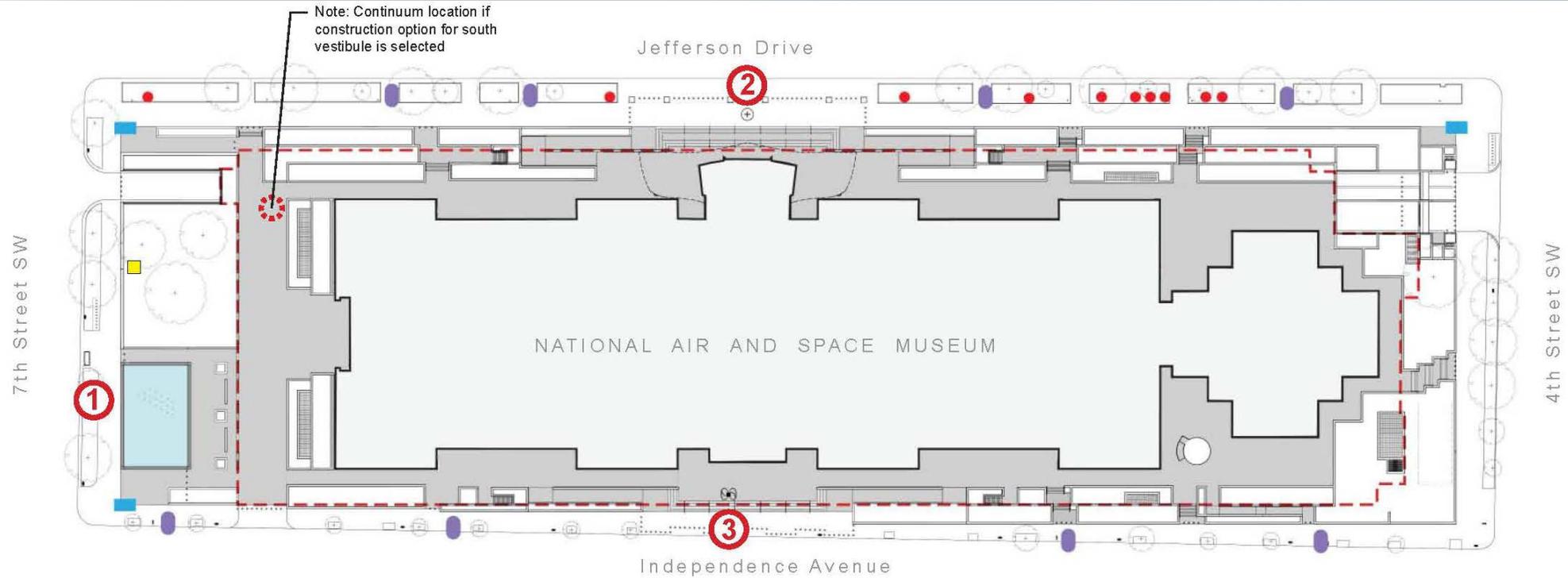
Illuminated Handrail



Illuminated Handrail, Flush Curb Detail



Linear Seat Wall



① Delta Solar



② Ad Astra

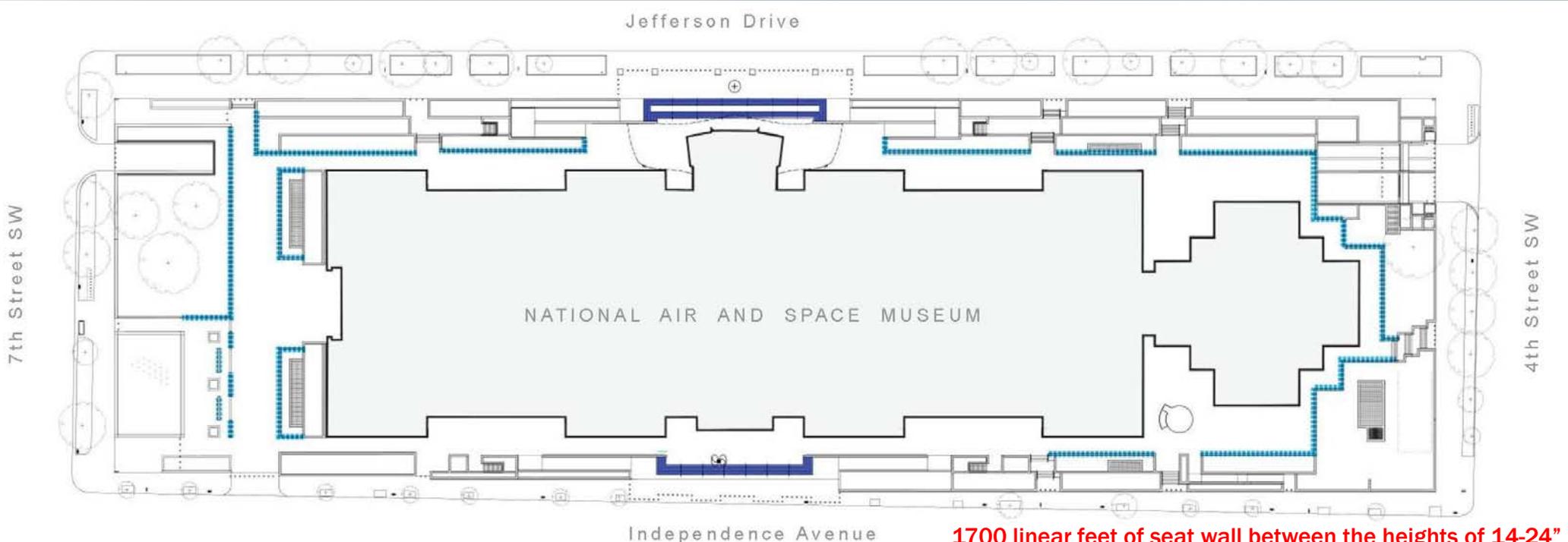


③ Continuum

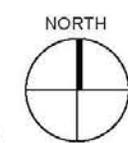
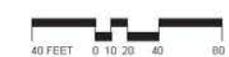
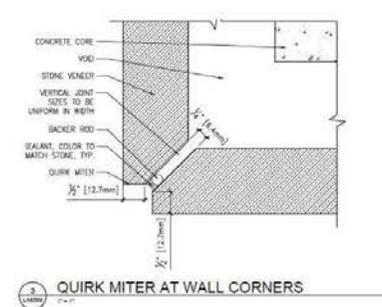
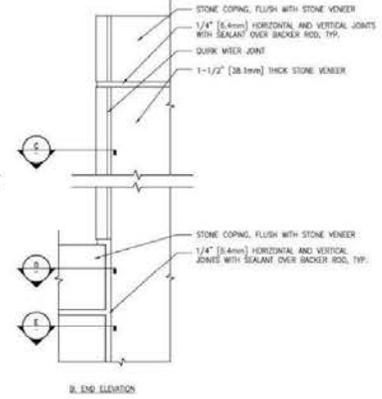
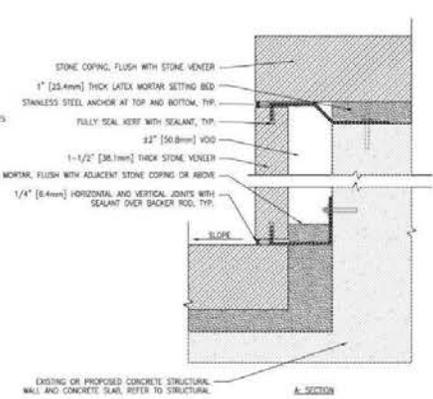
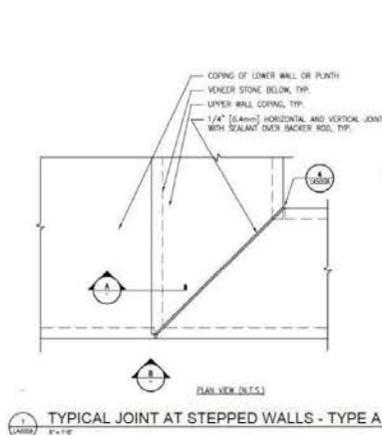


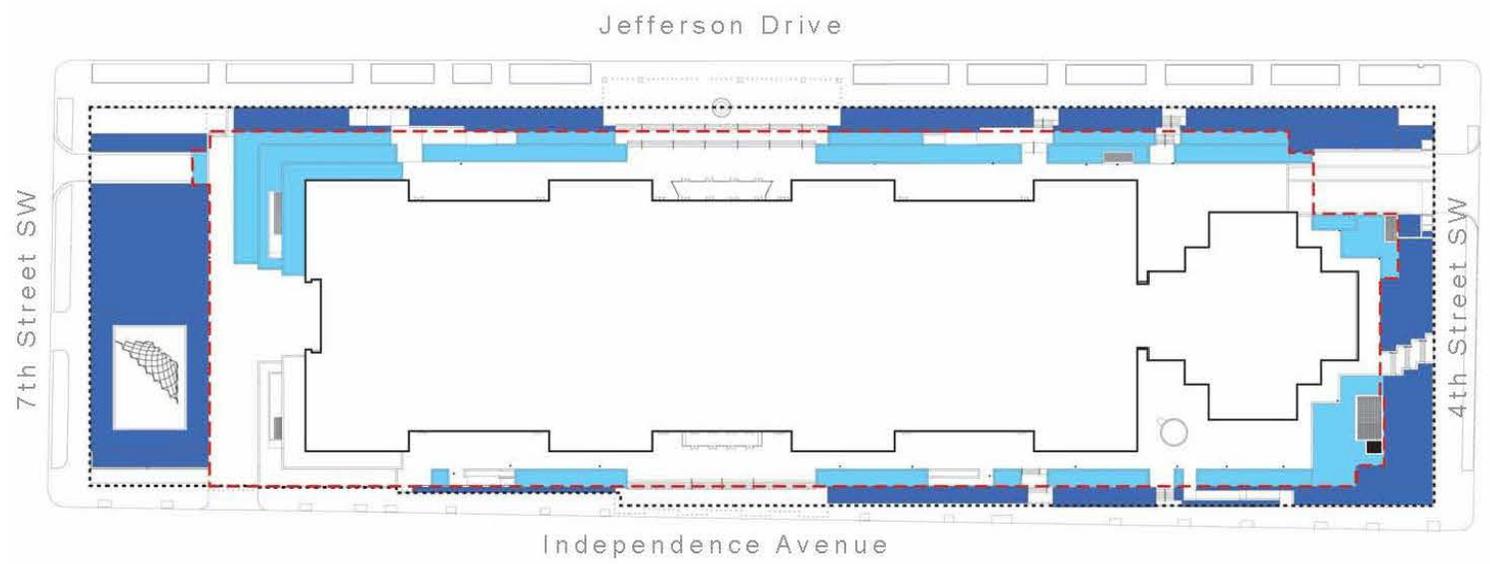
• Voyage Exhibition

- ① Existing Sculpture
- 'Voyage' Exhibit (NTS)
- SI-wide Signage (NTS)
- SI Program Signs (NTS)
- Cosmonaut Memorial (NTS)

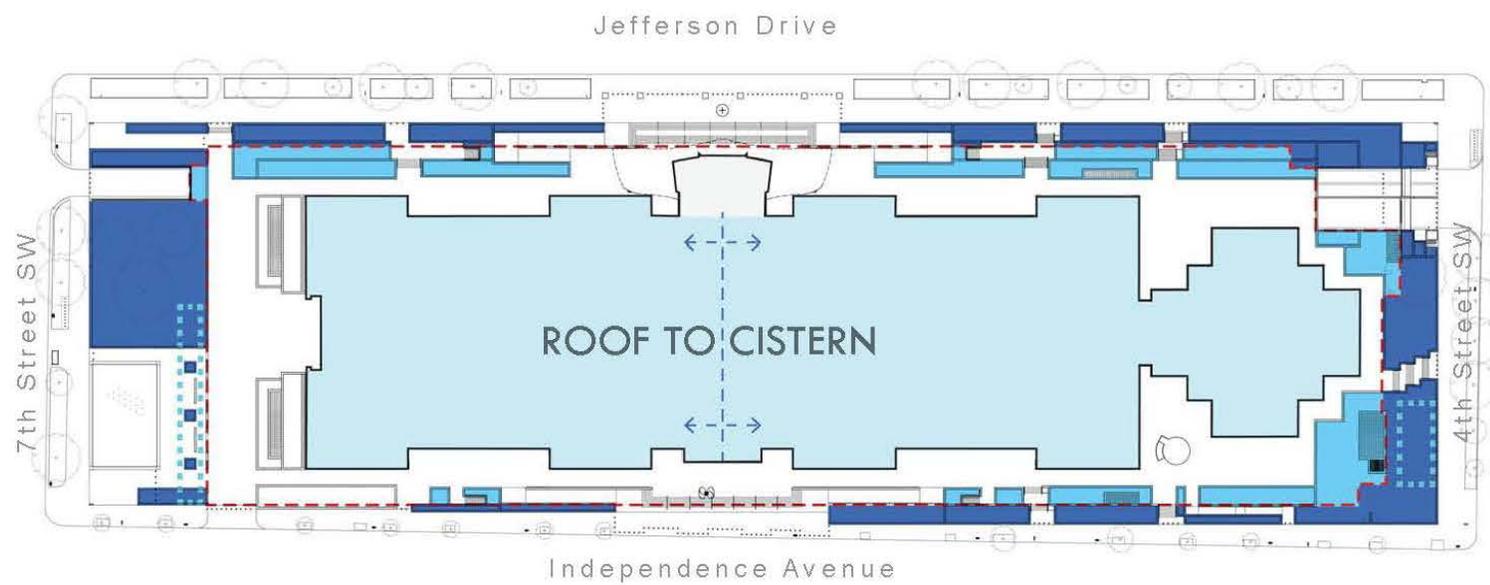


 Seat Walls
 Monumental Stair/ Informal Seating



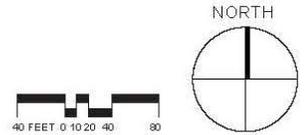


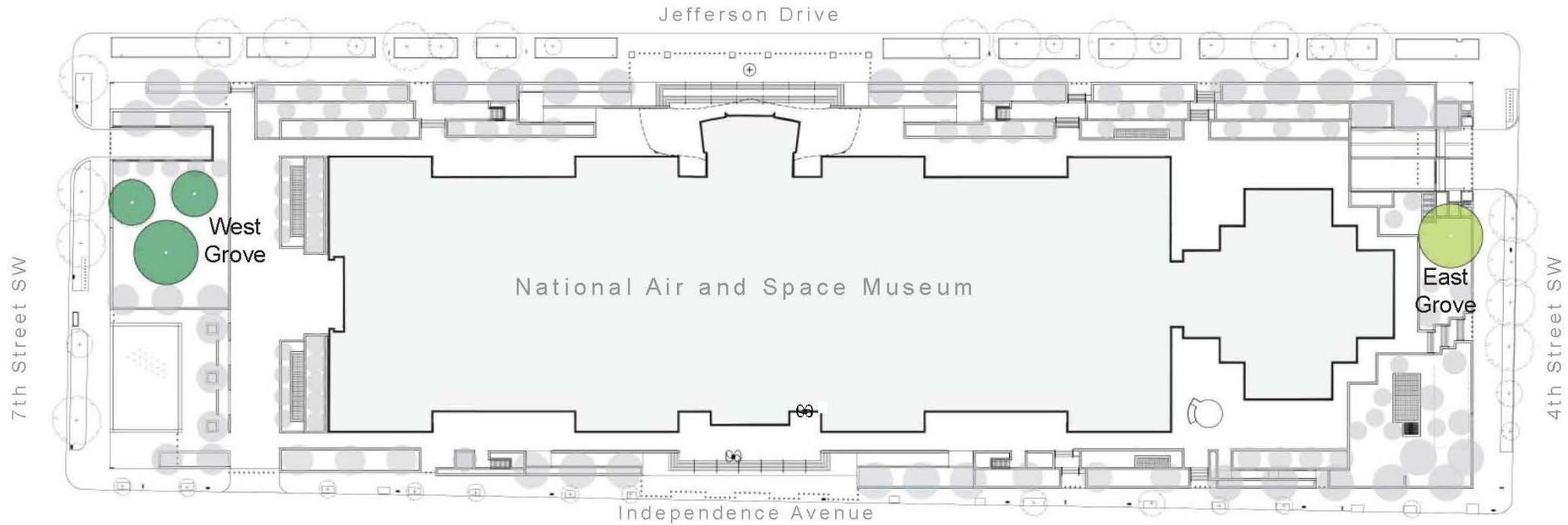
Existing Conditions



Final Design

- Project Scope-of-Work
 - To City System
 - ▨ Cistern (for Greywater Re-use)
 - ▨ To Cistern
 - ▨ Stormwater diverted to ongrade infiltration
 - ▨ Ongrade Infiltration
 - - - - - Basement Edge of Structure
- (Note: Cistern overflow to city system)





#870 Willow Oak



#875 Willow Oak

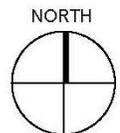


#880 Willow Oak

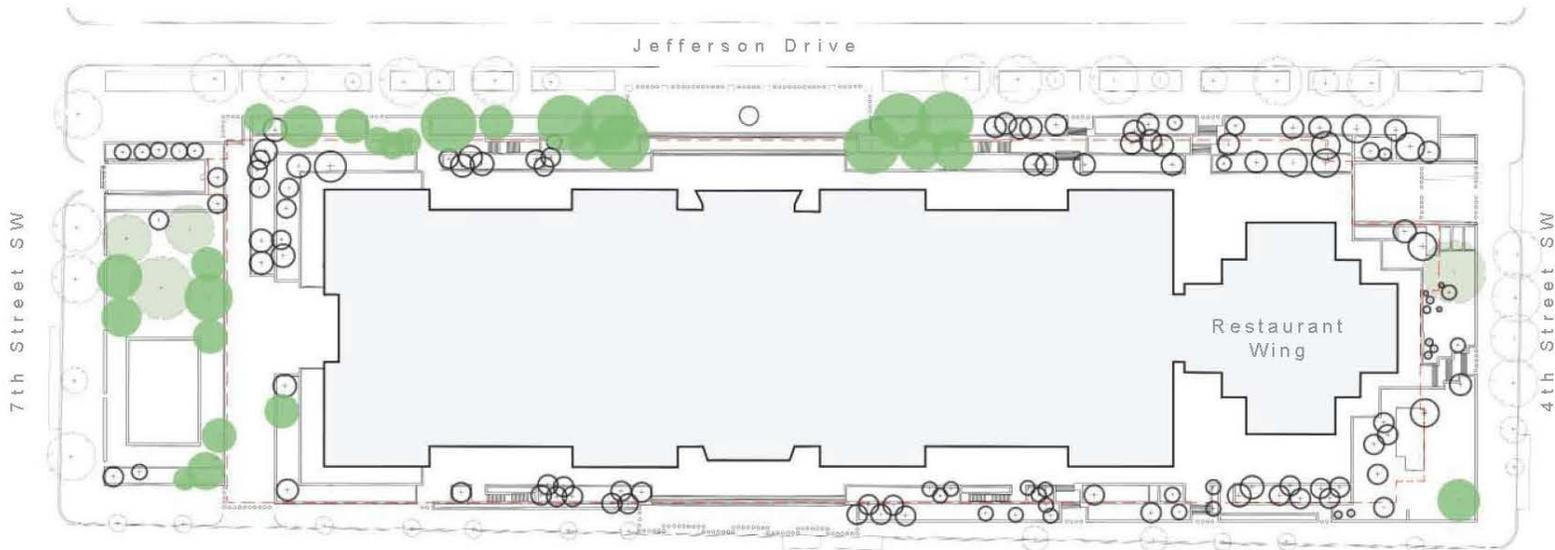


#2157 Scarlet Oak

- Willow Oak (3)
- Scarlet Oak (1)

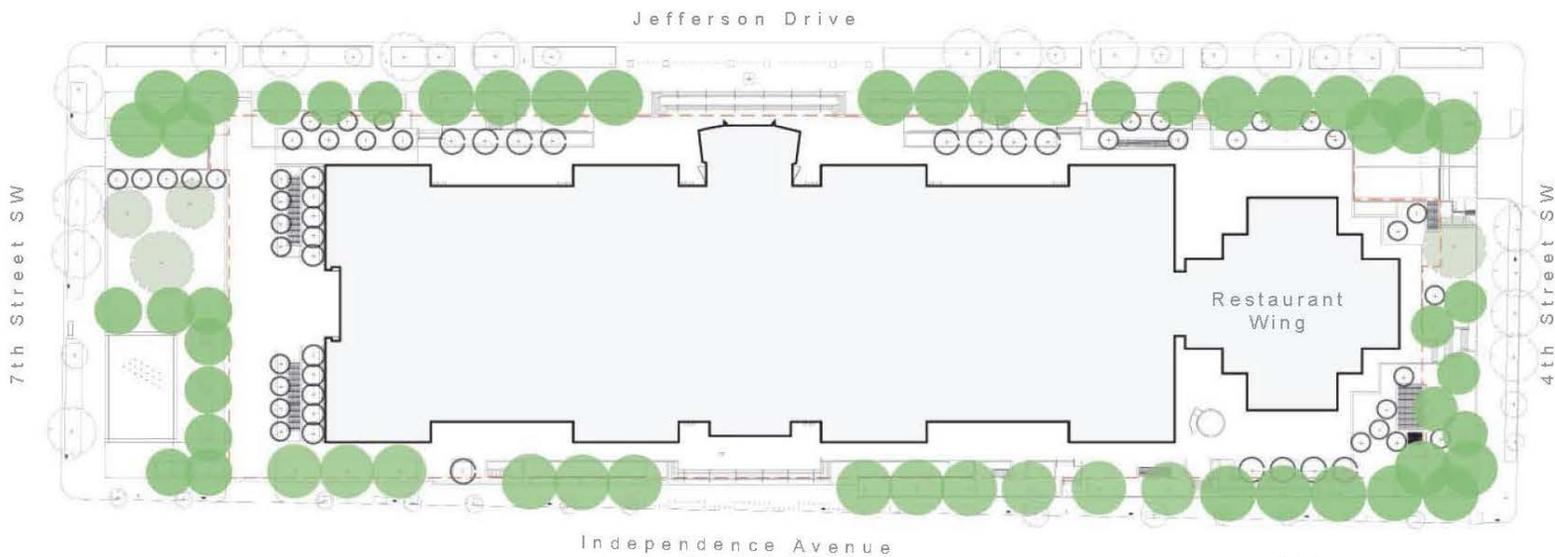


Existing Trees to Remain



EXISTING

● Existing Shade Trees to be Removed:	(408 inch Caliper)
● Existing Trees to Remain:	(121.5 inch Caliper)
○ Existing Understory to be Removed:	(1,070.5 inch Caliper)
Total Existing Tree Caliper:	1,600 inch Caliper

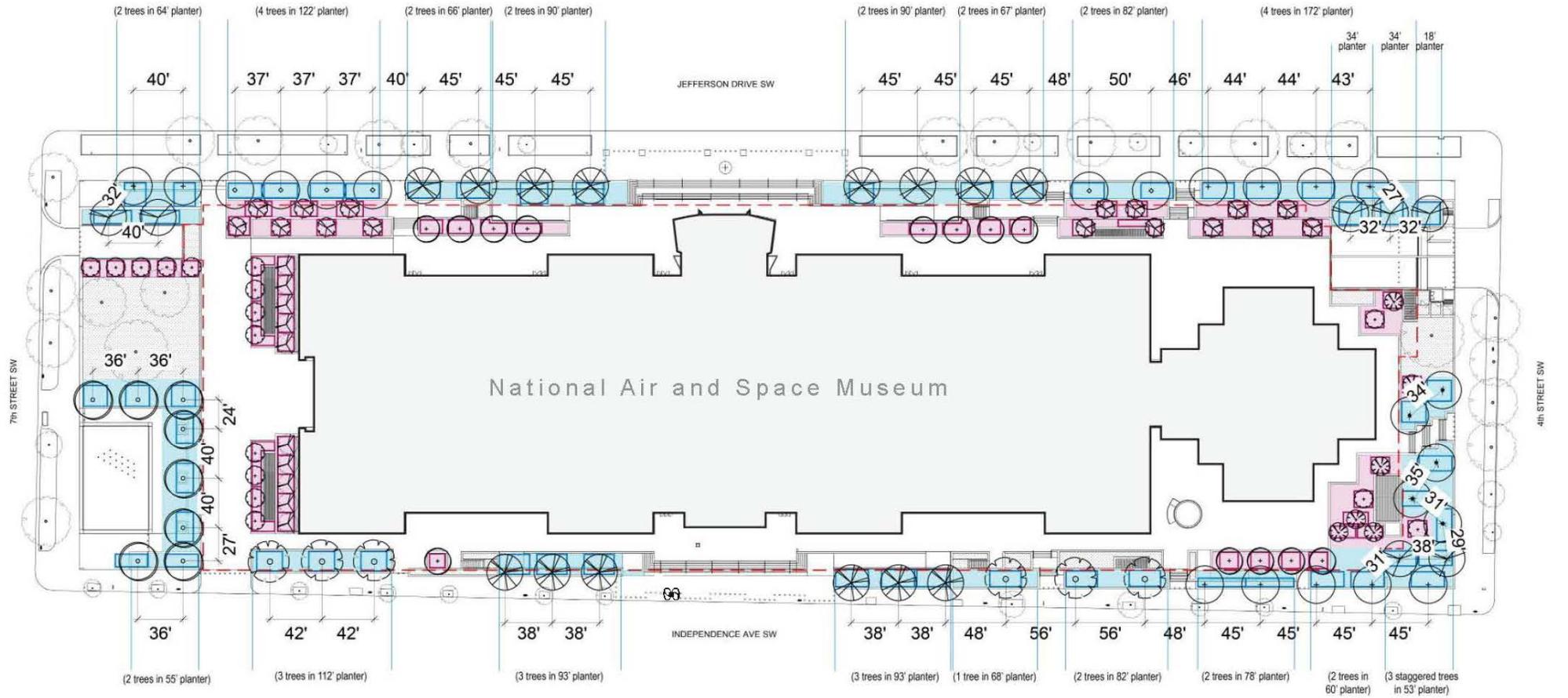


FINAL DESIGN

● Proposed Shade Trees	(224.0 inch Caliper at Installation) (1008 inch Caliper at 25-30 years)
● Existing Trees to Remain	(121.5 inch Caliper)
○ Proposed Understory	(180.0 inch Caliper at Installation) (530 inch Caliper at 25-30 years)
Total Estimated Proposed and Preserved Tree Caliper:	1,659.5 inch Caliper at 25-30 years

--- Basement Edge of Structure

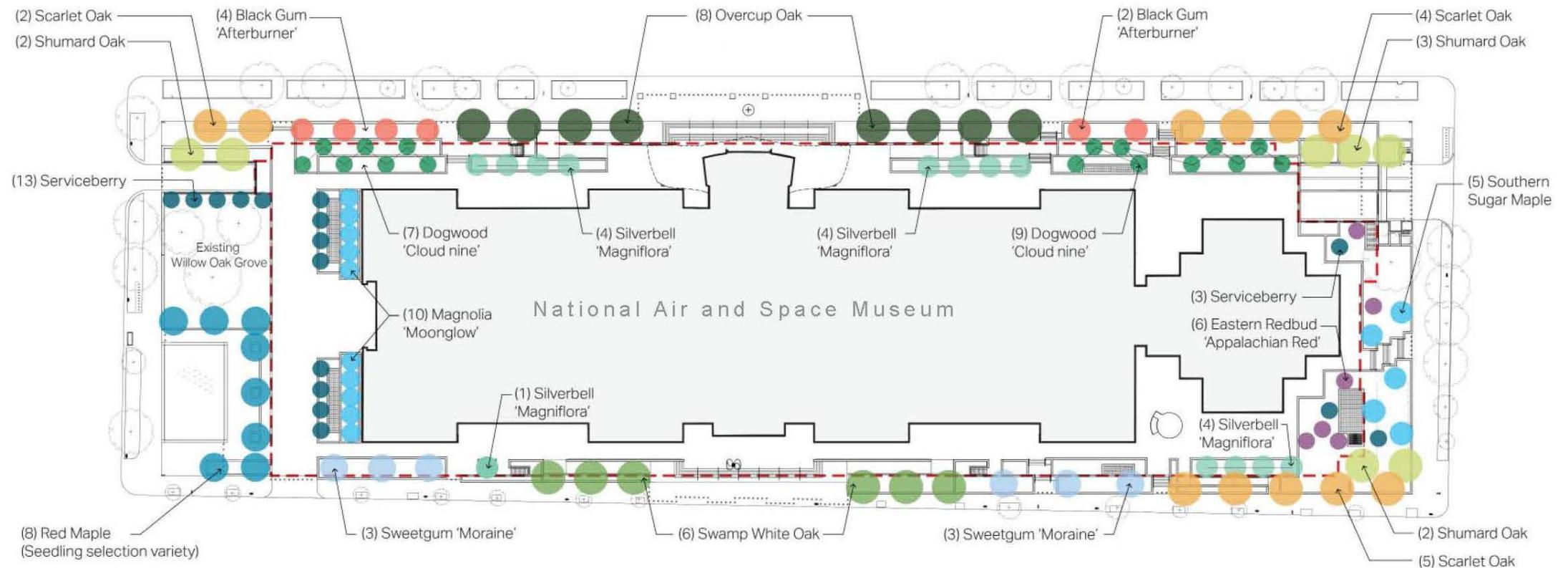
Notes:
 1. Existing tree size and locations are based on tree inventory from SI Gardens and AMT.
 2. Total tree Caliper at 25-30 years is estimated by Wetland Studies and Solutions and AECOM based on average growth rate in an urban condition.



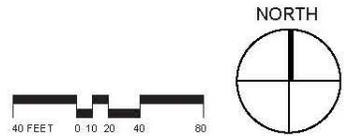
- Canopy Tree Soil Volume (1,100 cf min. per tree)
- Secondary Tree Soil Volume (600 cf min. per tree)
- Basement Edge of Structure

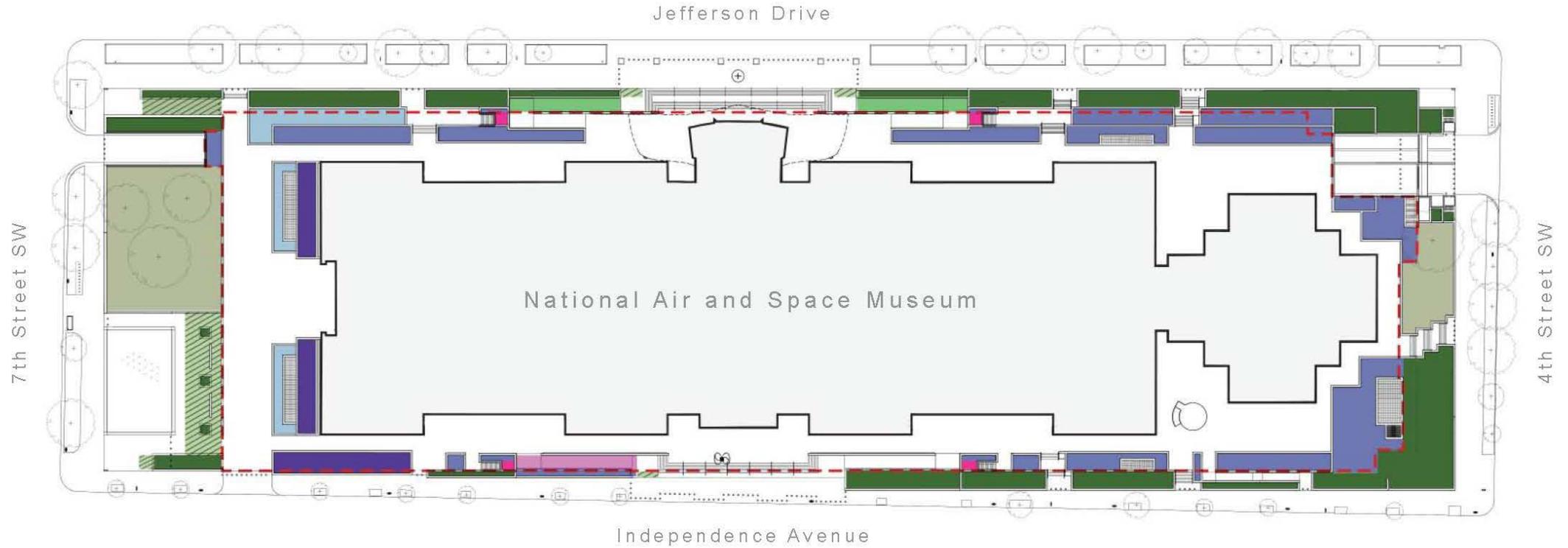


TREE Spacing, Planter Constraints, Soil Volume



- | | | | |
|----|-------------------------|----|----------------------------------|
| 8 | Overcup Oak | 16 | Serviceberry |
| 6 | Swamp White Oak | 13 | Silverbell 'Magniflora' |
| 11 | Scarlet Oak | 10 | Magnolia 'Moonglow' |
| 7 | Shumard Oak | 6 | Eastern Redbud 'Appalachian Red' |
| 5 | Southern Sugar Maple | 15 | Dogwood 'Cloud Nine' |
| 8 | Red Maple | | |
| 5 | Black Gum 'Afterburner' | | |
| 6 | Sweetgum 'Moraine' | | |





On Structure*

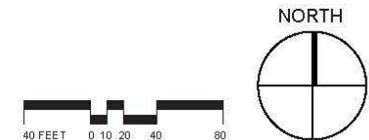
- 8"-44" Planter Depth under Inclined Walkway
- 21" Planter Depth
- 24" Planter Depth
- 30" Planter Depth
- 32" Planter Depth
- 37" Planter Depth

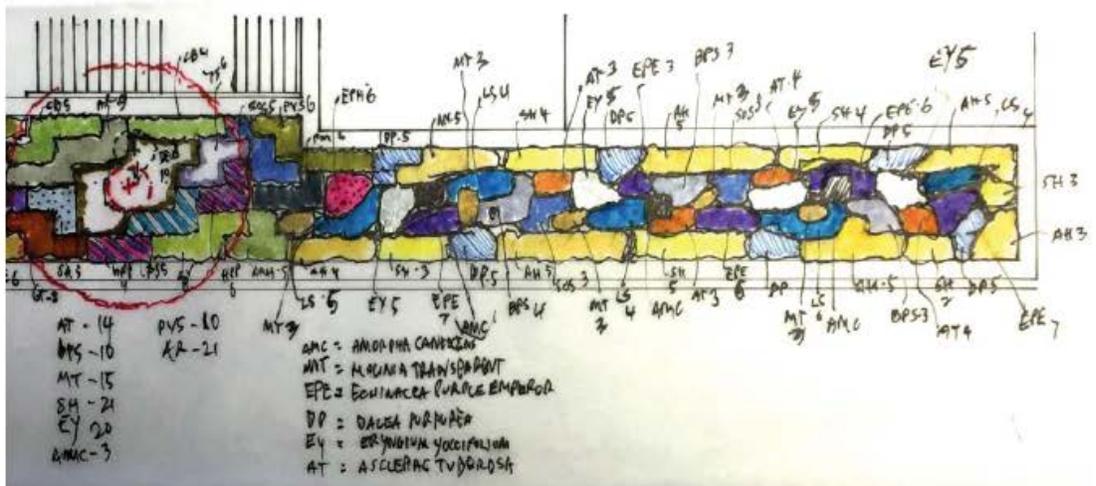
* all depths on structure are approximate

On Grade

- 36" Planter under Inclined Walkway
- 48" Structural Soil under Pavement
- 36" Planter Depth
- Soil for Existing Trees
- Basement Edge of Structure

Ground Plane Planter Soil Depth

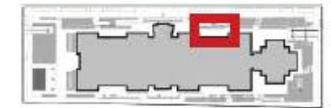




Patrick Cullina Sketch

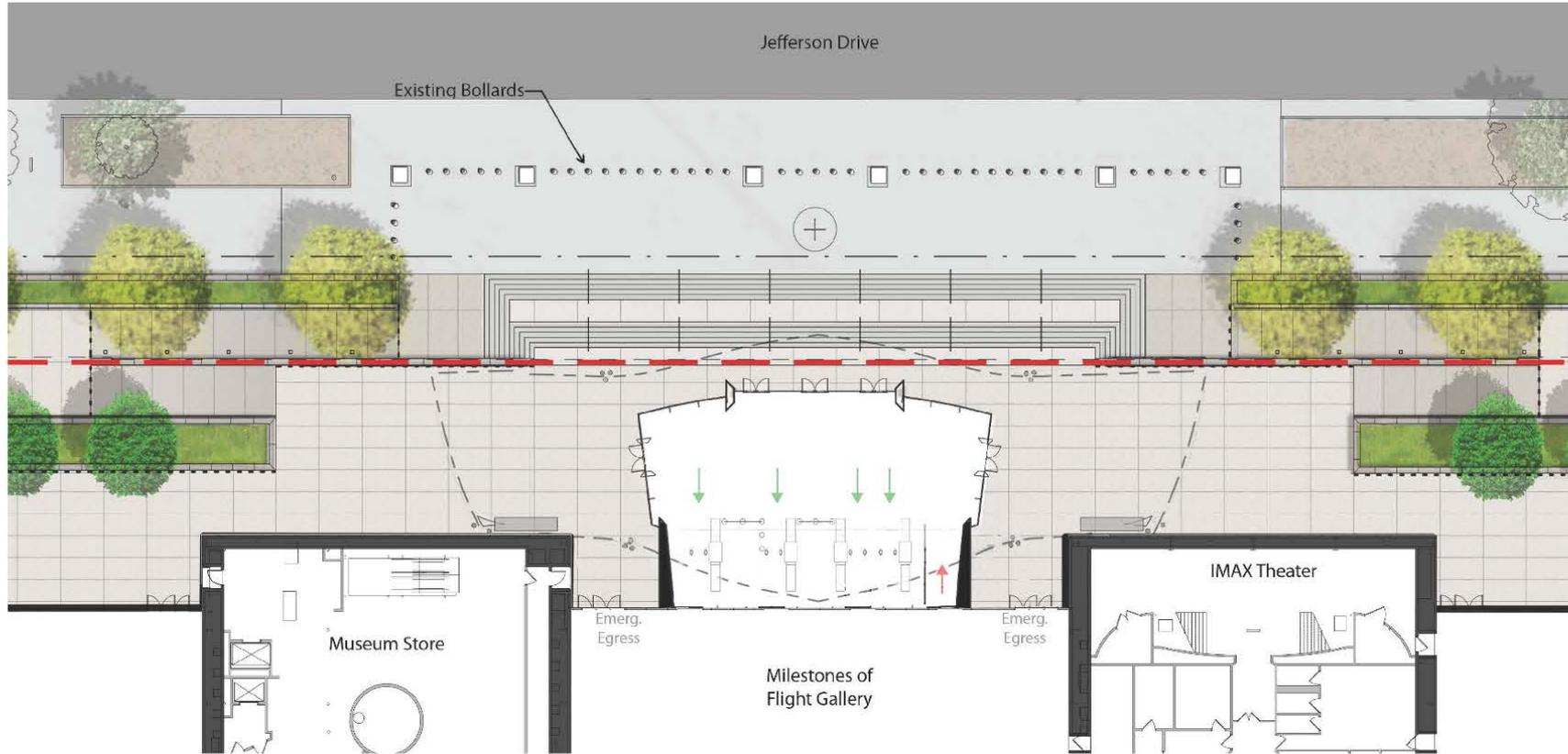
Planter Palette

Black Cohosh	<i>Actaea racemosa</i>
Lead Plant	<i>Amorpha canescens</i>
Blue Star	<i>Amsonia hubrichtii</i>
Thimbleweed	<i>Anemone virginiana</i>
Aruncus	<i>Aruncus 'Horatio'</i>
Butterfly Weed	<i>Asclepias tuberosa</i>
False Indigo	<i>Baptisia 'Purple Smoke'</i>
Reed Grass	<i>Calamagrostis brachytricha</i>
Purple Prairie Clover	<i>Dalea purpurea</i>
Japanese Shield Fern	<i>Dryopteris erythrosora 'Brilliance'</i>
Purple Coneflower	<i>Echinacea 'Purple Emperor'</i>
Purple Coneflower	<i>Echinacea pallida 'Hula Dancer'</i>
Rattlesnake Master	<i>Eryngium yuccifolium</i>
India Physic	<i>Gillenia trifoliata</i>
Coral Bells	<i>Heuchera 'Plum Pudding'</i>
Blazing Star	<i>Liatris spicata</i>
Moor Grass	<i>Molinia 'Transparent'</i>
Red Switch Grass	<i>Panicum virgatum 'Shenandoah'</i>
Creeping Phlox	<i>Phlox stolonifera 'Sherwood Purple'</i>
Prairie Dropseed	<i>Sporobolus heterolepis</i>
Aromatic Aster	<i>Symphotrichum oblongifolium 'October Skies'</i>
Toad Lily	<i>Tricyrtis 'Sinonome'</i>

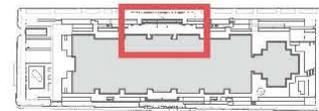


Herbaceous Ground Plane Planting - Partial Planter Perspective, Late Summer





North Vestibule Final Design - Floor Plan

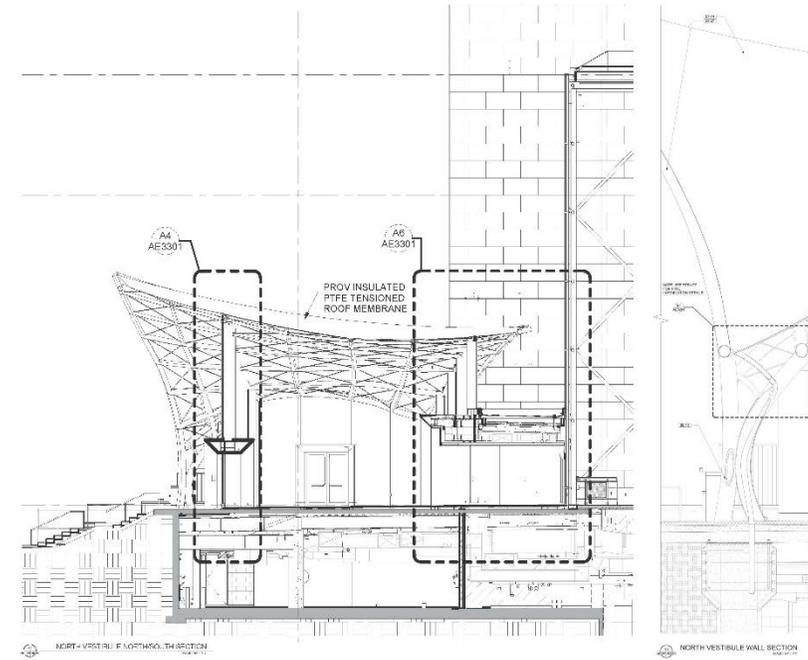




North Vestibule Final Design - Full and Partial North Elevation



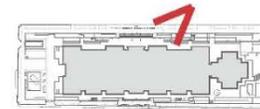
North Vestibule Final Design - Exterior Perspective

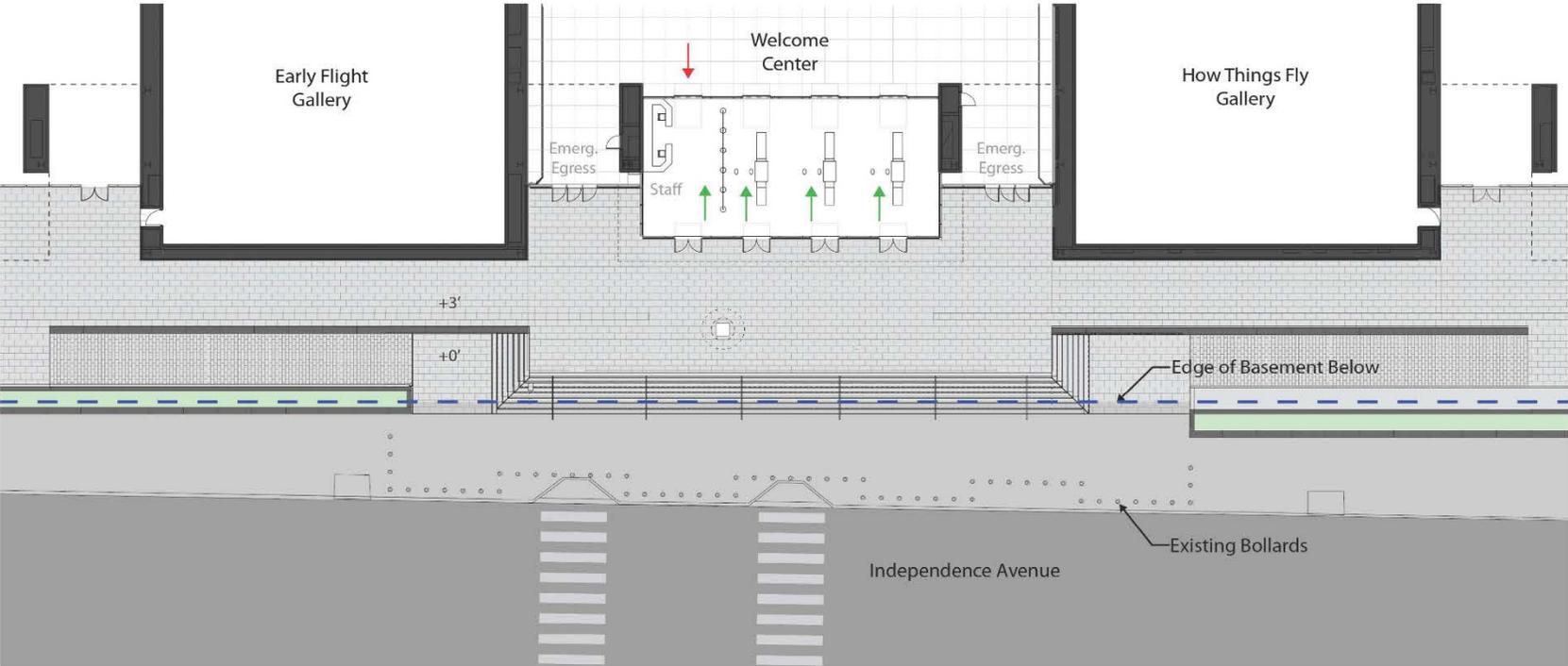


North Vestibule Final Design - North Vestibule Wall Sections and Canopy Base

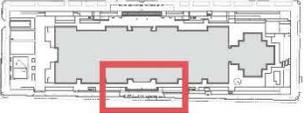


North Vestibule Canopy Base





South Vestibule Final Design - Floor Plan

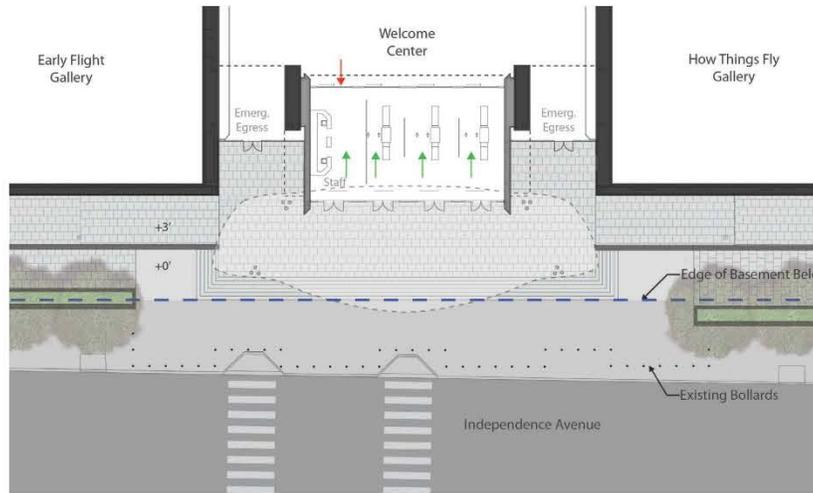




South Vestibule Final Design - Perspective from Southeast



South Vestibule Final Design - Full and Partial South Perspective Elevations



Floor Plan



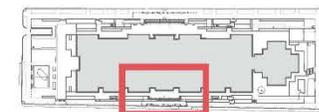
Partial South Perspective Elevation



Section Perspective



Perspective from Southeast



Construction Option - South Vestibule Replacement with Photovoltaic Canopy Addition

National Air and Space Museum Revitalization: September 2017 Colonial Rose Dry Lay Review

Smithsonian Institution

Quinn Evans Architects



Colonial Rose stone panel dry lay with dry surface as viewed from at grade in overcast conditions.



Colonial Rose stone panel dry lay with dry surface as viewed in sunny conditions from a drone hovering 50 feet above. *Image credit: Coldspring, 2017.*

National Air and Space Museum Revitalization: September 2017 Colonial Rose Dry Lay Review

Smithsonian Institution

Quinn Evans Architects



Colonial Rose stone panel dry lay with wet surface as viewed in sunny conditions from a drone hovering 50 feet above. *Image credit: Coldspring, 2017.*