



Smithsonian Institution
National Air and Space Museum

Construct Integrated Bezos Learning Center

**United States Commission of
Fine Arts:**

Concept Phase Project Report Submission

April 18th, 2024

Contents

A	Project Overview	3
	1 – Project Data	4
	2 – Mission and Goals	5
	3 – Description of Buildings and Project Scope	6
	4 – Outreach and Coordination	7
B	Project Information and Drawings	9
	1 – Design Inspiration	10
	2 – Site Context	11
	3 – Architectural Design	18
	Architectural Design Approach	18
	Program Areas	21
	Floor Plans, Site Sections, & Elevations	22
	Exterior & Interior Renderings	32
	Phoebe Waterman Haas Observatory	53
	4 – Landscape Design	59
C	Environmental and Historic Considerations	68
	1 – Historic Preservation	69
	2 – Natural Resources	77
	3 – Flooding Mitigation	78
	4 – Stormwater Management	80
D	Appendix	81
	1 – Connection to NASM Alternatives	82
	2 – Landscape Design Alternatives	90
	3 – Facade Materiality Alternatives	101
	4 – Building Composition Alternatives	109



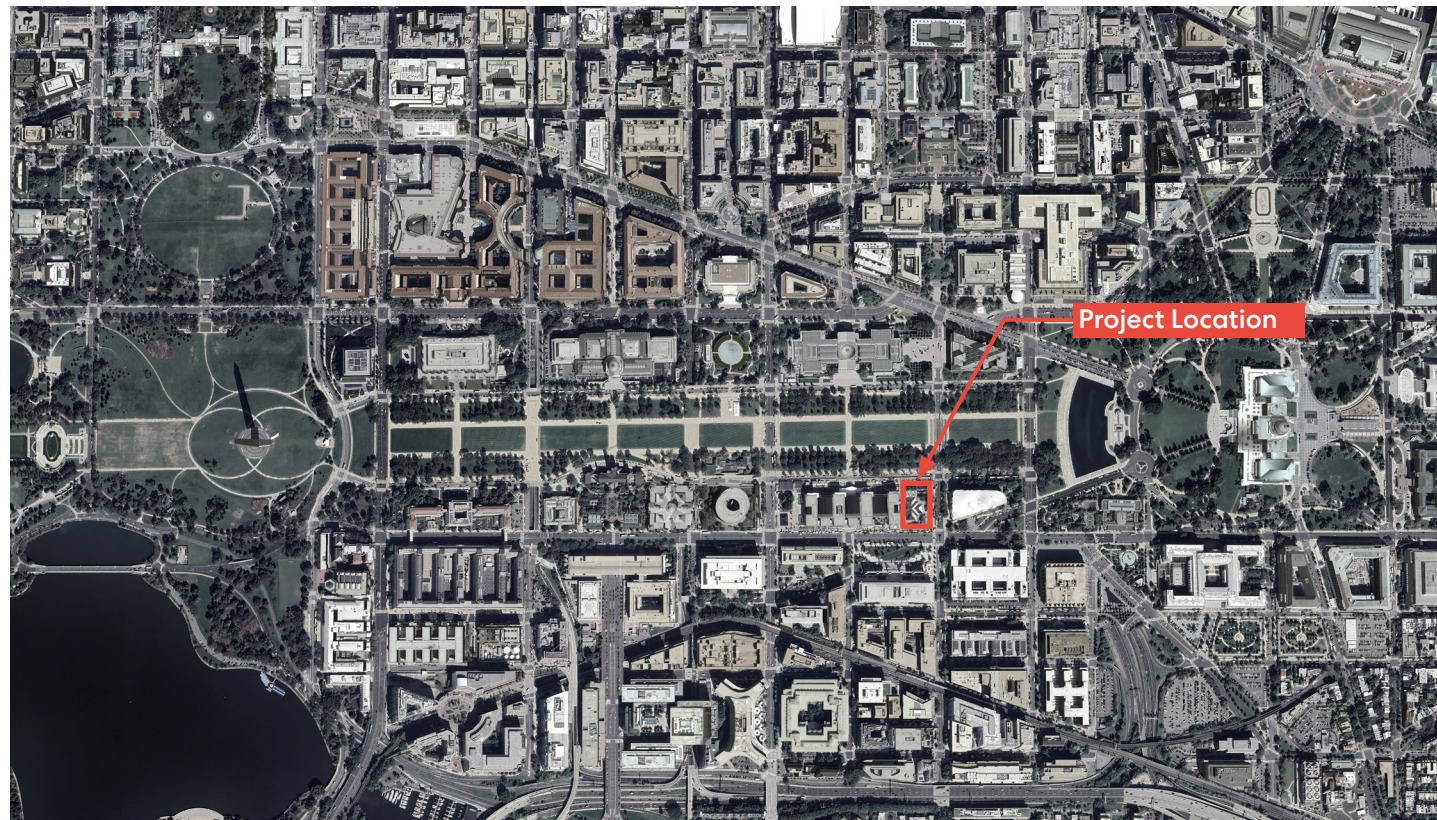
Project Overview

Project Data

Project Name

National Air and Space Museum - National Mall Building (NASM-NMB)
Bezos Learning Center

Vicinity Map



Agency

Smithsonian Institution

Smithsonian Institution (SI)

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Project Location and Site Area

The Bezos Learning Center (BLC) site is a 108,714 SF (2.50- acre) parcel that is part of the National Air and Space Museum. The site is bounded by Jefferson Drive SW to the north, Independence Avenue on the south, 4th Street SW on the east, and the existing NASM-NMB Building on the west. The immediate site context includes the National Mall, the National Museum of the American Indian, and the Dwight D. Eisenhower Memorial.

Proposed Development and Alternatives

The total area of the new buildings is approximately 81,733 SF (above grade only) and the total site coverage is 30.2%. The Smithsonian's preferred design and alternatives that are being considered are:

- Connection to NASM-NMB from the east of the site
- Overall landscape design approach.
- Facade materiality alternative
- Building composition alternative

See Appendix for illustrations of alternatives considered. Smithsonian's "preferred" design option is included in the body of the report. The appendix included both preferred design and alternate design for comparison.

Master Plan Alignment

The BLC fulfills the requirements of the 2013 NASM Master Plan which called for a replacement to the existing restaurant to include a new restaurant, education center, permanent observatory structure and renovations to the basement level.

Assigned Employment

SI anticipates relocating approximately 12 employees within the same complex from NASM-NMB to the BLC and this would not be expected to change over a 20 year period.

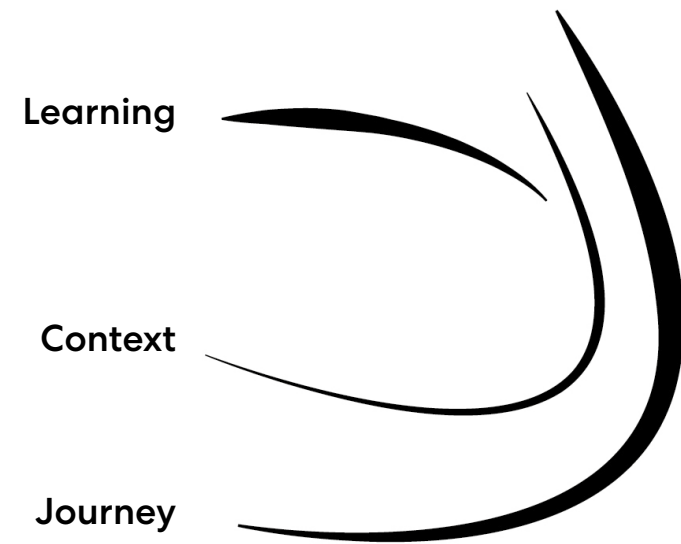
Construction Schedule

Construction start date: late 2025

Construction finish: early 2027

Opening: mid 2027

Mission and Goals



The Bezos Learning Center (BLC) is the next major evolution of the National Air and Space Museum (NASM) in support of its mission. The BLC will be a pan-institutional entity and will fill a critical need to inspire today’s learners - particularly those in under-resourced communities - to pursue STEAM (Science, Technology, Engineering, Art, and Math) careers and become the engineers, astronomers, scientists, and visionaries of our future.

In 2021, the Smithsonian Institution (SI) announced a \$200M philanthropic gift from Jeff Bezos in support of exhibition construction within the revitalization of NASM-NMB and the construction and operation of the BLC.

The architectural and engineering (A/E) team of Perkins&Will began work on the design of the BLC on June 1, 2023, after selection by SI through a competition process. The A/E team has engaged with a core team from SI on a bi-weekly basis and conducted discipline-specific workshops and meetings. This valuable input, coupled with feedback from the Commission of Fine Arts (CFA), the National Capital Planning Commission (NCPC), the District of Columbia State Historic Preservation Office (DC SHPO), and the Section 106 Consulting Parties, is reflected in this concept design.

The overarching design approach for the BLC is comprised of three tenets:

Learning: Creating spaces for experiential learning and traditional instruction

Context: The physical context on the National Mall and connection to NASM requires a deep understanding and sensitivity to our Nation’s shared place of learning, remembrance and inspiration.

Journey: A journey of discovery through project-based learning and exposure to the stories in NASM will spark curiosity and inspire further STEAM studies.

The following chapters of the CFA Concept Review outline how each tenet is addressed at this stage of the project’s design.

Description of Buildings and Project Scope

Bezos Learning Center

Phoebe Waterman Haas Observatory and Astronomy Park

The two projects noted above require an integrated design approach for cost effectiveness and timing efficiency. The BLC is to be located above and adjacent to the existing NASM loading dock in the basement level. The Phoebe Haas Observatory and Astronomy Park needs to be integrated with the surrounding East Terrace to create a comprehensive BLC site and landscape design that is conceptually aligned with the BLC architecture, yet respectful of the NASM Revitalization landscape.

Concept Design

This Concept Design establishes the architectural “parti”, which is the inspiration for the design, organization of the program components, and response to context. The conceptual parti is based on two design priorities, the spiral galaxy as inspiration and the Learning Courtyard. The landscape and building plans, architectural massing and expression will continue to evolve in the next design phase.

Project Scope

The comprehensive project scope includes:

- The Bezos Learning Center on levels two and three.
- A new 600-700 seat restaurant on level one (terrace level), readily accessible to museum visitors.
- A new east vestibule directly connected to NASM on level one and a new south entrance for school groups.
- Upper terrace to support BLC programming.
- A new Astronomy Park at the eastern portion of the site (the east terrace) and the permanent installation of the Phoebe Waterman Haas Observatory.
- The ability to project imagery on appropriate building facades.
- Aspects of the East Terrace from the NASM Revitalization project which were deferred when the BLC project was initiated.

Through the course of Concept Design, the following program elements were adjusted:

- The direct connection in the form of a bridge between BLC level two and NASM level two Concourse was eliminated to control public access to the BLC.
- Two, instead of one, security vestibules will be required: one dedicated to the BLC participants approaching from Jefferson Drive and one dedicated to scheduled school bus groups approaching from Independence Avenue. The general public visiting NASM will continue to enter through the existing main north and south NASM entries.
- The separation of BLC circulation from NASM circulation to the greatest extent possible is desirable as is entry to the museum restaurant from the main museum building.

Outreach and Coordination

Public Engagement

The SI, DC SHPO, and the NCPC executed a Programmatic Agreement in March 2022, which oversees the demolition of the restaurant addition, and future Section 106 consultation for the BLC. The agreement stipulated a design framework that was considered in the development of the concept design. Additionally, in their role as lead federal agency for Smithsonian projects, NCPC identified the need for a National Environmental Policy Act (NEPA) process with inclusion of an environmental assessment .

NASM East End Programmatic Agreement Bezos Learning Center Program

- Building Parameters: Two levels above a ground floor restaurant, connected to the NASM at the east end
- Observatory Program: Consultation to establish a permanent location for the Phoebe Waterman Haas Public Observatory
- Astronomy Park: Consultation to site the outdoor Phoebe Waterman Haas Astronomy Park on the east terrace
- Comprehensive East End: Cohesive design of the BLC, Observatory, Astronomy Park with east terrace site features and a revitalized landscape design

NASM East End Programmatic Agreement Bezos Learning Center Design Framework

- Respect the formal setting of the National Mall and neighboring museums
- Respond to NASM's architecture and massing with an addition that maintains the form and integrity of the NASM and environment
- Consider the physical connection to the NASM and exterior materials
- Respect contributing vistas of the National Mall Historic District and the building line established by the Plan of the City of Washington

The A/E team with support from a core SI team has conducted three consulting parties meetings throughout the current design phase. Consulting parties were held per Section 106's requirements for consultation process and procedures. The meetings introduced the Area of Potential Effects (APE) and identified the historic resources within the APE, as well as kept all Consulting Parties up to date on the project's design development.. The comments generated from consultation are reflected in this concept design.

The Consulting Parties Meeting were held on the following dates:

1. Consulting Parties Meeting #1 - 08/09/2023
2. Consulting Parties Meeting #2 and NEPA Scoping - 11/01/2023
3. Consulting Parties Meeting #3 - 02/26/2024

Topics of discussion for the Consulting Parties and NEPA Scoping meetings generally consisted of the following:

- Project introduction
- Section 106 and NEPA Process
- Context of Genesis of Form and Space
- Exterior Design Evolution
- View Sheds
- Alternatives
- NASM history and Identification of Historic Resources
- Contributing features
- Project purpose and need
- Area for Potential Effects (APE)

Outreach and Coordination

Coordination with Federal, State, and Local Jurisdiction

National Environmental Policy Act

The National Environmental Policy Act, or NEPA, requires federal agencies to involve the public when making decisions that may impact the natural, cultural, and socioeconomic environment. An environmental assessment, or EA, will look at the potential impacts from the proposed action.

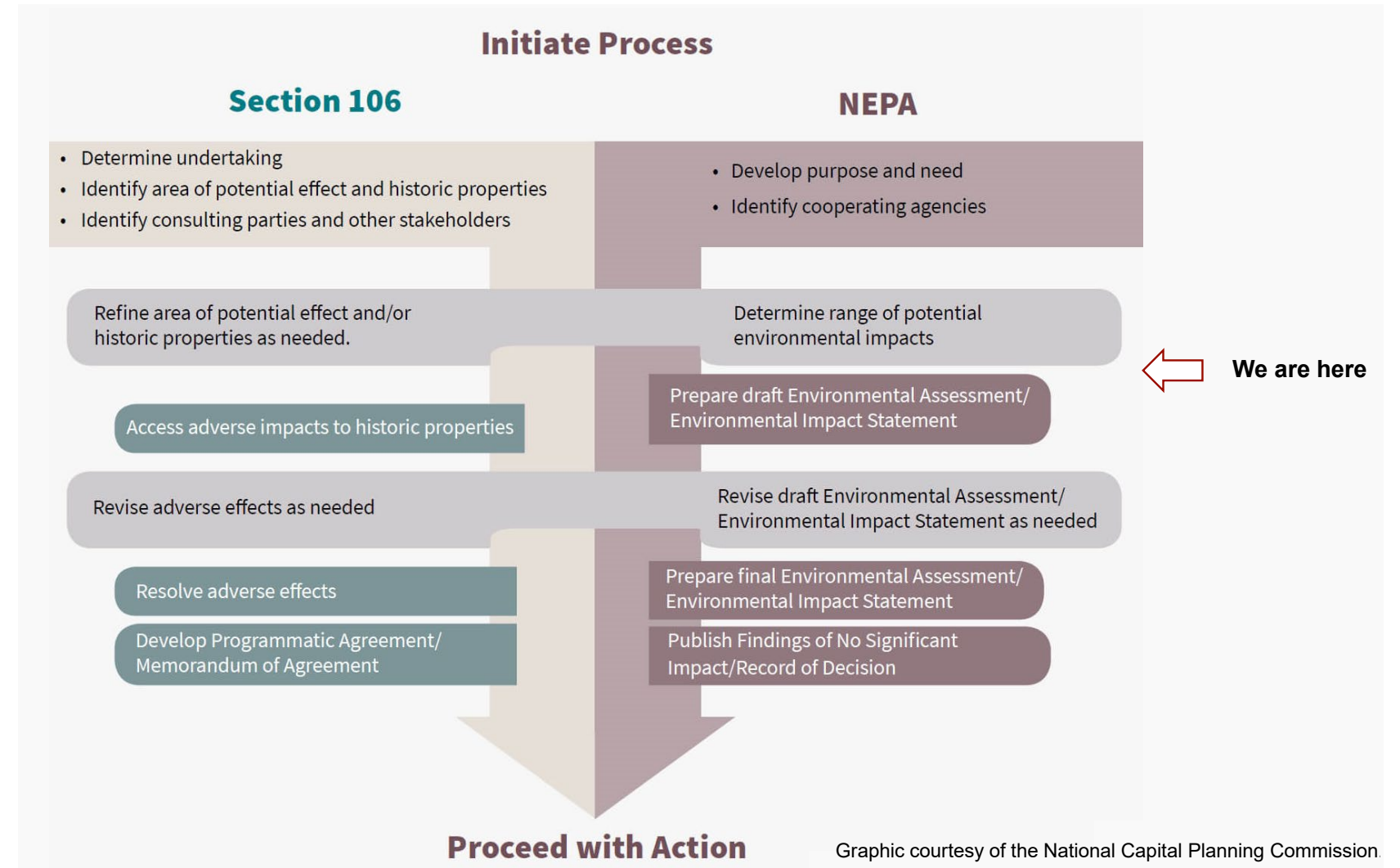
NCPC will serve as the lead and responsible federal agency and work with SI as project owner to comply with NEPA. NCPC and SI will prepare an Environmental Assessment (EA) to analyze the environmental impacts of a range of alternatives for this project, in accordance with NEPA. The National Park Service will serve as a cooperating agency in the preparation of the EA due to the project's proximity to the National Mall and Eisenhower Memorial. Concurrently, SI will conduct consultation under Section 106 of the National Historic Preservation Act (NHPA.)

Stormwater and Erosion and Sediment Control (ESC) permits from the Department of Energy and Environment (DOEE) will be obtained, as will the National Park Service (NPS) and the District Department of Transportation (DDOT) permits for any construction work impacting the sidewalk zones where maintenance responsibilities are shared.

The Bezos Learning Center will submit design progress to the following entities:

- U.S. Commission of Fine Arts (CFA)
- National Capital Planning Commission (NCPC)

Process Overview for Section 106 and NEPA compliance:





**Project Information
and Drawings**

Design Inspiration

The galaxy that is home to our solar system, the Milky Way, was once thought to be the entire universe. Today, we know our galaxy is one of billions. As the universe continues to expand ever outward, the mysteries to be explored and solved by scientists, astronomers, and students is equally vast. The National Air and Space Museum (NASM) Bezos Learning Center (BLC) provides a profound opportunity to re-imagine STEAM learning in the service of these planetary puzzles. Students and teachers from inside the Capital Beltway and across the country will immerse themselves in a creative learning environment where discovery awaits.

The inspiration for the form of the BLC is a spiral galaxy, whose form reflects two-thirds of the known galaxies, including our own Milky Way. The building's architecture metaphorically places the individual student, educator, and visitor at the core of the galaxy, surrounded by educational experiences and paths of discovery that lead to infinite possibilities for their future in science, innovation, and leadership.

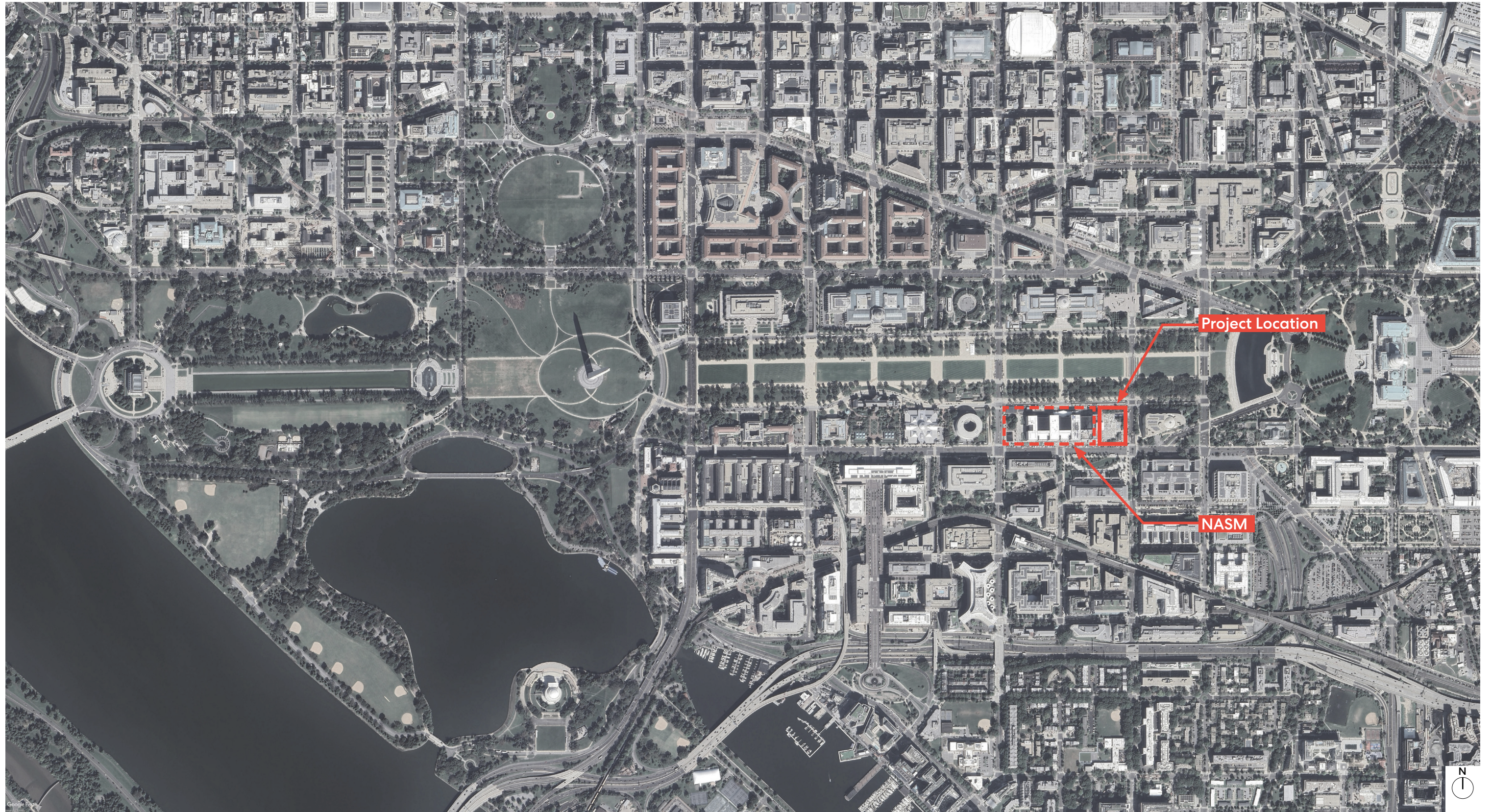
The central circulation spine of NASM, which takes visitors through the legacy of aviation and spaceflight, evolves into an energizing, spiral geometry within the BLC, creating a symbolic destination for the study of the universe. Flexible spaces support project-based, experiential learning for students within the BLC. The spiral trajectory takes shape in the Concourse - a panoramic, multi-story, circulation spine whose geometry extends out into the landscape to create the Learning Courtyard and Astronomy Park. From the Mall, visitors will see the Learning Courtyard framed by the Concourse rising skyward, recalling the form of the galaxy. The design of the exterior enclosure uses texture to create dramatic shadow patterns by day that reinforce the energy and movement within the BLC. At night, these openings will transform into streaks of subtle light, recalling shooting stars in the night sky and act as a beacon for space exploration and discovery.

NASM is one of our nation's greatest treasures. The BLC represents the next major evolution of the museum's mission, continuing the journey set in motion by the Wright brothers almost 120 years ago. Inspired by our Spiral Galaxy, the building design creates an experience for each individual student, educator, and visitor to unlock their potential in science, innovation, and leadership.



Site Context

NASM Site Location



Site Context

Aerial View of the National Mall looking west

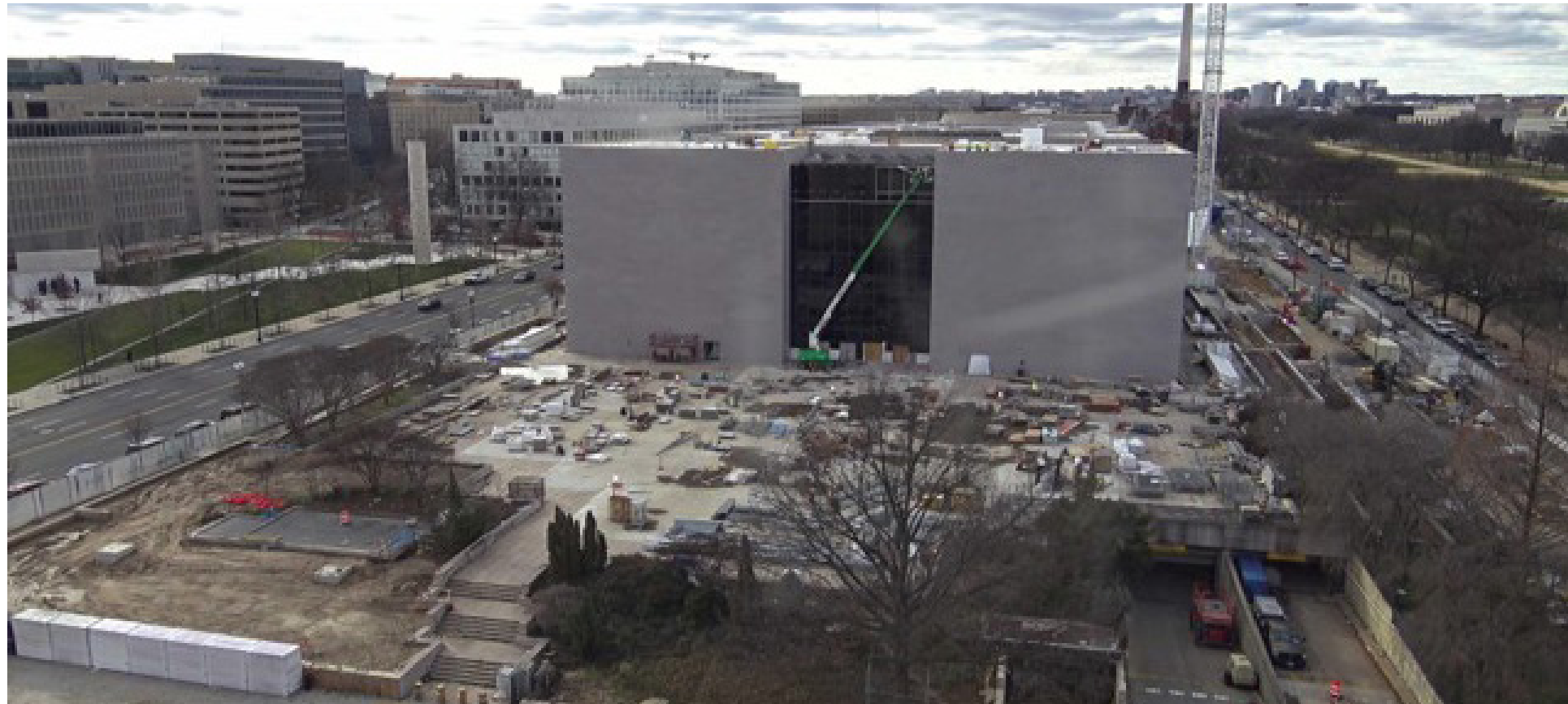
Aerial view of the National Mall (2007) looking west from the US Capitol to the Washington Monument, illustrating the broadening vistas of Maryland Avenue and Pennsylvania Avenue, and the reciprocal views between the Washington Monument and the U.S. Capitol building.



Aerial image of National Mall
Image courtesy of the Architect of the Capitol

Site Context

Existing Site Photographs



NASM east terrace looking west, December 2023.
Photograph courtesy from SI



NASM east terrace looking east, March 2023.
Photograph courtesy from SI

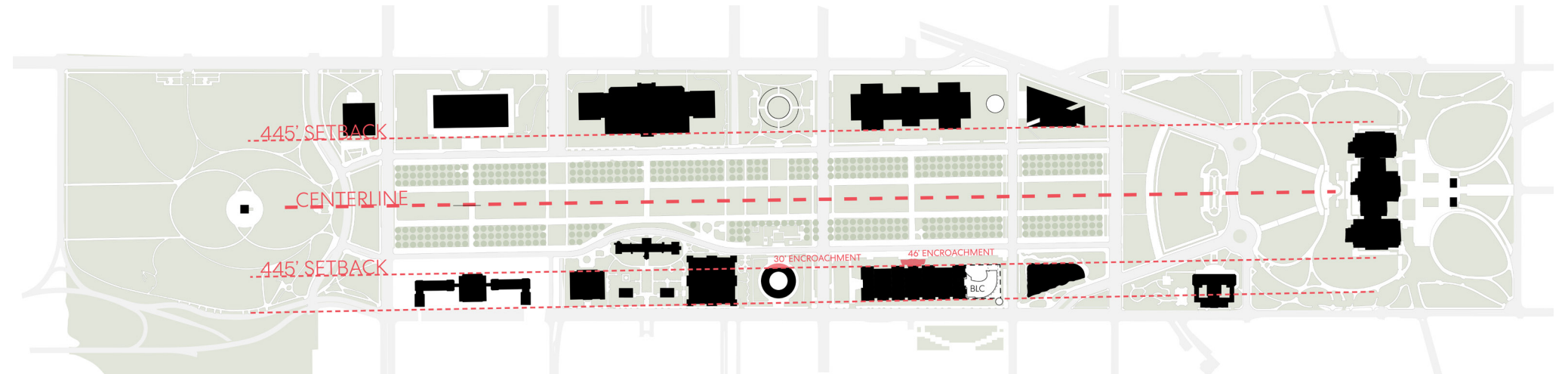
Site Context

Contextual Framework

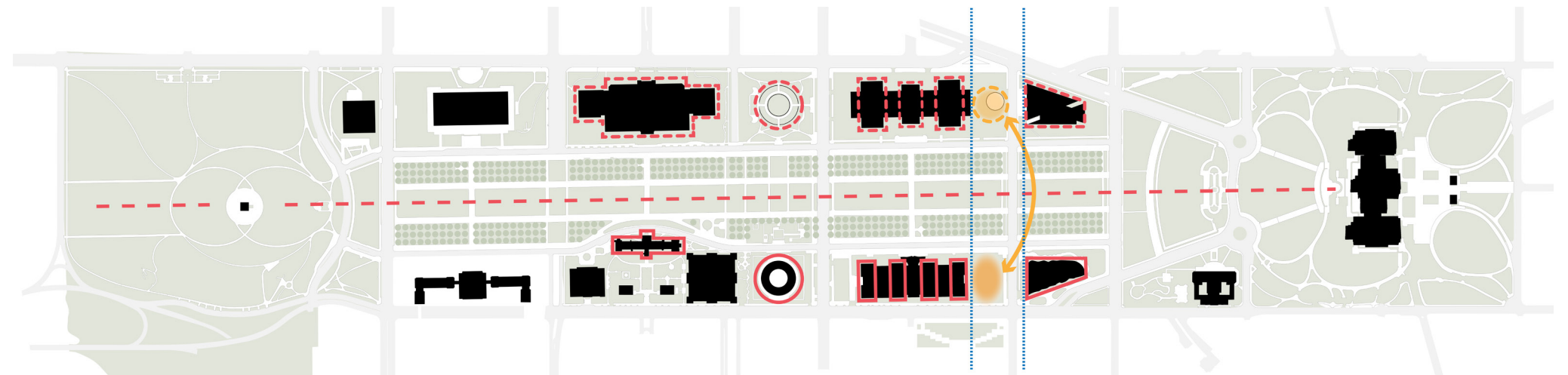
The site is defined on the north side by the face of the National Air and Space Museum (NASM) along the 445'-0" setback as prescribed by the McMillan Plan. It is aligned with the southern face of NASM-NMB and is cornered by the historic Maryland Avenue vista.

The Mall planning framework as set out by the McMillan Plan, includes a formal reflection of its building developments on either side of the east/west centerline between the Capitol building and the Washington Monument. In 1976 Gyo Obata's design for the National Air and Space Museum was reflected and is in alignment with the National Gallery of Art, fitting like two pieces of a puzzle. The site is situated across the Mall from I.M. Pei's cascading waterfall and entry plaza to the National Gallery of Art West Building. This sets forth a language of reciprocal open space and building mass fronting the Mall.

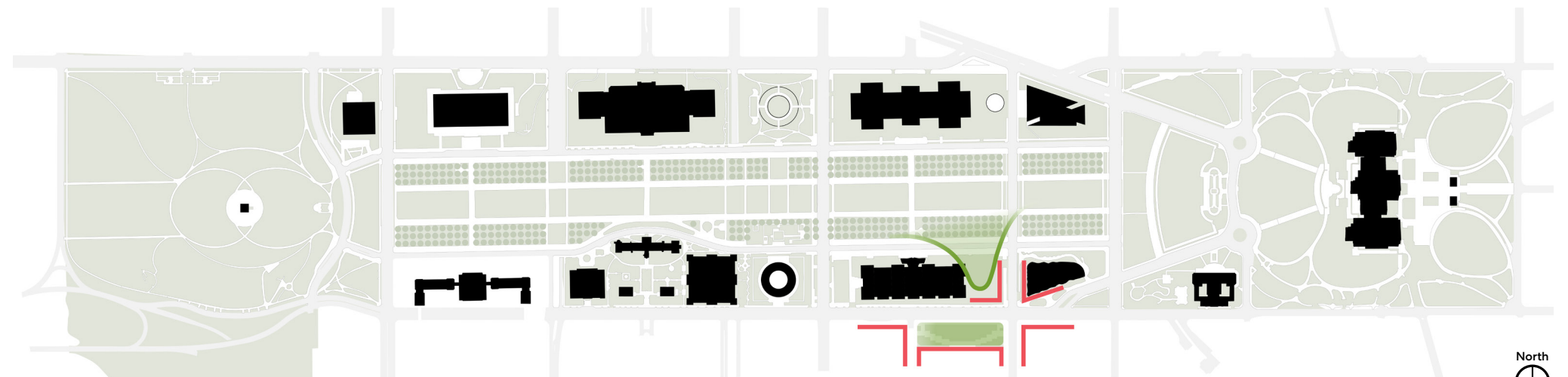
To the south the site is fronted by an urban environment and the Dwight D. Eisenhower Memorial across Independence Avenue. With the presence in between two major public realms, The National Mall and the Dwight D. Eisenhower Memorial, the site is a connection between the two, and the BLC will provide spectacular views of both.



Contextual Alignment - McMillan Line



Open Space Reflection



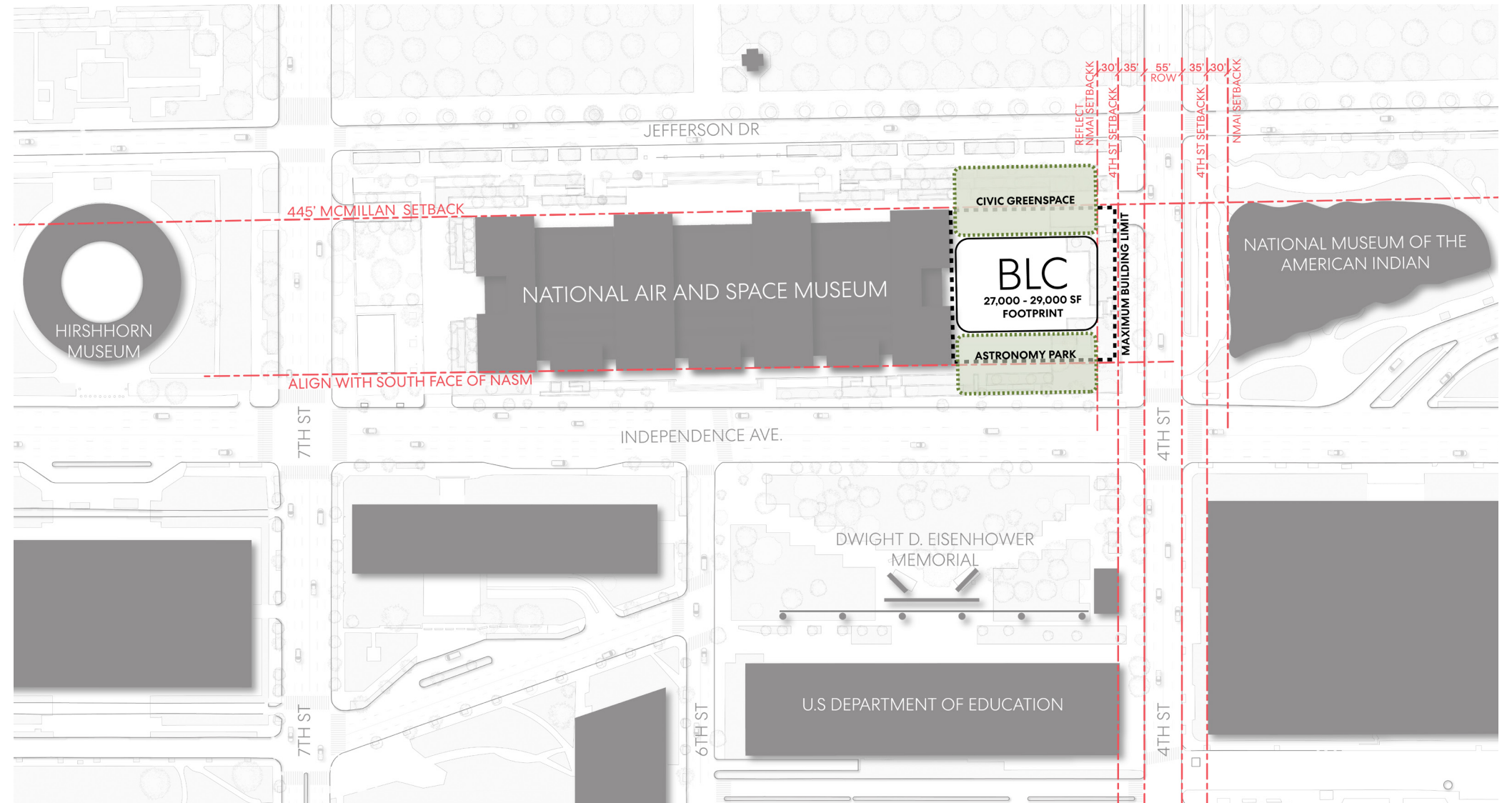
Urban Edge and Green Space

Site Plan diagram

Contextual Framework

As previously mentioned the northern and southern edge of the National Air and Space Museum (NASM) defines the setback extents for the BLC. The BLC includes exterior programs along each respective northern and southern edge. This adjacency of public programs to the National Mall and the Dwight D. Eisenhower memorial facilitate a threaded connection between the two major public realms.

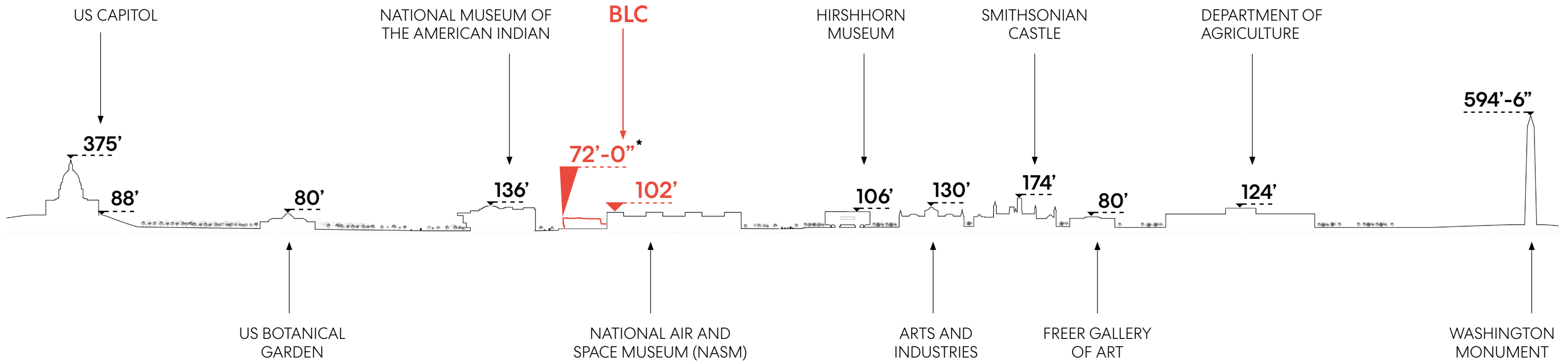
The eastern edge of the site is defined by the reflection of the additional 30' setback from the 4th Street corridor established by the National Museum of the American Indian & the National Gallery of Art's East Building.



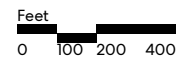
The National Mall Section

Contextual Framework

The BLC is framed between two large structures of the National Museum of the American Indian and the NASM. The top of the NASM is identified as a maximum vertical constraint as the museum shall always be the primary building relative to the BLC.



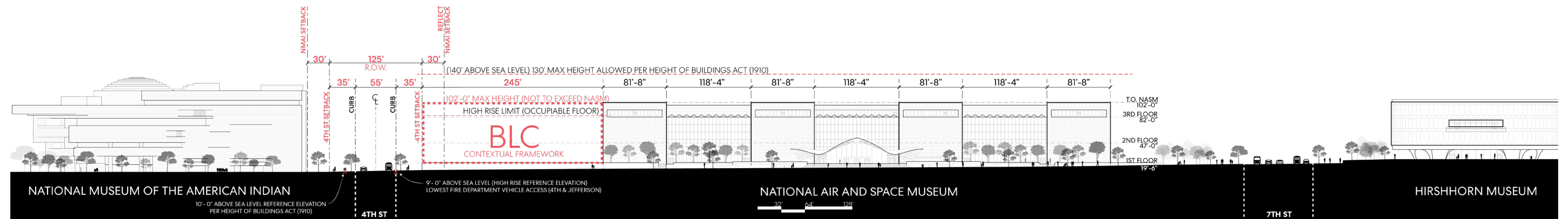
* All building heights are measured from mean sea level



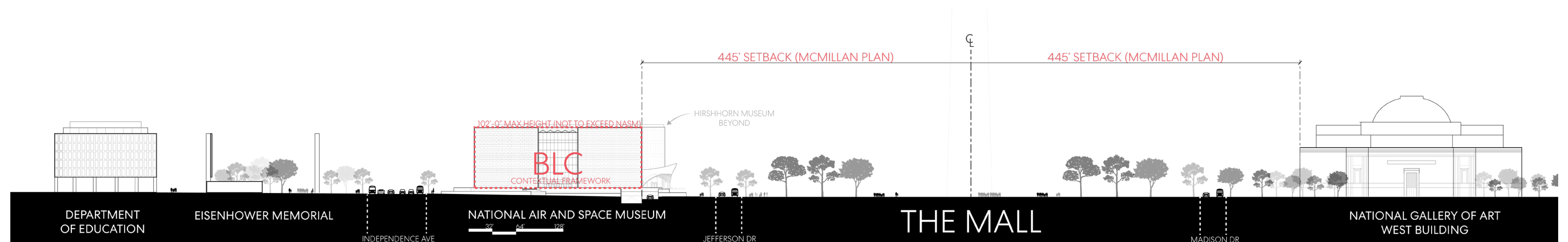
Elevation

Contextual Framework

The maximum vertical constraint is set up based on the top height of the NASM. The concept design of the BLC is well within the maximum project limit. The eastern edge of the site is to reflect the National Museum of the American Indian's additional setback from the 4th Street SW corridor (30'-0")



From Jefferson Drive to South



From 4th Street to West

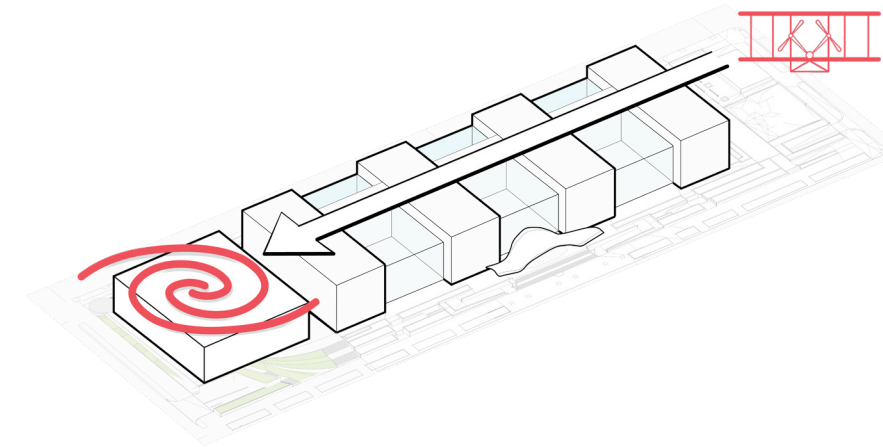
Architectural Design Approach

The spiral organizing parti of the BLC originates from the central circulation spine of NASM, creating a symbolic destination for the study of the universe. The spiral 'force lines' of this parti both draw people into the site and building and metaphorically represent the diffusion of knowledge from the BLC out into the world. Through the course of Concept Design, the SI, external agency staff, and the broader Consulting Parties group have encouraged the design team to further emphasize the energy of the spiral galaxy in the design progression of the two dimensional planning and three dimensional expression of the integrated landscape and building. Highlights of the design progression follow.

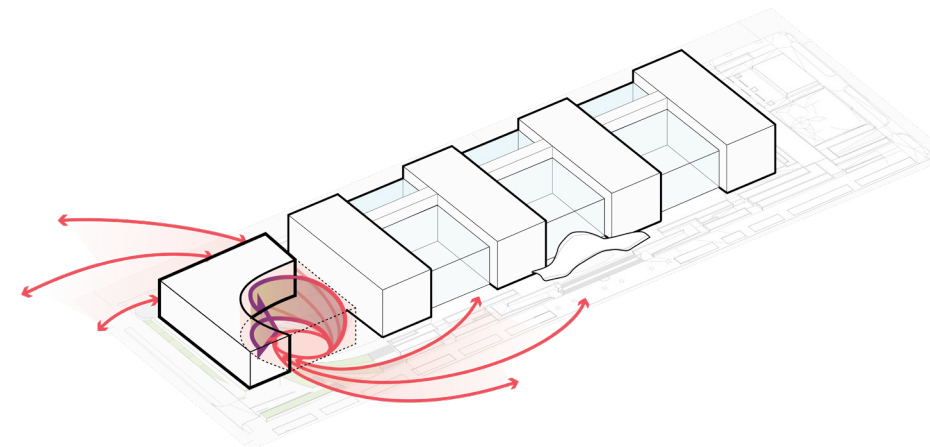
The site design reinforces the spiral energy through sweeping circulation patterns connecting the Learning Courtyard and Astronomy Park. The courtyard has evolved to be a green space with a gathering space for BLC programming, metaphorically representing the core of the galaxy. An elevated, shaded viewing platform has been created, floating over the loading dock ramp and mitigating its visual impact from the northeast. This platform offers views of the Mall as well as the east wall of NASM-NMB, for the potential to accommodate viewing large scale audio-visual projections. Refer to the Landscape chapter for a detailed description of the site design.

The east terrace designated for the Astronomy Park has been sized to accommodate the educational programming needs. The Phoebe Waterman Haas Observatory location has been finalized relative to the basement and underground cistern locations and the outwardly expanding force lines of the landscape terraces.

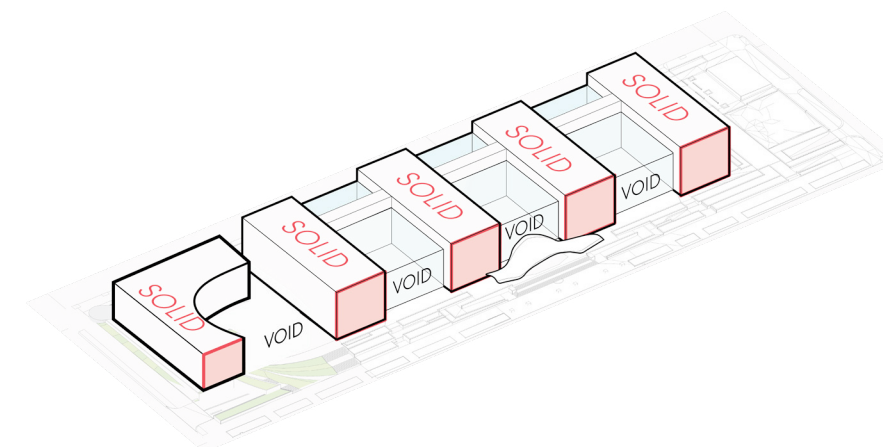
The BLC identity is purposefully not an extrusion of NASM, but rather a pavilion-like form surrounded by landscape. The architectural parti draws from the different solid to void patterns of the NASM's north and south elevations. The physical connection from BLC to NASM-NMB is a one-story link, the width of the eastern glazed facade of NASM-NMB. The southern entrance to the BLC has grown in width to accommodate security and egress from NASM-NMB. This entrance volume will lightly touch the stone of NASM-NMB with a glazed skylight, allowing the stone wall to be an interior surface at this location.



Spiral Galaxy



Learning Courtyard



Solid/Void

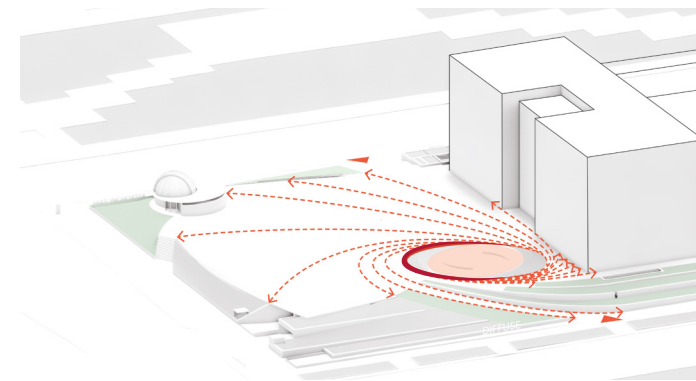
Architectural Design Approach (continued)

The BLC entry at the northeast corner of the building improves the desired separation of BLC circulation and NASM visitor circulation to the restaurant. The circulation to and from NASM has been made gracious and intuitive on Level 1. The multi-story circulation spine, referred to as the Spiral Concourse, is incorporated with dining on Level 1. The future development of this space will provide for a clear circulation path between the BLC Lobby and NASM for BLC attendees to access NASM.

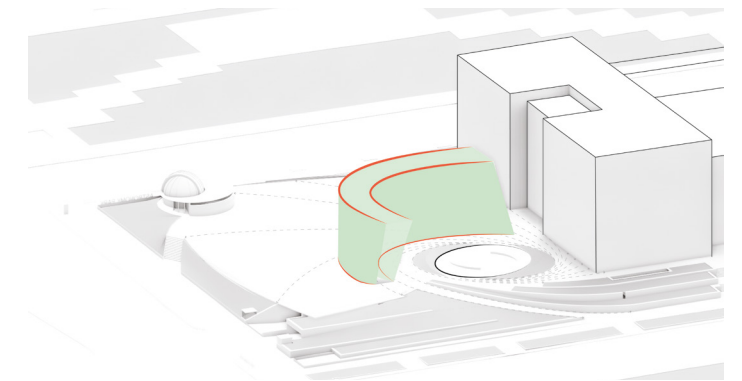
The plans for Levels 2 and 3 have been refined to reinforce the spiral geometry and are organized by a display wall on both levels facing the Spiral Concourse. Entering the BLC at Level 2 via a grand stair and elevator, learners arrive at the Convening Space with awe-inspiring views to the National Mall and NASM-NMB. This large, flexible space can accommodate a variety of group sizes and activities and is surrounded by Breakout Spaces for team project work. A view to the Dwight D. Eisenhower Memorial is also a feature from the Convening Space and adjacent Hang Out space. The key interior volumes of the Convening Space and Spiral Concourse, presented in renderings, are included in this report.

The energy and dynamic movement of the galaxy is expressed not only two-dimensionally but also volumetrically. This trajectory takes shape in the Spiral Concourse, a panoramic, multi-story, circulation spine whose geometry extends out into the landscape to create the Learning Courtyard. To evoke the energy and dynamic movement of the galaxy, three-dimensional radial lines are expressed in the canted walls and soaring height of the Spiral Concourse. Both the Spiral Concourse and solid mass of Levels 2 and 3 sweep upward toward the Mall. These floors float above the glazed volume of Level 1, extending towards the Mall to create the Event Terrace.

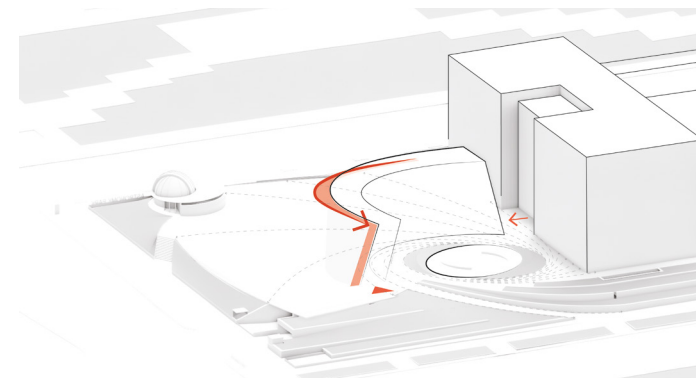
Similar to the newly constructed canopy at NASM's north visitor entry vestibule, the geometry of the BLC sits in contrast to the NASM building form. However, there are no other formal design relationships or concepts that have been established between the north entry addition and the BLC.



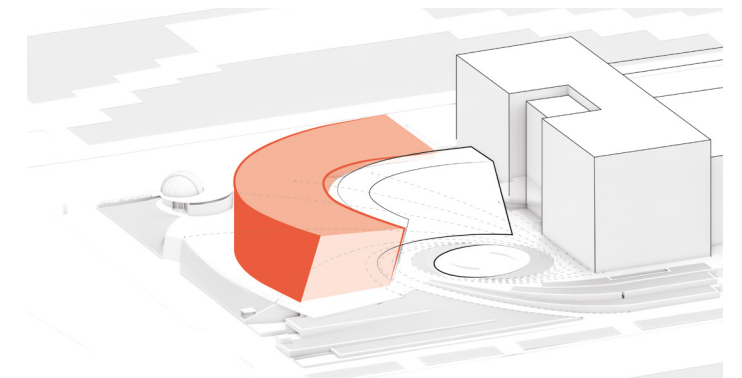
Spiral Galaxy



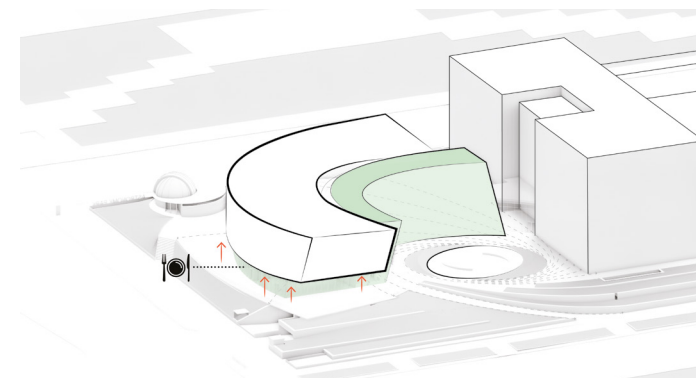
Diffusion of Knowledge



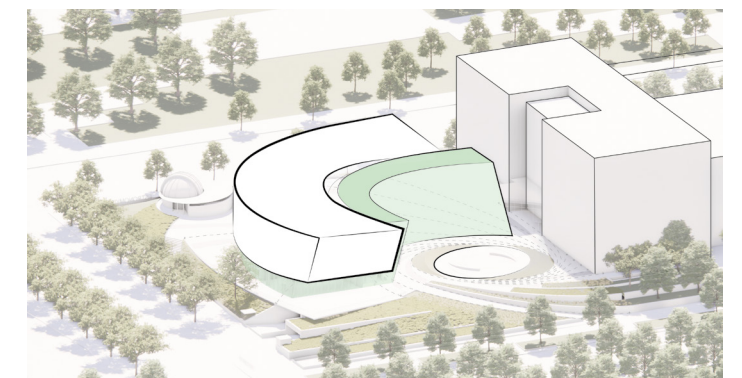
Circulation Spine



BLC Program Bar



Lifting the Pavilion



Pavilion in the Garden

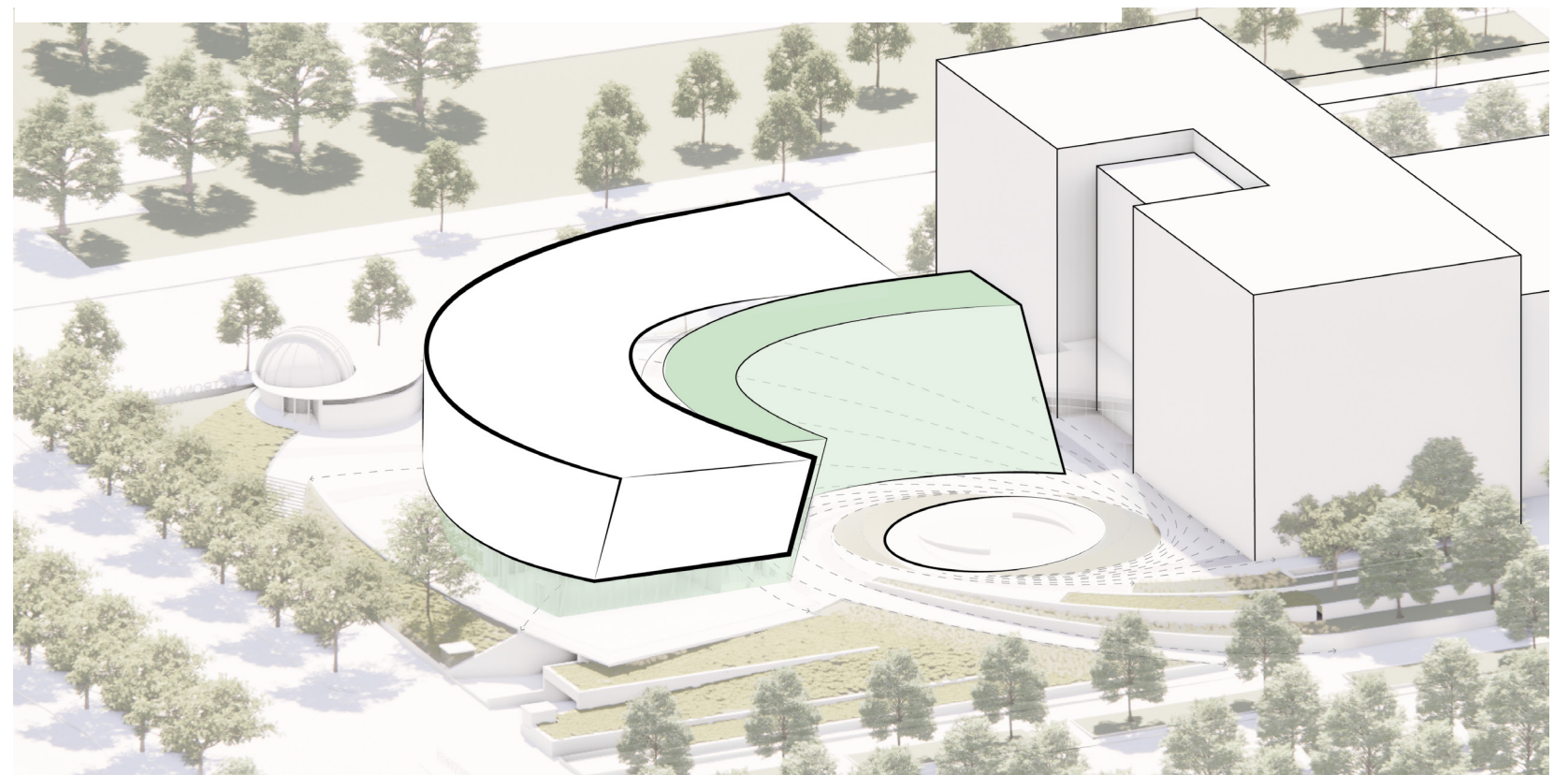
Pavilion in the Garden

Certain aspects of the NASM restaurant addition, constructed in 1988 and demolished in 2023, have inspired the development of BLC concept and its relationship to the NASM.

- Pavilion form in a garden setting
- Minimal connection to the NASM at the east curtain wall
- Geometric building massing in deference to the NASM building geometry

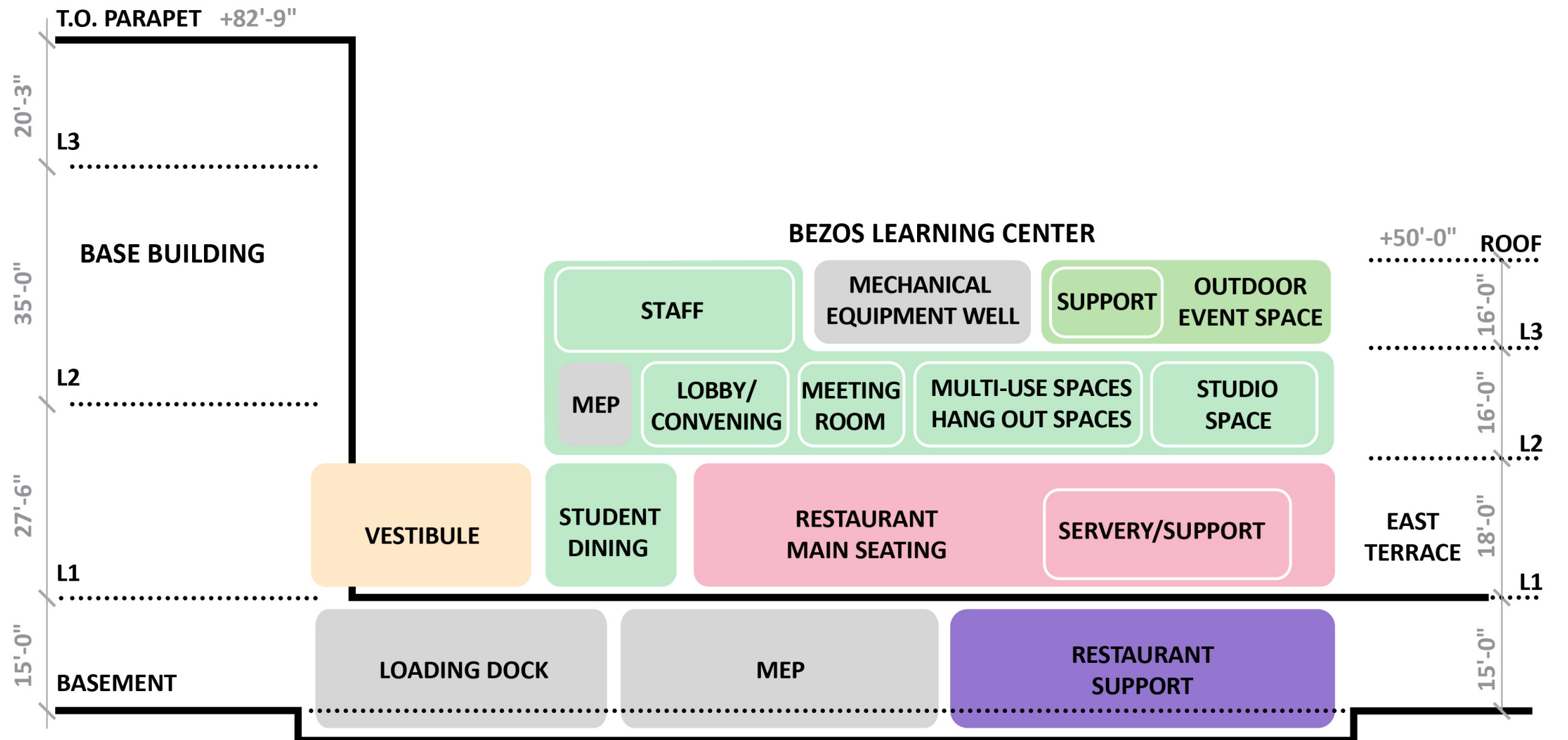


Restaurant addition and planted area at the east end of the NASM site
Historic American Building Survey, 2017



Program

Stacking Program



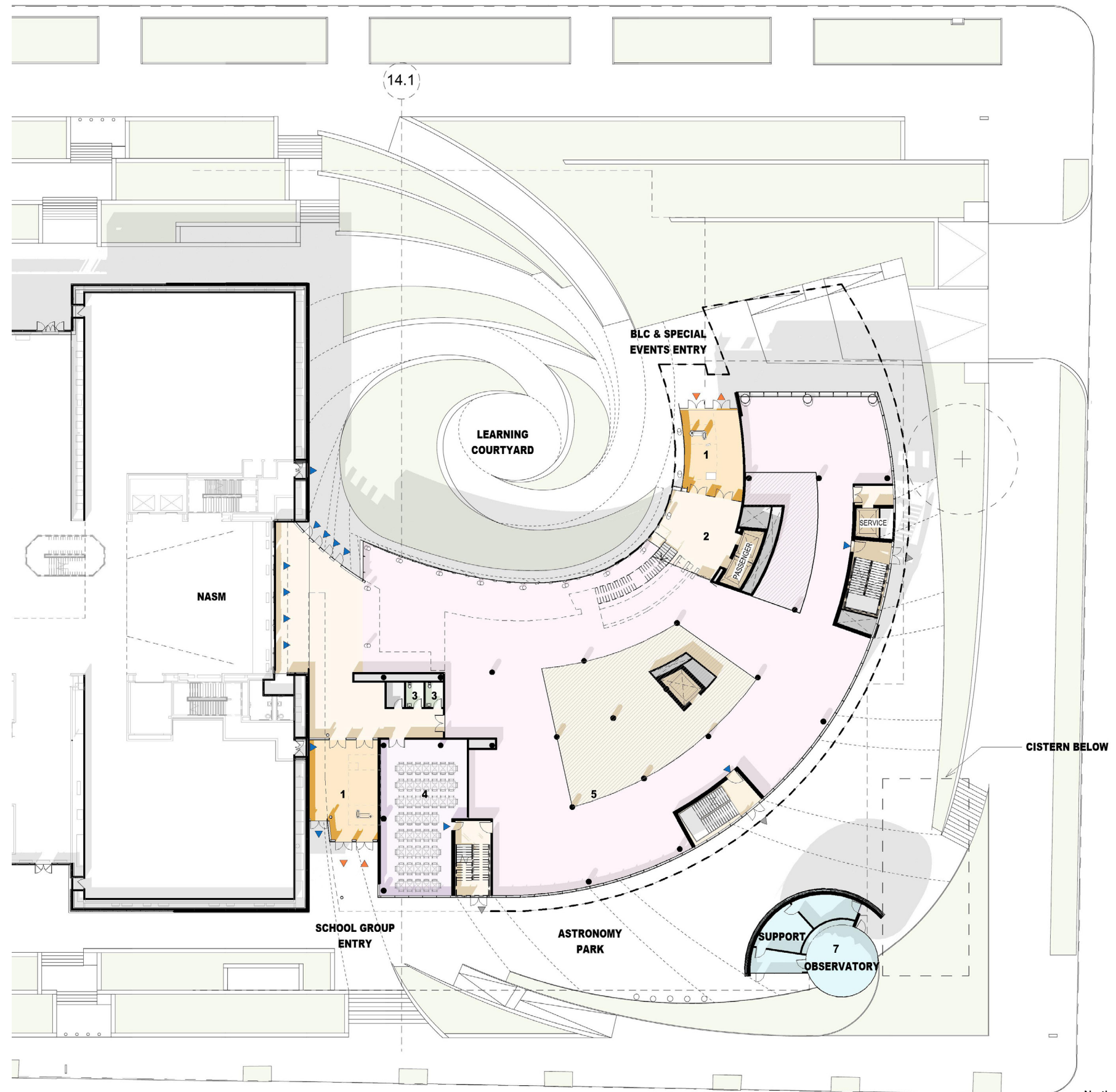
Floor Plans

Level 1

Legend

- 1 Security / Screening
- 2 BLC Lobby
- 3 Inclusive Restrooms
- 4 Multi-Purpose / School Group Seating Area
- 5 Dining
- 6 Servery

- ▲ NASM Egress
- ▲ BLC Egress
- ▲ Egress from Above and Below



Grid 14.1 shown for location reference

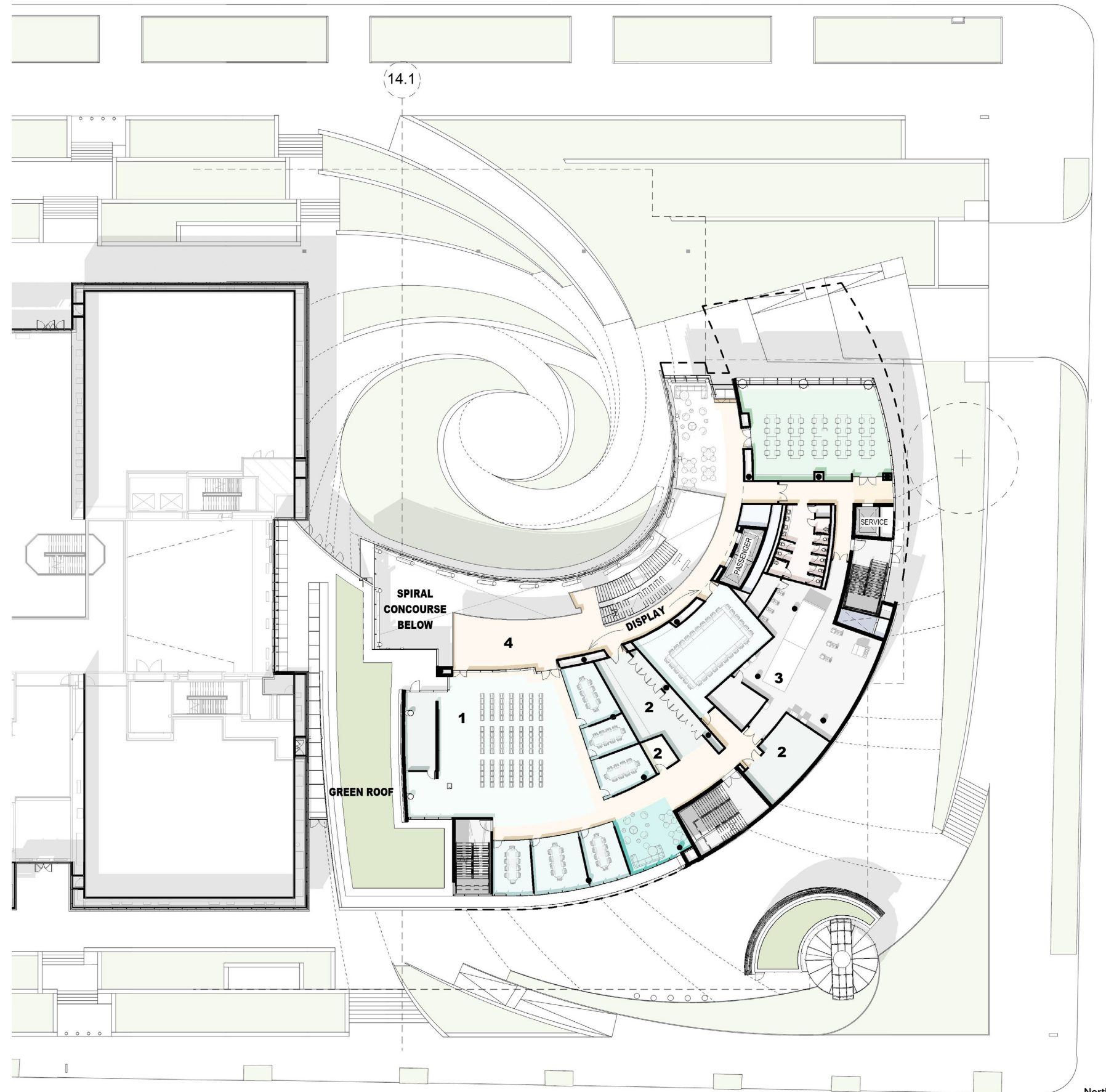


Floor Plans

Level 2

Legend

- 1 BLC Lobby / Convening Area
- 2 Support Space
- 3 MEP Space
- 4 Circulation



Feet



Grid 14.1 shown for location reference

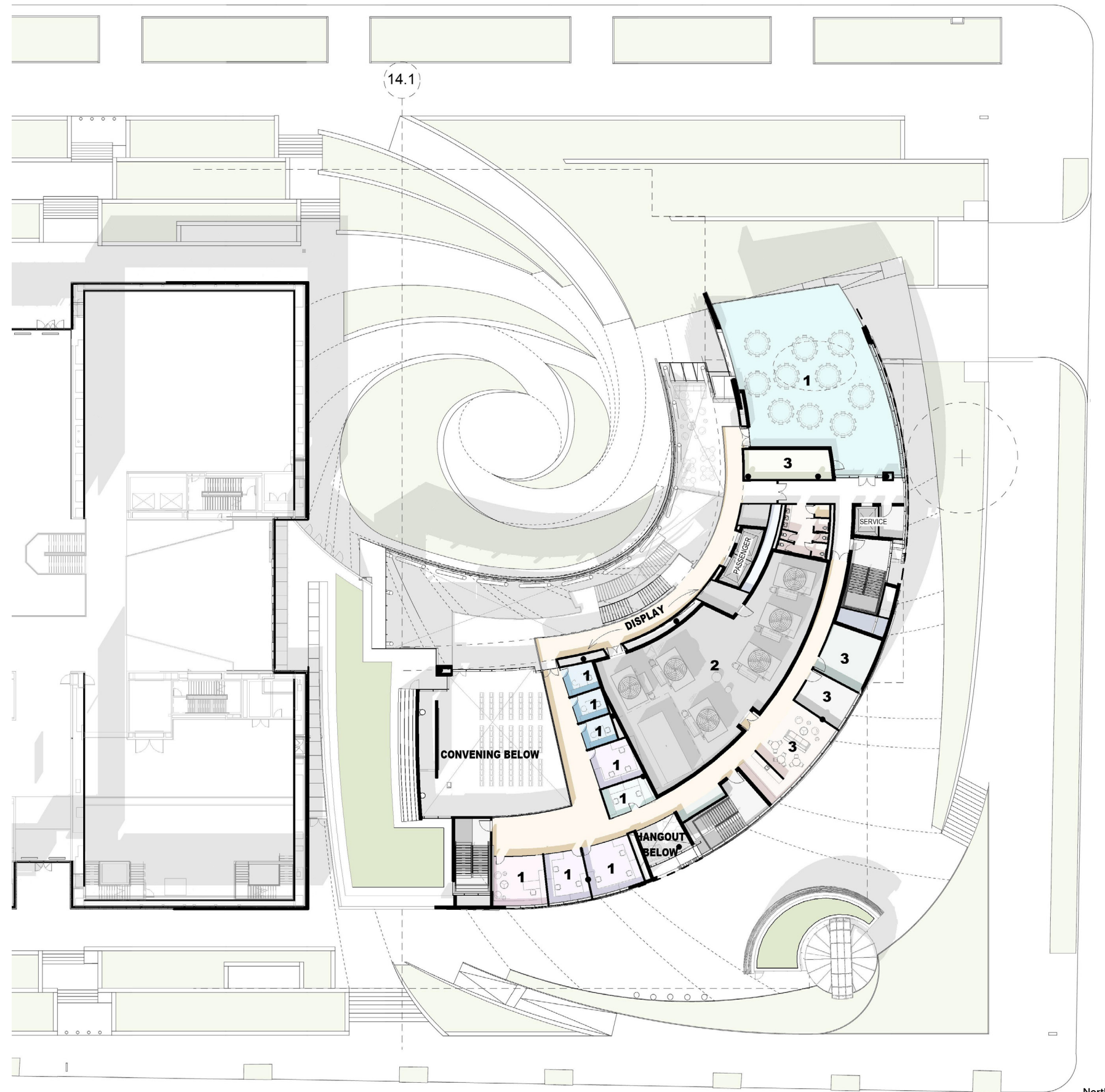


Floor Plans

Level 3

Legend

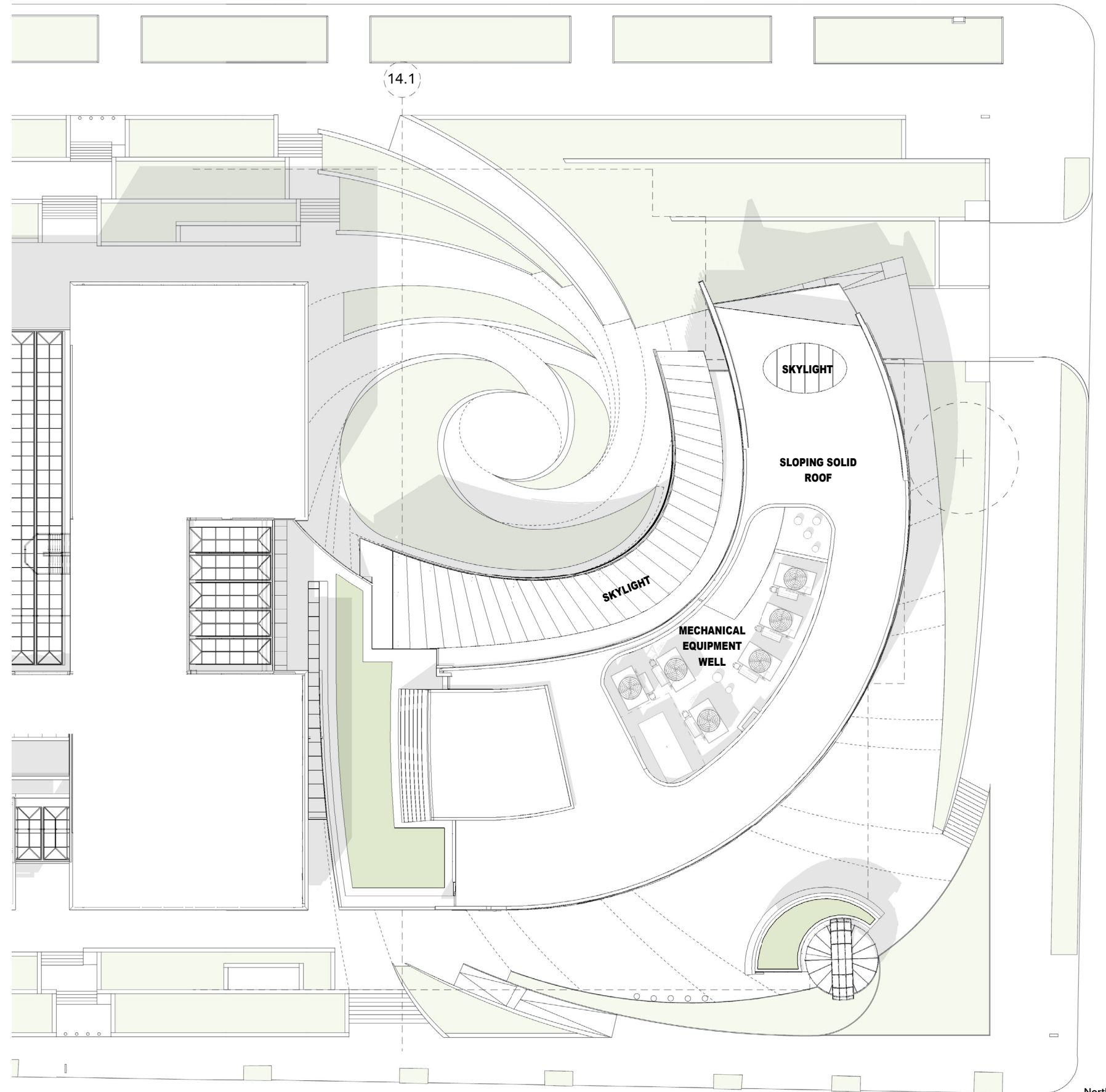
- 1 BLC/Staff
- 2 Open Air Mechanical Equipment Well
- 3 Support Space



Grid 14.1 shown for location reference



Roof Plan

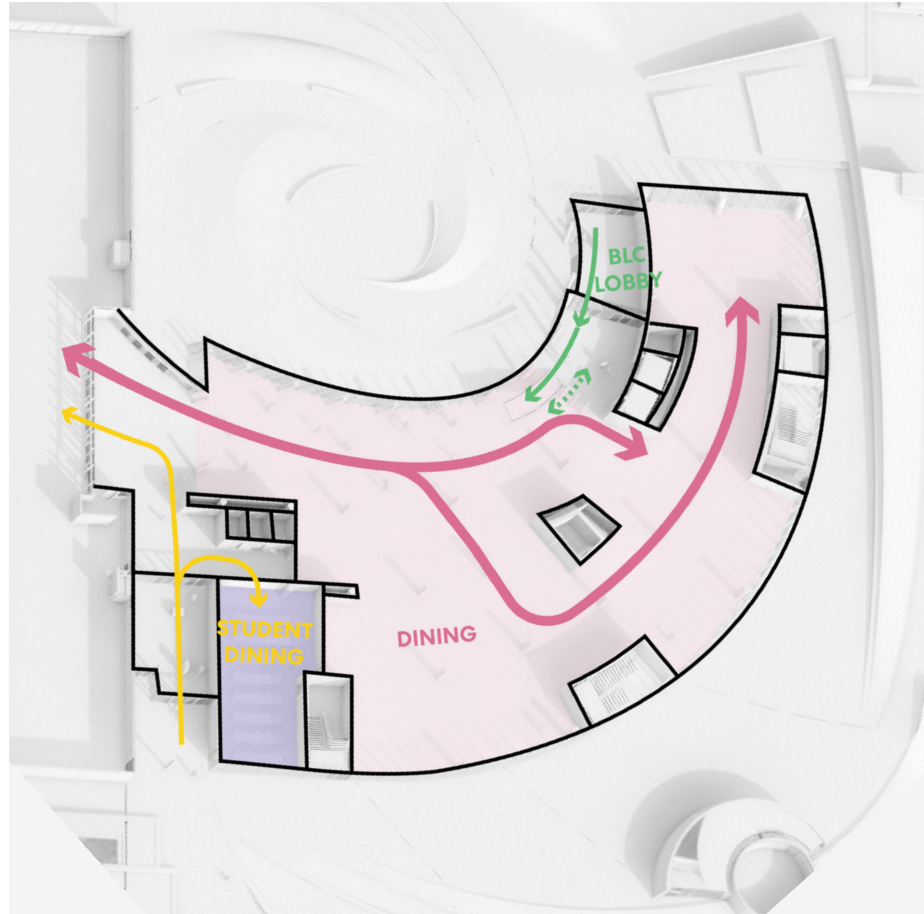


Grid 14.1 shown for location reference

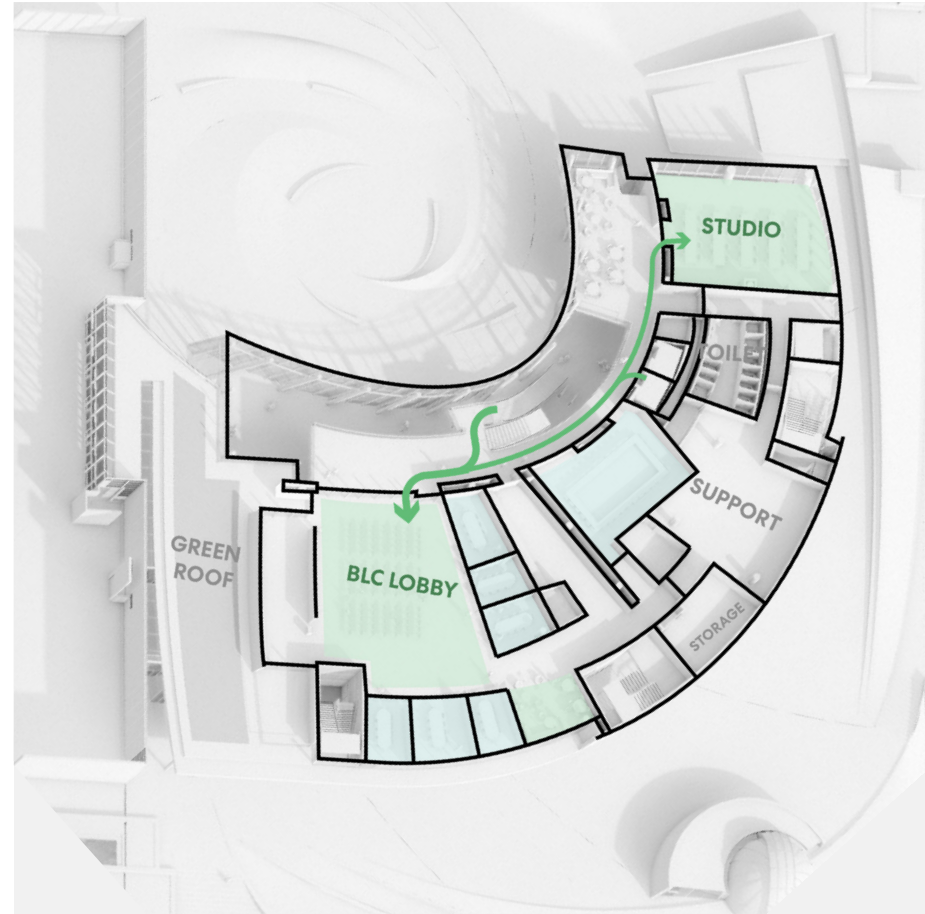


Axometric Views

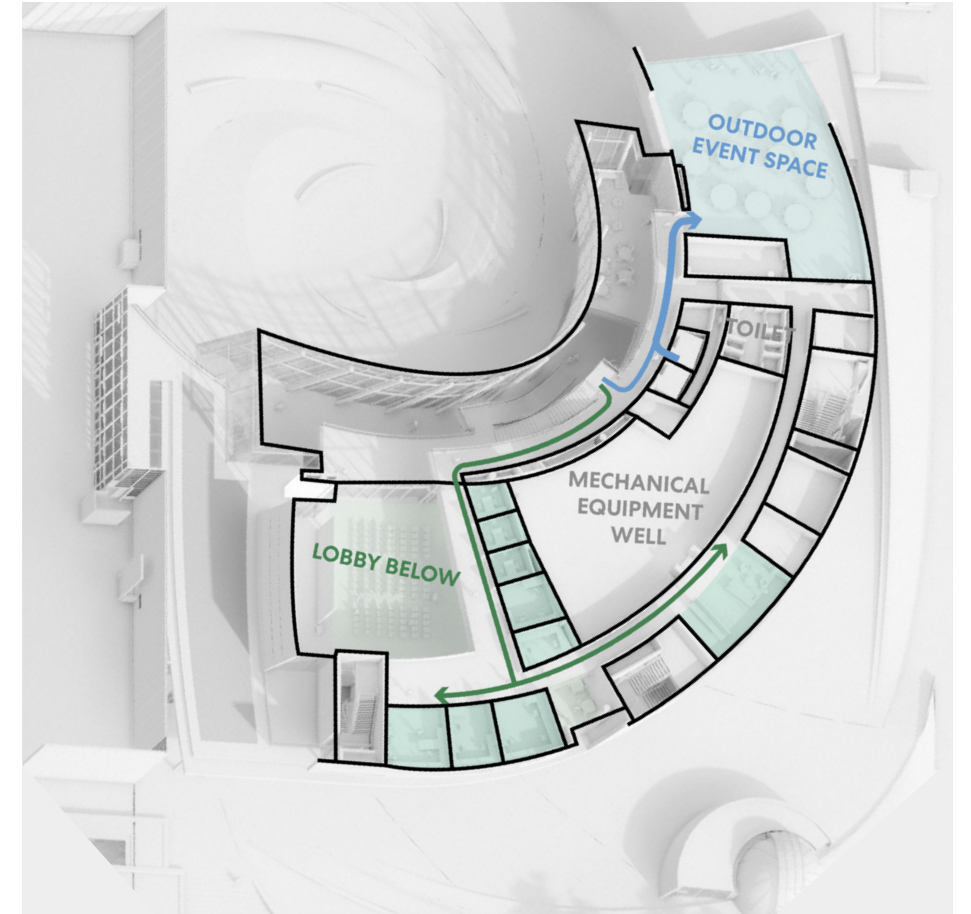
Circulation



Level 1



Level 2



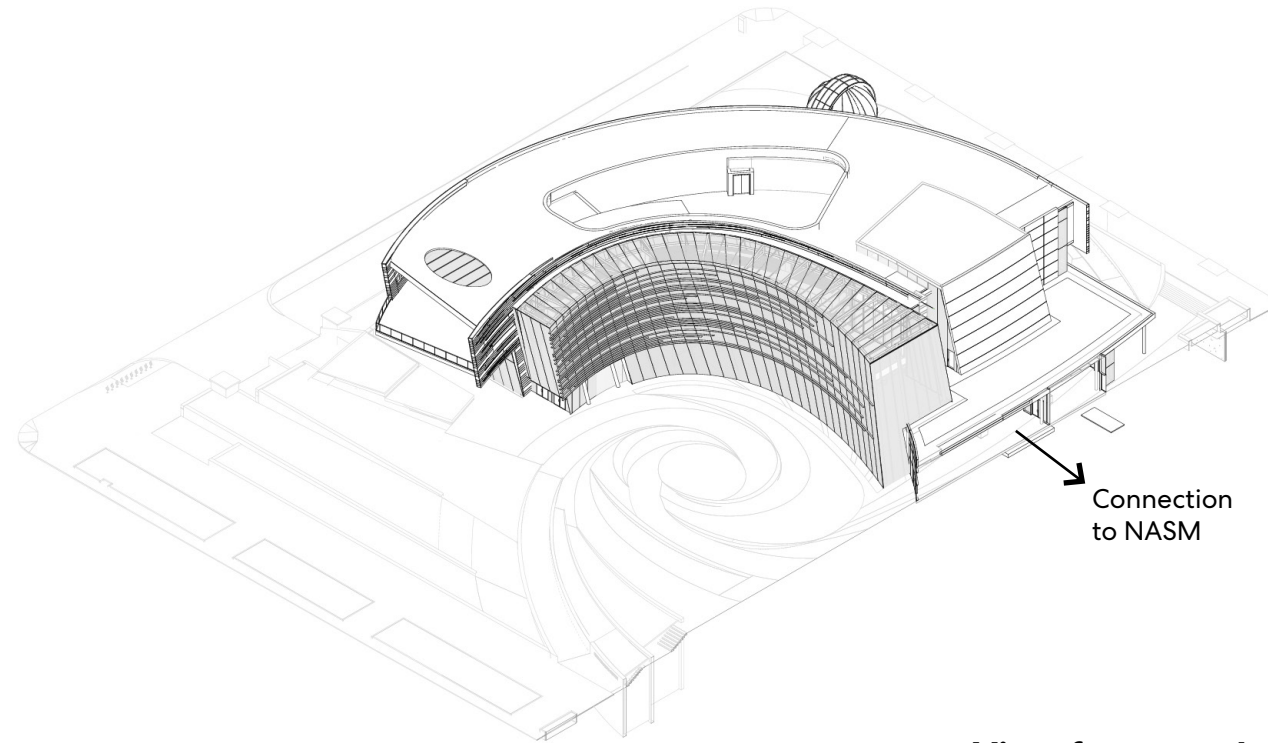
Level 3

- ← NASM Public Visitors
- ← School Groups
- ← BLC Staff and Students
- ← Special Event Attendees

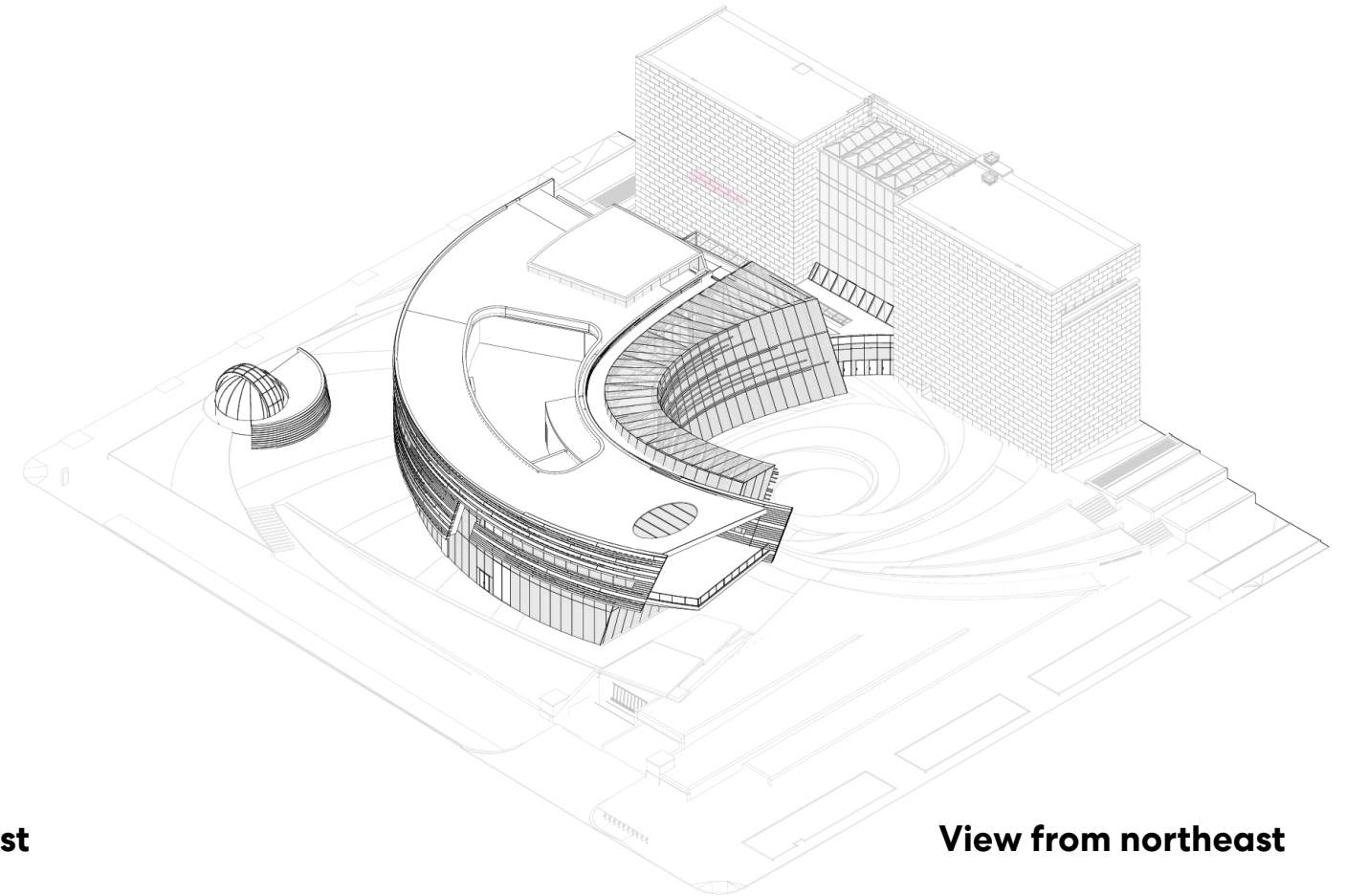


Axonomic Views

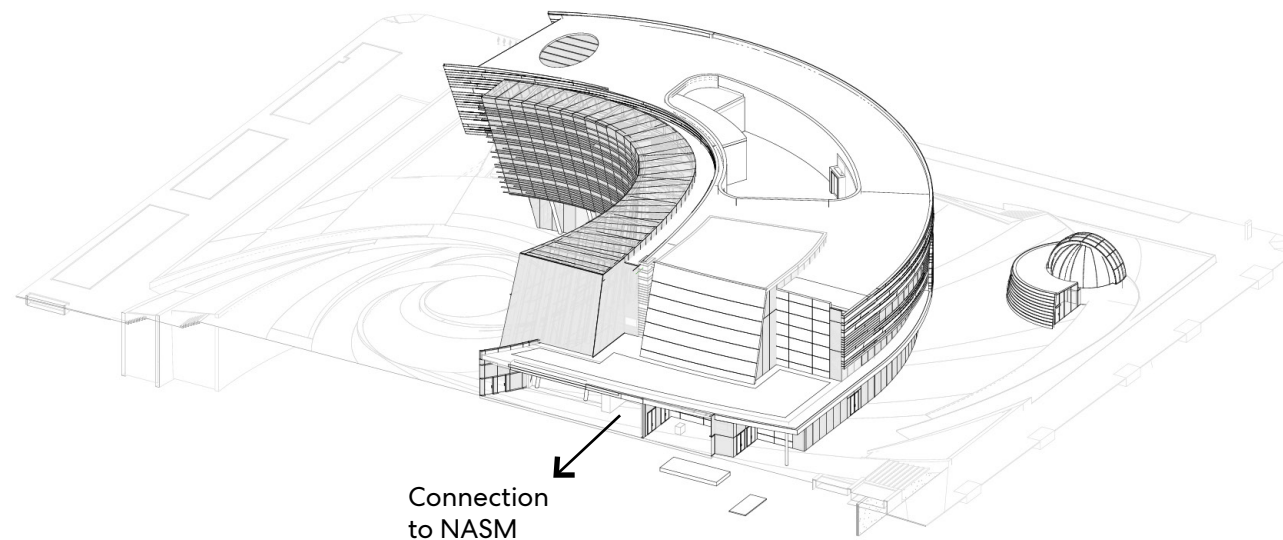
Exterior



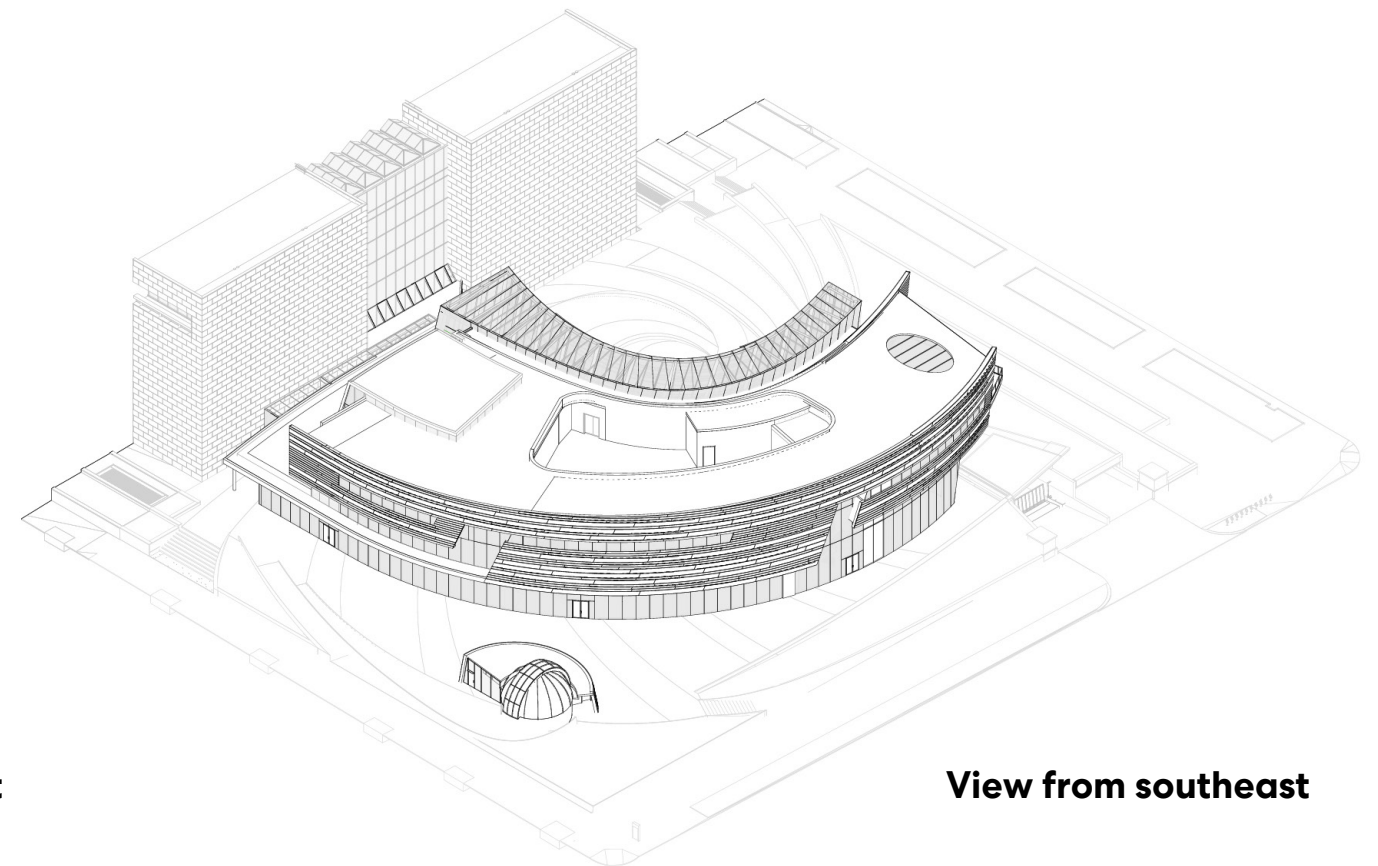
View from northwest



View from northeast



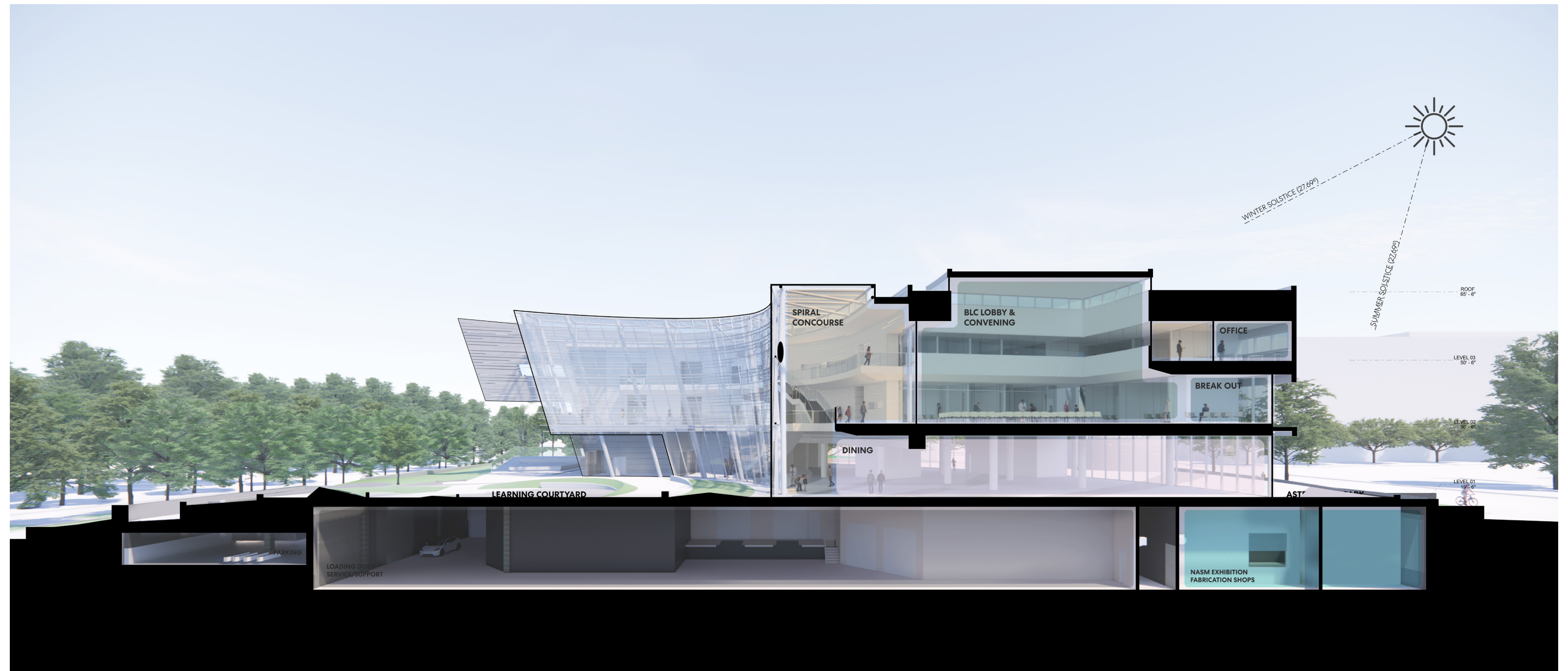
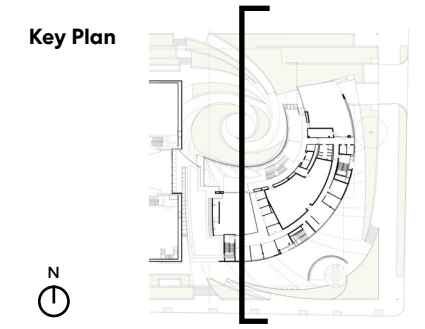
View from southwest



View from southeast

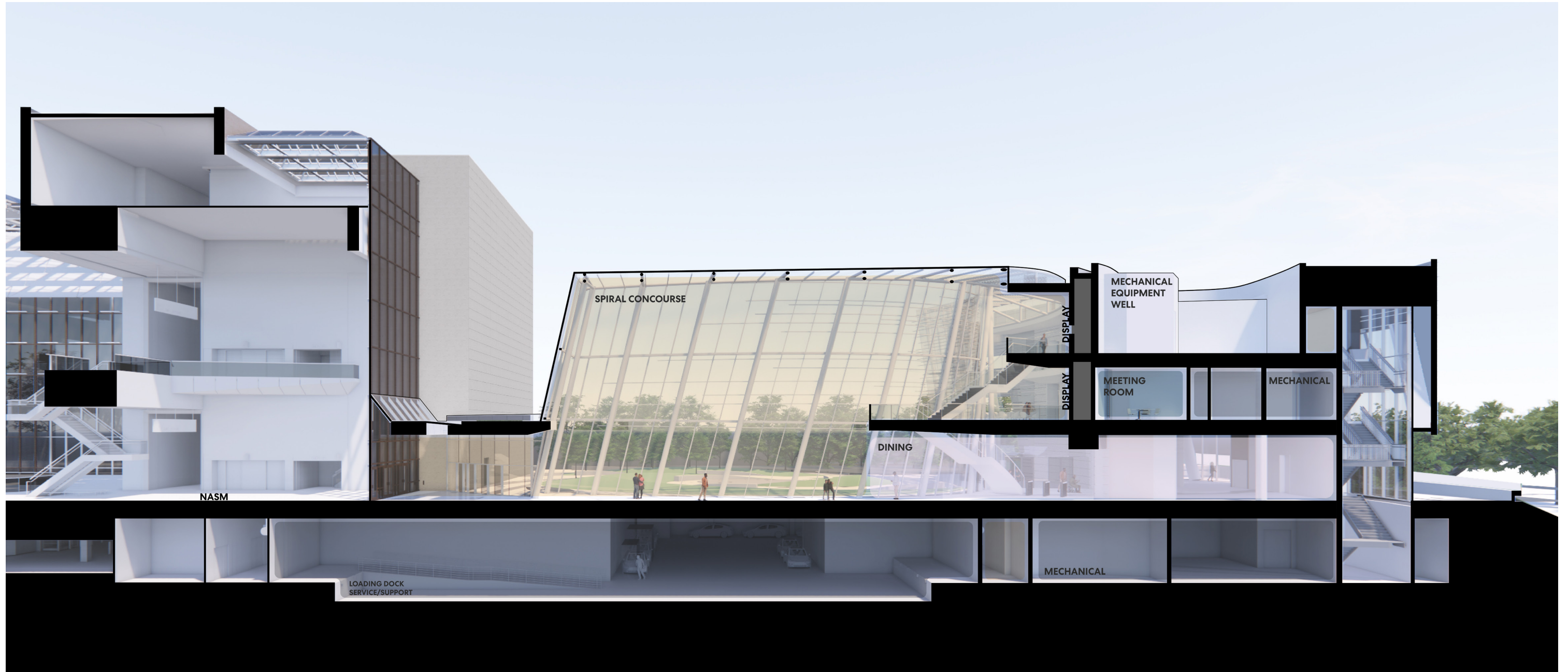
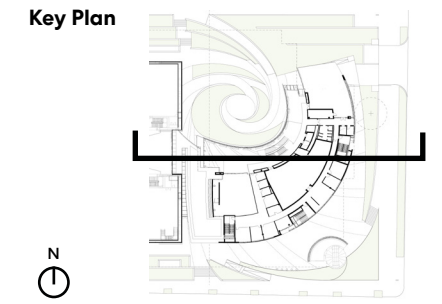
Overall Site Section

BLC North-South Section through Lobby / Convening



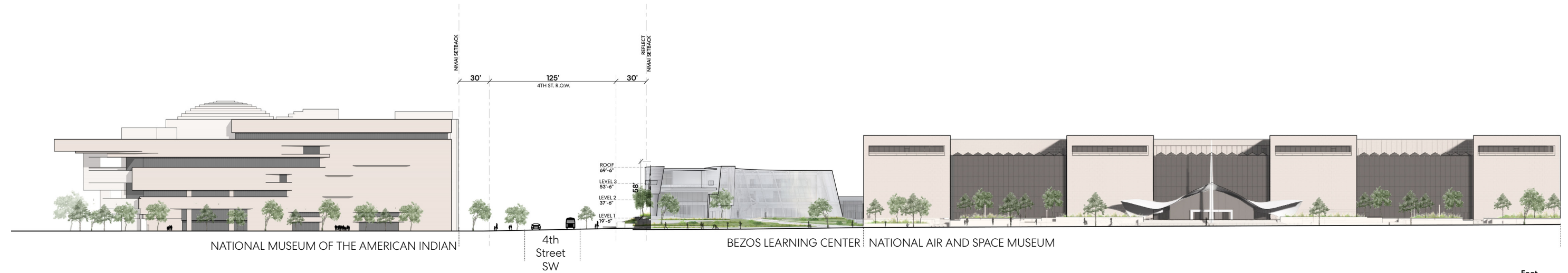
Overall Site Section

BLC East-West Section through Spiral Concourse

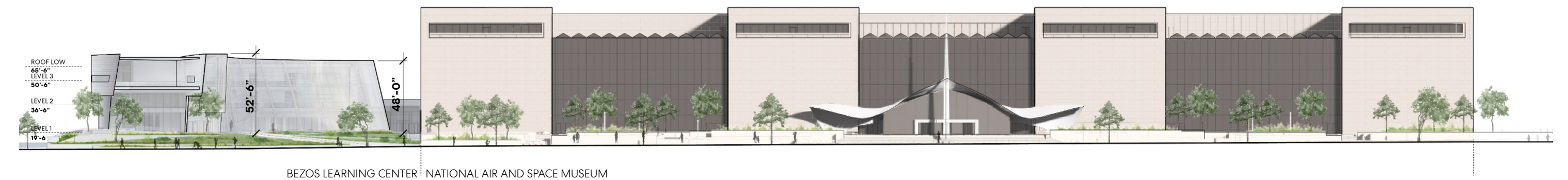


Architectural Massing

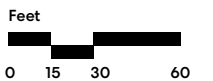
North Elevation



Overall North Elevation

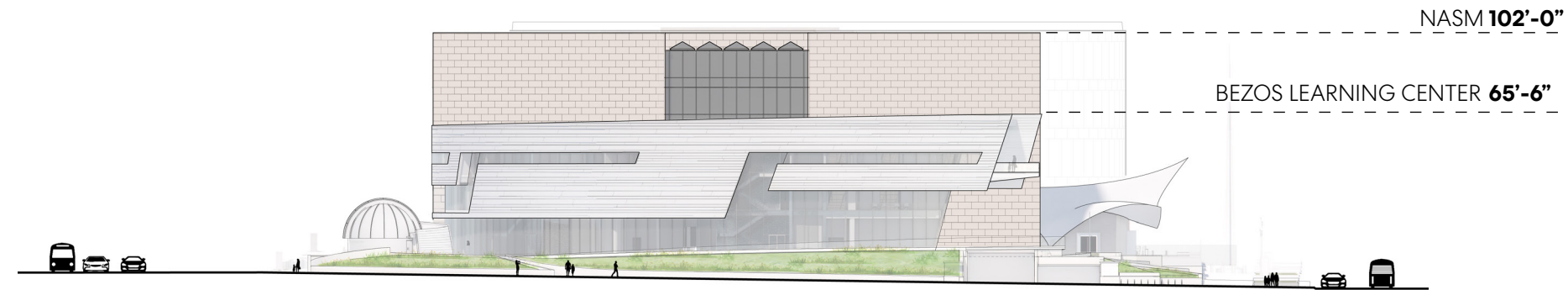


Enlarged North Elevation

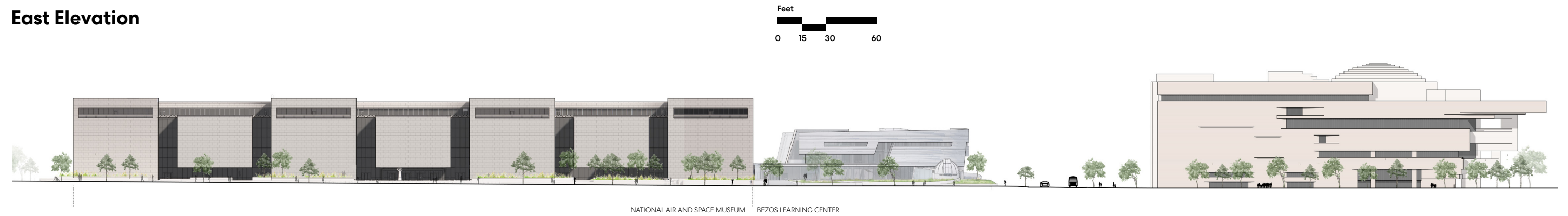


Architectural Massing

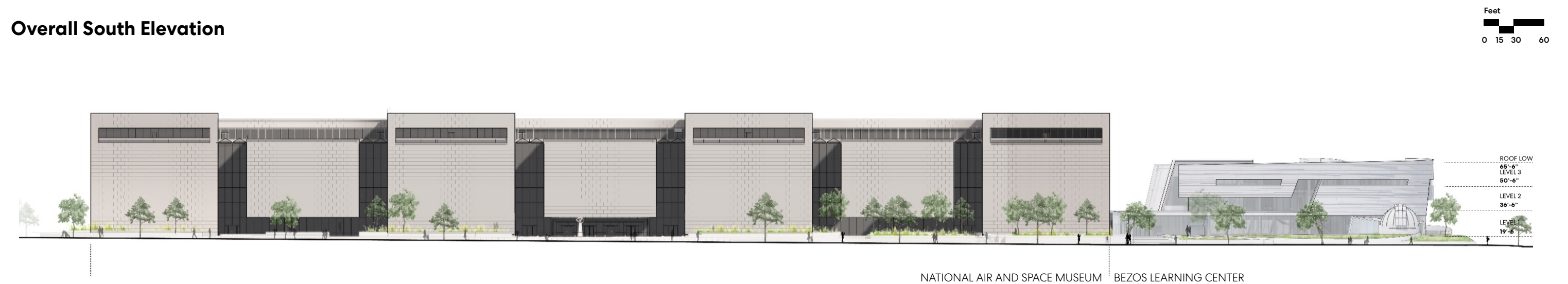
East & South Elevation



East Elevation



Overall South Elevation



Enlarged South Elevation



Illustrative Aerial View

NASM-NMB and BLC Site



Aerial View

North



Aerial View

North



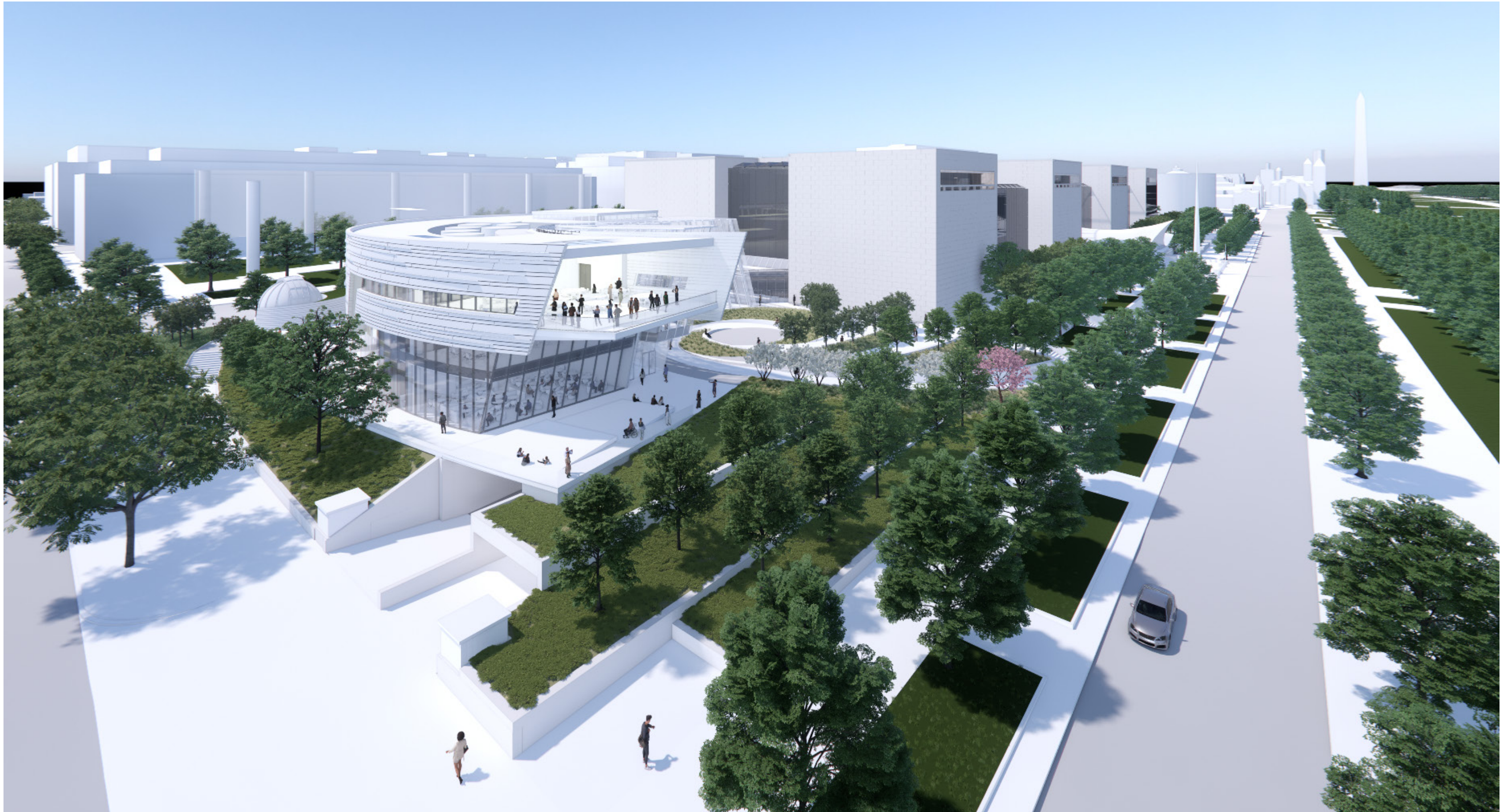
Aerial View

North



Aerial View

Northeast



Aerial View

Southeast



Aerial View

South (image depicts preferred design alternate at connection to NASM)



Aerial View

Southwest (image depicts preferred design alternate at connection to NASM)



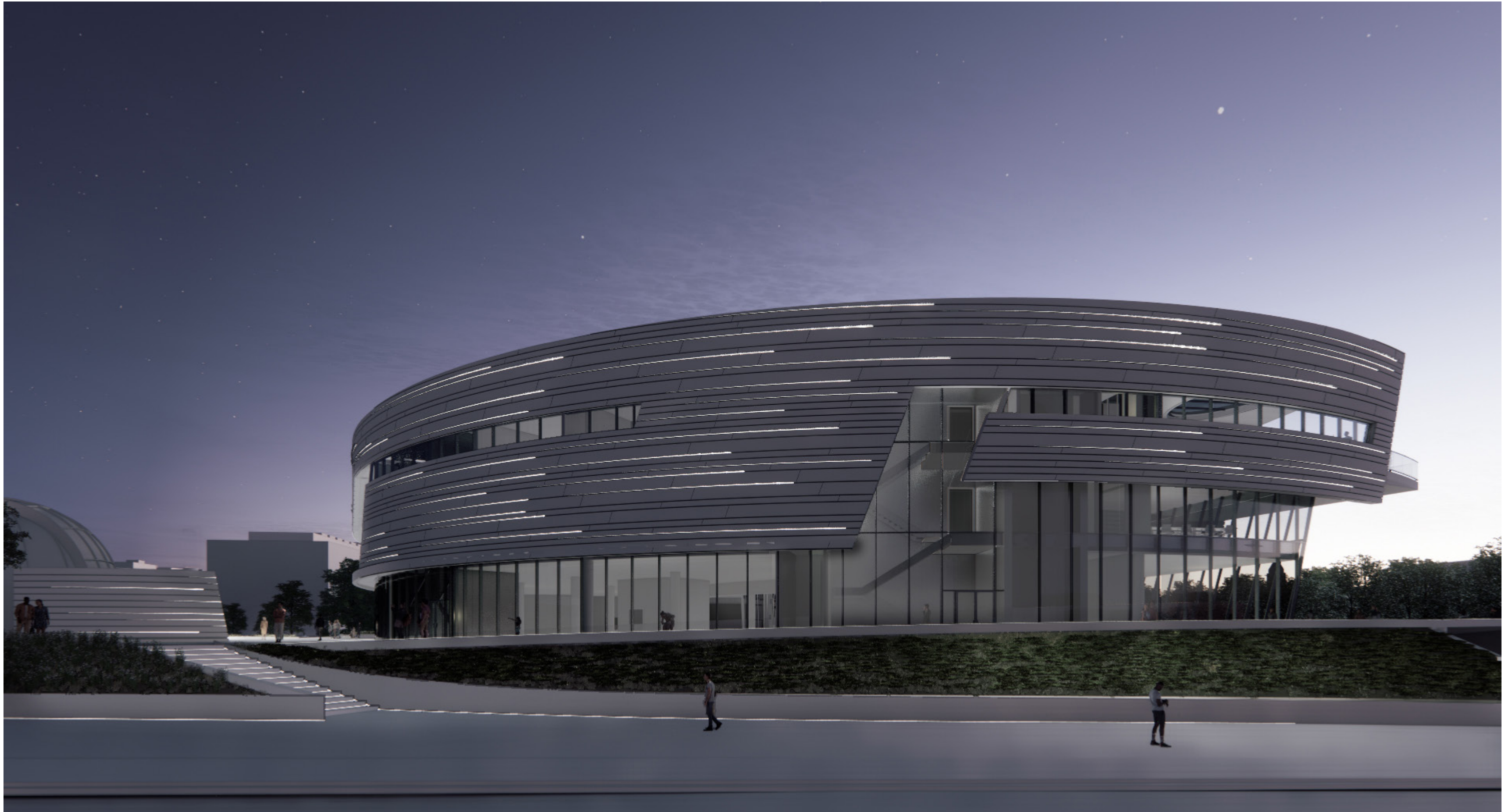
Eye Level View

South



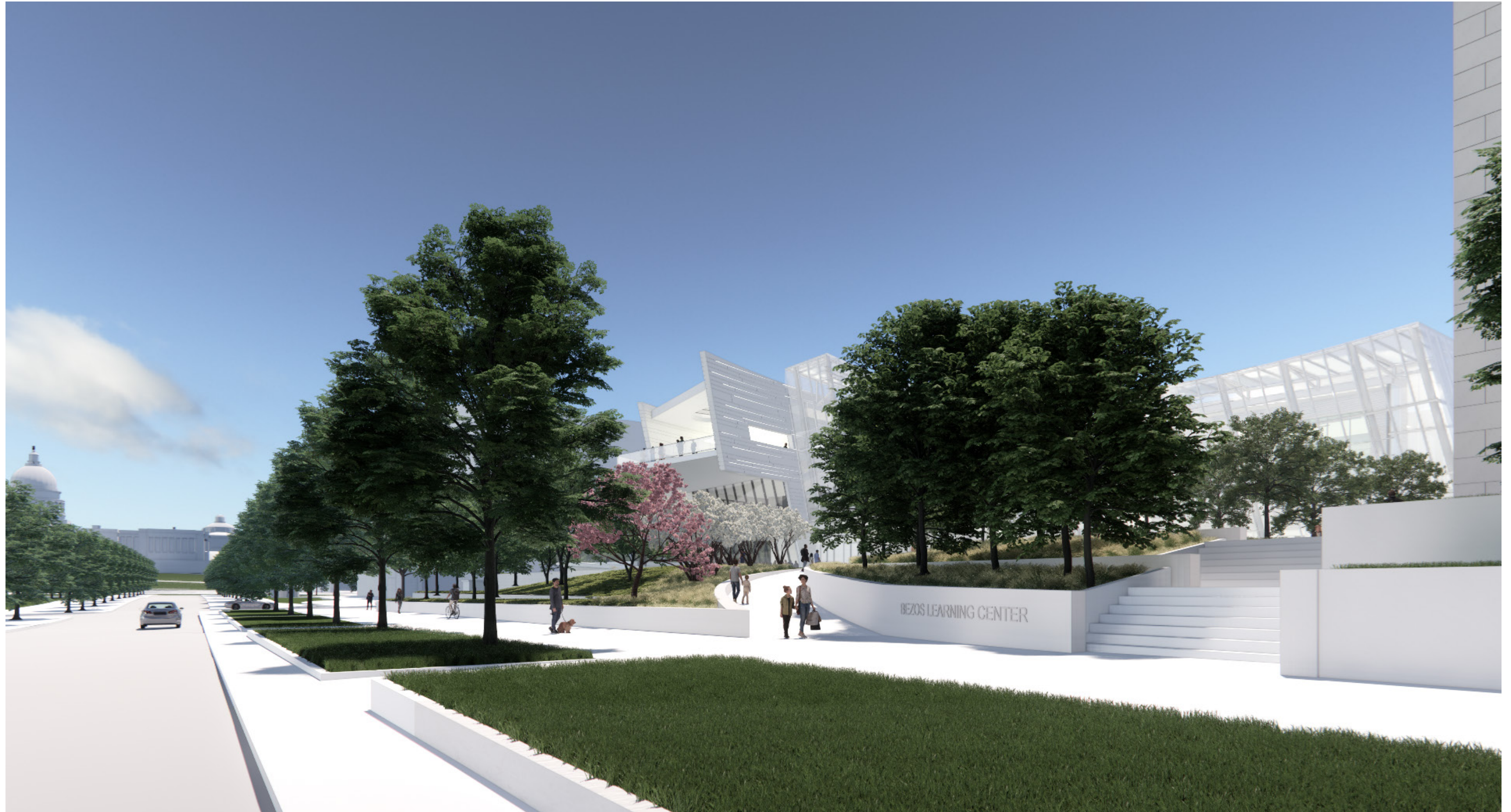
Eye Level View

East



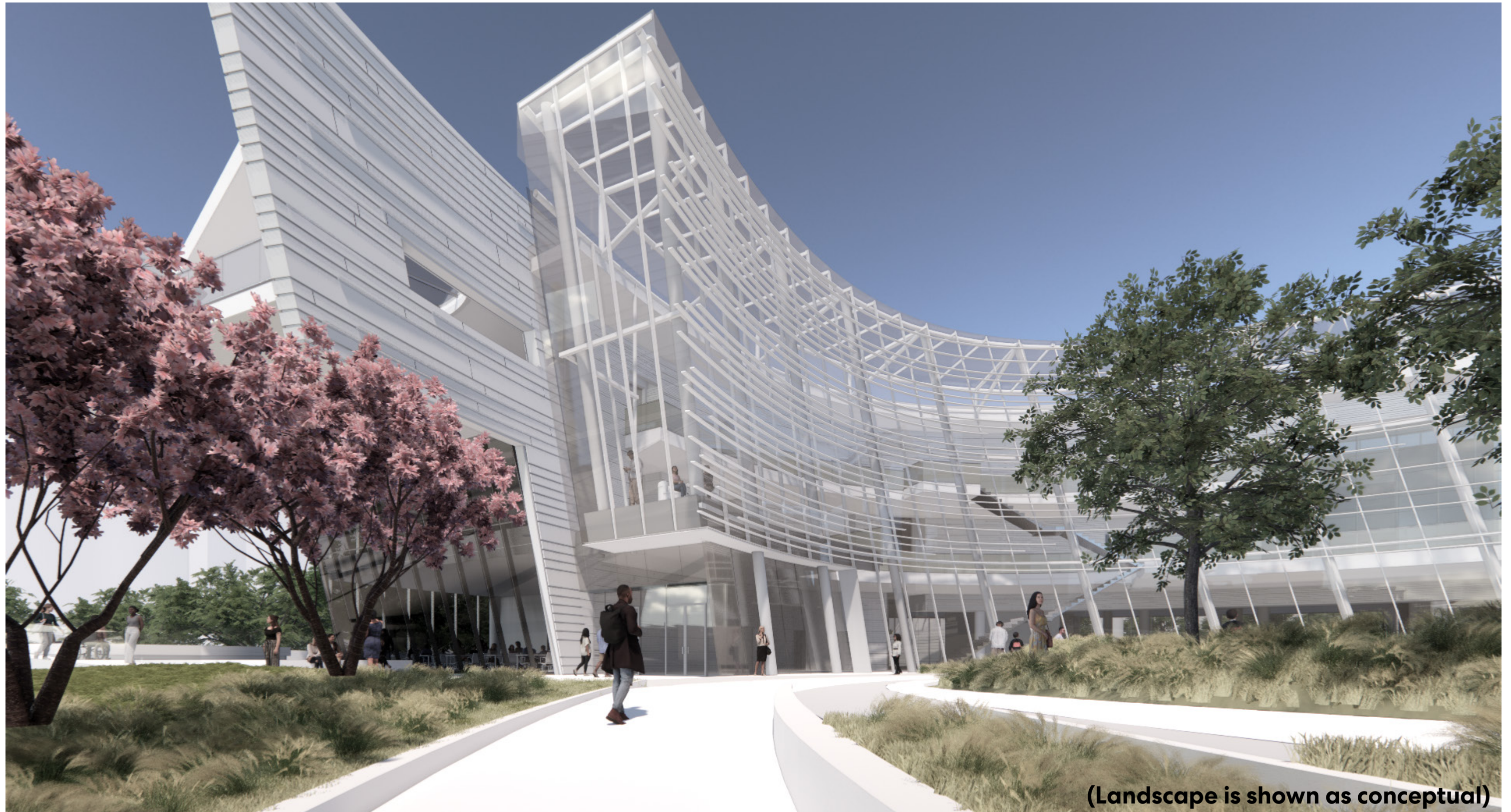
Eye Level View

Jefferson Drive



Eye Level View

Learning Courtyard Ramp (image depicts preferred building composition alternate of roof sloping up to the Mall)



(Landscape is shown as conceptual)

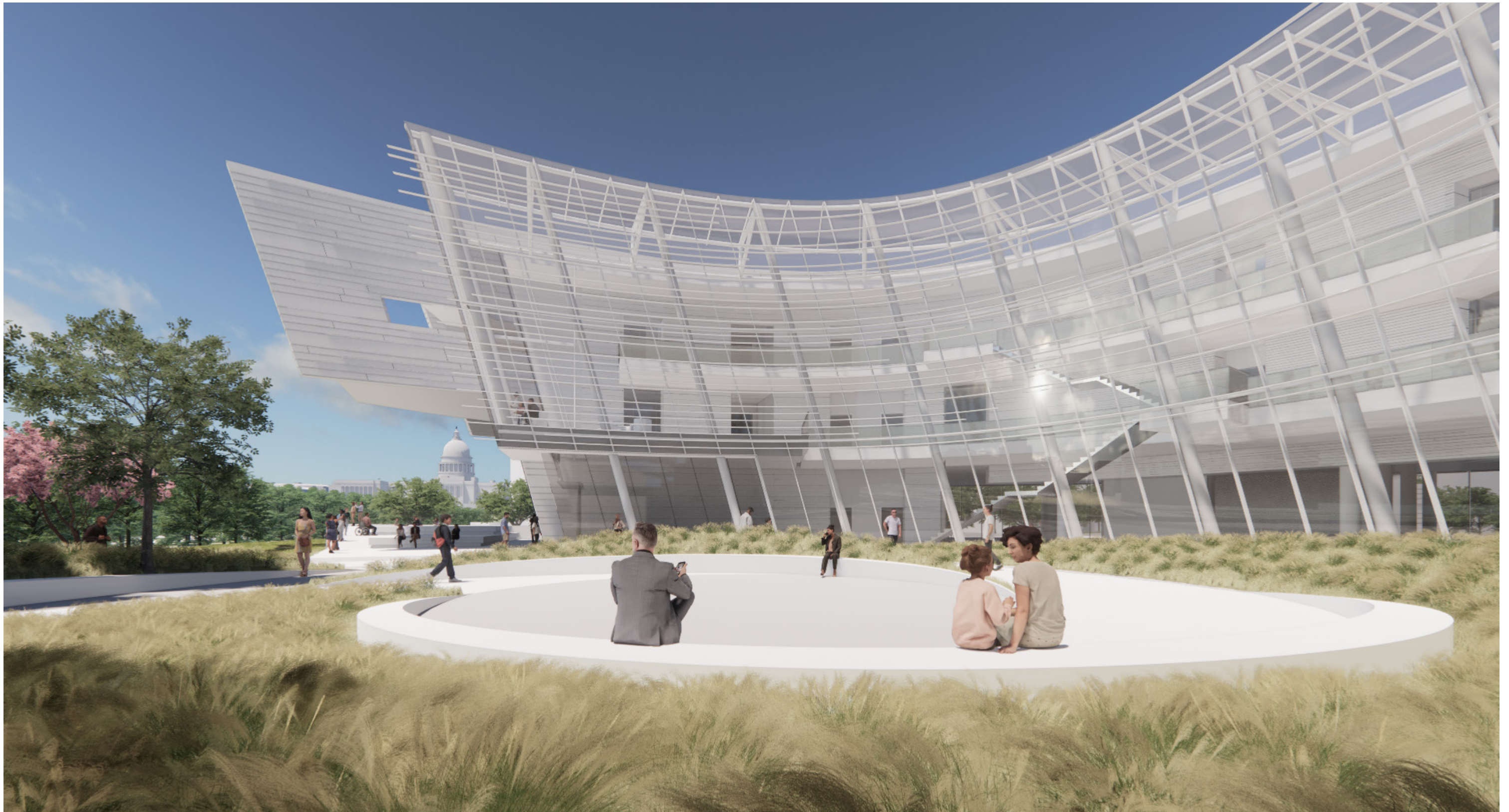
Eye Level View

Observation Deck



Eye Level View

Learning Courtyard (image depicts preferred building composition alternate of roof sloping up to the Mall)



Eye Level View

From Eisenhower Memorial



Eye Level View

Astronomy Park Entry



Aerial View

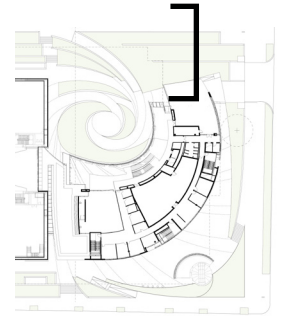
South Entry (image depicts preferred design alternate at connection to NASM)



Section View

Viewing Platform

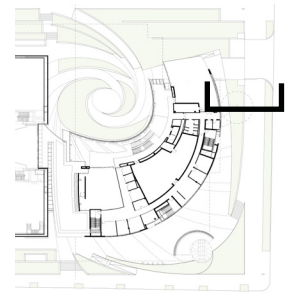
Key Plan



Section View

East Terrace

Key Plan



Interior View

Dining Entry to Learning Courtyard Connection



Interior View

BLC to NASM Connection



Phoebe Waterman Haas Observatory & Astronomy Park

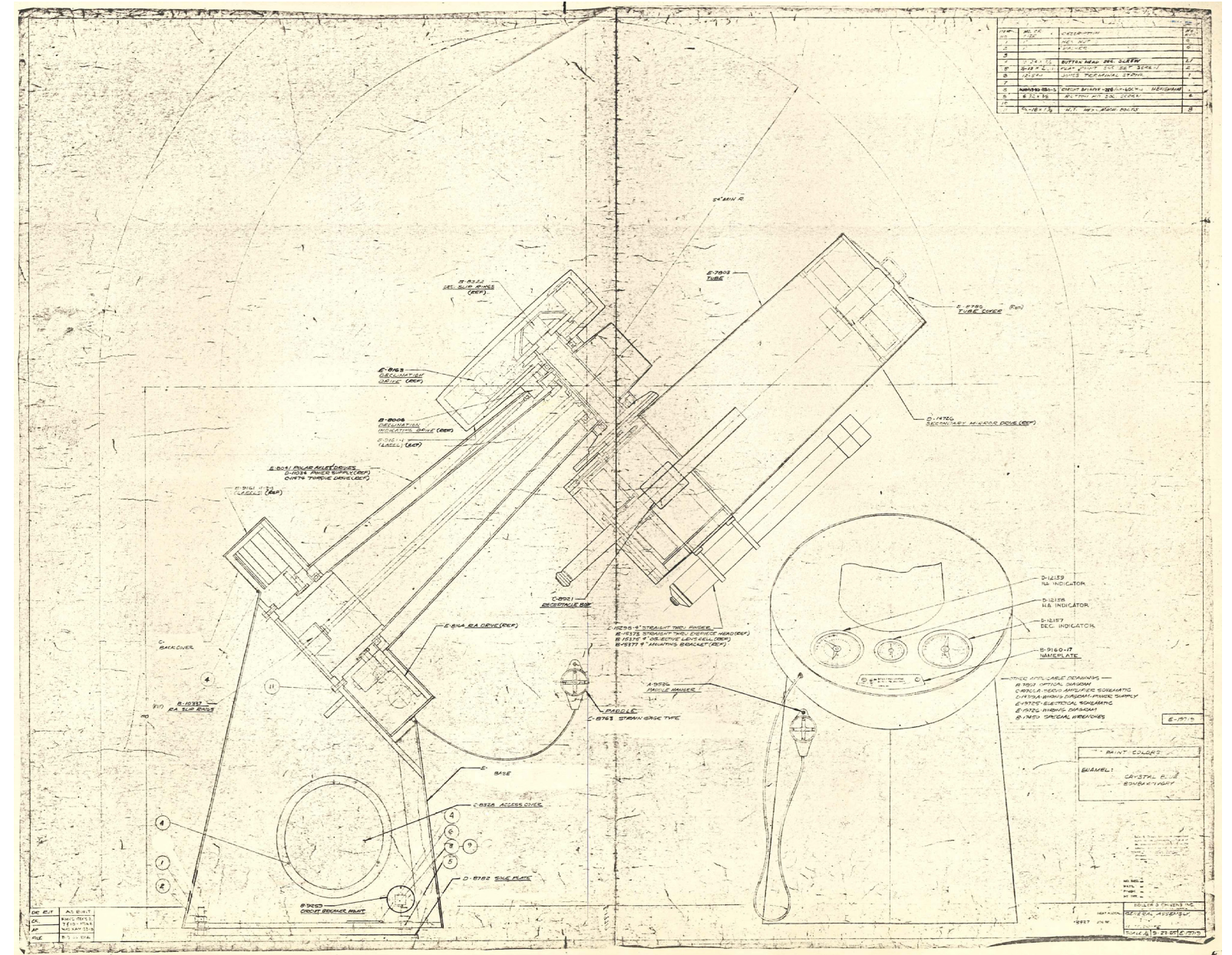
A new permanent observatory will replace the previous temporary structure located on the south terrace.

The south-facing Astronomy Park and Phoebe Waterman Haas Observatory are sited to offer the best views of the night sky. The position of the Observatory at the intersection of 4th Street SW and Independence Avenue is also a prominent marker for NASM.

The design of the Observatory is an extension of the spiral galaxy parti of the landscape and architecture of the BLC. The observatory dome sits as an object, rising from the spiraling Independence Avenue landscape terrace. The curving plane forming the Secondary Chamber of the Observatory matches the BLC exterior envelope, invoking the sense of dynamism and movement of our galaxy.

The Main Chamber of the Observatory houses the relocated 1960's Boller and Chivens 16" telescope within a 26' diameter prefabricated dome with dual apertures. The entry is on the west side of the Observatory, with queuing among the educational installations of the Astronomy Park. From the Entry Vestibule, visitors continue into the unconditioned Main Chamber to experience viewing the sky through the telescope. The exit is positioned for a linear flow of visitor traffic. The Secondary Chamber consists of the supporting program spaces for staff access only.

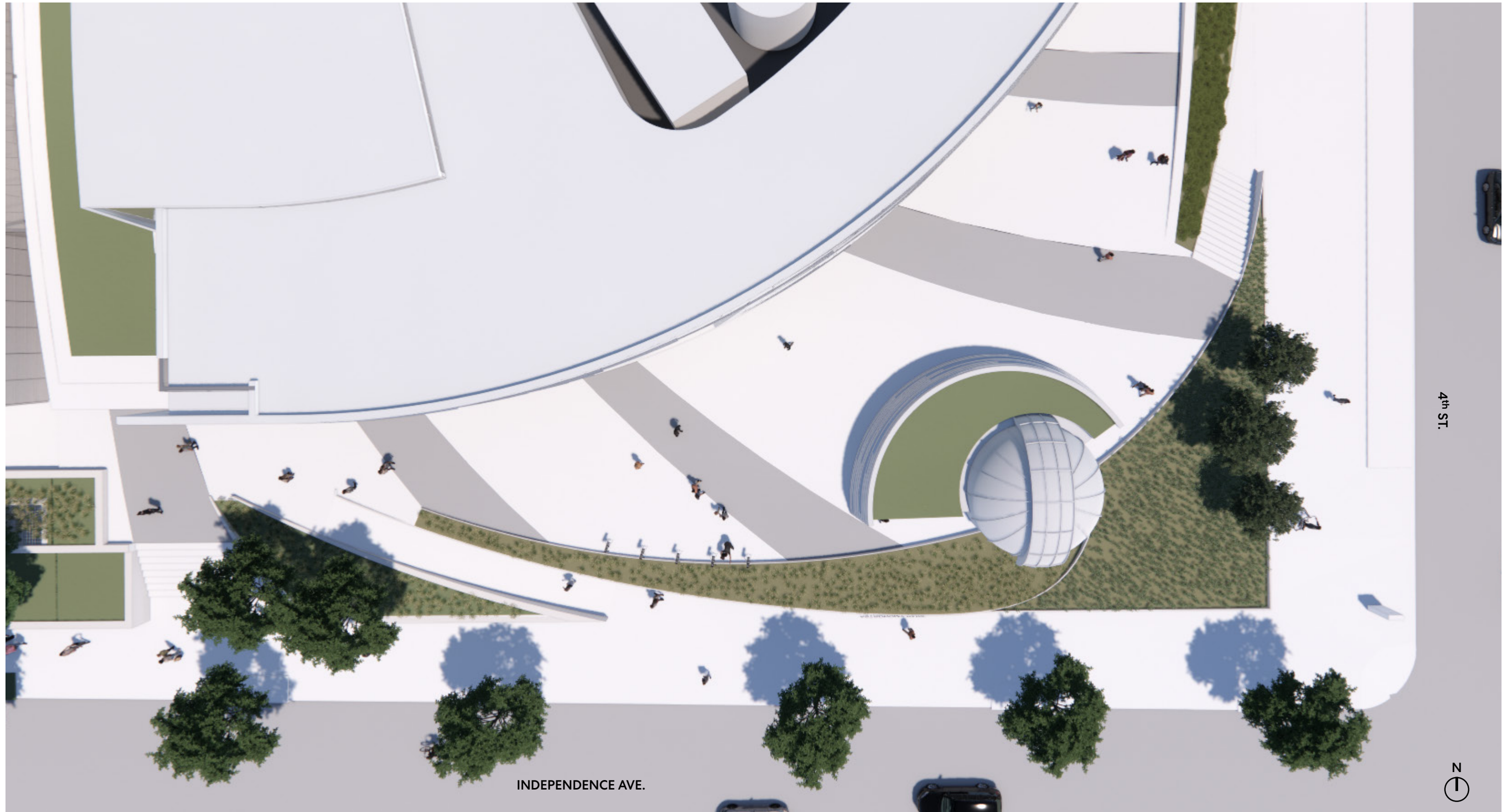
The Astronomy Park educational installations will occupy the terrace to the west and north of the Observatory, integrated with space for small groups facilitated programming and seating. The installations will strive to engage learners in astronomy through self-directed, interactive experiences and accompanying interpretive graphics that assist in fostering critical thinking. These interactive experiences will connect to concepts presented in NASM. Together, the Astronomy Park and Observatory will give visitors the unique opportunity to see and experience the wonders of our universe.



Boller and Chivens Shop Drawing, May 05, 1966

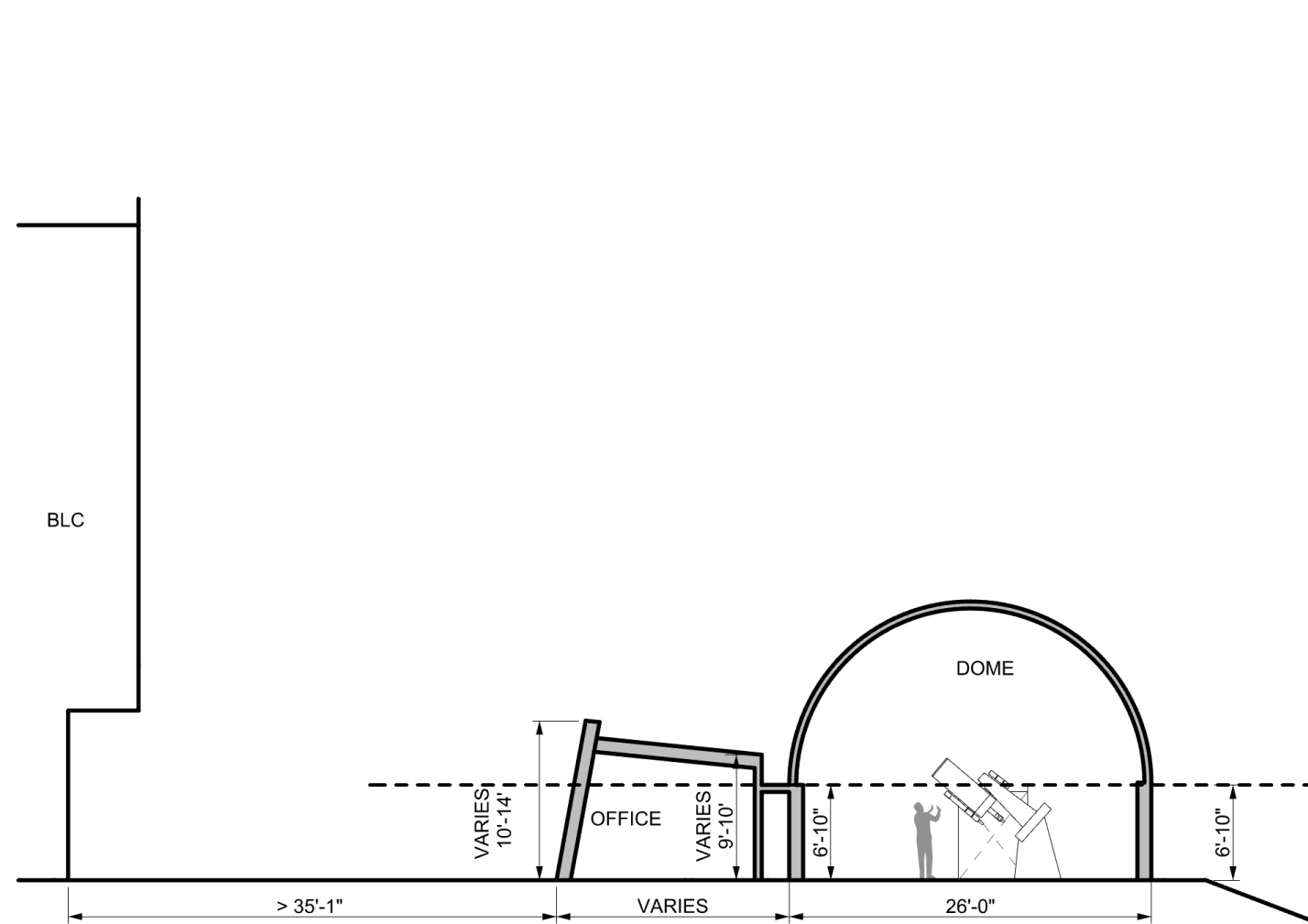
Phoebe Waterman Haas Observatory

Site Plan

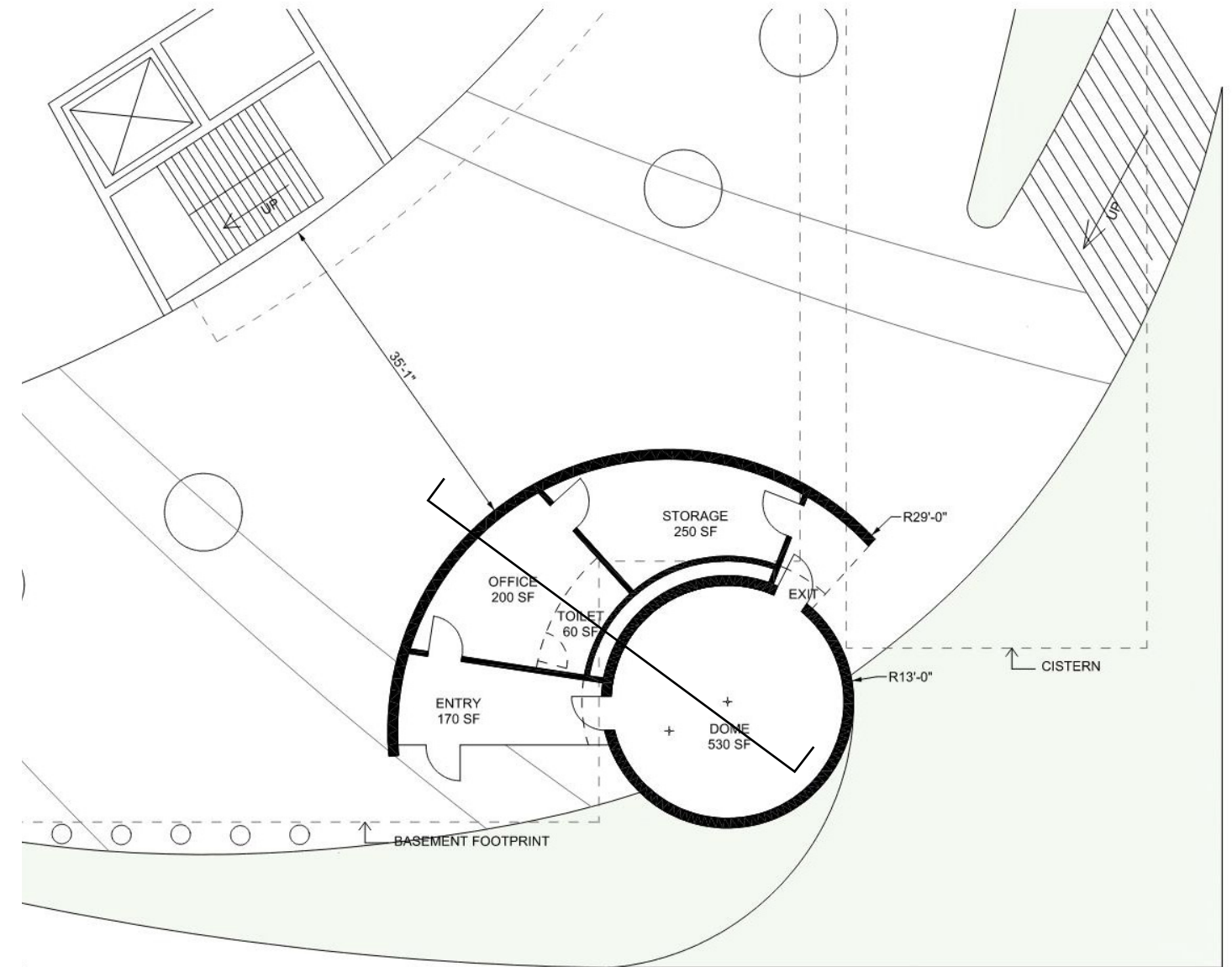


Phoebe Waterman Haas Observatory

Enlarged Drawings



Section

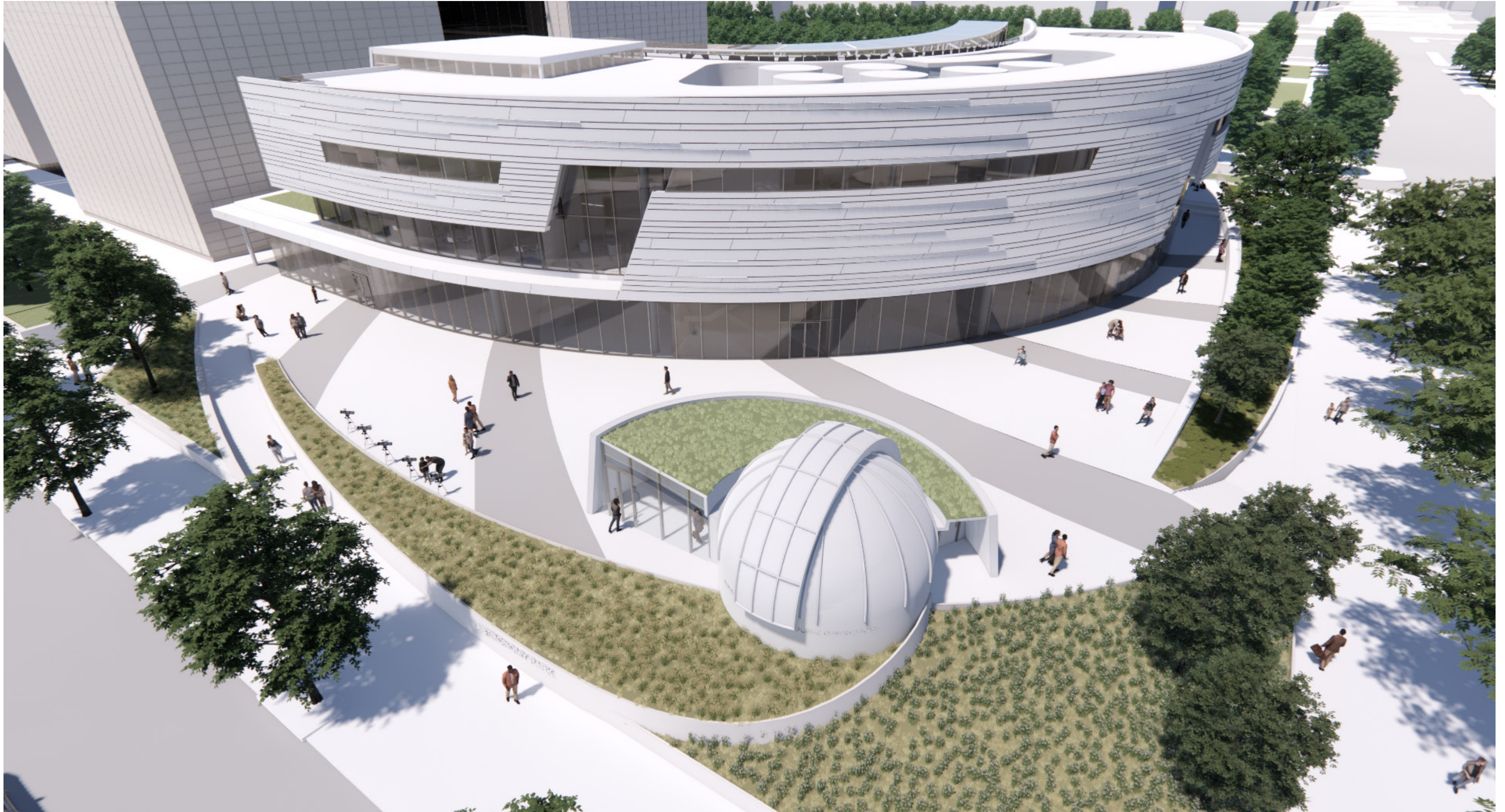


Plan



Phoebe Waterman Haas Observatory

Southeast Aerial View



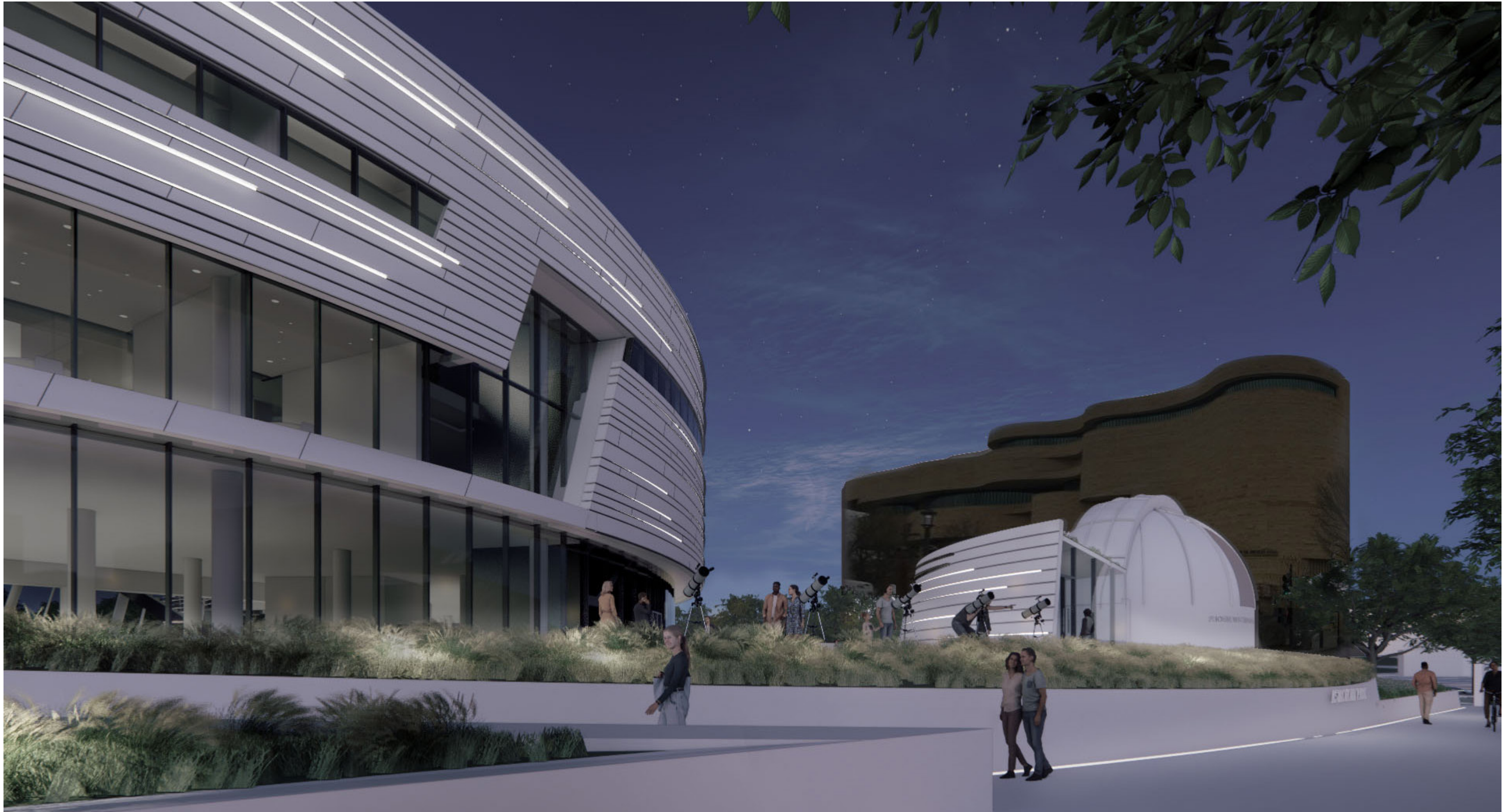
Phoebe Waterman Haas Observatory

Southeast Eye Level View



Phoebe Waterman Haas Observatory

South Eye Level View



Landscape Design

Introduction

The BLC's open space concepts are evolving within the NASM's revitalized landscape framework.

That landscape derives its organizational structure from the original Gyo Obata Site Plan proposed in the 1970s, wherein a series of rectangular terraces surrounded the NASM-NMB to frame and define a centralized approach to the main museum entrances on Jefferson Drive and Independence Avenue. Those terraces reinforced the building's symmetry and strongly axial parti, with mirror configurations along the north and south frontage and almost identical east and west gardens extending to 7th Street and 4th Street, respectively. The original plan predated the Americans with Disabilities Act and did not consider the need for universal accessibility; instead, the steps impart a ceremonial character to the landscape at every approach. Moreover, by bringing the terraced planting beds to the building wall, the opportunity to circumnavigate the museum at its facade or conduct outdoor space programming except at the building entries was moot.

While the NASM-NMB's length and scale made slope and grade changes imperceptible along the sidewalk, the east garden's terraced planters and cascading steps showed the height difference between the public right of way and NASM's first floor. The building plinth's elevation above 4th Street made the east garden a logical location for the restaurant pavilion added in 1988. The resulting redesign to connect the restaurant pavilion addition with

the surrounding urban fabric modified these grand steps, added others on 4th Street, and reconfigured planters to incorporate ramps for universal access from Independence Avenue. The redesign also removed planters restricting perambulation within the site.

The museum has demolished the restaurant pavilion but retained the perimeter planters as part of the accepted Revitalization Plan. They remain the historical context for the BLC site.

The galactic spiral that informs the BLC architectural form introduces an organic, outwardly expanding landscape scheme with two program areas: the north-facing Learning Courtyard fronting Jefferson Drive and the south-facing Astronomy Park, which offers the Observatory and telescope array the best views of the night sky. The design promotes visual and spatial continuity between interior and exterior spaces on the main floor and at Level 2 to planted roofs and canopy vegetation, including canopies of trees on the National Mall.

Visitors specifically coming to the BLC as well as scheduled student groups to NASM will enter and exit through these outdoor spaces, prioritizing exterior circulation and continuous perambulation around the BLC to connect the Learning Courtyard and Astronomy Park. These spaces extend to the surrounding urban fabric in outwardly spiraling movements through revitalized planting areas. The landscape design explores the juxtaposition of the

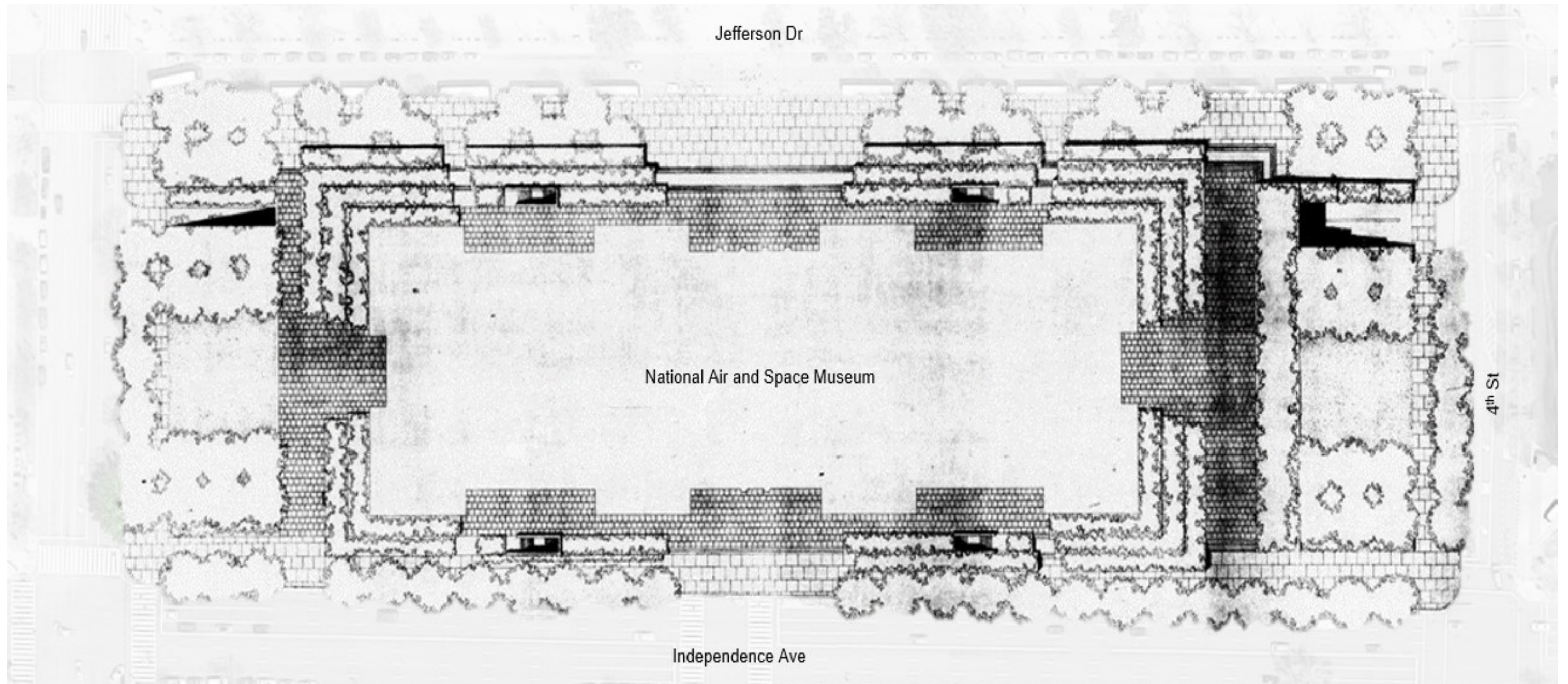
spiral with the revitalized landscape in Option 1 Orthogonal Scheme, which transitions between the spirally organized open spaces and rectilinear planters in the NASM's revitalization parti, and Option 2 Spiral Scheme, which overlays spiral circulation and planting elements on the NASM's Revitalization parti.

The details of the orthogonal and the spiral schemes are illustrated in the Landscape Alternatives in Appendix.

Landscape Historical Context

1972 Site Plan

The 1972 Gyo Obata site plan shows the strongly axial and nearly symmetrical organization of the original NASM landscape, which comprised terraced planters and sloped turf areas. Their hierarchy purposefully directs foot traffic to the centrally located main entries to the museum. It offered an alternate spatial experience and a softer landscape when exiting the site.



Landscape Historical Context

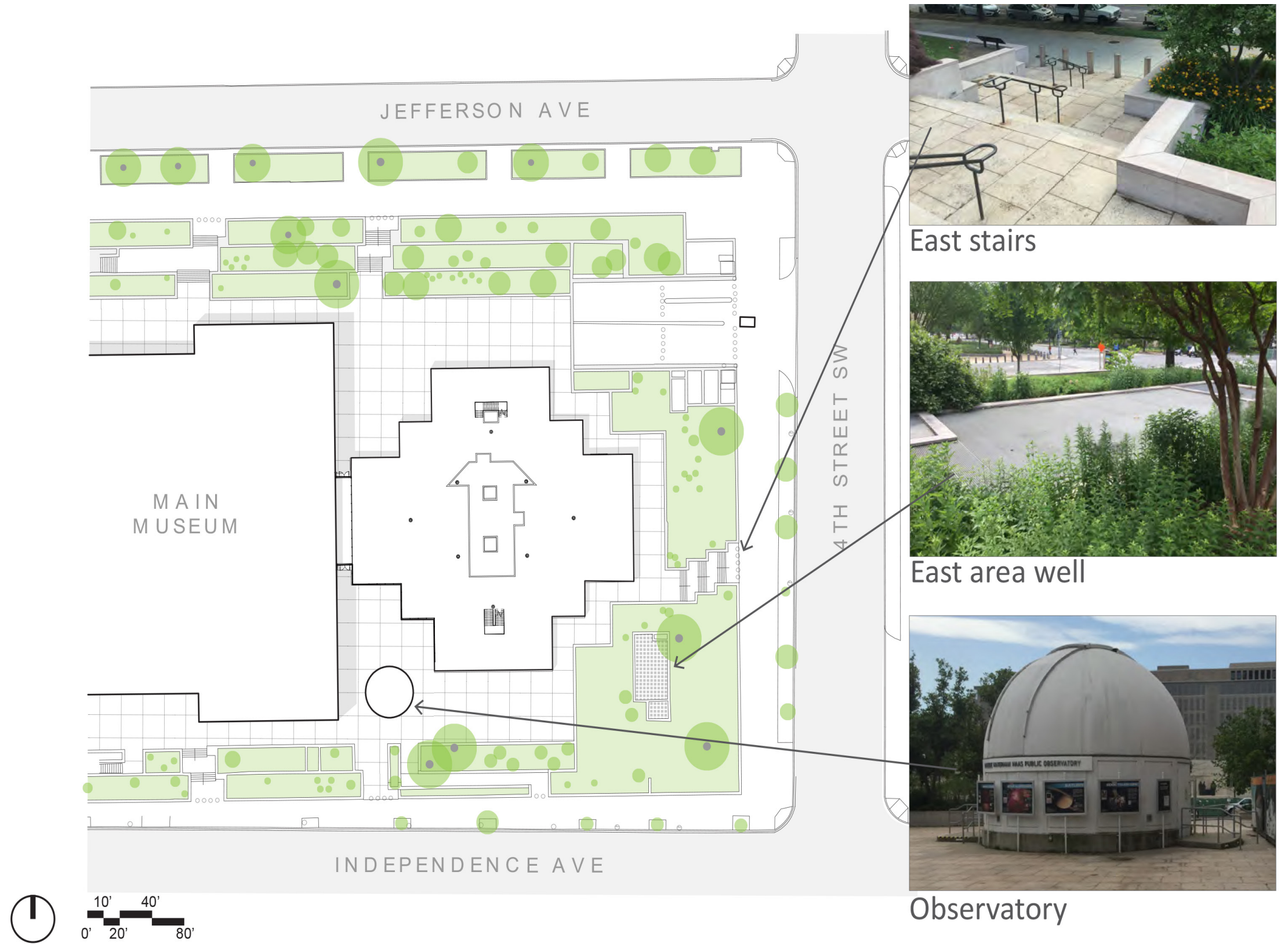
Site Aerial, 1980

This image predates the construction of the Obata restaurant pavilion and the NMAI to show a bird's eye view of the NASM 4th Street SW landscape.



Previous Site Conditions

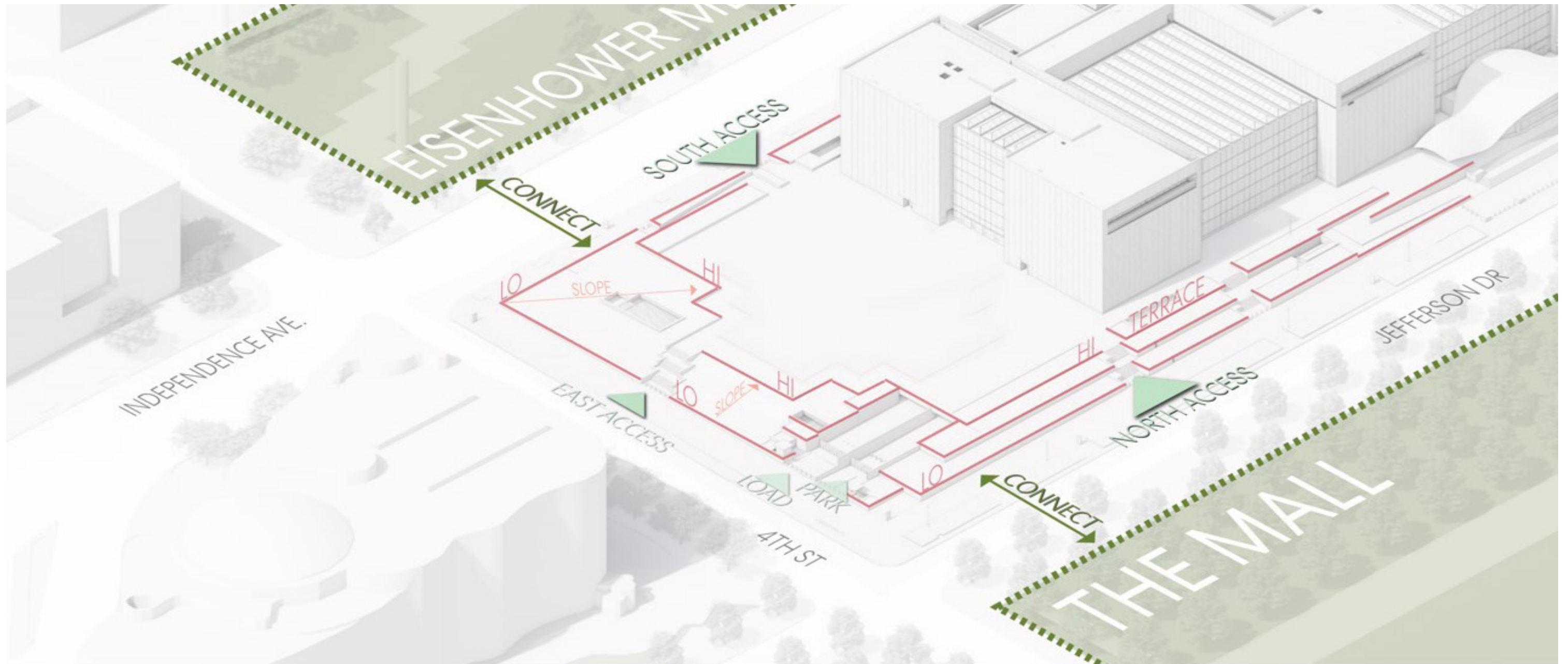
Restaurant Addition Landscape Plan



Existing Site Conditions

North-East Axonometric

The Revitalization Landscape Plan retains the east garden's planting tiers, whose design Gyo Obata modified to construct the restaurant addition.



Revitalization Landscape Plan

The landscape architecture design team at AECOM, with consultation from horticulturist and landscape designer Patrick Cullina who focused on perennial and smaller scaled plantings, reconceived the landscape design for the NASM Revitalization to diversify plantings, add native trees, shrubs, and herbaceous understory, and introduce pollinator species within refurbished planters. The design also restores tree canopy to the NASM site, with tree spacing to provide sufficient sunlight for the planting understory.



Hardscape Materials

The terrace level paving will be cast-in-place concrete with exposed aggregate and integral color, similar to the current paving at NASM-NMB installed as part of the Revitalization project. The existing materials as implemented in the Revitalization plan include granite at the north and south entries, exposed aggregate concrete throughout the remaining site walkways and public space, and benches in the west grove. Color and aggregate selections may be utilized to define galactic spirals as the landscape design progresses, reinforcing the architectural design. Paving joints shall be scored or formed by non-corrosive metal divider strips. A distinctive paving material such as granite may be used to highlight features, for example the center of the Learning Courtyard.

The NASM-NMB stone cladding is “Colonial Rose” granite. The Revitalization hardscape includes granite at the north and south entries, aggregate concrete for remaining hardscape of the NASM site along with the appearance of benches in the west grove. This project proposes using blocks of this granite in “ribbons” as planters and knee walls, undulating in height from zero to eighteen inches and width from four to eighteen inches. Exterior lighting for egress and safety will continue the strategies used on NASM-NMB. It too may be configured to reinforce the spiral galaxy metaphor.

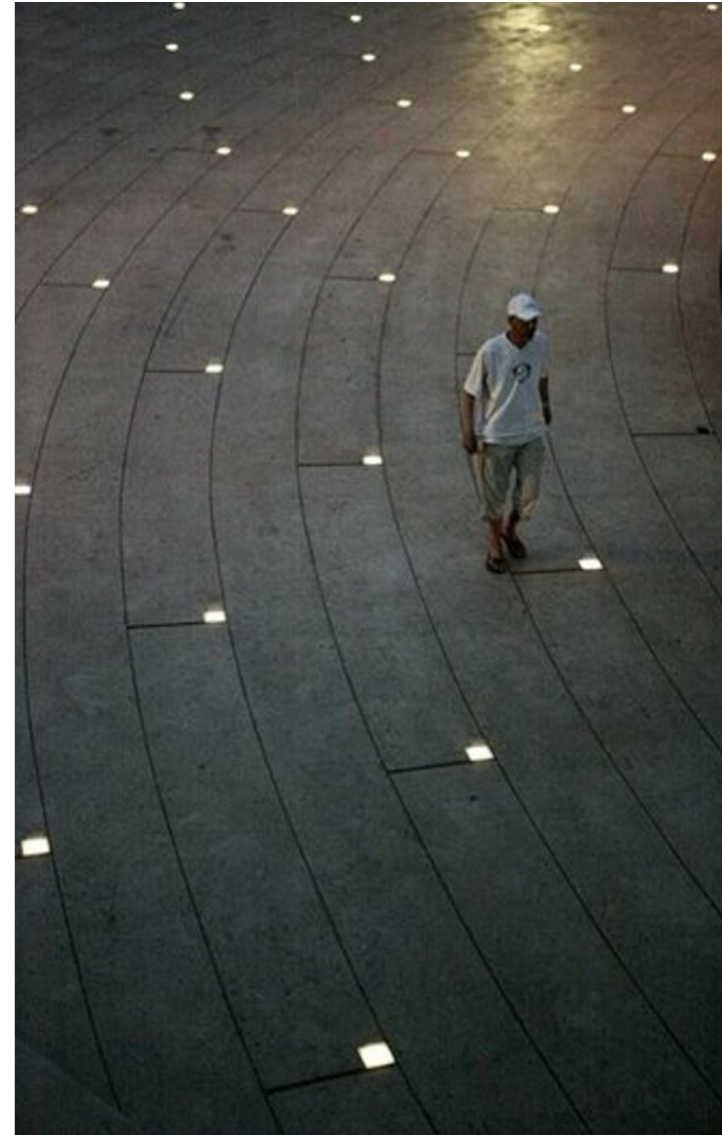
Monolithic concrete paving



Thermal-finish granite slab



Exterior lighting



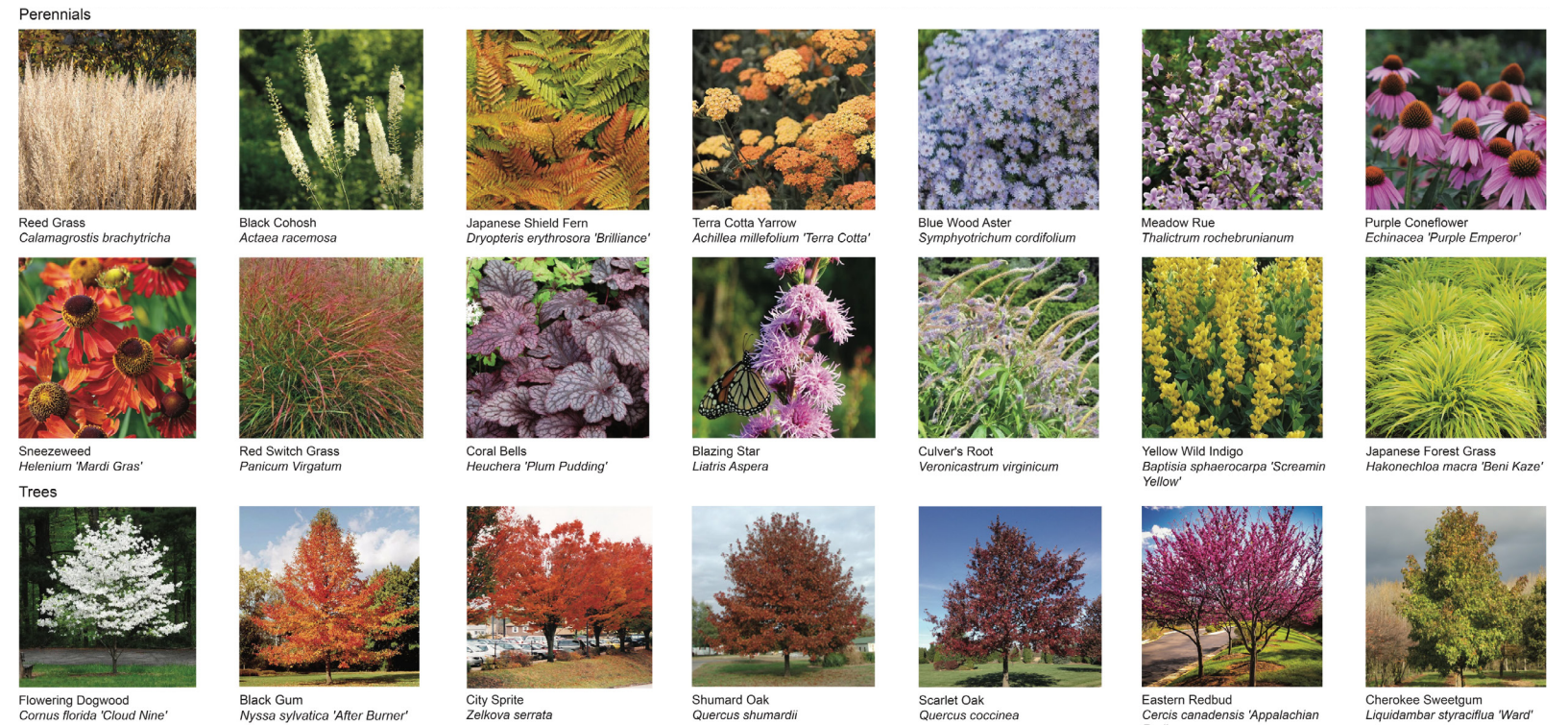
Granite block ribbons



NASM Revitalization Planting Palette

Incorporating the NASM Revitalization planting concept, a carefully chosen palette of mostly native perennial and prairie plants, as well as trees that serve to foster biodiversity and support a diverse array of pollinators are being considered. This approach establishes a visual and ecological connection with the broader national prairie landscape of the Mall, contributing to a harmonious integration within the site.

NASM Revitalization Perennials



Prairie Plants



Night-Blooming Plants

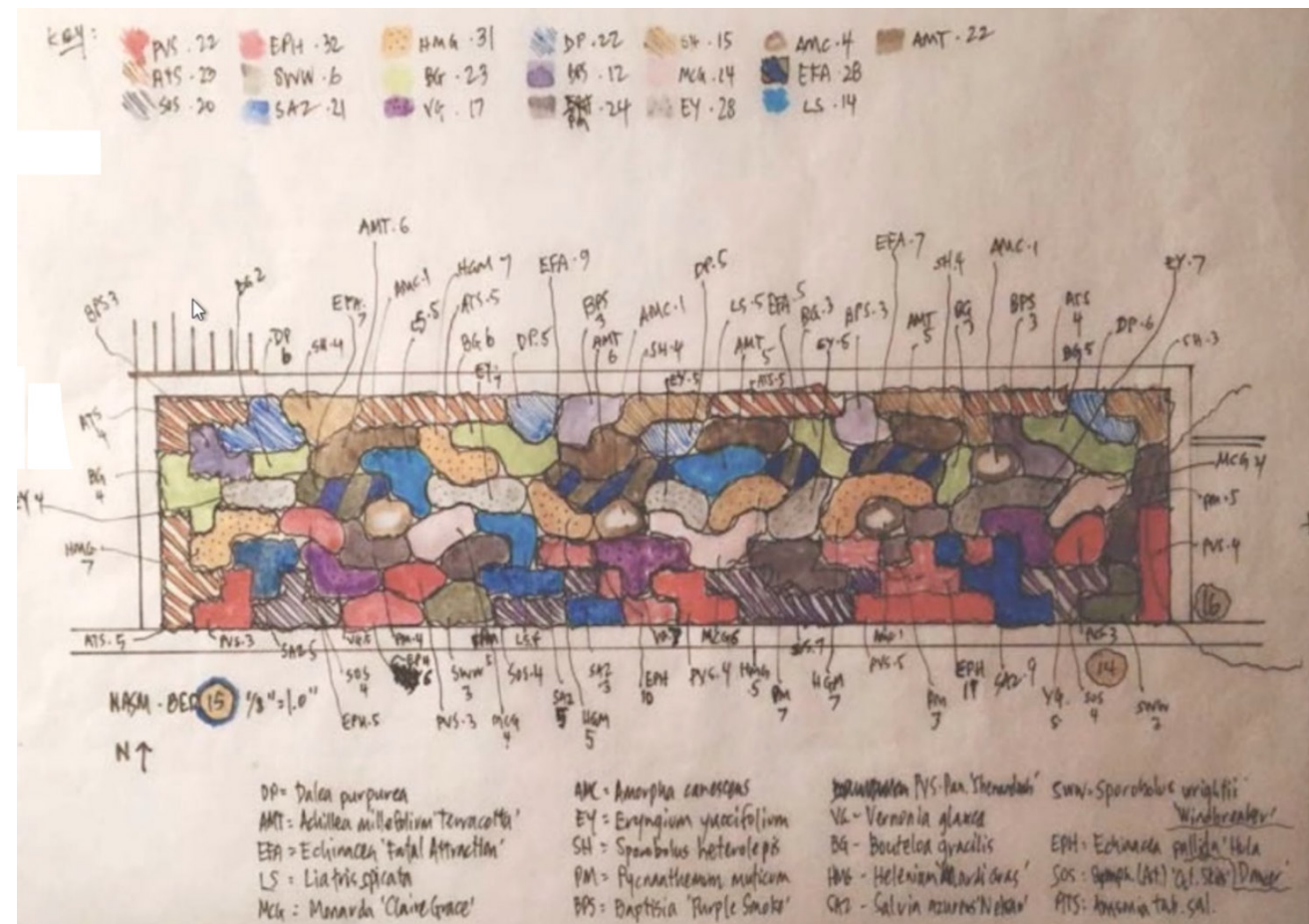
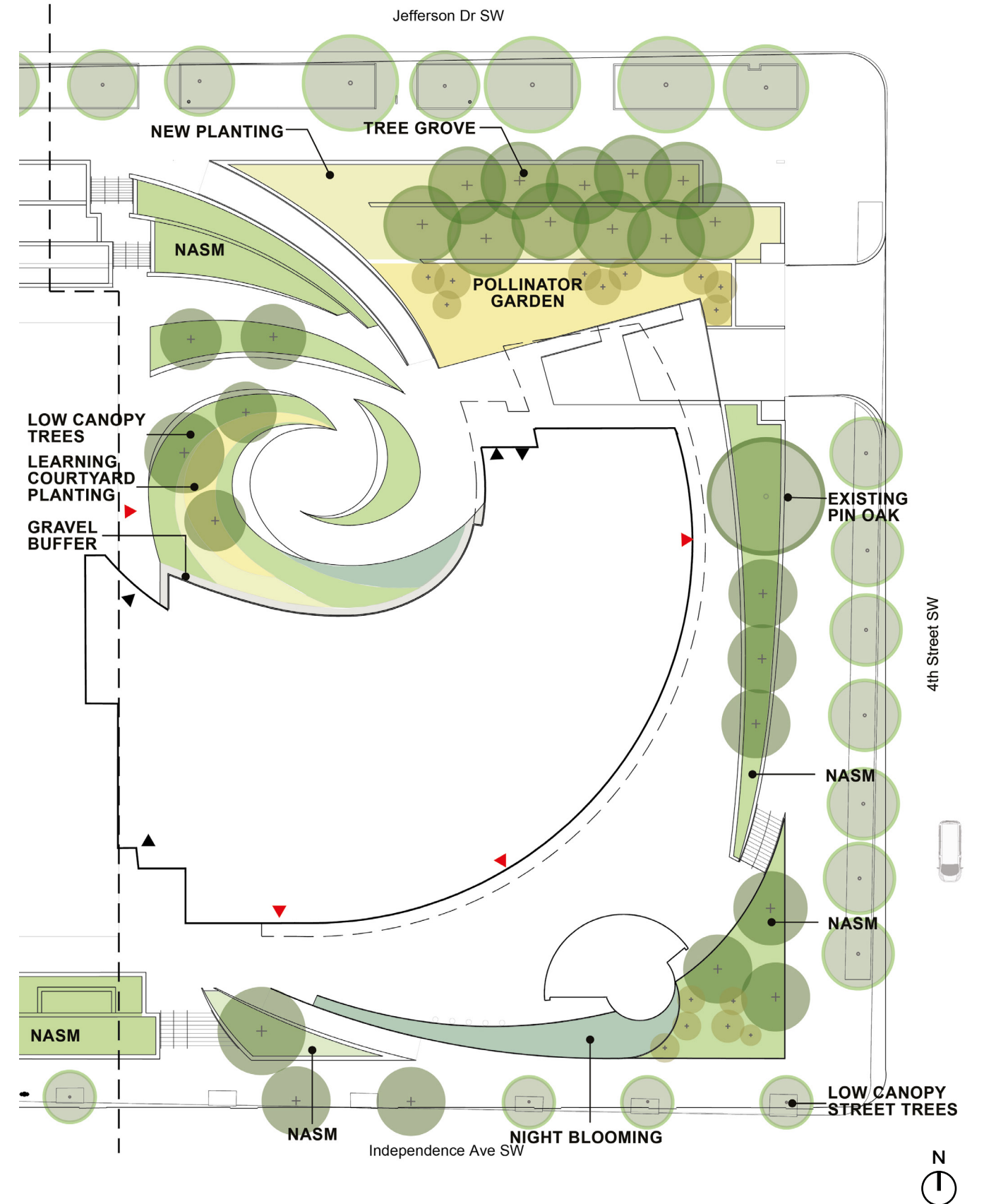


Image of Patrick Cullina sketch for planting concepts, December 2023
Image courtesy of SI

Landscape Planting Concept

Ties to the National Landscape

Regional landscapes along Route 66, with the country's darkest skies and numerous observatories, can be interpreted within the Cullina planting palette using native plantings and fine grading.





Environmental and Historical Considerations

Historic Preservation

Section 106 Process Overview

Section 106 of the National Historic Preservation Act (NHPA):

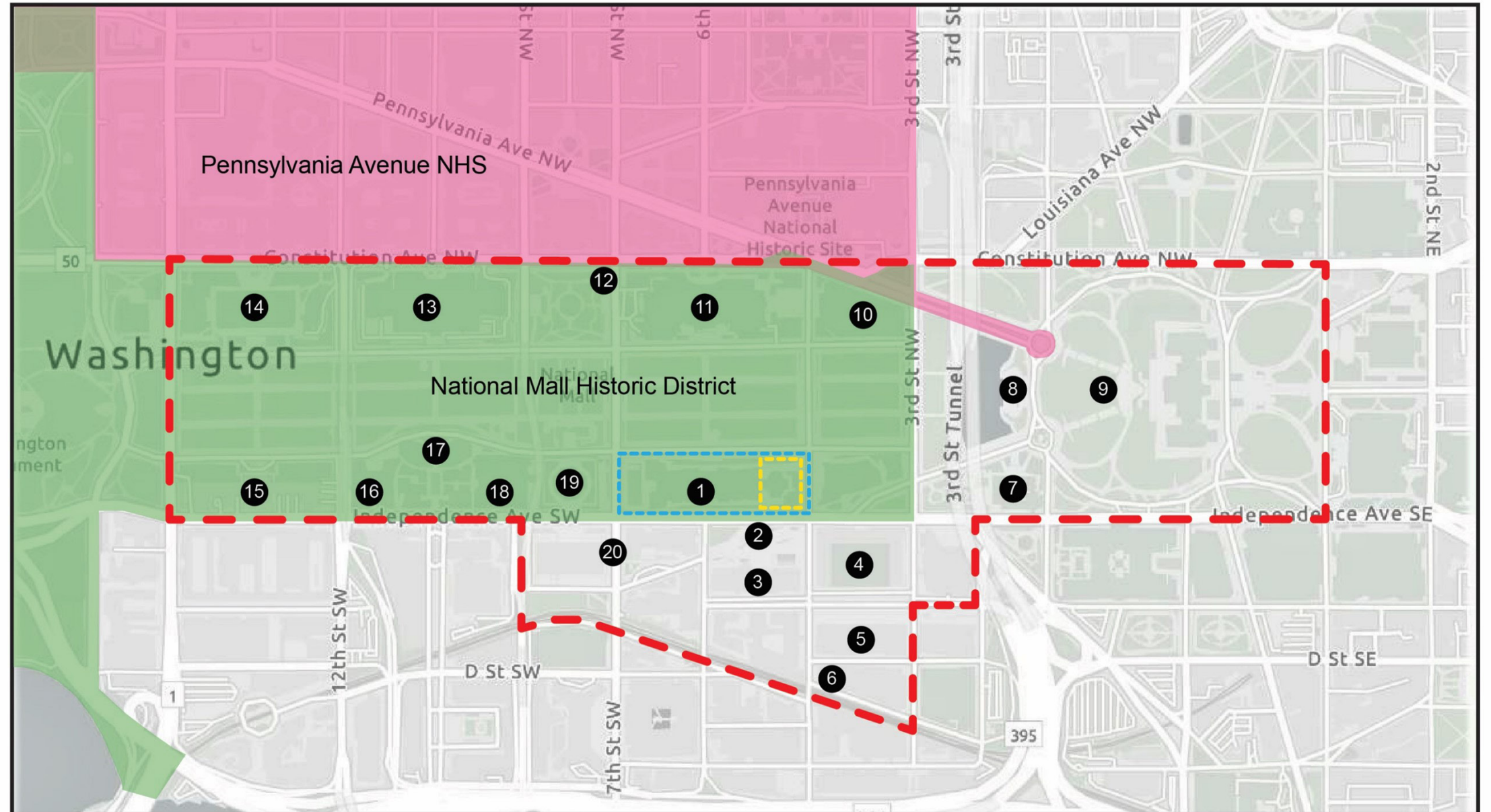
- NASM contributes to the National Mall Historic District
- Section 106 requires federal agencies to consider the effects of their projects on historic properties and seek ways to avoid, minimize, or mitigate any adverse effects
- Section 106 requires consultation to seek, discuss, and consider the views of “consulting parties” who are invited to participate in the process
- Approximately 90 consulting parties or organizations were invited to participate

NASM View Looking SW from NE, Historic American Building Survey, 2017.



Historic Preservation

Area of Potential Effect



Key			
	NASM Site		Project Area
	Area of Potential Effects		
	National Mall Historic District		
	Pennsylvania Avenue NHS		
1	National Air & Space Museum (NR Eligible)	5	Mary E Switzer Federal Building
2	Dwight D Eisenhower Memorial	6	Terminal Refrigerating & Warehousing Co.
3	Lyndon B Johnson Dept of Education	7	US Botanic Gardens
4	Social Security Administration	8	Ulysses S Grant Memorial
5	Natural History Museum	9	US Capitol and Grounds
6	Bulfinch Gatehouses and Gateposts	10	National Gallery of Art East Wing (NR Eligible)
7	National Gallery of Art West Wing	11	National Gallery of Art West Wing
8	National Museum of American History	12	Hirshhorn Museum (NR Eligible)
9	US Dept of Agriculture	13	Orville & Wilbur Wright Federal Buildings (NR Eligible)
10	Freer Gallery	14	Plan of the City of Washington (Not Shown)
11	Smithsonian Castle		
12	Arts & Industries Building		
13			

Historic Preservation

National Mall Historic District

Contributing Views and Visual Relationships

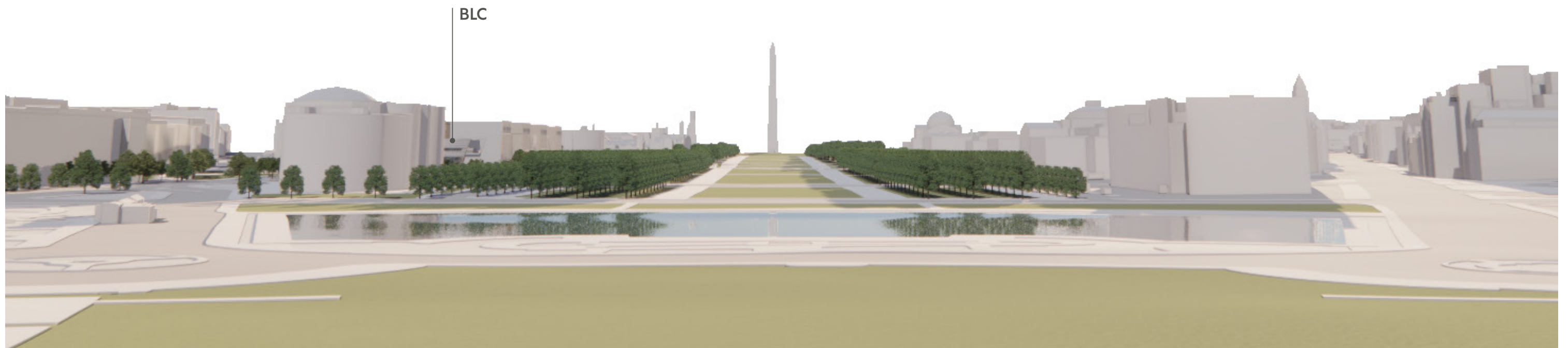
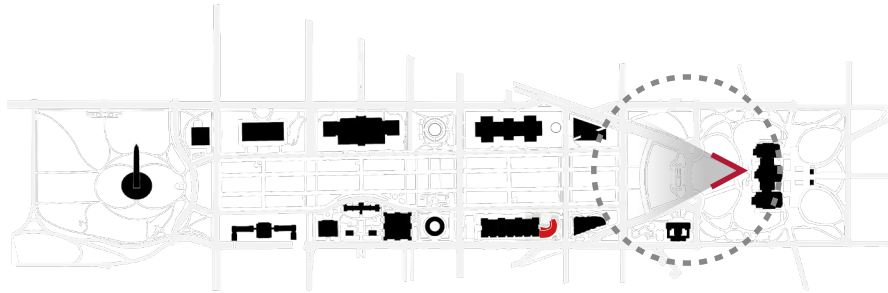
- Reciprocal view east-west between the Washington Monument to the Capitol
- North-south vista along 4th Street
- North-south vista along 6th Street, between NASM and the National Gallery West Building
- North-south vista along 8th Street, toward the National Archives
- North-south vista along 10th Street, between National Museum of Natural History and the Smithsonian Institution Building
- Visual relationships include views to the elms and the buildings along the Mall from the pedestrian walks and central grass panels



Contributing Viewsheds

Capitol Steps

This northeast view from the Capitol steps highlights the pavilion-like nature of the BLC relative to its larger context. The much lower height, setbacks, and surrounding open areas of the BLC allow the building to be deferential to its more prominent and primary NASM and NMAI neighbors.

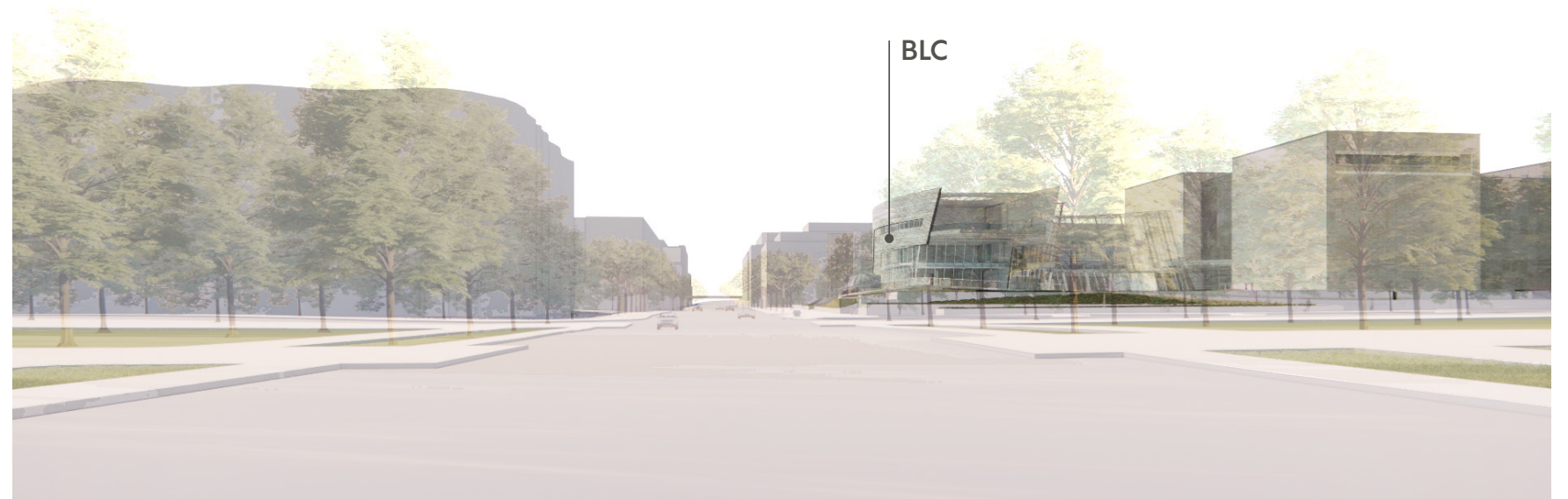
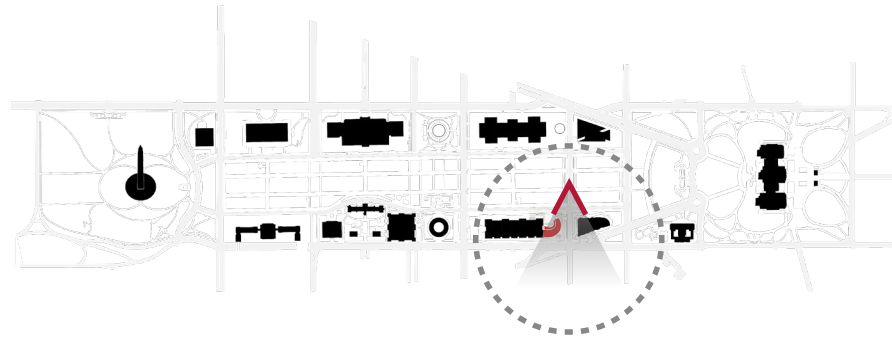


Contributing Viewsheds

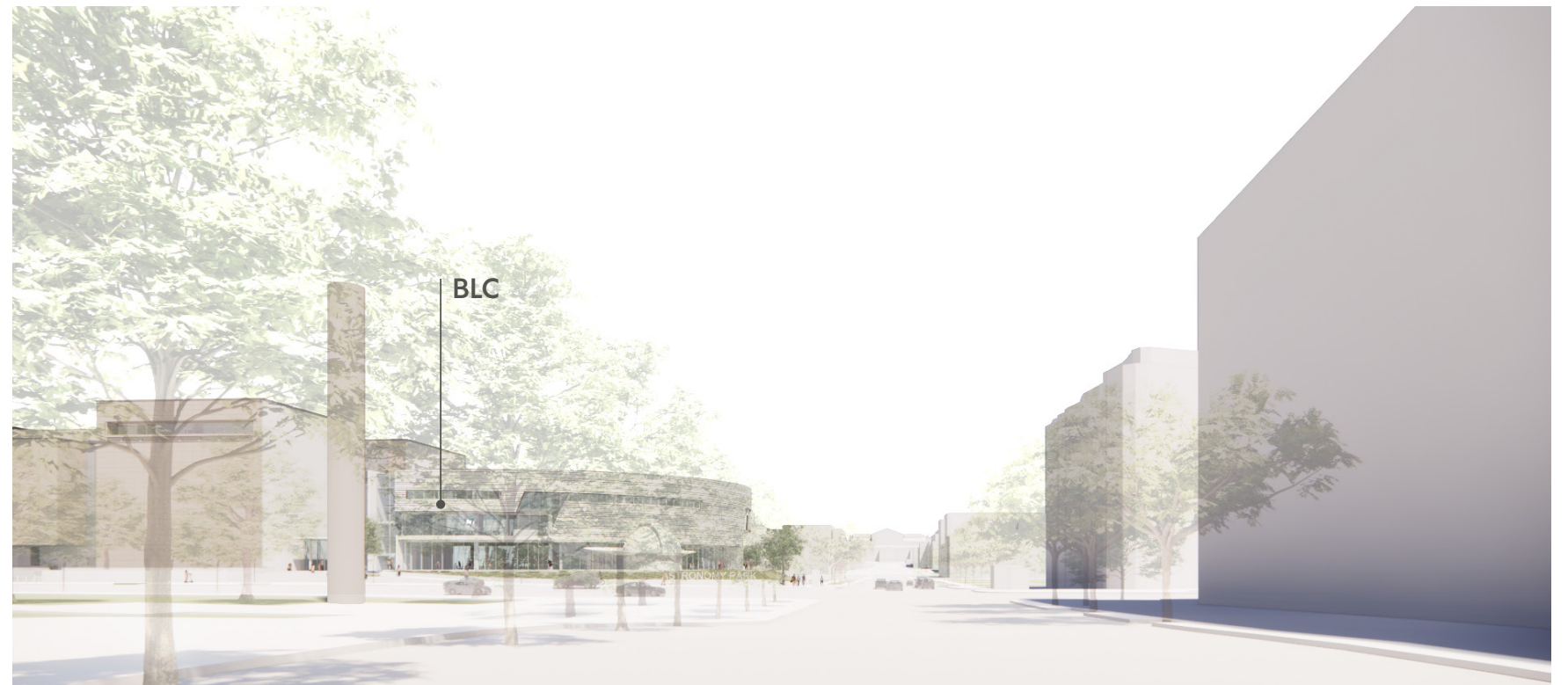
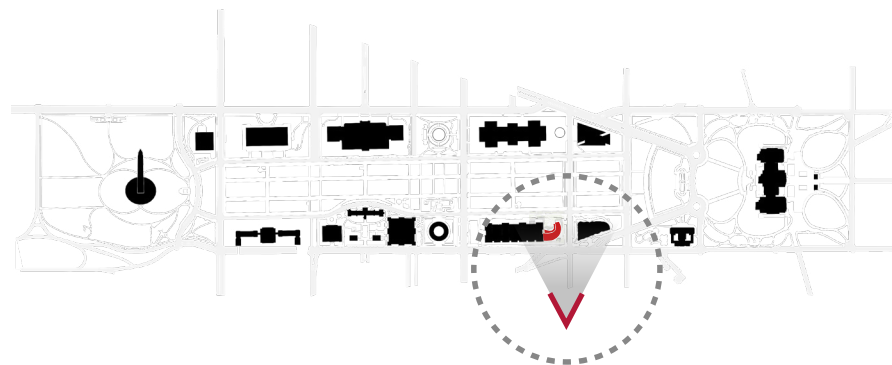
4th Street

The view from 4th Street looking south reveals how the additional thirty foot setback from the 4th Street corridor mirrors the NMAI setback, visually widening the corridor as it approaches the National Mall. The Learning Courtyard provides an open space connection to the major public realm of the National Mall to the north across Jefferson Drive.

The view from 4th Street looking north reflects how the green space within the additional thirty foot setback and the Astronomy Park located south of the BLC provide another open space connection to the more prominent Eisenhower Memorial across Independence Avenue.



4th Street South

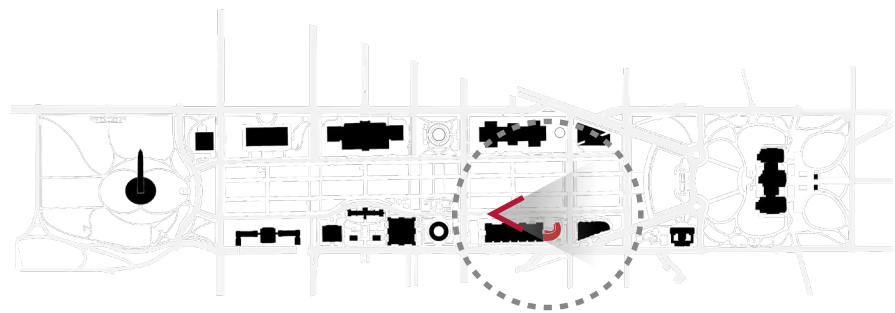


4th Street North

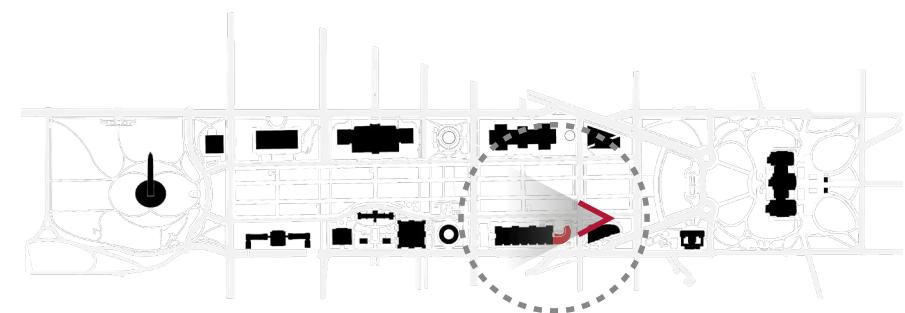
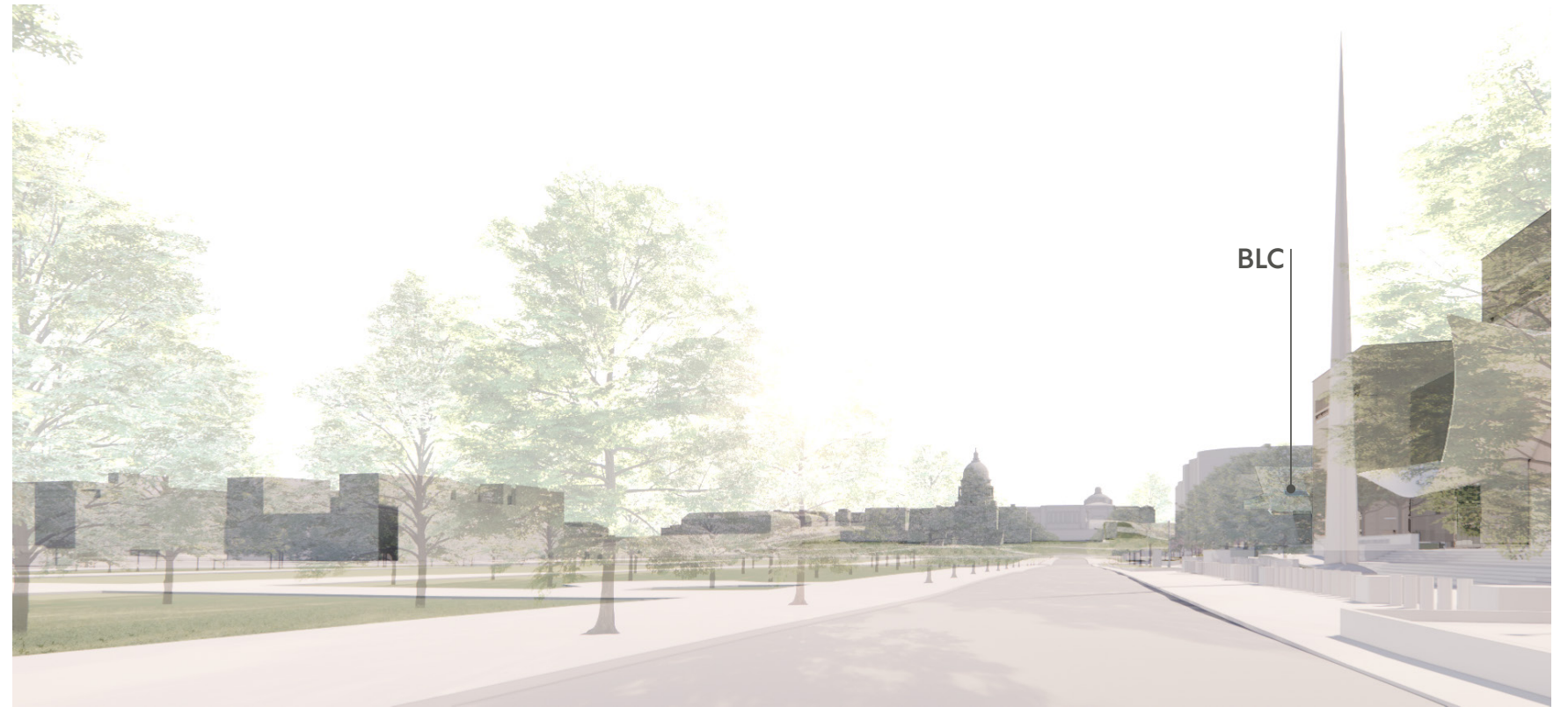
Contributing Viewsheds

Jefferson Drive

The views looking east and west along Jefferson Drive show the relationship of the BLC as lowered and setback from NASM, its primary neighbor. In both views, the new exterior canopy at NASM's north vestibule is visually dominant in the streetscape, signaling this point as the main entrance.



Jefferson Drive East



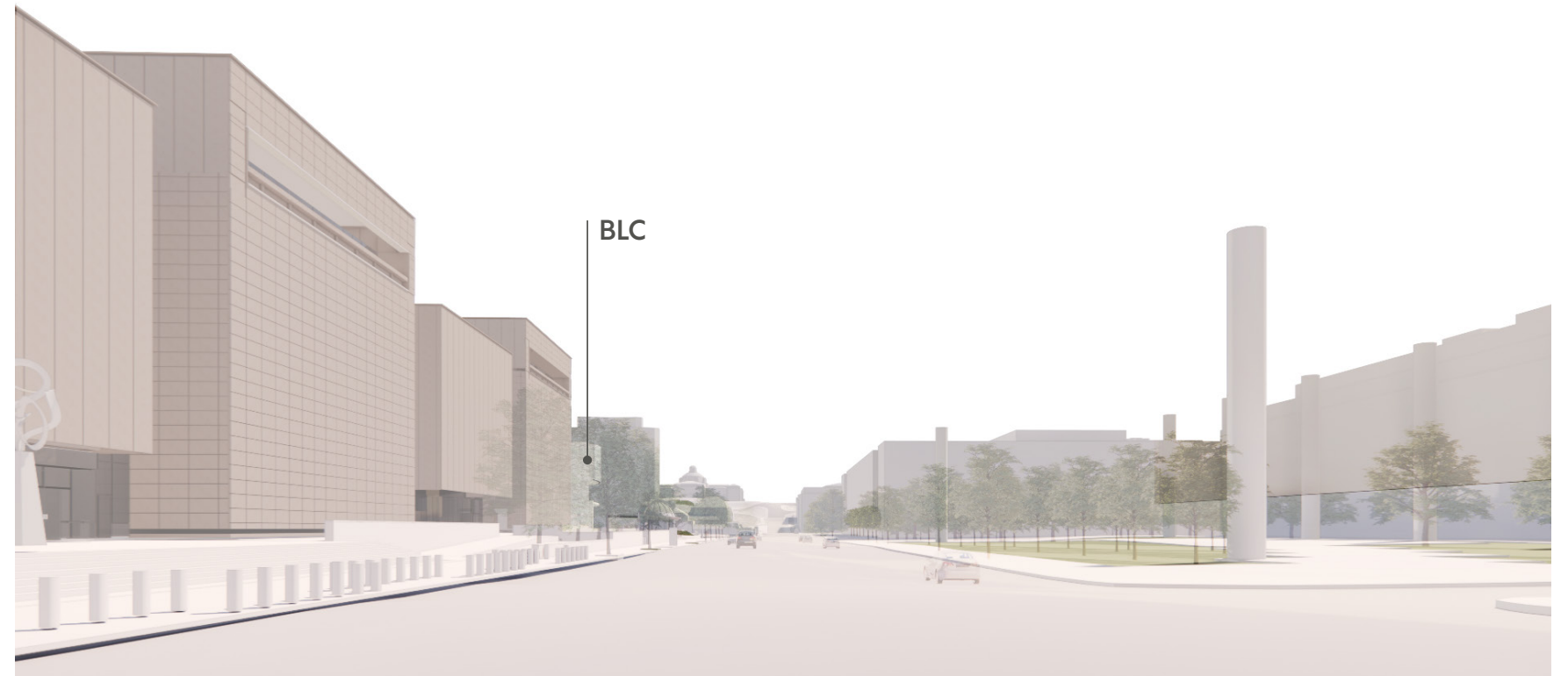
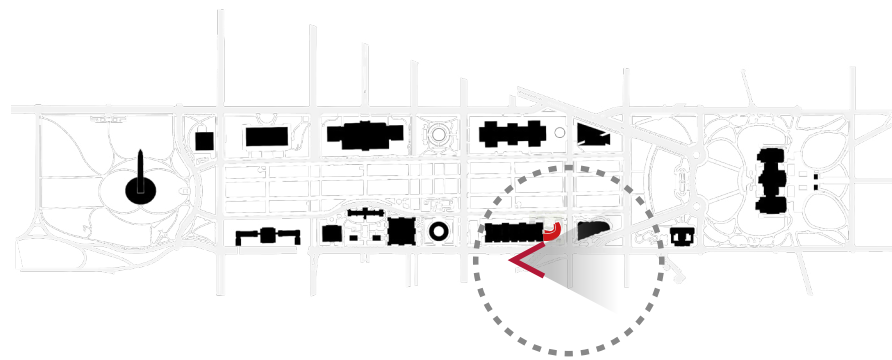
Jefferson Drive West



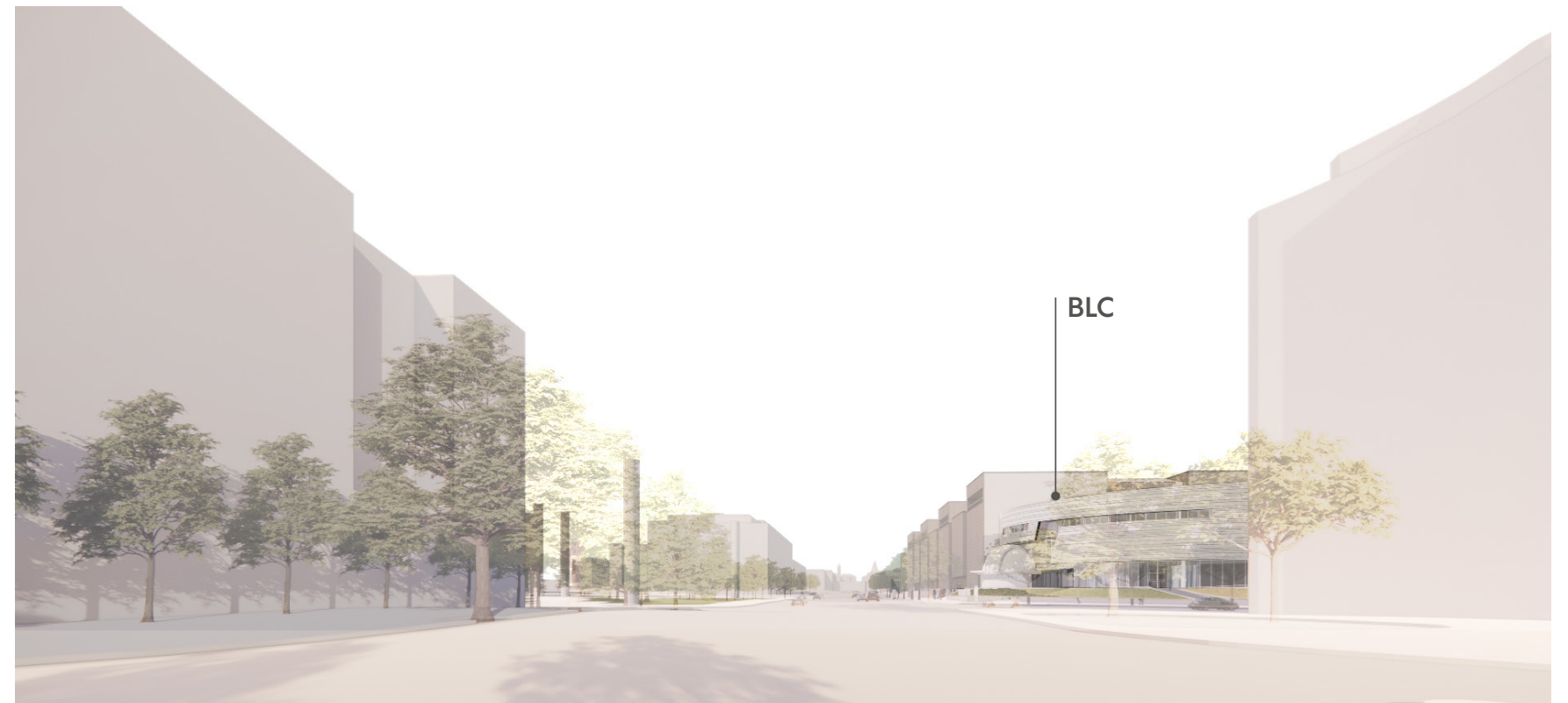
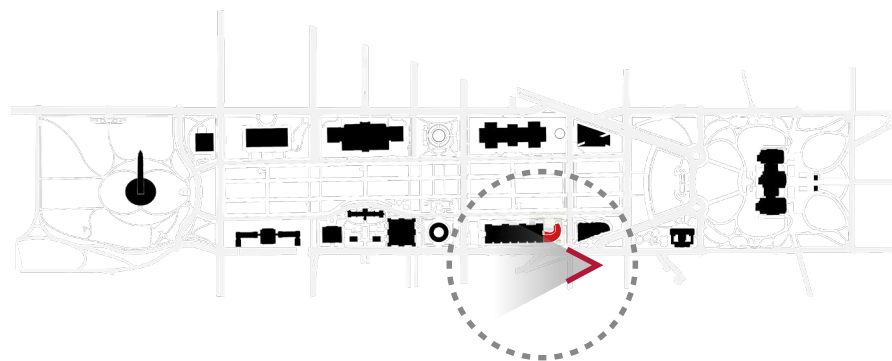
Contributing Viewsheds

Independence Ave

The west view highlights the distinct nature of the spiral form of the BLC as it bends away from the 4th Street and Independence intersection allowing the open space of the Astronomy Park to occupy the corner as it flows around the building.



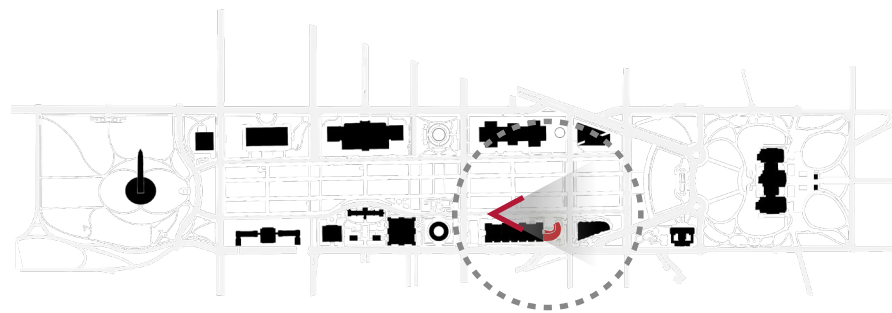
Independence Ave East



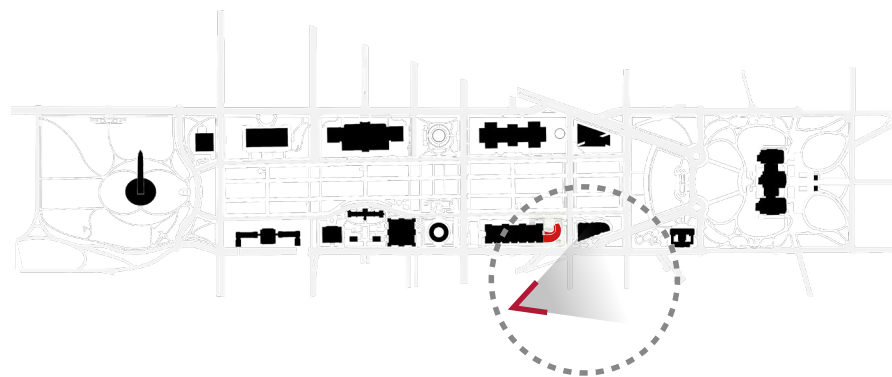
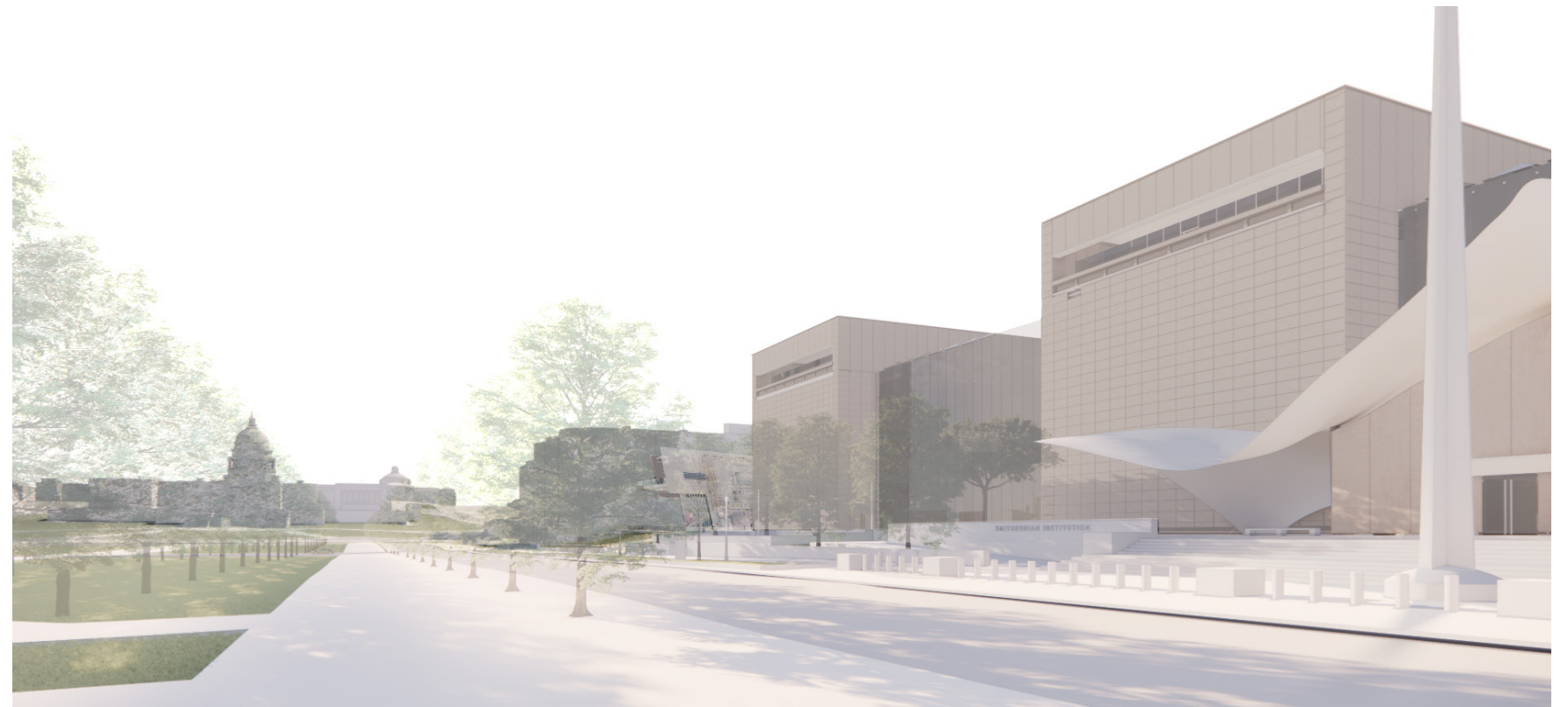
Independence Ave West

Contributing Viewsheds

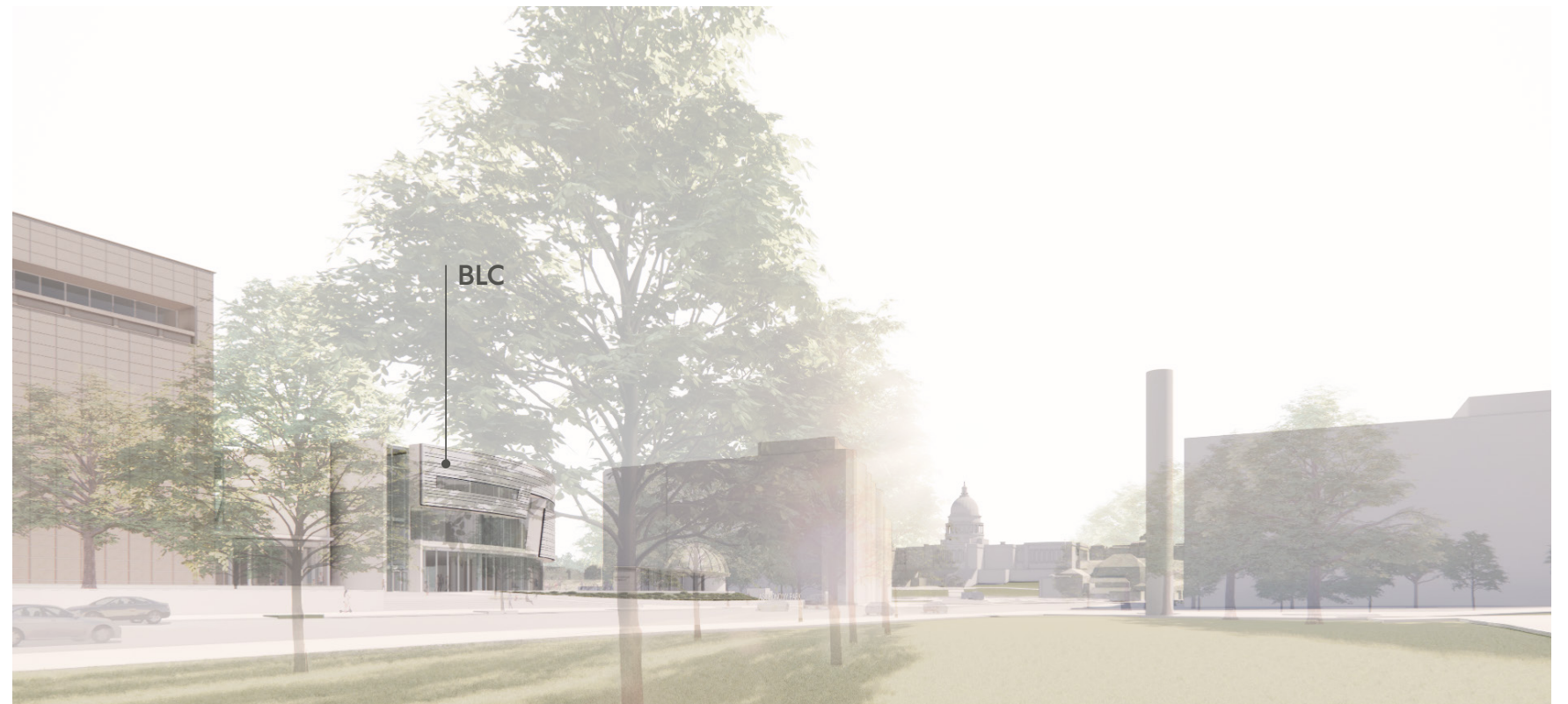
The pedestrian level view at the new exterior canopy at NASM's north vestibule reinforces this point as the main entrance and the BLC as secondary. The pedestrian view looking east reveals the relationship of the BLC to its larger context including the Capitol.



Jefferson Drive access from NASM entry



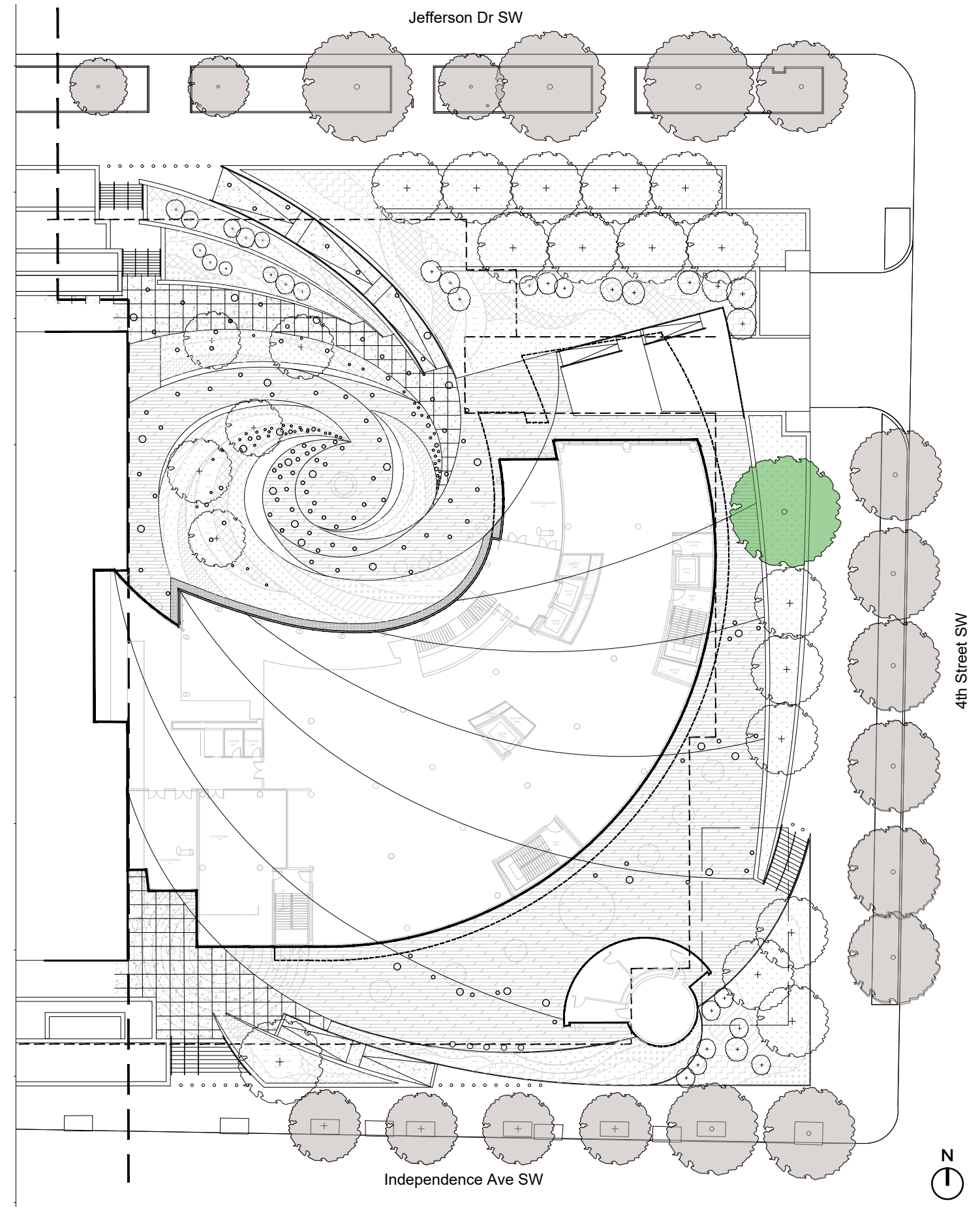
Independence Ave West

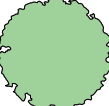



Natural Resources

Existing Tree Preservation

The site does not contain sensitive environmental resources and there is no anticipated adverse effects on natural resources with the construction of the BLC. The site plan design will allow for the preservation of an existing Pin Oak tree on the east side of the site. In addition, street trees will be preserved and protected during the construction phase.



-  Existing Pin Oak Tree to be protected
-  Existing Public Space Street Tree to remain and be protected

Flood Mitigation

Climate

Washington DC published the Climate Ready DC Plan in 2016, amassing months of analysis of climate science data, vulnerability assessments, stakeholder workshops, and public comment to create an actionable approach to planning for change. The plan focuses on the three major risks to the District: extreme heat, extreme precipitation, and combined sea level rise and storm surge.

- The city anticipates higher general temperatures in the future, including longer heat waves and more “code red” days (days when the heat index is anticipated to be above 95°F and when emergency plans are activated).
- DC will experience more frequent intense rainfall events, where 100-year storm events become 25-year storm events by 2050. These storms can overwhelm existing drainage systems and pollute waterways.
- While the District is not on an oceanic coast, it sits at the connection of two tidal rivers and will experience higher tides in relation to sea level rise. These will be exacerbated by coastal storms which can cause surges upriver, endangering low-lying land.

While Climate Ready DC focuses on the District government’s plan for climate change and identifies pressing risks for the city overall, the SI’s 2021 Climate Change Action Plan (CCAP) outlines the approach the Institute will take to ensure the longevity of its mission and collection, and its commitment to the goals of Executive Order 14008. The priorities outlined in the CCAP provide an additional set of lenses through which the BLC should be viewed, and a set of criteria that must be benchmarked against the documented, site-specific risks for the District of Columbia and the NASM. The Vulnerability Assessments included in the CCAP provide robust overlap with the climate data for the District of Columbia.

Of the 5 priorities identified in the CCAP, the design of the BLC at NASM can most directly support #3 Collections and #5 Facilities and Infrastructure, which also can address the Updated Vulnerability Assessments outlined in the report as well. The design team is working to understand how the low existing elevation of the site and below-grade spaces compare against flooding projections for the site, and what additional mitigation measures may be needed. This includes both flooding from sea level rise and storm surge as well as “nuisance flooding” and inundation from intense rainfall. In addition, the design of the BLC can work to mitigate rising temperatures and heat events by through the design of vegetated spaces, efficient mechanical systems, and inclusion of elements that provide shade and respite from the sun.

Flood Mitigation

Resiliency measures against the risk of flooding were established by the NASM Revitalization project. The following is from the NASM Final Construction Documents: Basis of Design Report, Volume 1, SF Project No. 1206101, dated 31 January 2018, pages 4.13 – 4.14:

“The site design incorporates the target of maintaining facility resiliency against the risk of floods. Per Executive Order 13690, the site perimeter is designed to withstand the flood water elevation that is equivalent to a 100 year flood plain, plus an additional three feet of clearance. This establishes a target elevation of 15’-6” above sea level that must be accommodated in the design of perimeter site walls and flood gates where needed.

Automated hydraulic flood gates are proposed for installation at the top of the northeast ramp to the parking garage and loading dock due to location of north, east and southern edges of the site in the 100 and 500 year flood plains, with further risk represented in the flood water target of a 100 year flood plain plus three feet. The existing site wall accommodates the 15’-6” target elevation, with the exception of approximately 12 feet of length at the east end of the north wall to the ramp; the wall is proposed to be extended vertically by approximately 2’-9” in this location to establish a consistent barrier to the design flood water elevation when the flood gates are deployed.”

Matching the Revitalization project scope, the BLC project scope does not include basement wall waterproofing or other remedial flood mitigation work. The exception will be new waterproofing at the terrace walls and the new terrace floor slab, and on any walls being repaired or replaced as part of the BLC scope of work.

Life safety and emergency systems in the BLC will be placed on elevated slabs or be protected with curbs, with sump pumps provided in critical areas. Equipment located in the basement, as well as access to habitable spaces in the basement, will be located 4’-0” above the Loading Dock drive aisle elevation. This elevation difference occurs past the planned hydraulic flood gates and trench drain across the entry ramp to the basement. Other critical mechanical equipment is located at the second and third floor levels of the building.

These design strategies support Priorities Three (Collections) and Five (Facilities and Infrastructure) of the CCAP, providing multiple means of mitigation should a flood event occur.

Flood Mitigation

Flood zones on existing NASM Site



- 1% Annual chance of flood hazard
- ▨ Regulatory floodway
- 0.2% annual chance flood hazard
- ▨ Areas with reduced risk due to levee
- ▨ Buildings

Image courtesy of dcfloodrisk.org

Stormwater Management

Rainwater Harvesting

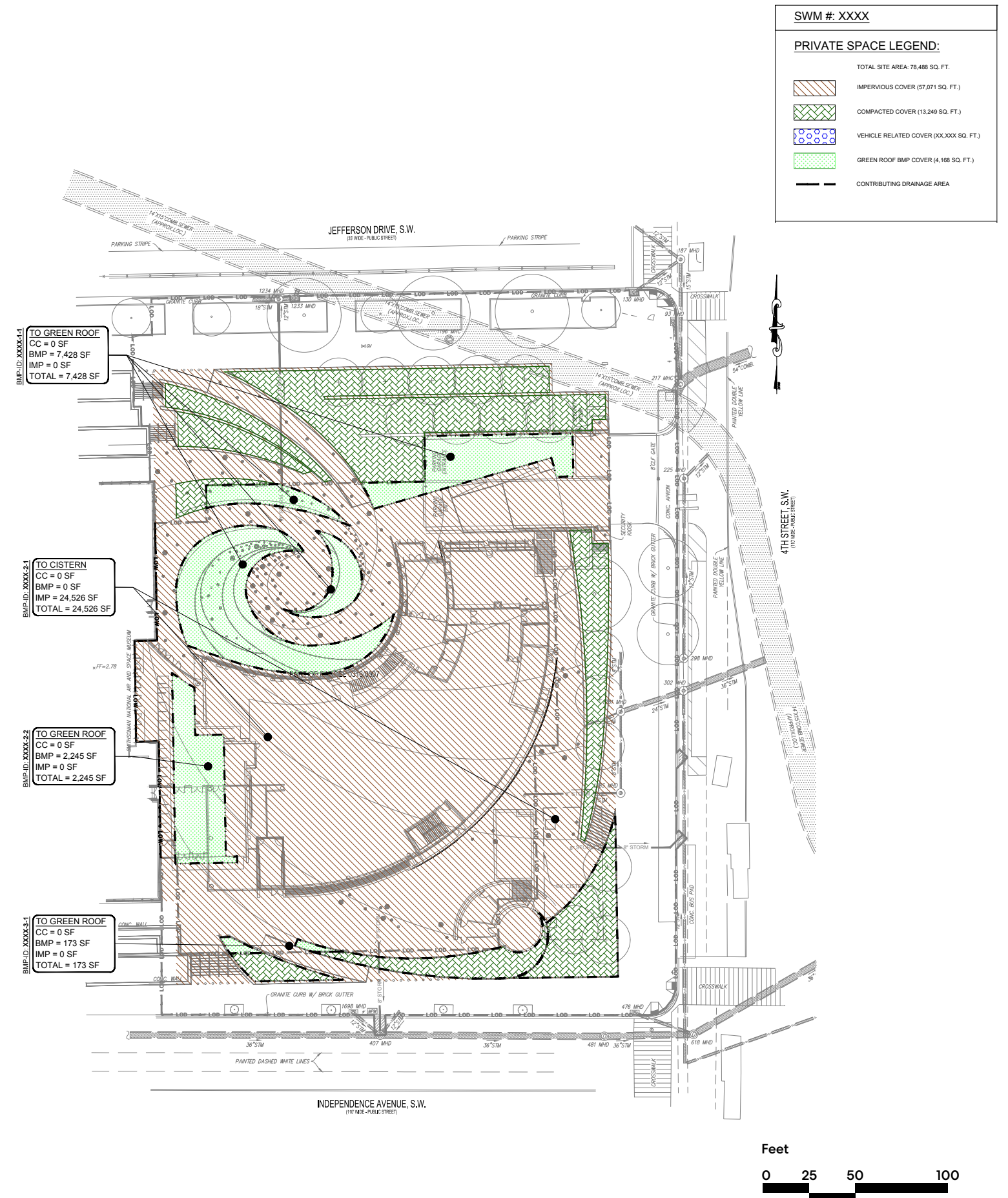
The existing rainwater harvesting system provided in the Revitalization project collects and conveys rainwater into two cisterns located below grade and outside the building, one on the west side of the site, and one on the east side of the site, adjacent to the planned BLC, where it is used for non-potable water uses and on-site storm water disposal and filtration. The impervious surface area of the Revitalization project will be increased by the additional impervious portions of the Bezos Learning Center roof.

The rainwater harvested from the BLC will be piped to the existing East Cistern, through harvesting pre-filters provided in the Revitalization project. Non-potable harvest piping to the existing day tanks, and non-potable harvest final filtration and booster pump system located in PM10 Mechanical Room are also provided in the Revitalization project. A new connection from the Revitalization non-potable harvest piping system will be provided in the Loading Dock to serve the BLC.

In addition to the rainwater from the roof discussed in the storm water section above, air conditioning condensate will be harvested for reuse and connected to the existing rain water harvesting system.

A significant use for the non-potable harvest water will be cooling tower makeup. Similar to the Revitalization project, non-potable harvest piping will be routed to water closets and urinals for flushing.

A 4" high pressure non-potable harvest pipe pathway for East Terrace irrigation was provided as part of the Revitalization project. New non-potable harvest piping will be extended from the piping in the Revitalization project to the new irrigation system.

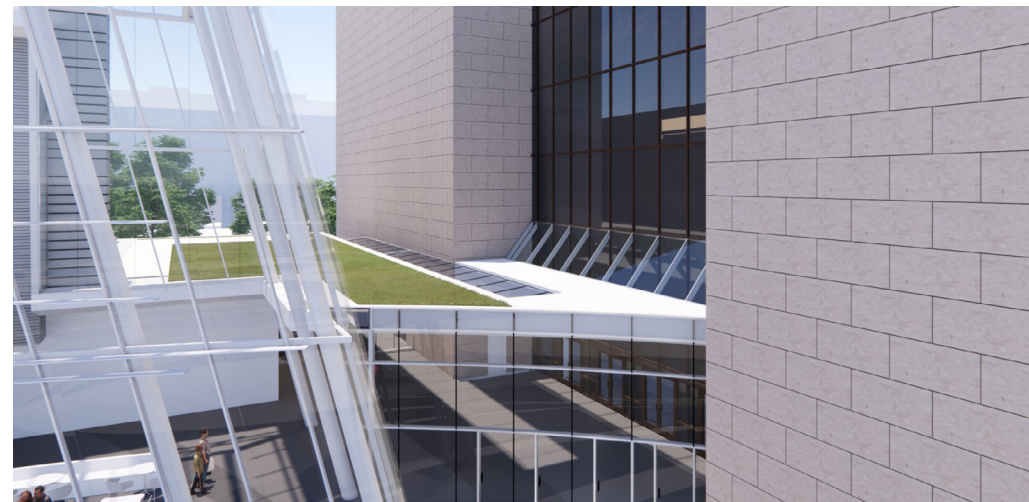




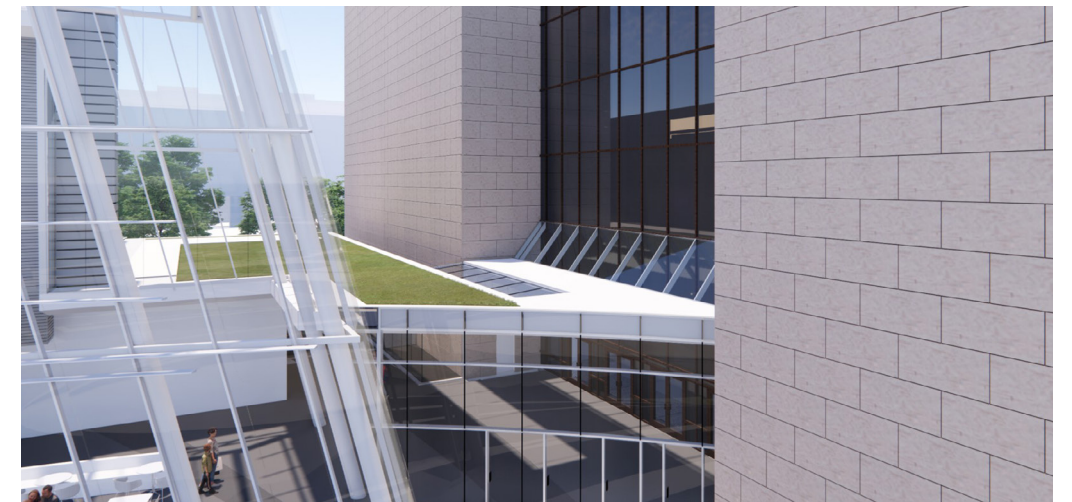
Appendix

Connection to NASM Alternative Comparison

Option 1: Infill (preferred)



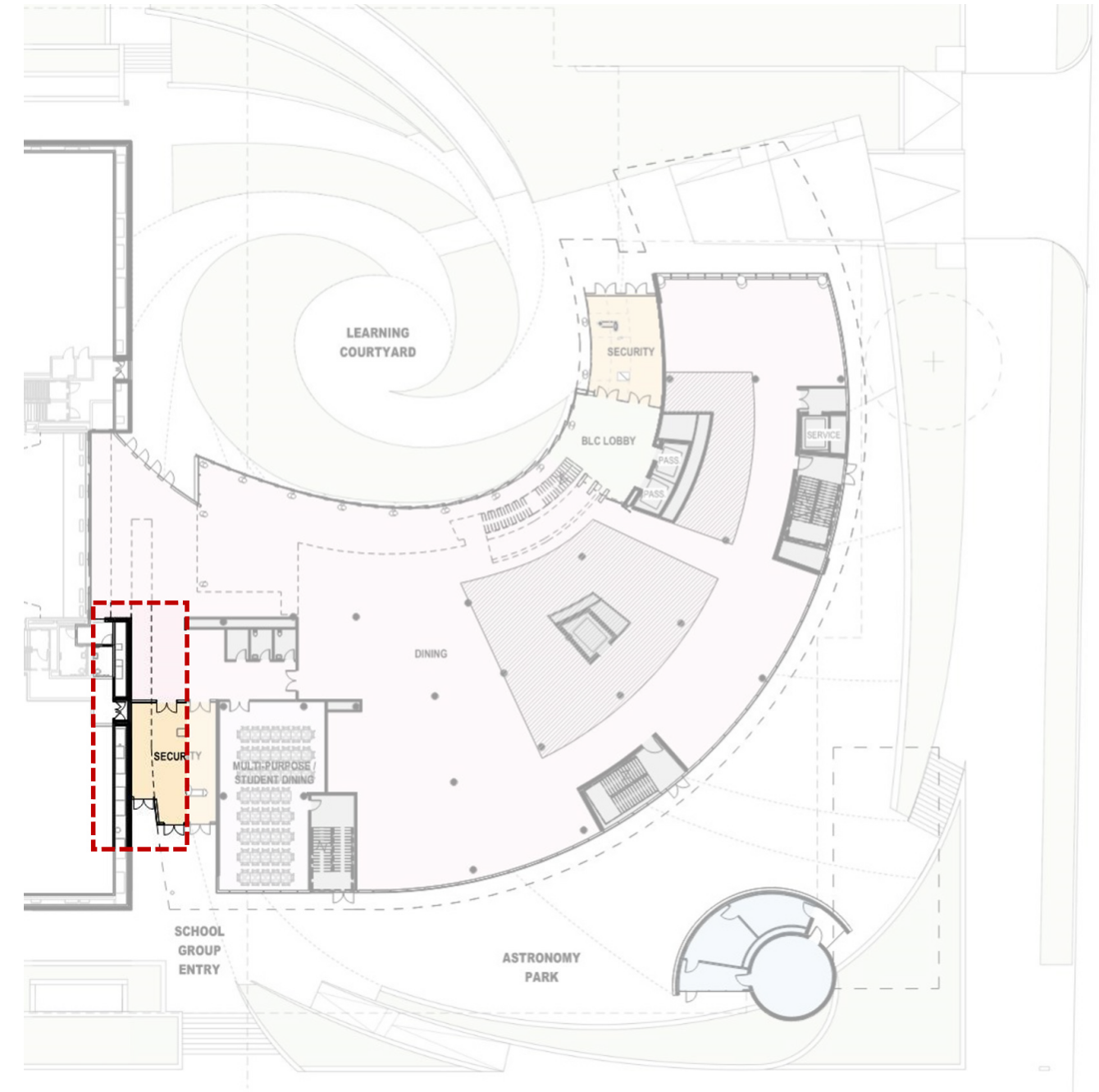
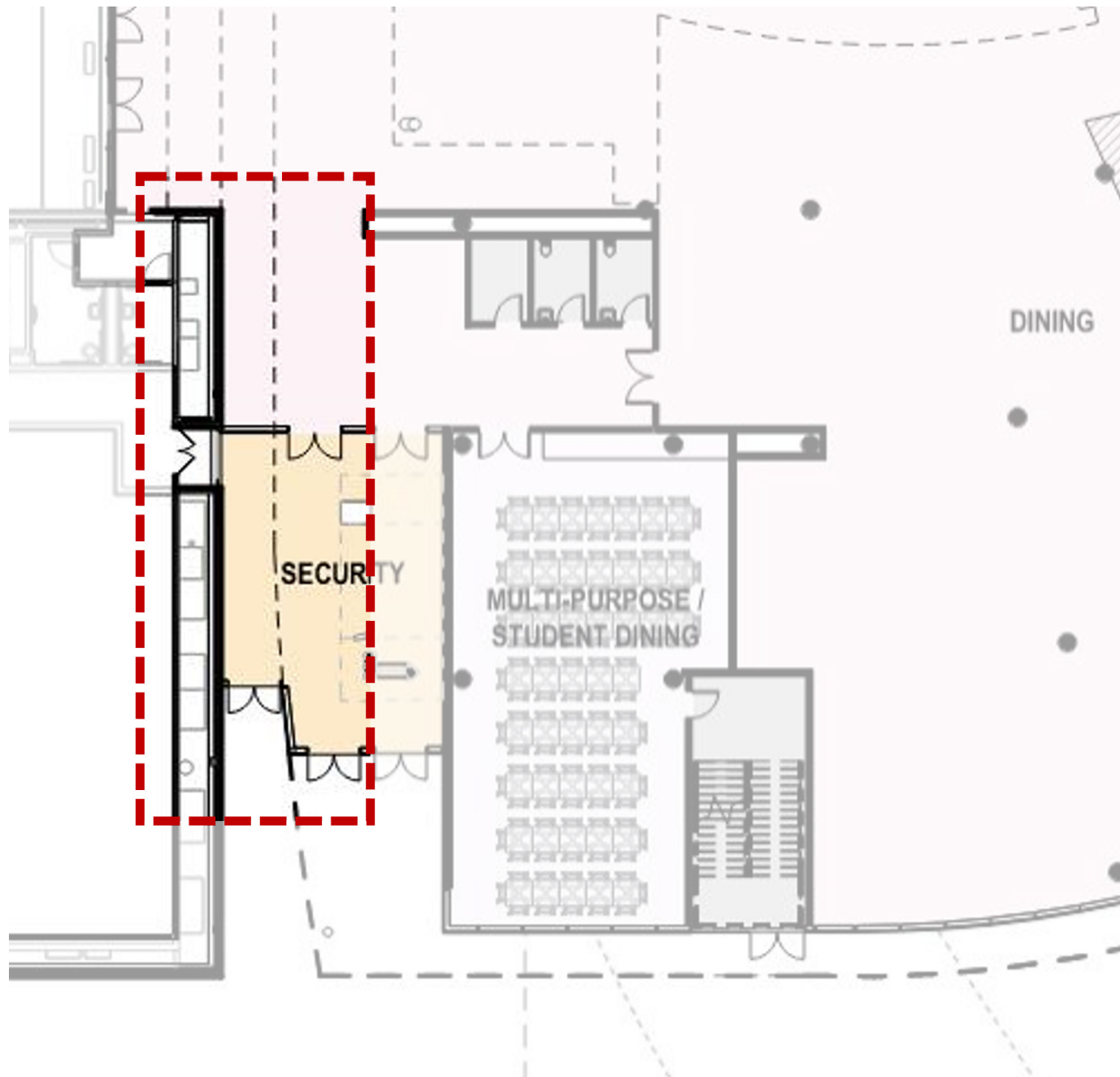
Option 2: Gap



Connection to NASM Alternative

Option 1 : Infill at NASM (Preferred)

This option is preferred because it allows the required east egress door from NASM to exit through an integrated vestibule and avoids an ill-proportioned and visually awkward gap in the building. The roof connection at this point will be glazed as it touches NASM, allowing visibility to NASM's full existing exterior wall from the interior of the BLC.



Connection to NASM Alternative

Option 1 : Infill at NASM (Preferred)



Connection to NASM Alternative

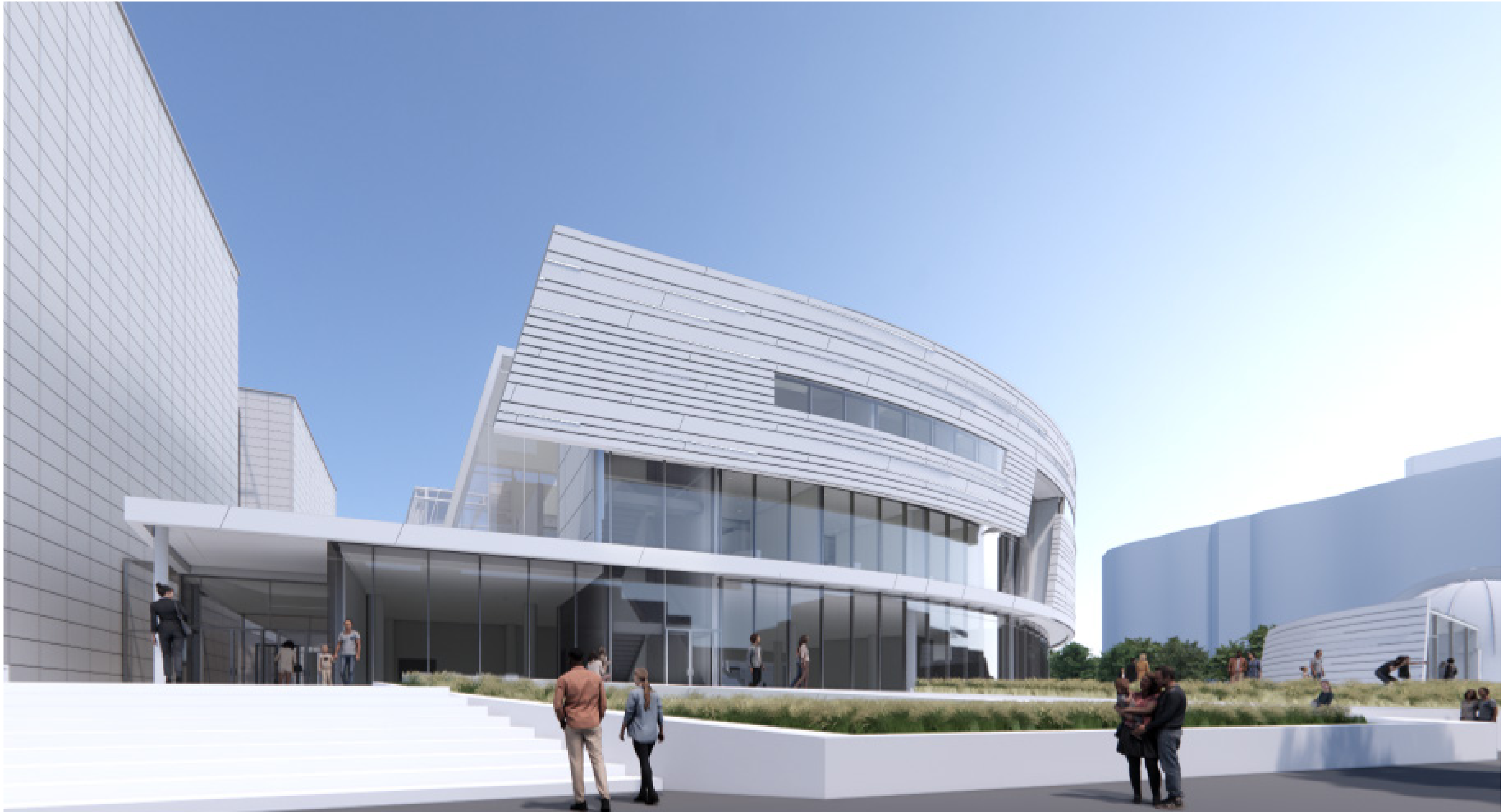
Option 1 : Infill at NASM (Preferred)



Connection to NASM Alternative

Option 1A : Infill at NASM : Sloped edge of wall of upper level cladding

This alternative explores sloping the upper portion of the BLC facade to relate more to the other sloping elements of the building and to better reinforce the dynamic spiral form.



Connection to NASM Alternative

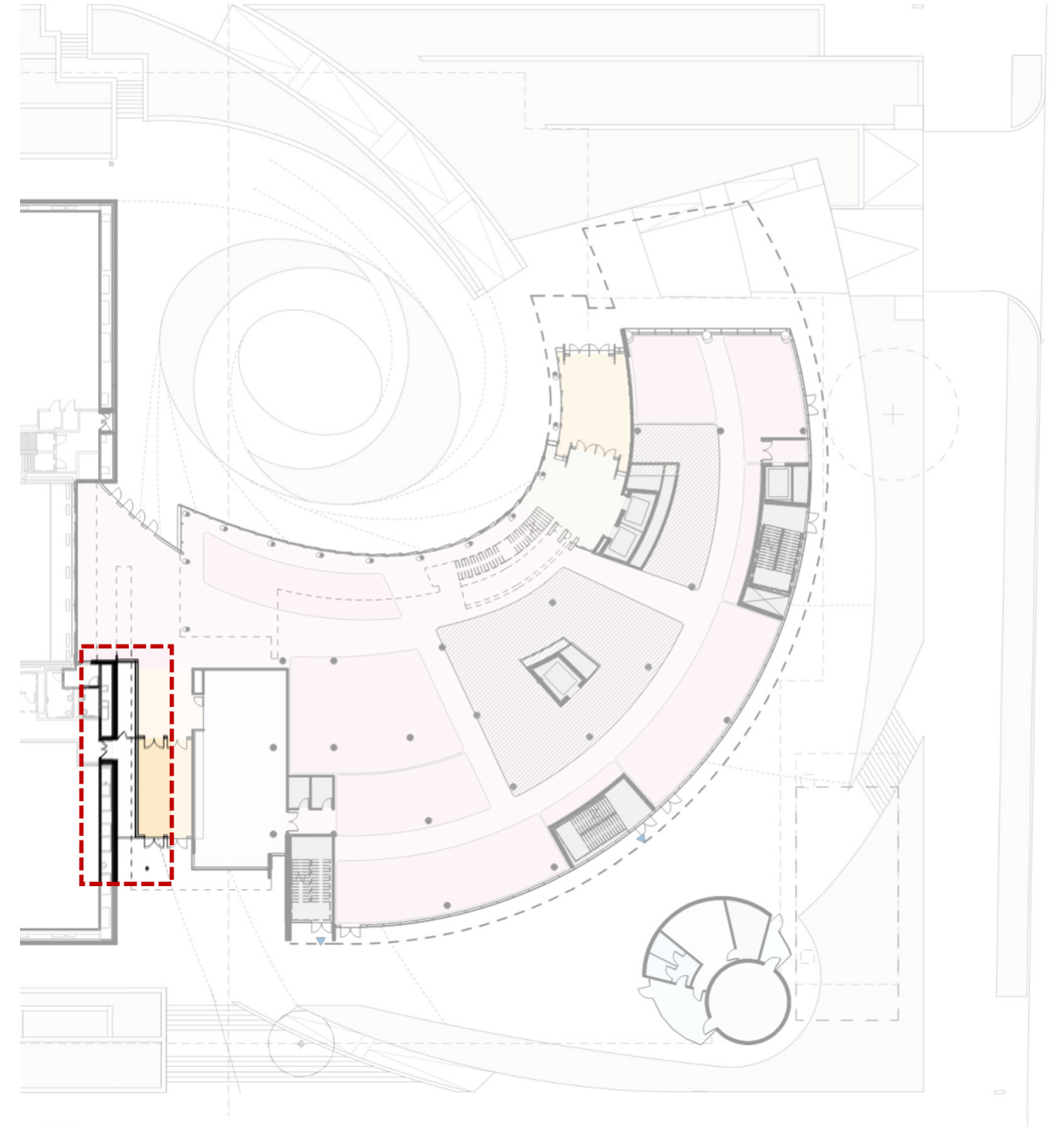
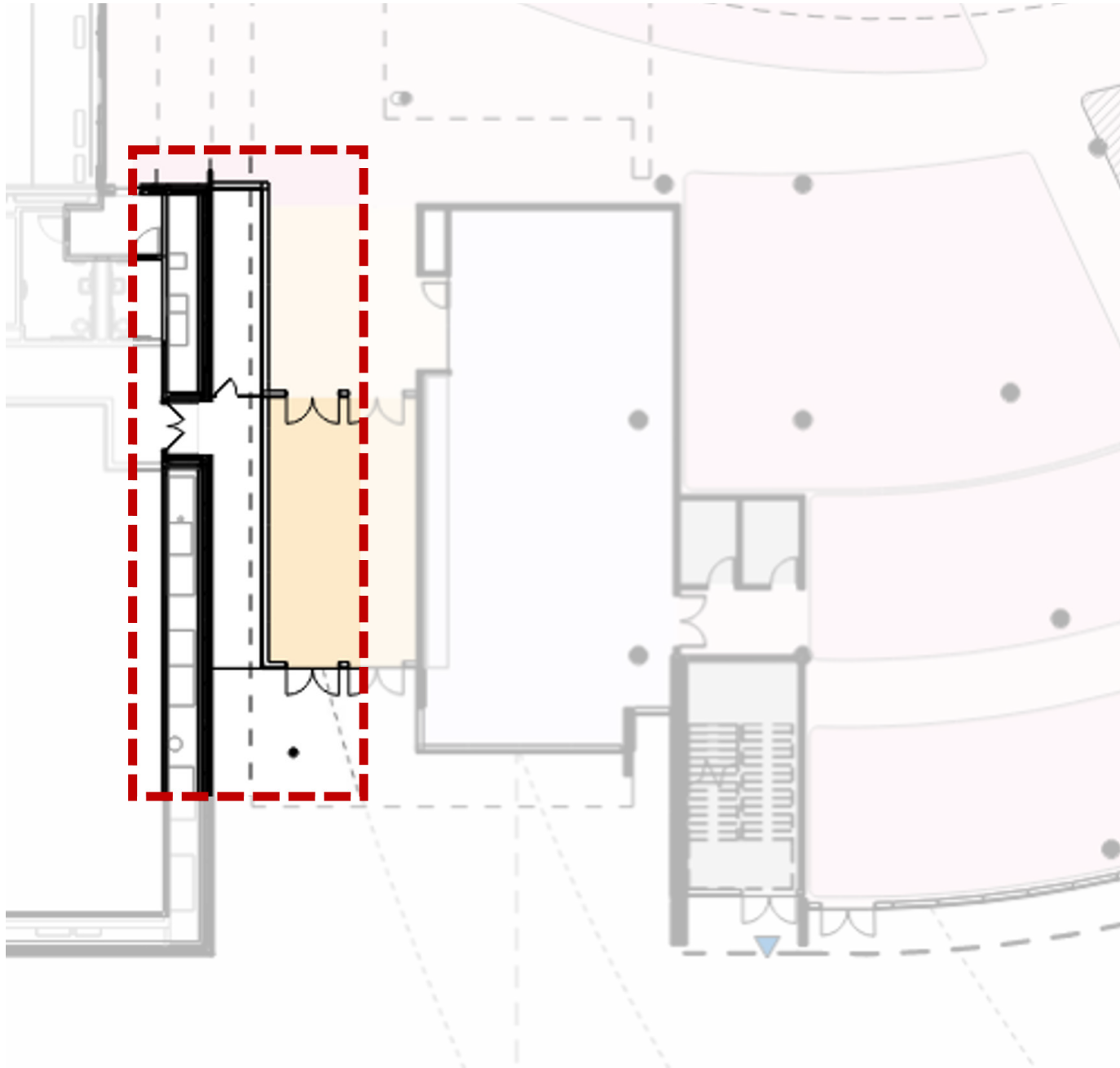
Option 1A : Infill at NASM : Sloped edge of wall of upper level cladding



Connection to NASM Alternative

Option 2 : Gap at NASM

This option was developed to explore a complete physical separation of NASM and the BLC at this vestibule entrance. This would allow the existing wall of NASM to remain largely untouched and might be desirable from a preservation perspective. This alternative creates a crevasse-like exterior space between the BLC and the NASM, which may pose security and maintenance concerns.



Connection to NASM Alternative

Option 2 : Gap at NASM

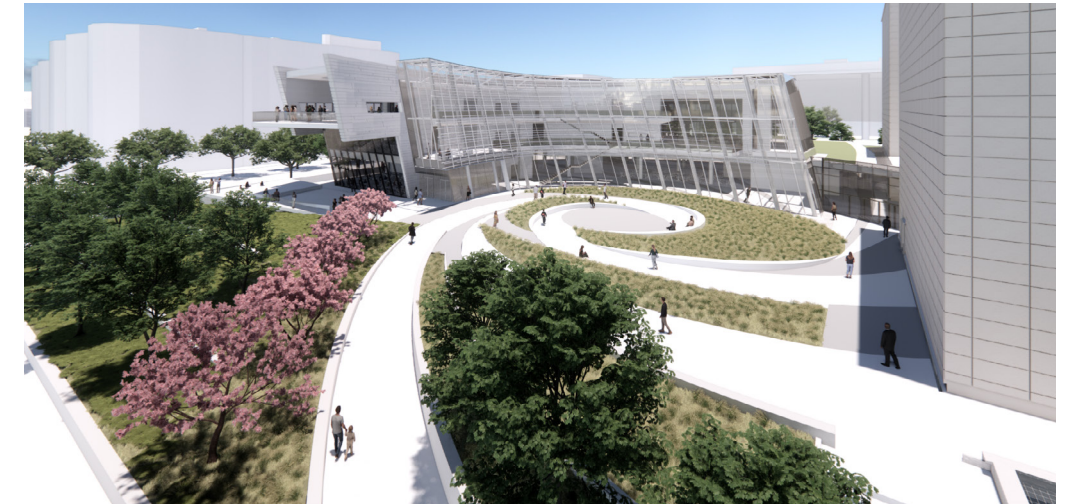


Landscape Design Alternative Comparison

Option 1: Orthogonal Landscape Concept



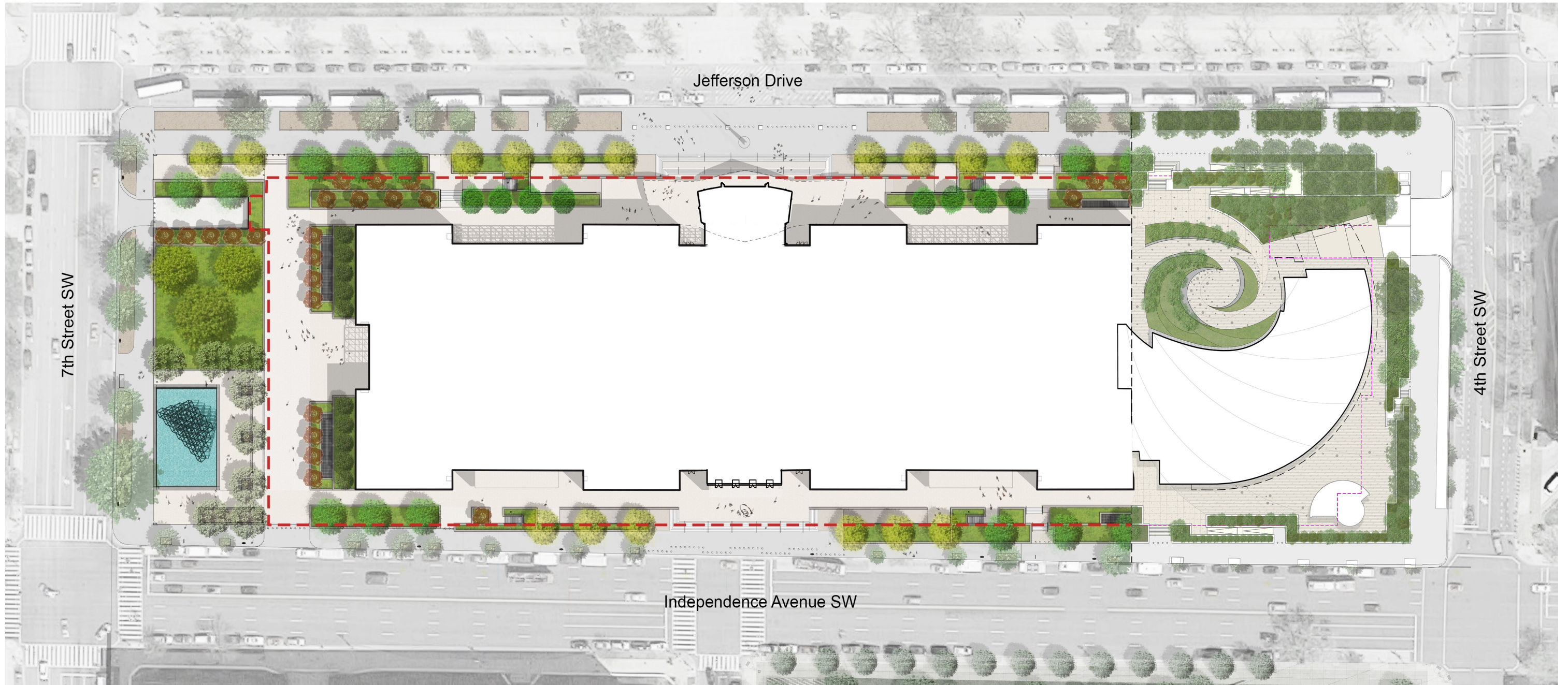
Option 2: Spiral Landscape Concept (Preferred)



Landscape Design Alternative

Option 1 : Orthogonal

The revitalized Gyo Obata's 1988 landscape surrounds the Learning Courtyard and Astronomy Park so that perambulation conforms to the refurbished planters' orthogonal geometry. The concept incorporates ramp access for visitors from Jefferson Drive, stairs on 4th Street, and refurbishes the existing ramp on Independence Avenue.

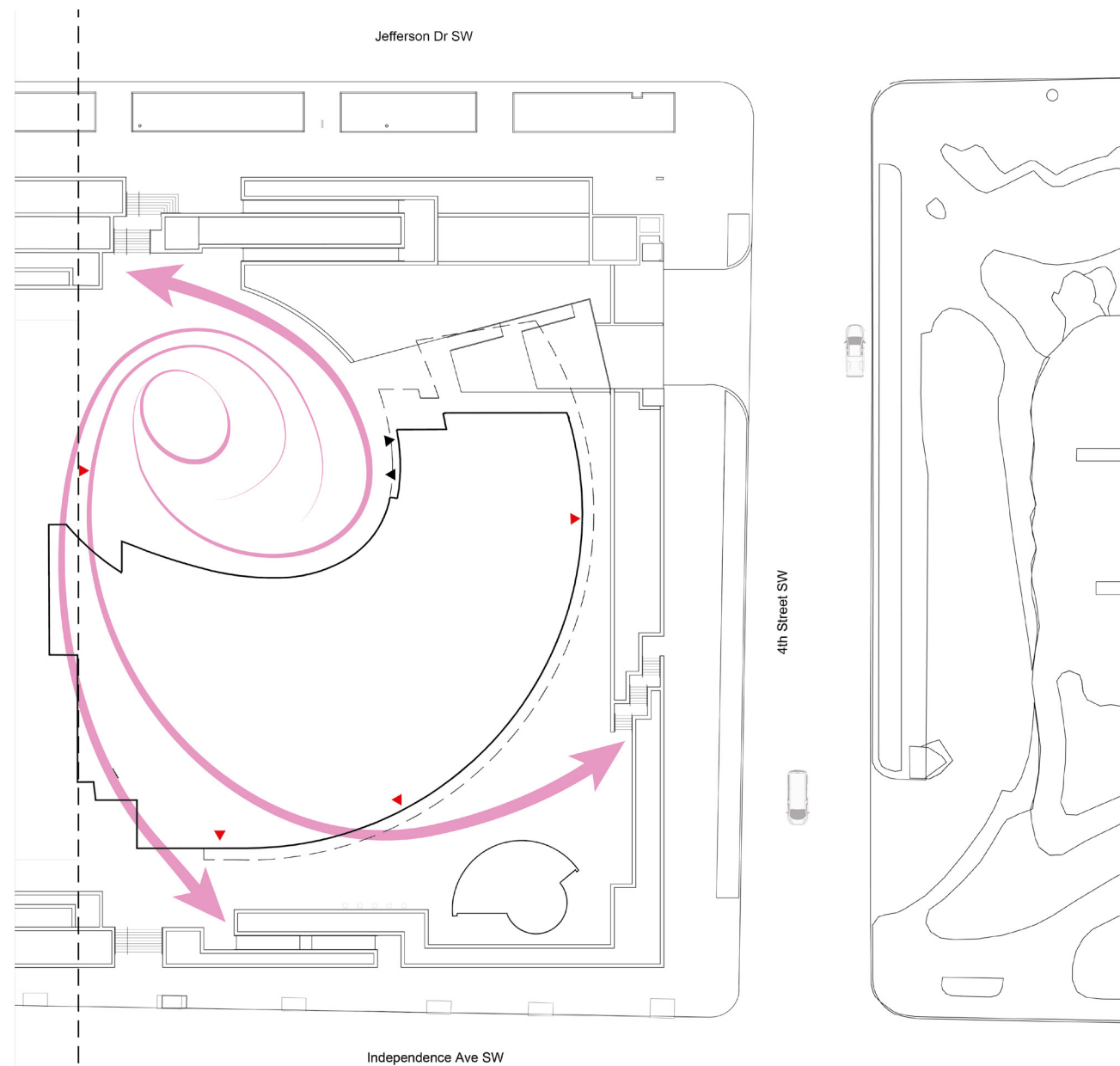


Landscape Design Alternative

Option 1 : Orthogonal

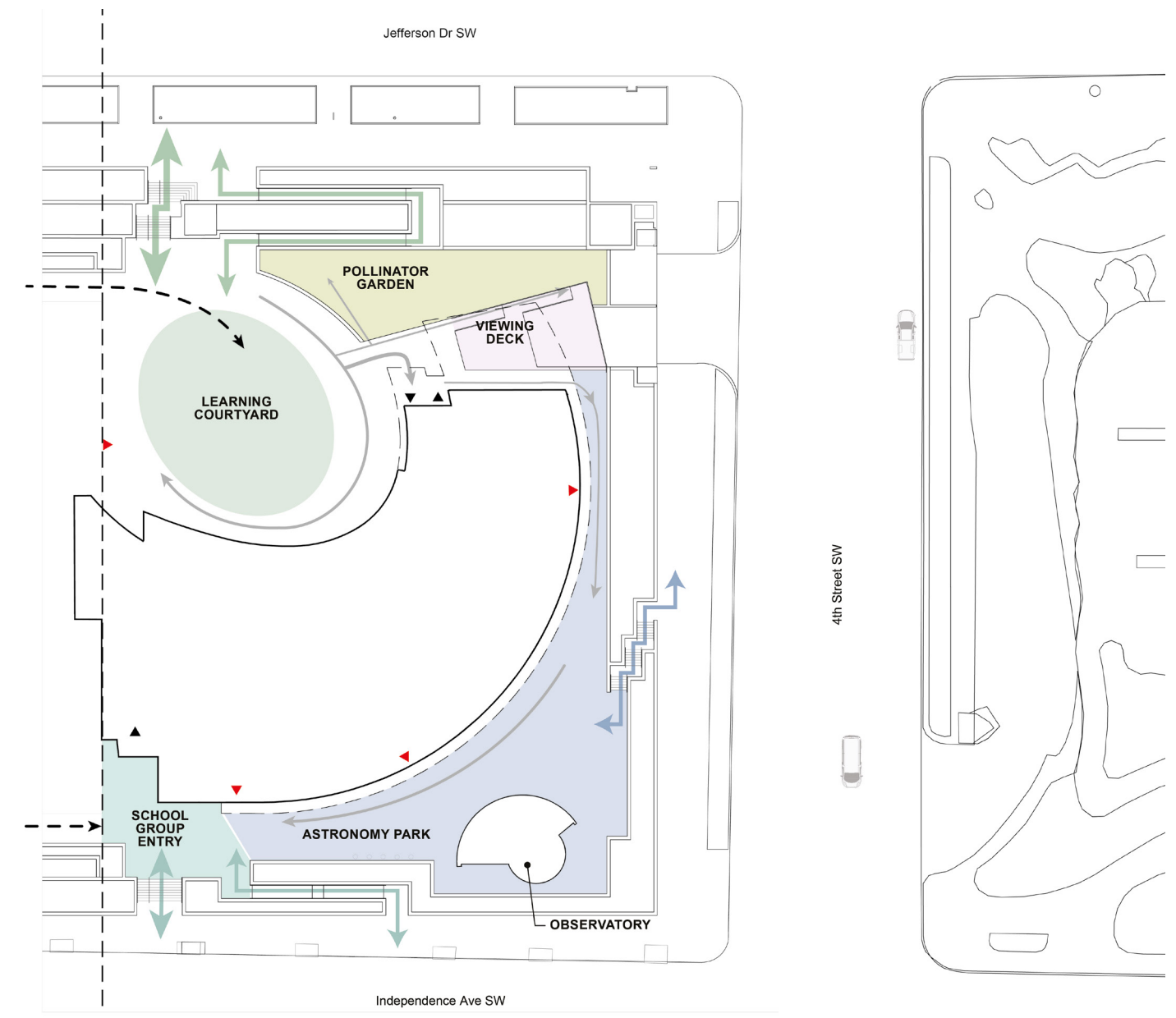
Spatial Organization

The Learning Courtyard and Astronomy Park spaces, which expand outwards towards the National Mall and Eisenhower Memorial to “spread the knowledge” of the Smithsonian Institution, must transition to the Revitalization Landscape Plan’s rectilinear planter geometry to maintain the approved plan’s continuity.



Circulation

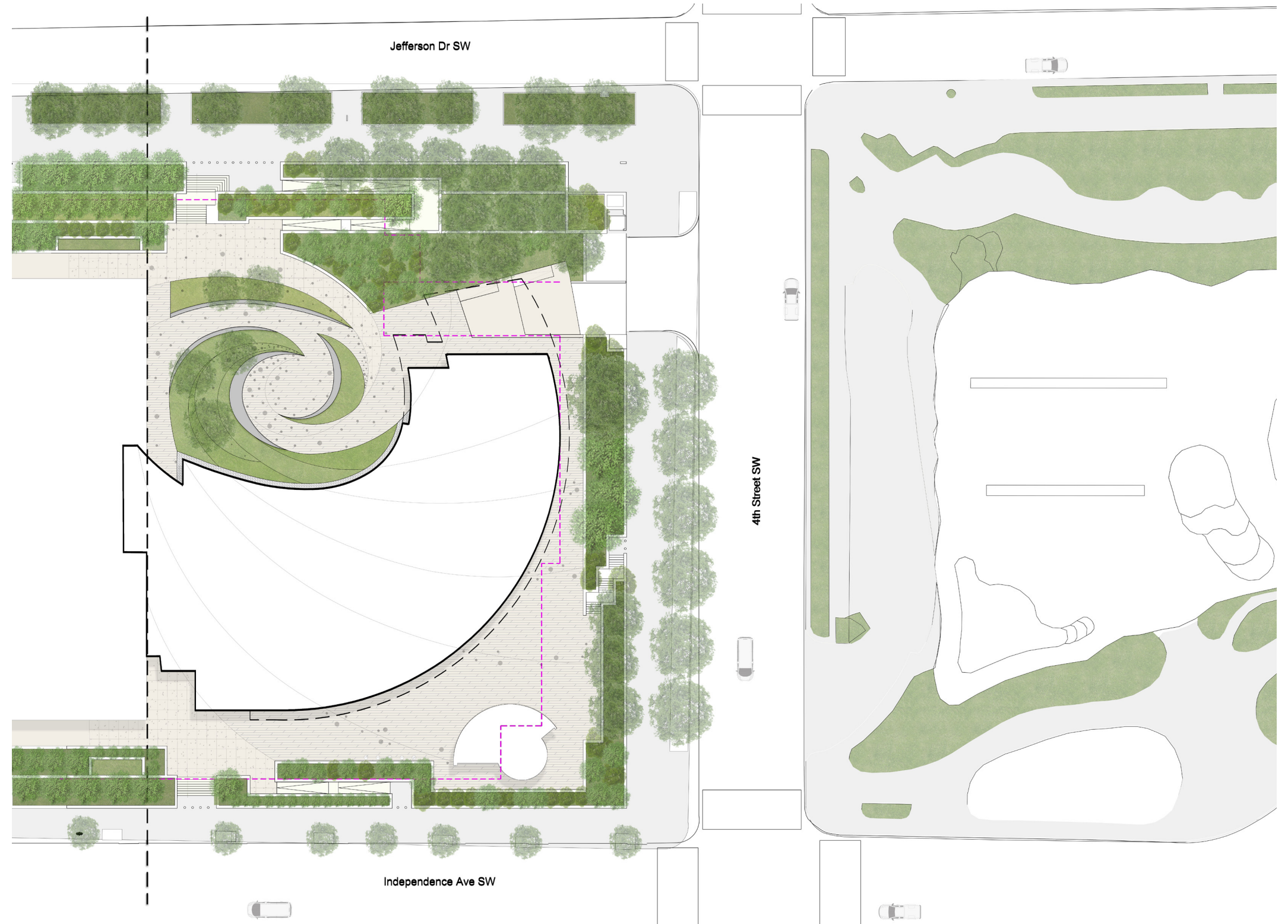
Option 1 BLC Orthogonal Landscape Concept maintains the Major Revitalization Landscape Plan’s orthogonal parti and adds green roof areas over the parking ramp and loading dock. The BLC’s footprint reduces the depth of the east-facing planting area. In response, the steps leading to the upper terrace from 4th Street are reoriented north-south.



Landscape Design Alternative

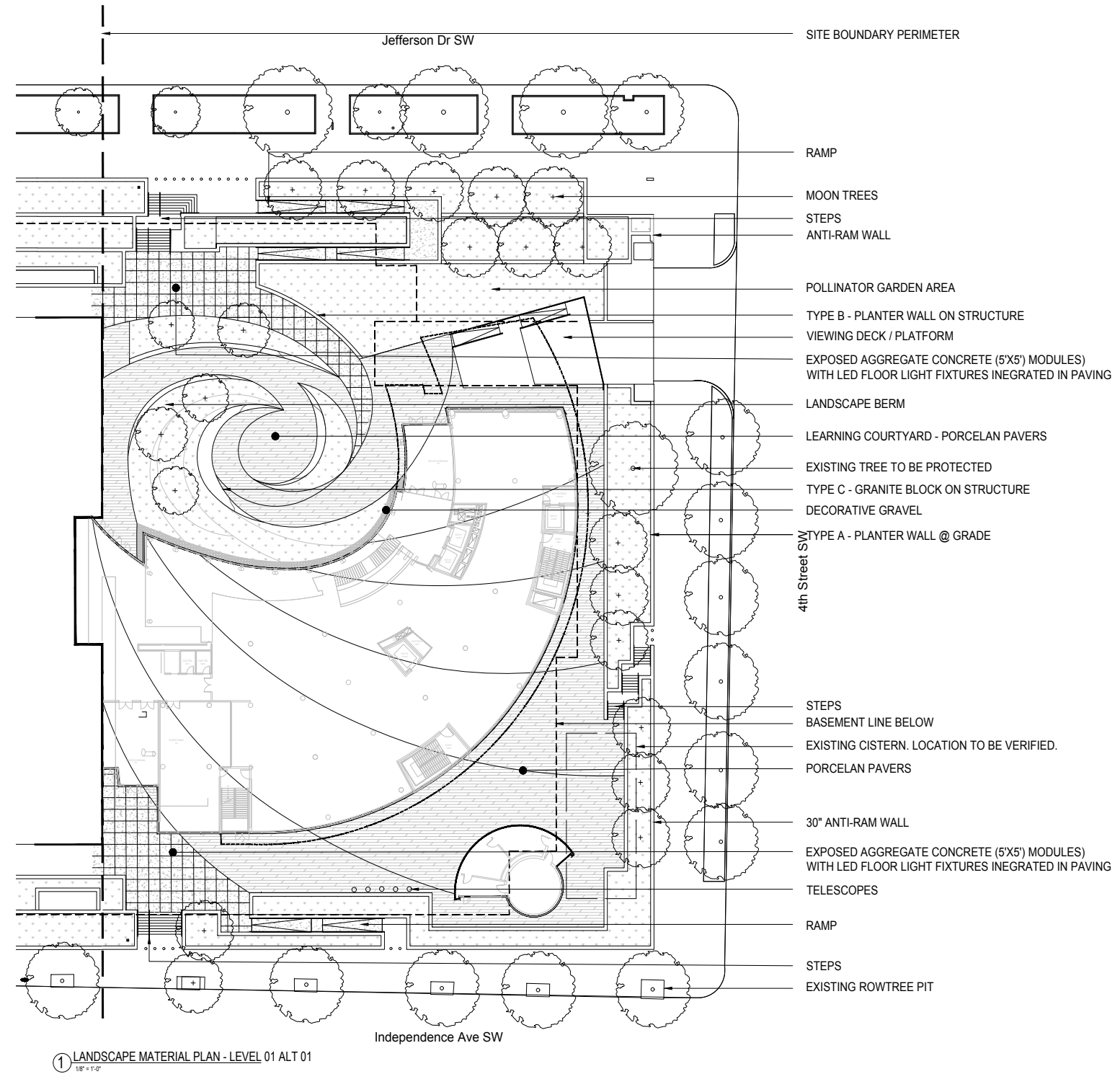
Option 1 : Orthogonal

The galactic spiral that informs the placement of program elements and paving design within the Learning Courtyard and Astronomy Park ends at the terraces' orthogonal boundary. The scheme adds trees to increase the vegetative canopy.



Landscape Design Alternative

Option 1 : Orthogonal - Detail



Landscape Design Alternative

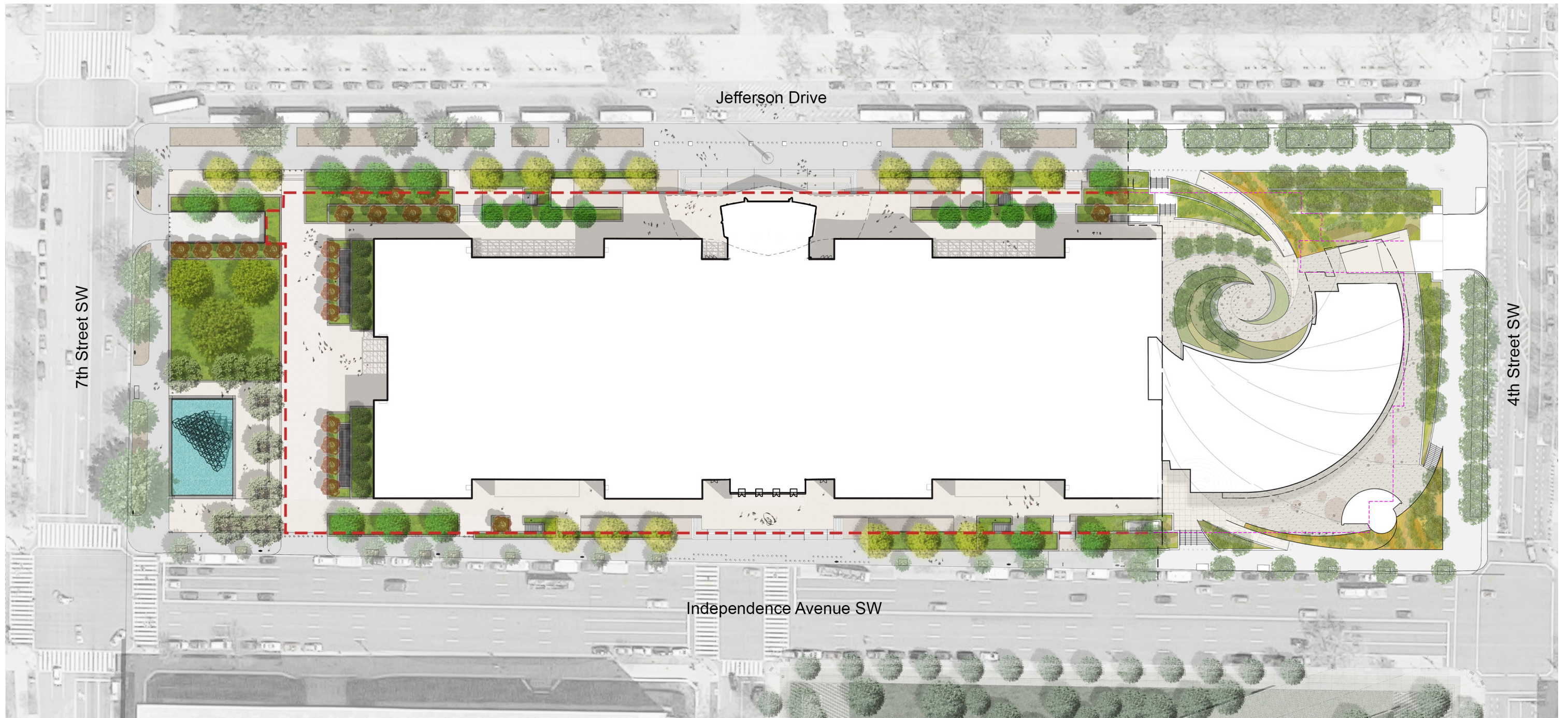
Option 1 : Orthogonal - Northwest Aerial View



Landscape Design Alternative

Option 2 : Spiral (Preferred)

The spiral landscape extends the Learning Courtyard north to Jefferson Drive and the National Mall; the Astronomy Park opens south to Independence Avenue, connecting to Dwight D. Eisenhower Memorial and the NMAI landscape.

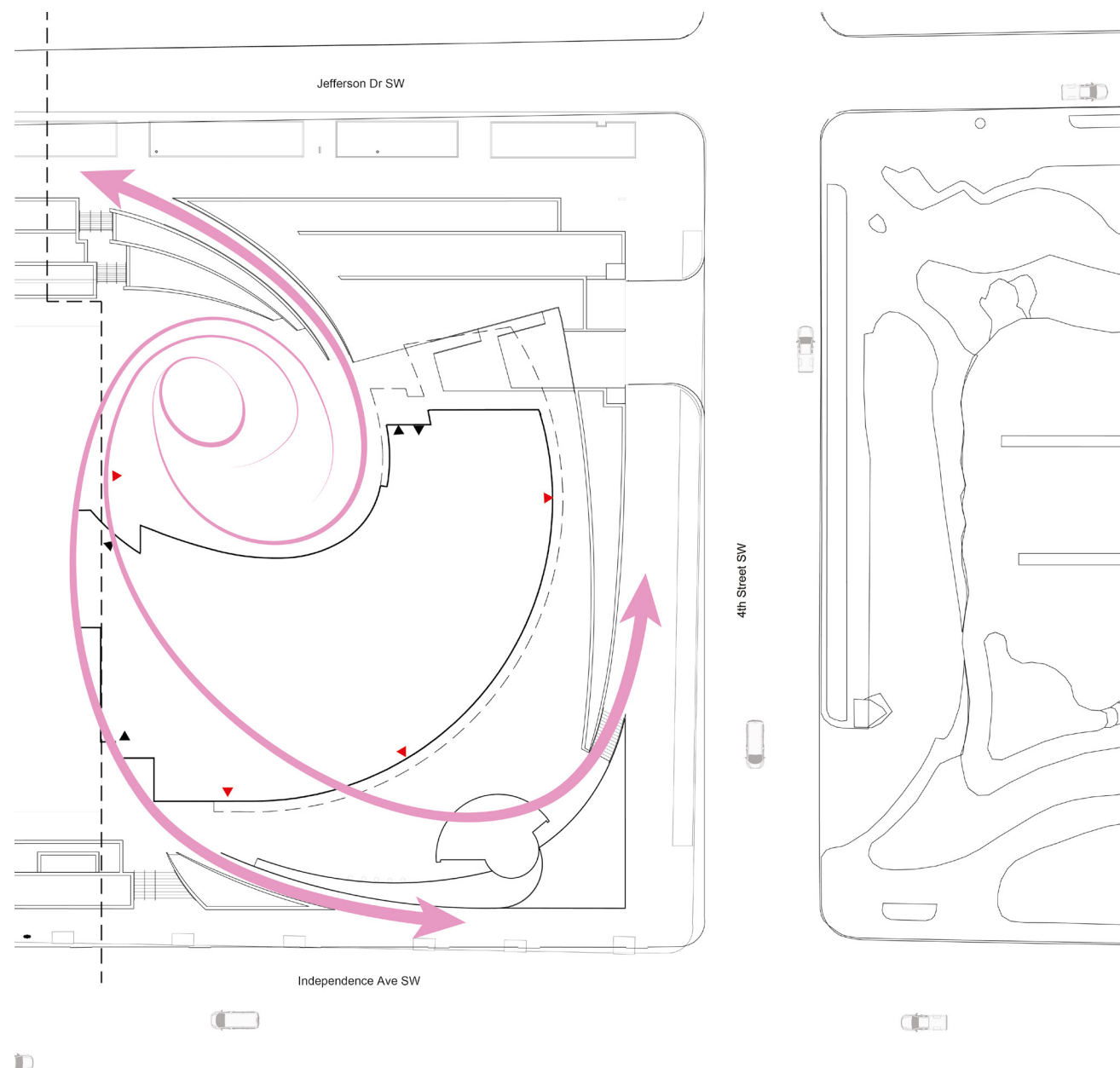


Landscape Design Alternative

Option 2 : Spiral (Preferred)

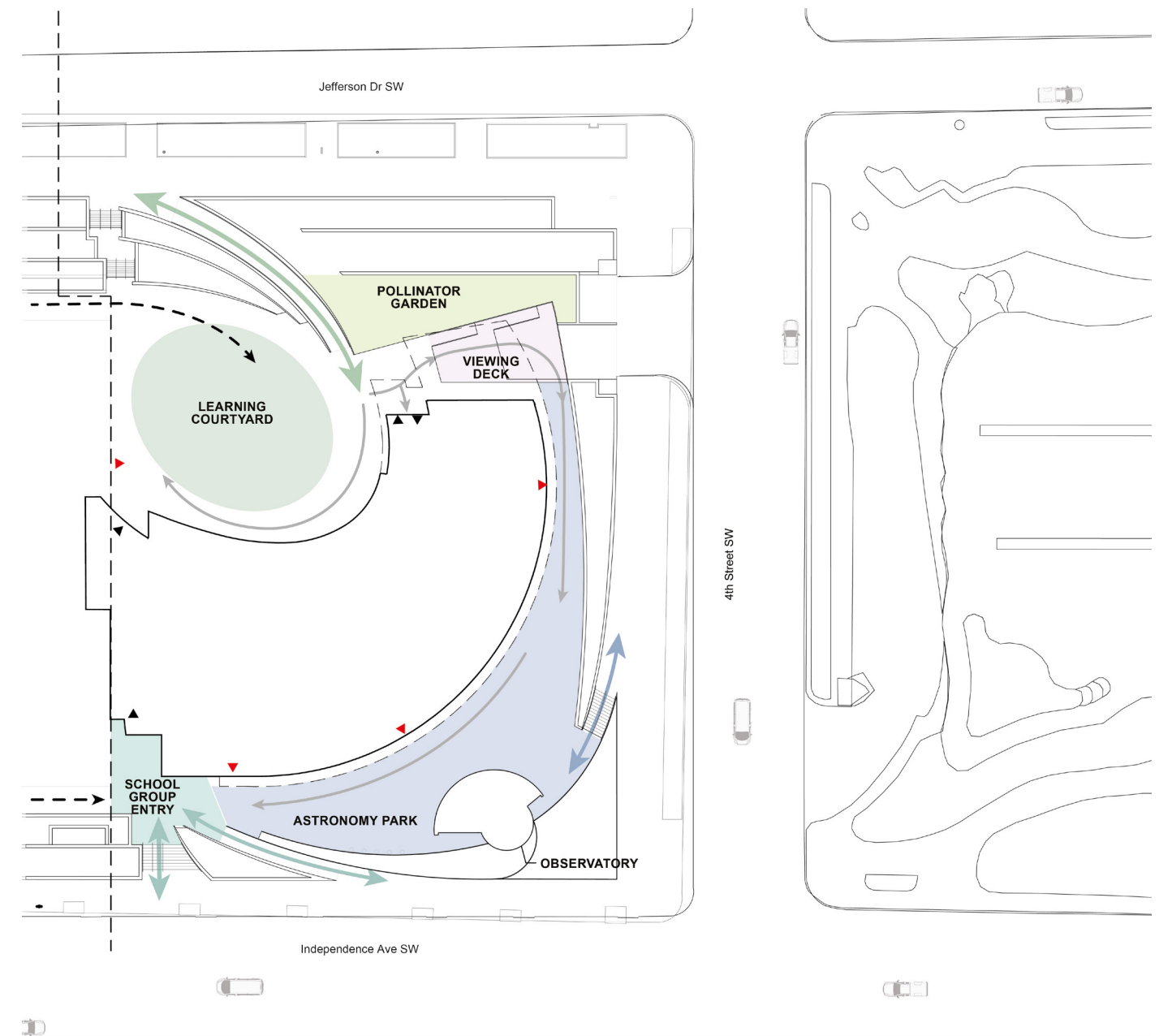
Spatial Organization

The galactic spiral derived from the Learning Courtyard vortex element informs architectural and open space configurations to extend into and over the revitalized landscape.



Circulation

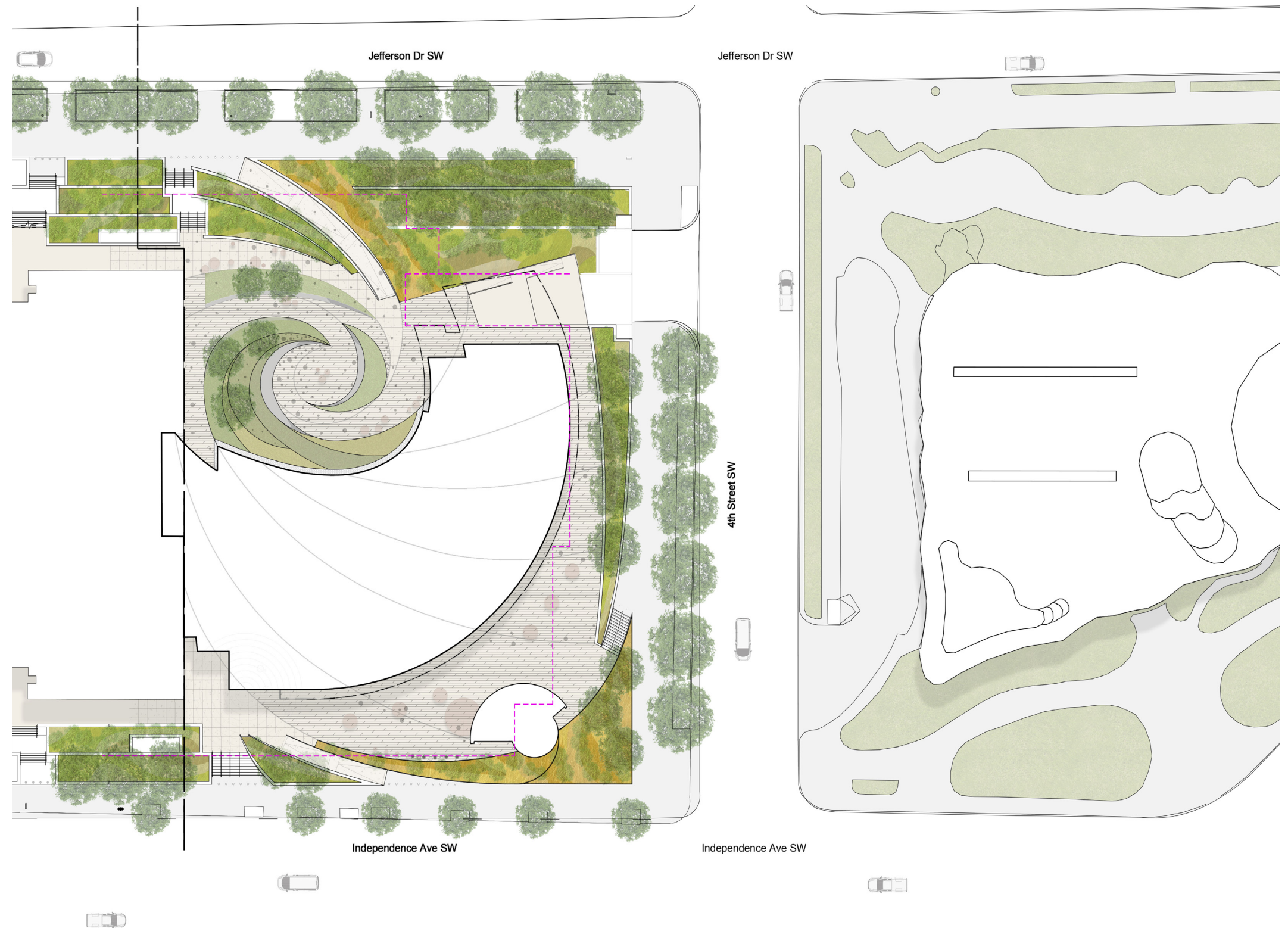
The galactic spiral defines circulation, the ability to perambulate outdoor program areas, and the BLC's architectural form.



Landscape Design Alternative

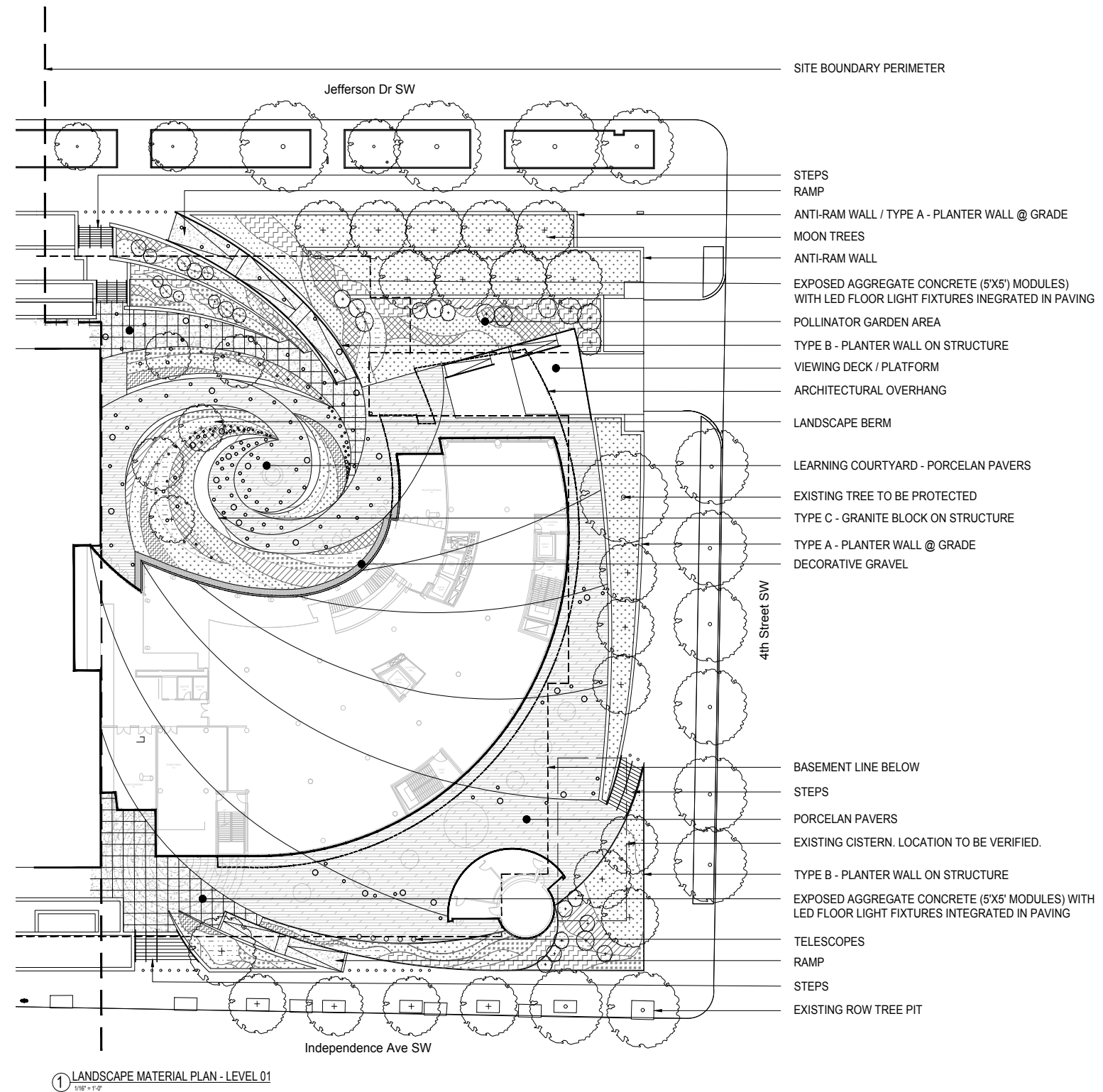
Option 2 : Spiral (Preferred)

The spiral concept shapes the paving design, ramps, new plantings, and program elements, including the green roofs over the parking ramp/loading dock and on Level 02. Extending the spiral voids north and south to overlay the revitalized landscape opens the Learning Courtyard and Astronomy Park to broader public participation in open space programming per the Smithsonian Institution's mission to share knowledge. The planting concept builds upon the Cullina palette to recall American landscapes where stargazing and space exploration grab young imaginations.



Landscape Design Alternative

Option 2 : Spiral (Preferred) - Detail



Landscape Design Alternative

Option 2 : Spiral (Preferred) - Northwest Aerial View



Facade Materiality Alternatives

Facade Inspiration

Gazing at the night sky instills a sense of wonder and awe. From the textures of stars scattered across the sky to the historical mapping of our cosmos, our perception of the universe is a source of inspiration for arts, sciences & innovation.

Similarly, the linear movement and energy of stars streaking across the night sky are inspiration for the exterior skin. A dynamic texture of light and shadow wraps the spiral building form evoking the linear energy and dotted landscape within the Spiral Galaxy.

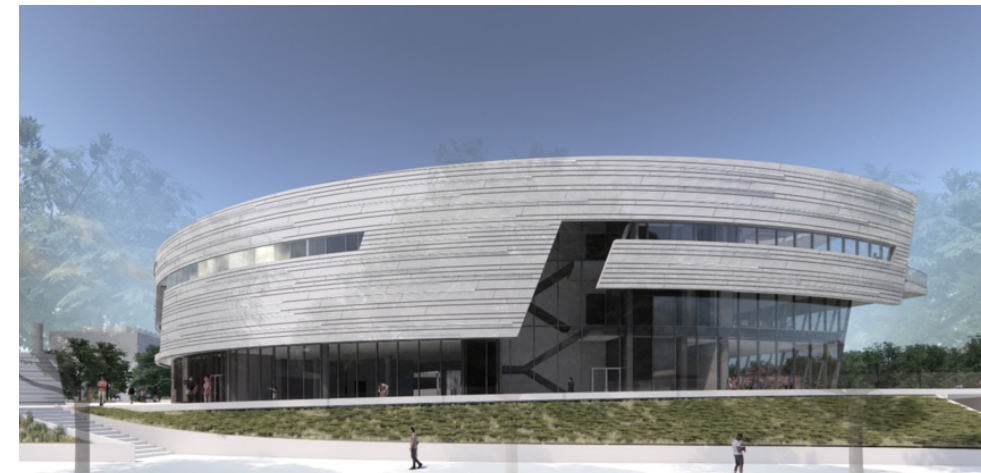
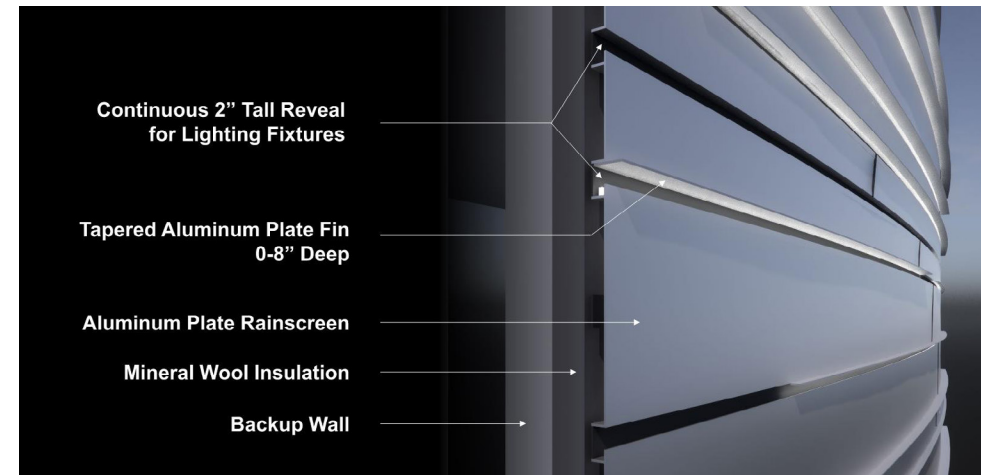
Reflecting the ephemeral qualities of our cosmos, the aluminum plate skin color will need to strike a delicate balance with NASM-NMB. As day transitions to night, interior lighting will gently emanate through the perforated texture further reinforcing the streaking light pattern and the mission of the Bezos Learning Center as a beacon along the National Mall for space exploration and discovery.

While specific material and color options will be explored as design progresses, the goal is to balance the relationship with and the distinction between the NASM facade. Elements of NASM such as the scale and proportions of glazed openings, expansive solid wall areas, and the monolithic nature of the material continue to be inspiration for the design of the BLC facade.

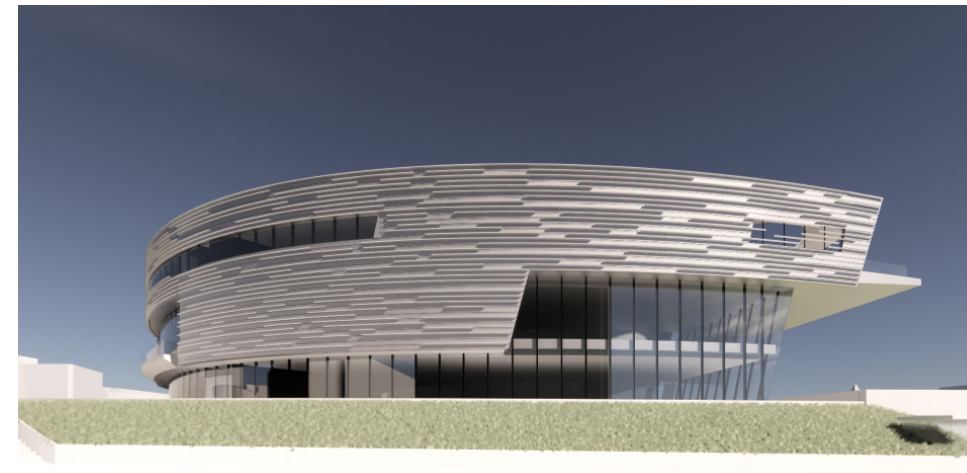
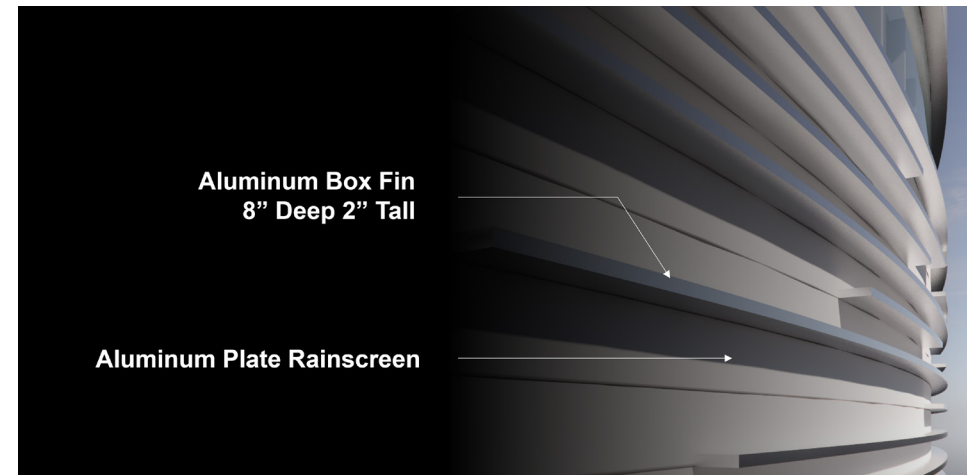


Facade Materiality Comparison

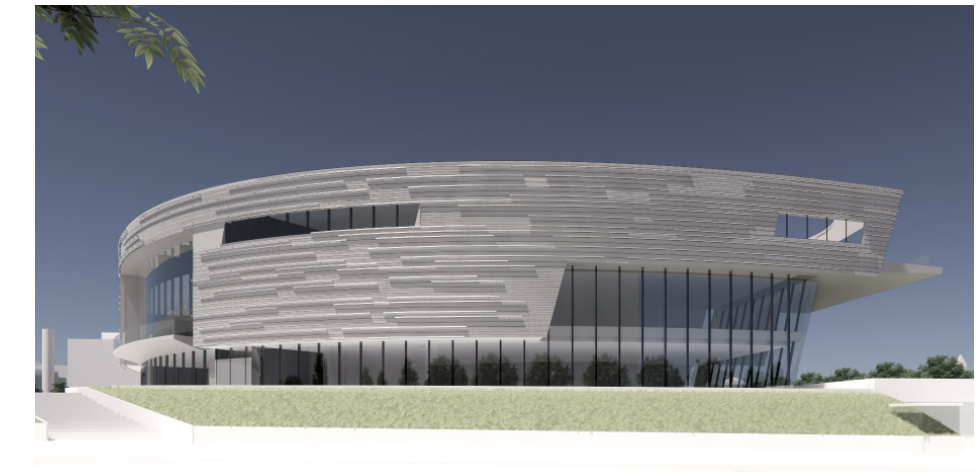
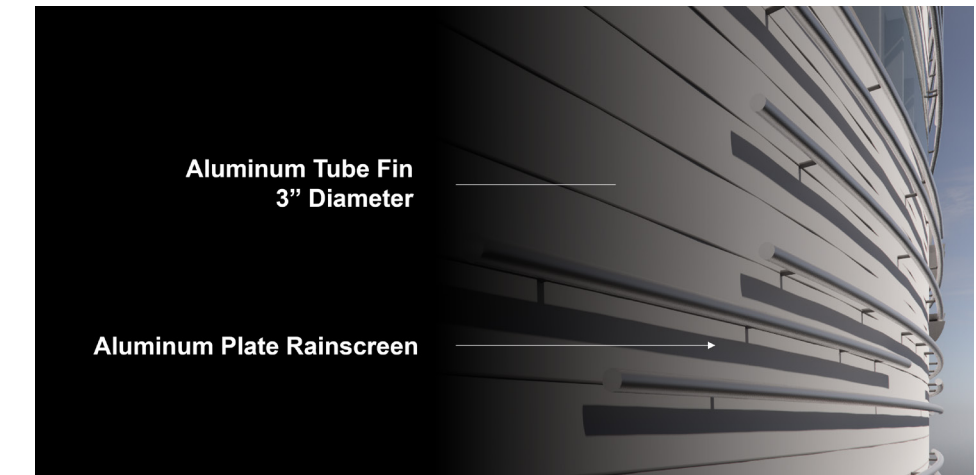
Option 1: Tapered Fin (Preferred)



Option 2: Dense Fin

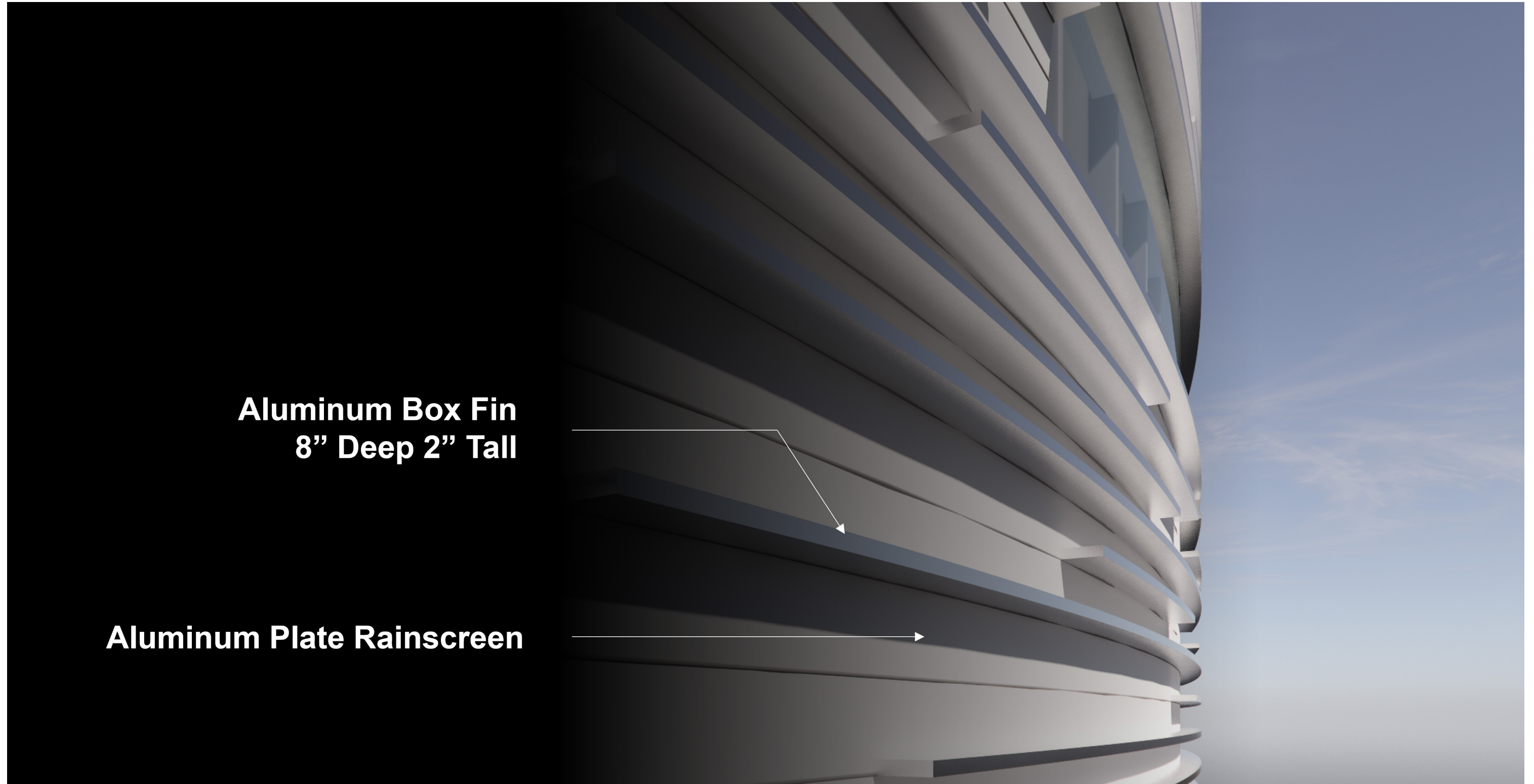


Option 3: Tube Fin



Facade Materiality Alternatives

Option 1- Tapered Fin (preferred)



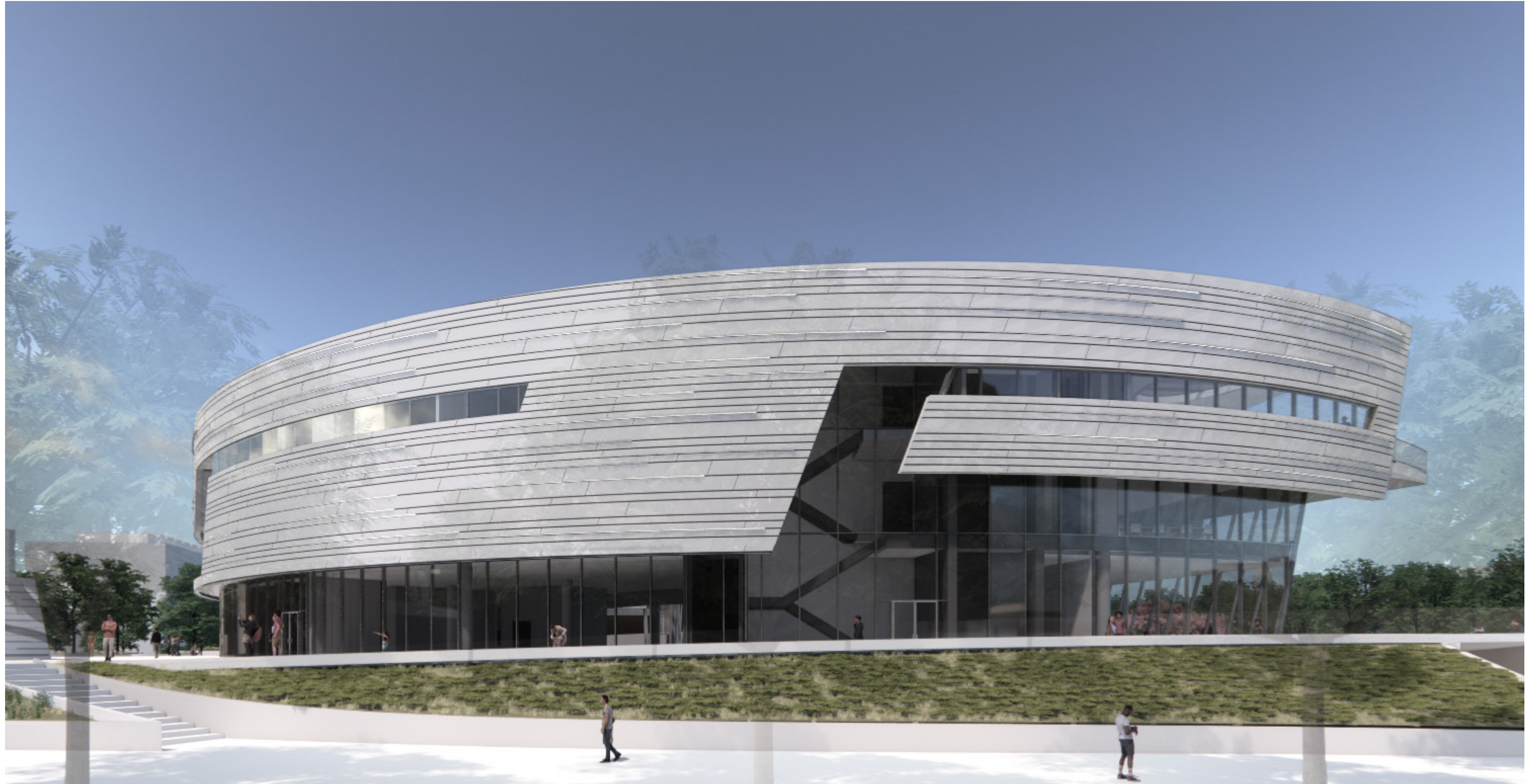
Aluminum Box Fin
8" Deep 2" Tall

Aluminum Plate Rainscreen

Facade Materiality Alternatives

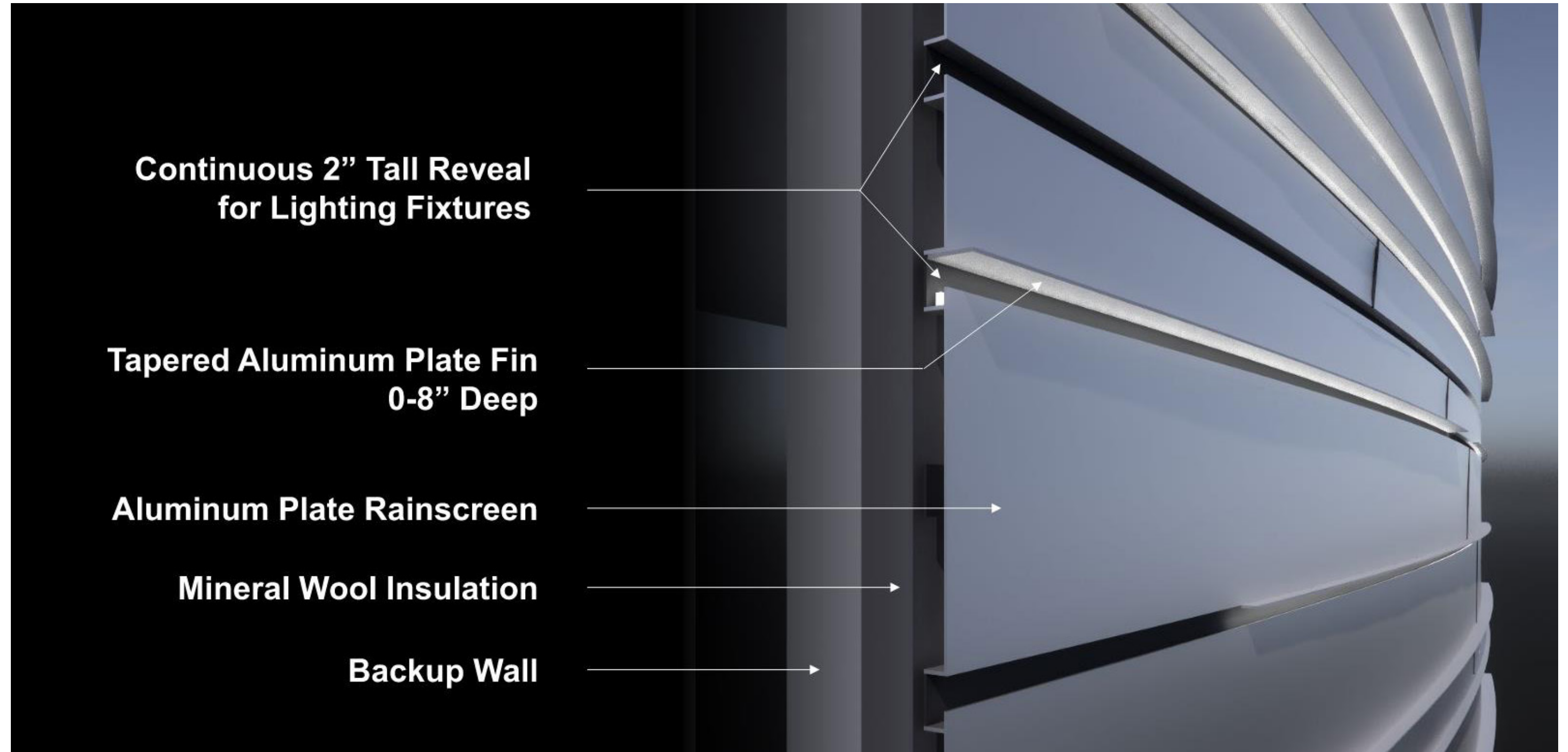
Option 1- Tapered Fin (preferred)

The tapered fin is the preferred alternative because it allows the skin to capture the sense of energy and reflectivity in the Spiral Galaxy. By day, the fin provides texture and dimensionality by modulating natural shadow and light. By night, artificial lighting gently uplights each fin without causing excessive light spill. The tapering form of the fins allows light to illuminate the varying width of the fin surface resulting in a streaking effect reminiscent of stars streaking across the night sky.



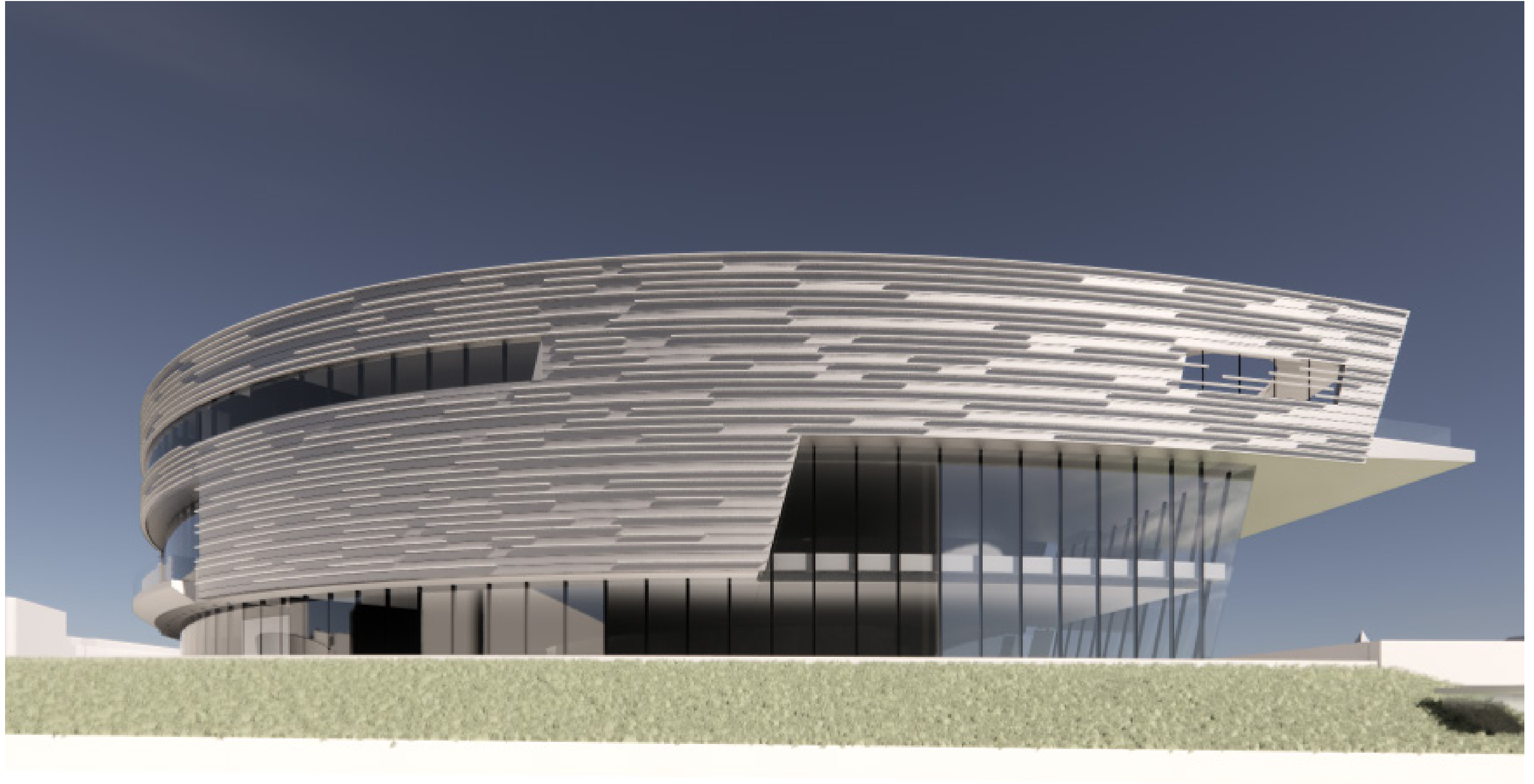
Facade Materiality Alternatives

Option 2- Dense Fin



Facade Materiality Alternatives

Option 2- Dense Fin



Facade Materiality Alternatives

Option 3 - Tube Fin

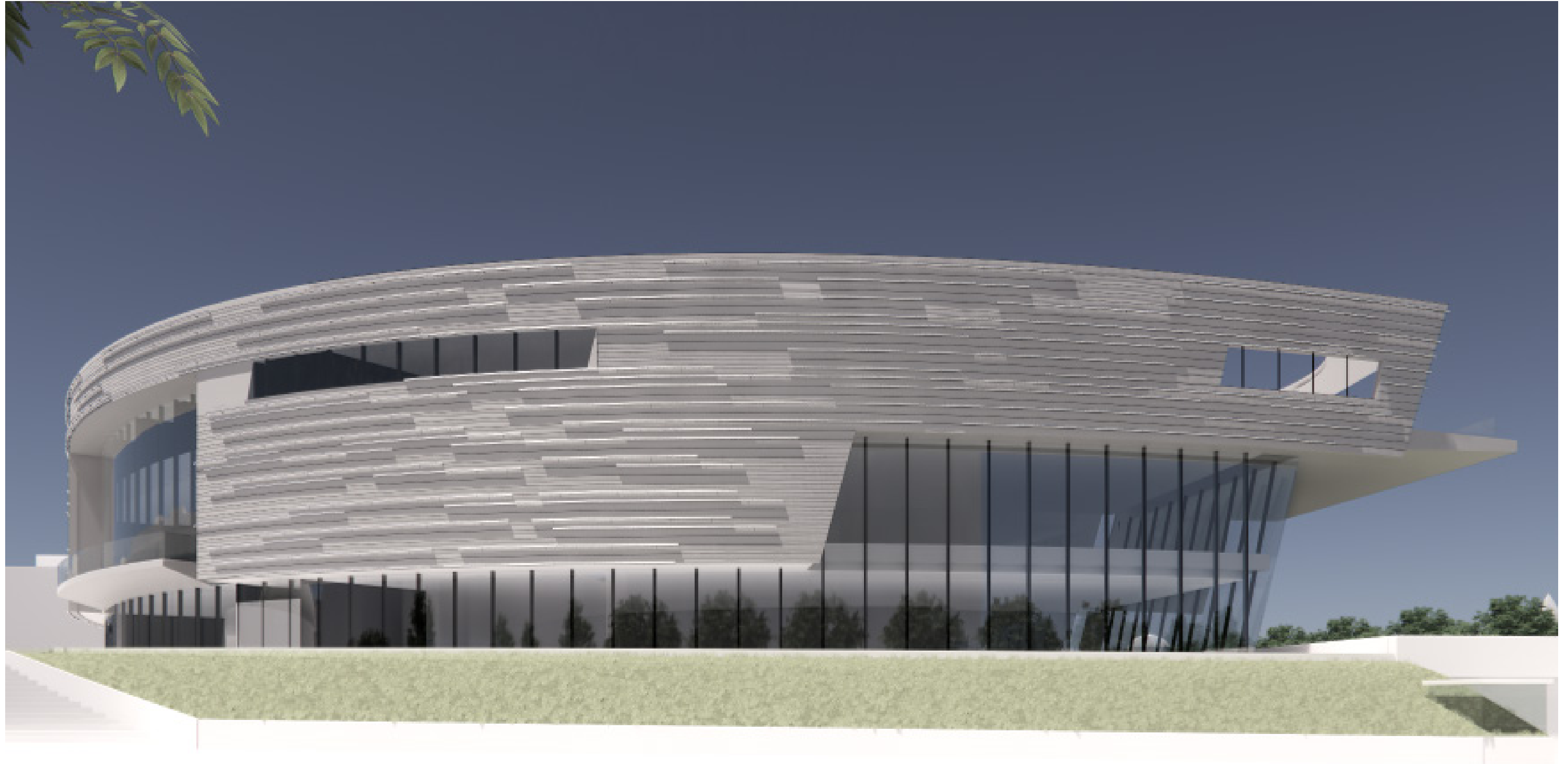


**Aluminum Tube Fin
3" Diameter**

Aluminum Plate Rainscreen

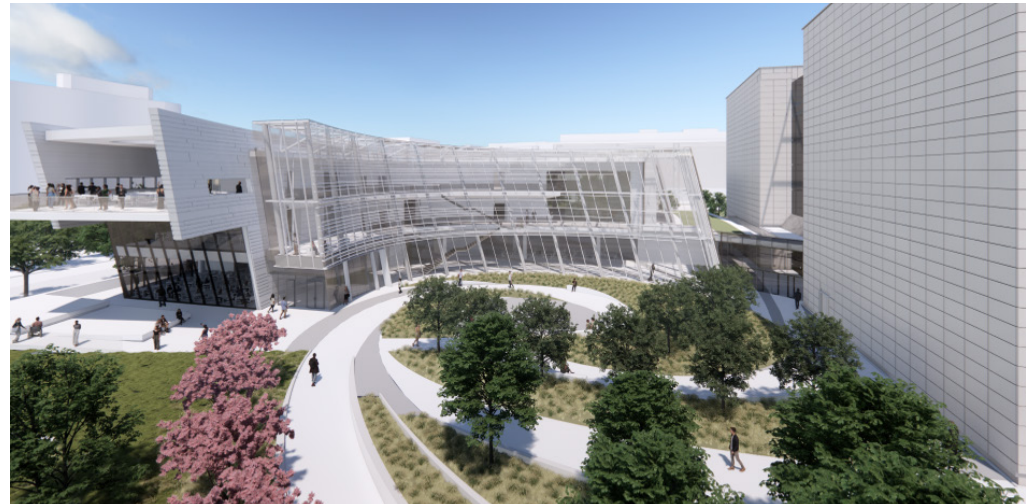
Facade Materiality Alternatives

Option 3 - Tube Fin

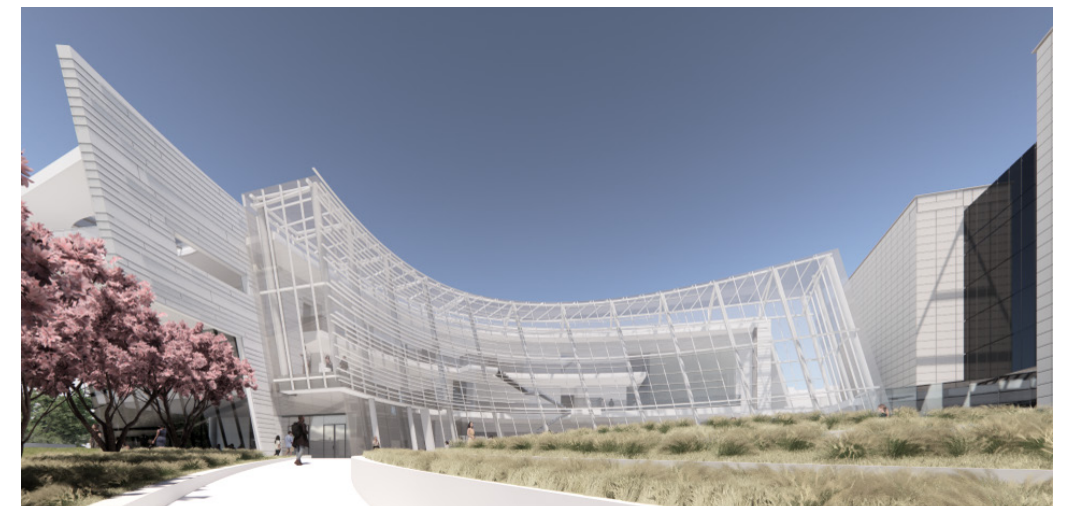
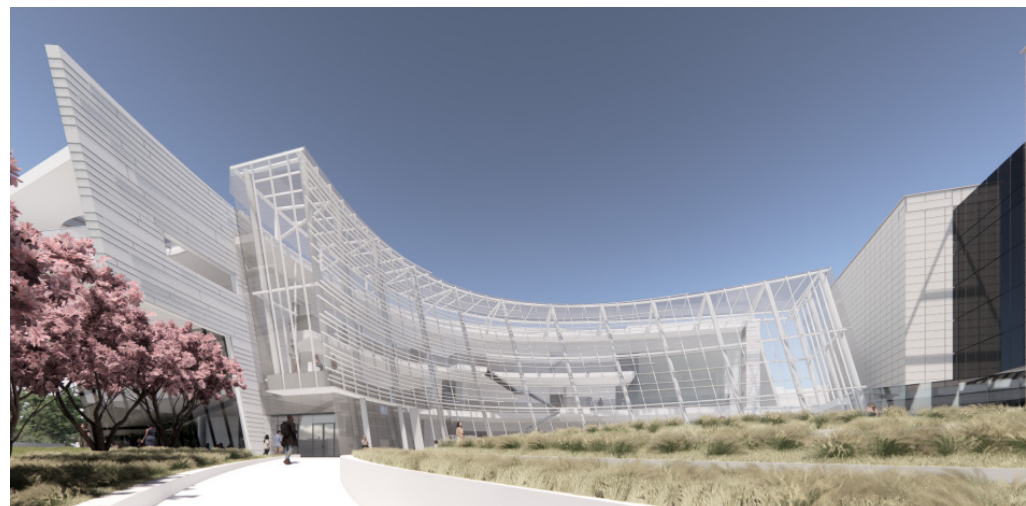


Building Composition Alternatives Comparison

Option 1: Spiral concourse roof sloping up to the Mall (Preferred)



Option 2: Spiral Concourse roof sloping up to NASM



Building Composition Alternatives

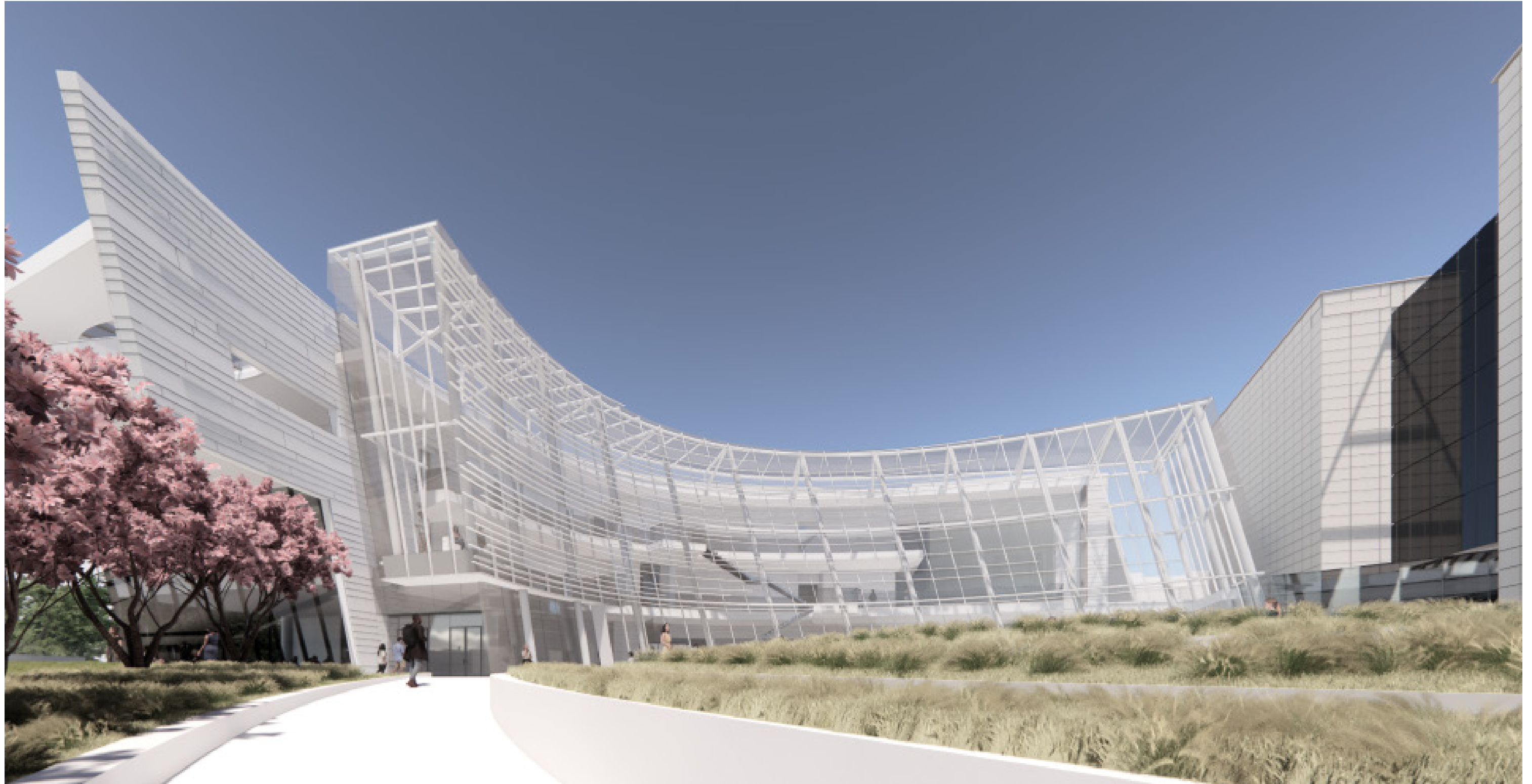
Option 1 - Spiral concourse roof sloping up to the Mall (Preferred)

This option depicting the glazed Spiral Concourse roof sloping upward from NASM towards the Mall is preferred. The gesture of the Concourse lowering as it approaches NASM is consistent with the movement of the main BLC building form and is deferential to NASM as primary. It also metaphorically expresses the BLC mission to diffuse knowledge outward.



Building Composition Alternative

Option 1 - Spiral concourse roof sloping up to the Mall
(Preferred)



Building Composition Alternative

Option 2 - Spiral concourse roof sloping up to NASM



Building Composition Alternative

Option 2 - Spiral concourse roof sloping up to NASM

