



Smithsonian

## National Capital Planning Commission

Preliminary and Final Submission for

## Smithsonian Institution Botany Greenhouse Replacement



*Date*

October 2, 2020

*Project Location*

4210 Silver Hill Road, Suitland Maryland, 20746

*Smithsonian Institution Project No.*

1530101

## **Smithsonian Institution Botany Greenhouse Replacement**

**Preliminary and Final NCPC Submission  
October 2, 2020**

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## Project Overview

### Introduction

The Smithsonian Institution is requesting NCPD's review of the NMNH Botany Greenhouse Replacement project. This project is included as a near term project in the 2020 Suitland Collections Center Master Plan, which was approved at the June 4, 2020 meeting. The proposed building has been reduced in size and its position on site has shifted in response to performance criteria which will be addressed in this submission.

A virtual pre-submission briefing to NCPD staff was conducted on July 29, 2020. Based on that discussion, the Smithsonian Institution is providing a submission for combined Preliminary and Final review by the Commission.

### Project Description

The new National Museum of Natural History (NMNH) Botany Greenhouse facility will replace the current facility, which is located adjacent to the Museum Support Center (MSC) at the Suitland Collections Center (SCC). The existing 9,150 GSF Botany facility and its 2,592 SF outdoor shade structure will be demolished as part of the Pod 6 development project at MSC. The new Botany Greenhouse will be located at the northeast corner of the SI Suitland Campus, adjacent to the Smithsonian Gardens (SG) greenhouses and headhouse.

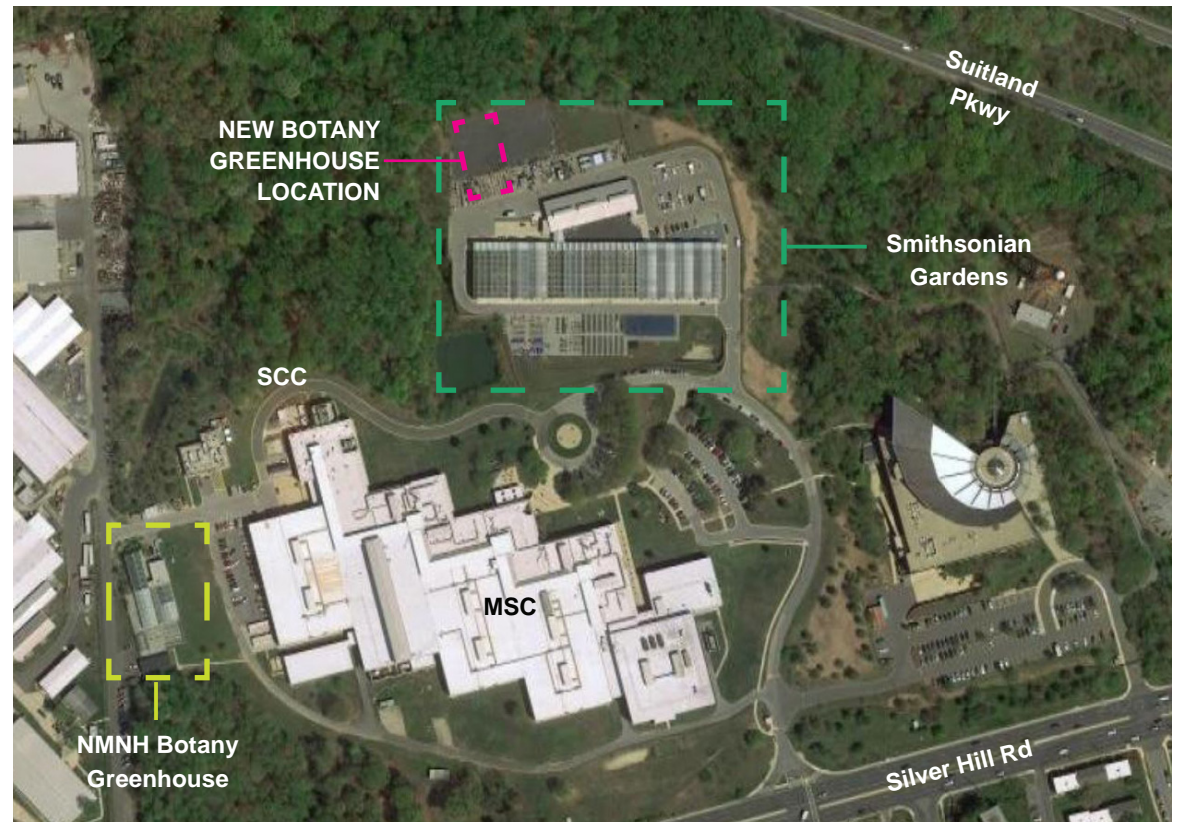
The new proposed facility will be 10,749 GSF. It will consist of a 1,939 GSF headhouse with an adjoining 8,810 GSF pre-engineered greenhouse. The outdoor space to the west the facility will include a 2,400 SF open pre-engineered shade structure. The outdoor areas to the east of the facility will be preserved for Smithsonian Gardens use. The new building will complement the 65,410 GSF SG facility which was built in 2010.



Existing NMNH Botany Greenhouse



Area North of Existing SG Headhouse



Existing SCC Site

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NMNH Botany Greenhouse Replacement

Two NMNH Botany full-time staff (FTE) will move to the relocated Botany Greenhouse.

The existing access road to the SG site and parking lot will remain as is. No additional parking spaces will be provided for the SI Botany Greenhouse. The existing security fence along the north and west borders of the site will remain in place.

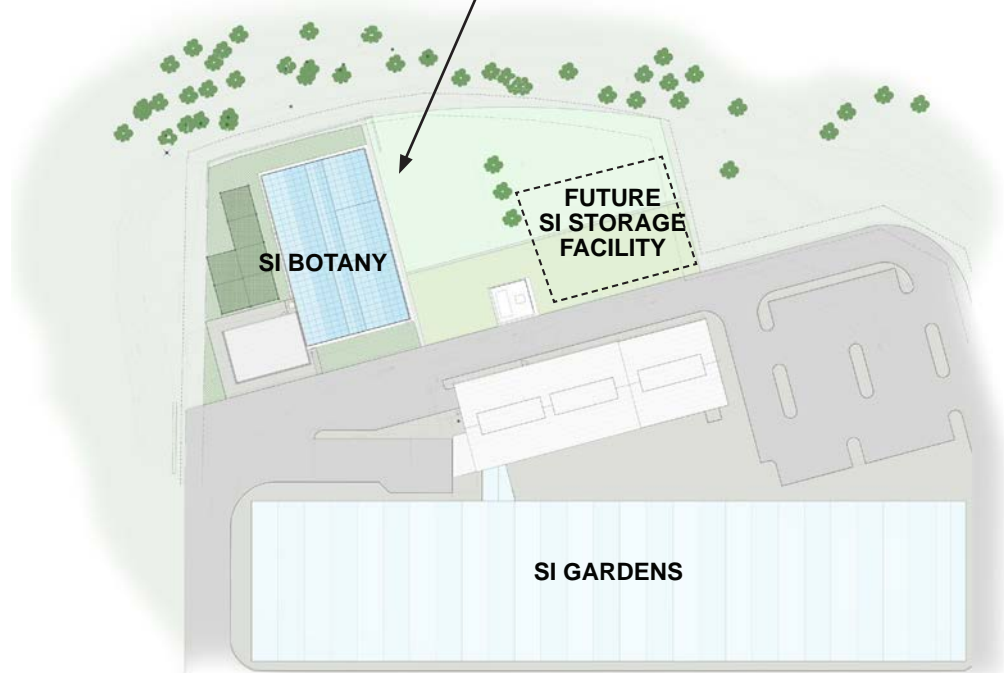
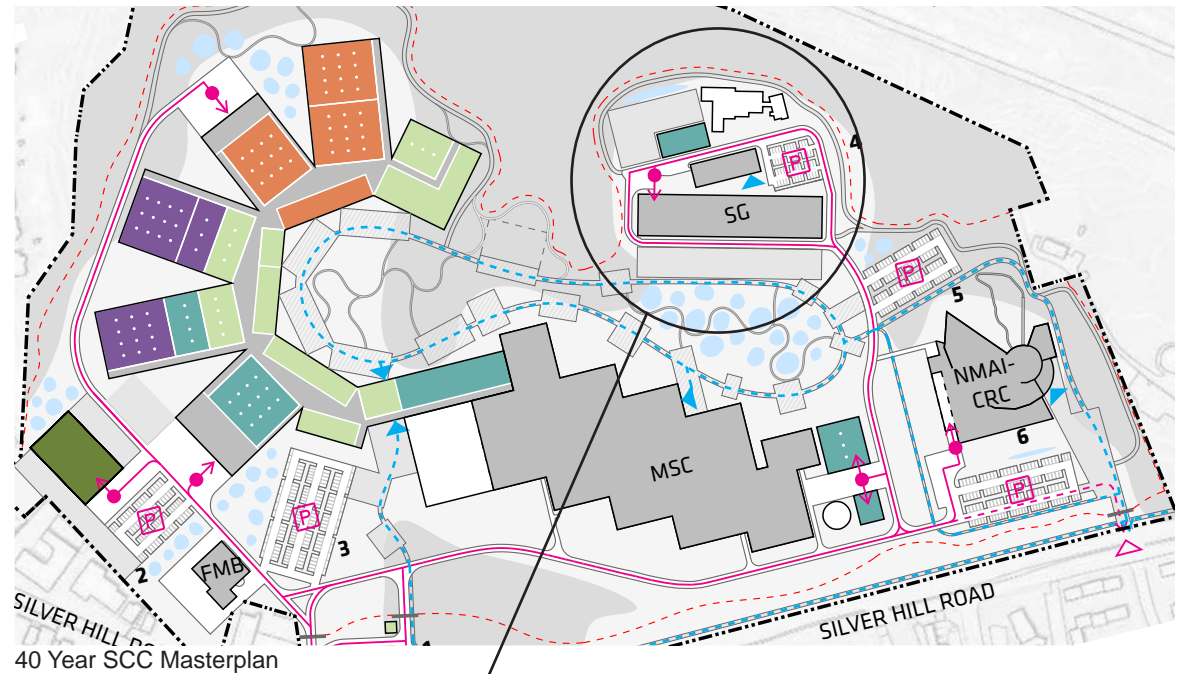
**Masterplan Alignment**

The Botany Greenhouse project is referenced in the Suitland Collection Center (SCC) Master Plan which was approved by NCPC on June 4, 2020. The NMNH Botany Greenhouse program will relocate from its current location, adjacent to the Museum Support Center (MSC), to the Smithsonian Gardens (SG) site.

The Smithsonian conducted a feasibility study in 2016 evaluating alternative locations for the Botany Greenhouses replacement on the SCC campus and selected the proposed location due to the opportunity to build off existing utilities, synergies, and share resources with the SG greenhouses.

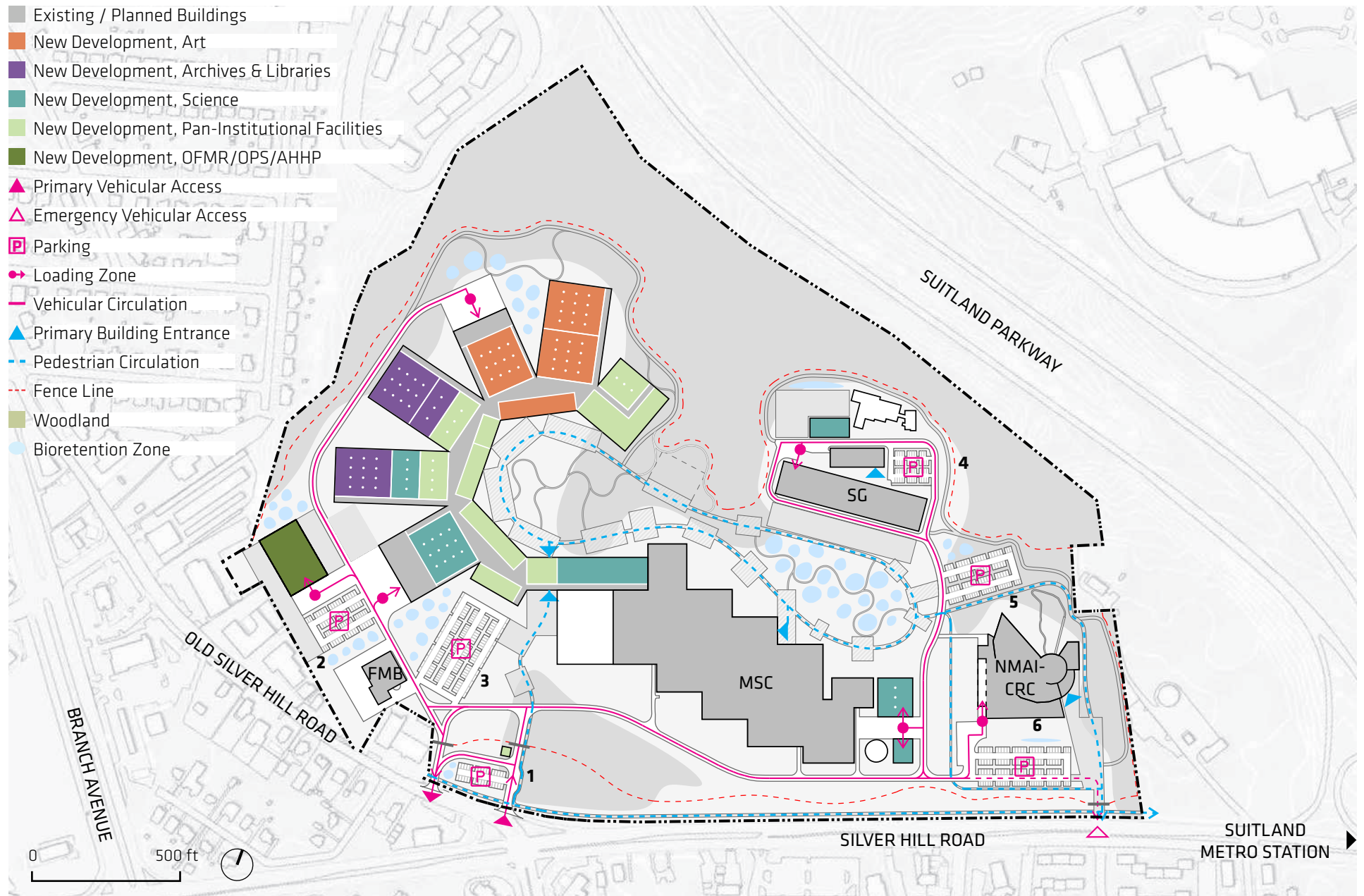
Solar studies indicated that shadows cast by the SG Headhouse would compromise the functionality of the Botany Greenhouse if it were to be located to the northeast side of the SG site. The proposed northwest location exposes the greenhouse to more favorable sunlight conditions throughout the day, and limits the clearing of existing trees to the north. Additionally, it allows the two facilities to share the SG loading dock.

With the Botany Greenhouse on the northwest side of the SG site, the future two story SG general storage facility location will also need to be revised from the SCC Masterplan.

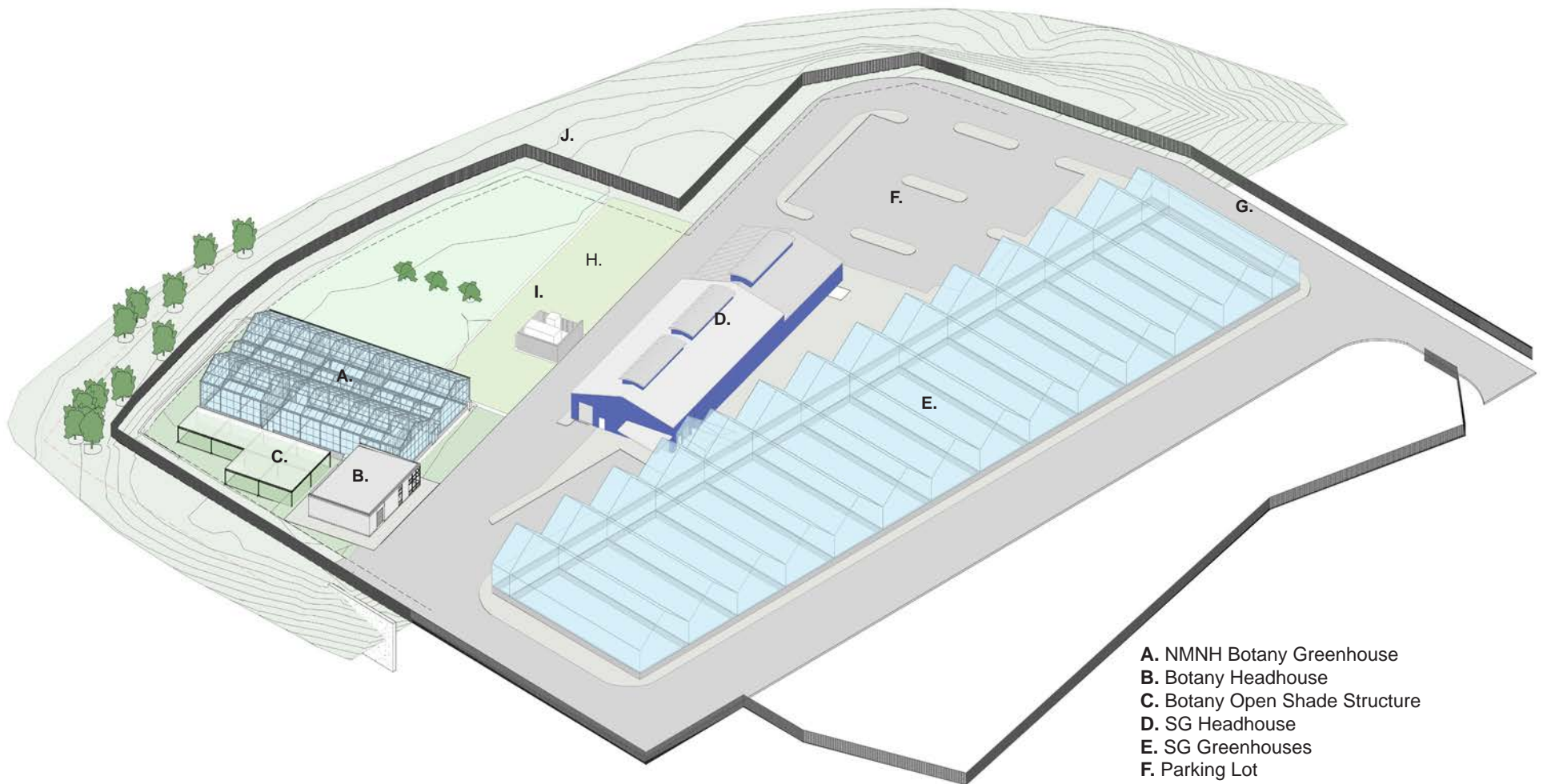


Proposed Site Plan

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 NMNH Botany Greenhouse Replacement



40 Year SCC Masterplan



**Axonometric View of Proposed Design**

- A. NMNH Botany Greenhouse
- B. Botany Headhouse
- C. Botany Open Shade Structure
- D. SG Headhouse
- E. SG Greenhouses
- F. Parking Lot
- G. Main Access Road
- H. SG Outdoor Storage & Laydown Area
- I. Transformer
- J. Existing Security Fence

## Schedule

In order to move forward with the construction of Pod 6 at MSC, the replacement facility for the Botany Greenhouse must be completed by the summer of 2022. Construction will be completed by July 2022, and SI Botany will move into their new facility in September 2022.

## Outreach and Coordination

Preliminary stormwater management (SWM) and sediment and erosion control (E&S) drawings have been submitted to the Maryland Department of the Environment (MDE) for site concept review. MDE's final comments have not been received yet. The AE team is coordinating with them during the review process.



View of Site, Looking Northeast

## Detailed Project Information and Drawings

### Site Description

The Botany Greenhouse will sit on a 0.64-acre site to the north of the Smithsonian Gardens facility and access road. The site is generally flat and is comprised of gravel, pervious pavers and lawn. SI Gardens uses portions of this open area for outdoor storage and laydown space. Those programmed outdoor spaces will be relocated to the northeast side of the site in the future.

### Transportation and Circulation

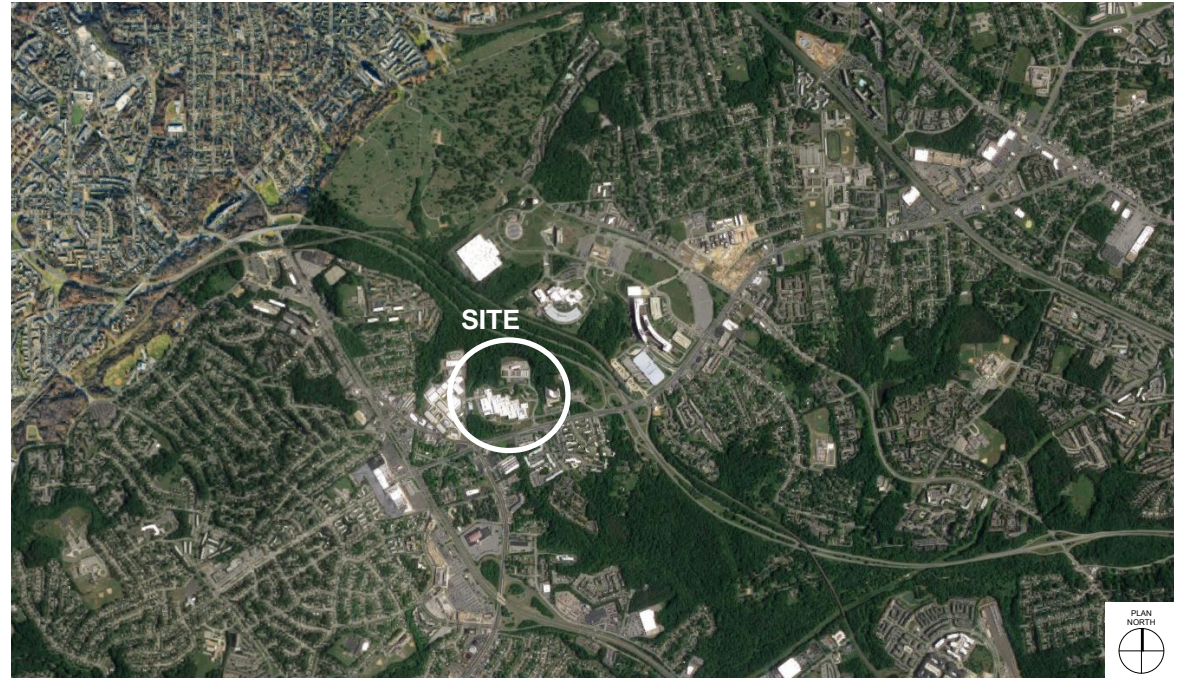
No changes are proposed to existing vehicular and pedestrian circulation at the SG site.

### Parking

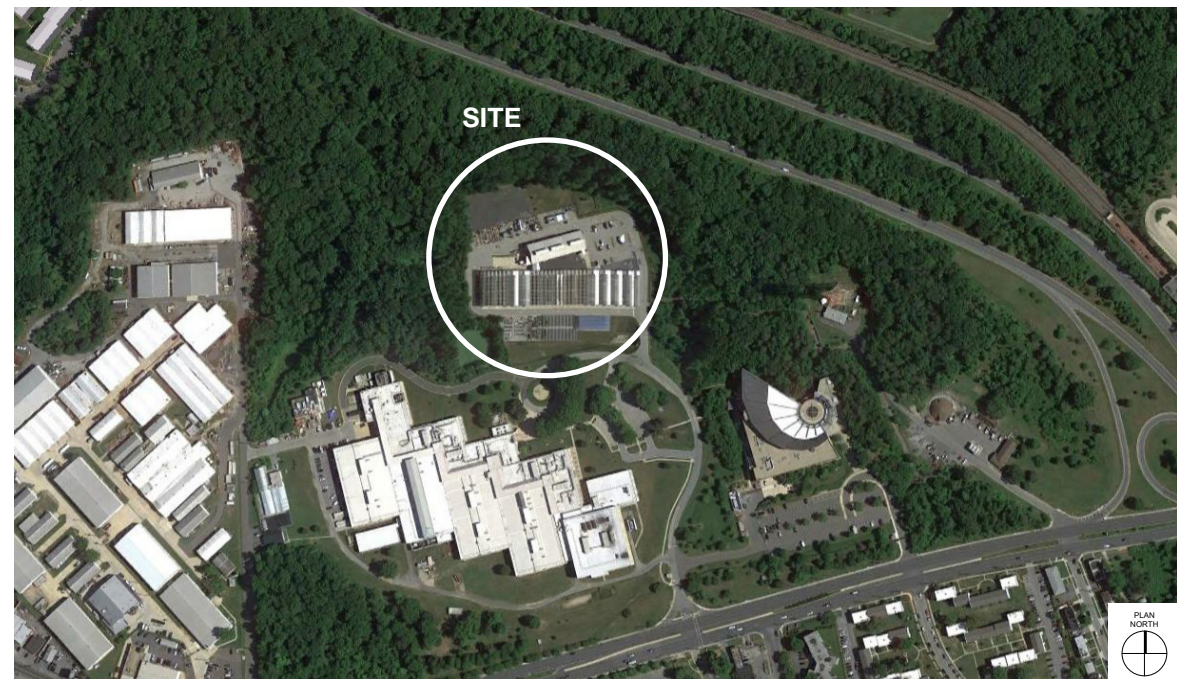
To meet the Smithsonian's commitment to gradually reach a parking ratio for SCC-based employee spaces of 1 space/ 3 employees over the next twenty years, a total of 40 existing spaces will be removed or repurposed as part of four projects anticipated to be undertaken in this decade. The removed or repurposed spaces would be distributed among projects and areas of the campus as follows: Botany Greenhouse Replacement, 5 spaces at the Smithsonian Gardens lot; MSC Pod 6, 15 spaces from the west side of MSC; AHHP Storage Building, 5 spaces from Garber lot and NMAI-CRC West Addition, 15 spaces from CRC lot. SI will conduct a survey of transportation in FY 2021.

### Landscaping and Streetscaping

This project will preserve the existing landscape and streetscape at the SG site.

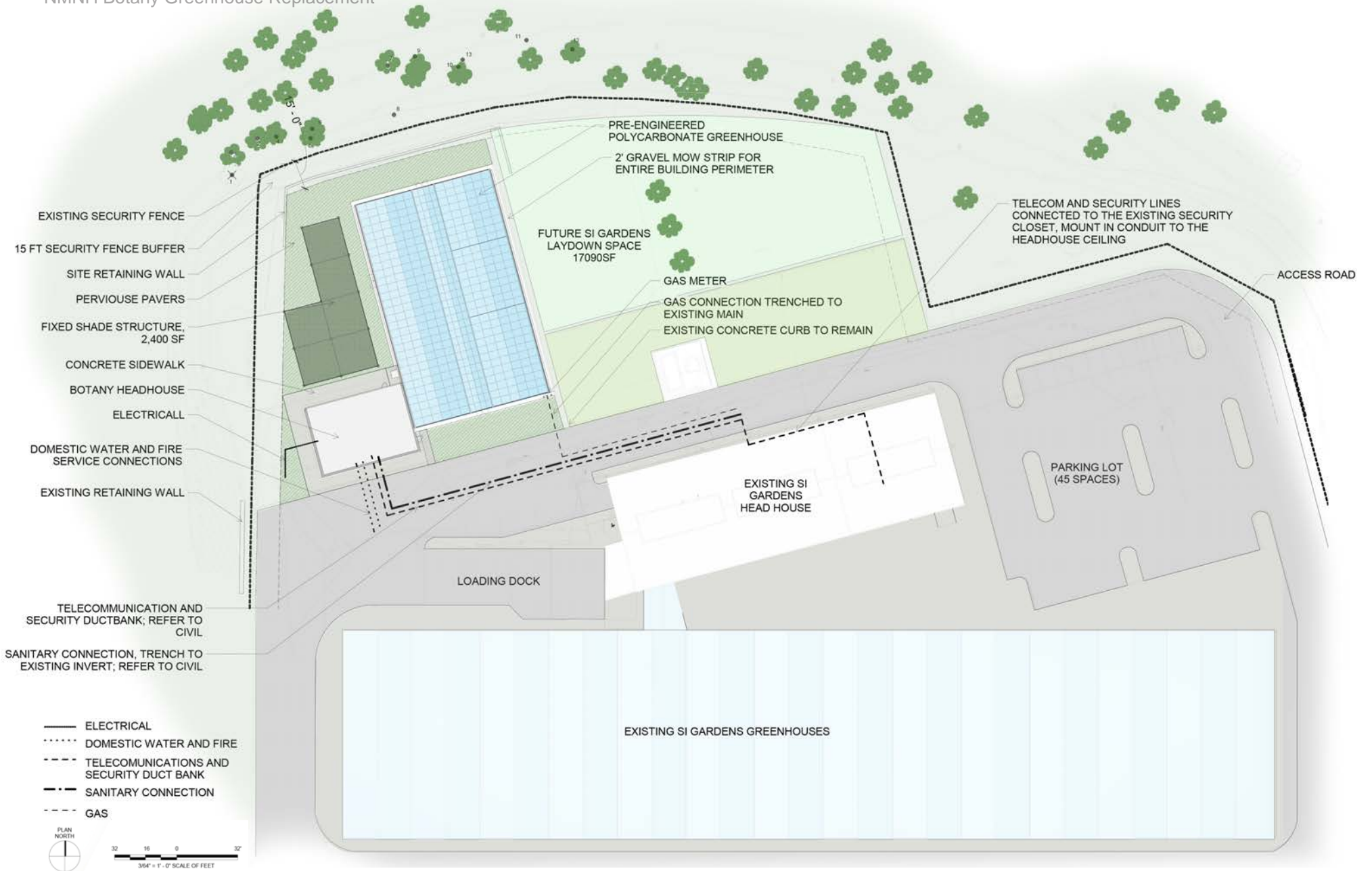


Vicinity Map



Existing Conditions

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**Proposed Site Plan**



Northwest Corner of the Site, Looking Towards Suitland Parkway

No additional landscaping is proposed at the Botany site and no trees are planned to be removed within the perimeter fence.

A discussion of the condition of the trees north and west of the security fence is included in the Natural Resources section of this submission.

Exterior site lighting will comply with the SCC Master Plan requirements for Dark Sky friendly lighting. This system can be selected to provide the levels needed around the surveillance area and security cameras, but not go beyond that. Also, motion activation of site lighting will be considered.

### **Perimeter Security**

The existing security fence along the north and west borders of the site will remain in place. A 15 foot lawn on the SI side of the existing security fence will provide a buffer zone,



Existing SI Gardens Parking Lot and Headhouse

which allows the Office of Protection Services to navigate the edges of the site.

### Utilities

Infrastructure is available within the existing Smithsonian Gardens Greenhouse Complex at the Suitland Collections Center for all utilities required for the greenhouse complex. The project plans to connect to existing utilities including:

- Domestic and fire water service
- Sanitary sewer
- Storm drains
- Electric
- Telecommunications
- Natural gas

### Building Description

The new SI Botany facility is comprised of a 8,810 GSF prefabricated greenhouse with five separately zoned greenhouses and a 1,939 GSF headhouse. The headhouse includes a dedicated workroom, office/security space, bathroom, indoor/outdoor storage spaces, and supporting mechanical and IT rooms.

The greenhouse layout will be similar to the existing Botany greenhouse with two greenhouse structures joined with a center connecting corridor. The five greenhouses will be accessed off the corridor and will be separated with glazed partition walls.

The greenhouse system and materials will be as follows:

- The greenhouse framing structure will be aluminum and stainless steel and will stand on a concrete knee-wall.



North Side of the Site, Looking West Along the Existing Security Fence



Existing Botany Shade Structure



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- The glazing system which supports the glazing panels will be aluminum and per manufacturer's proprietary design.
- The roof glazing will be clear sixteen millimeter (16mm) twin-wall structured acrylic sheet. The side wall and partition wall glazing will be clear eight millimeter (8mm) twin-wall structured polycarbonate sheet.

The Botany Headhouse is designed to provide a functional and comfortable light-filled workspace environment. Both the workroom and office area will have glazed storefront windows. The building materials are also meant to complement the SG Headhouse facility. They include the following:

- Roof: low-slope standing-seam insulated metal roof system.
- Exterior walls: composite walls that consist of corrugated metal panels with insulation/air-barrier backing over CMU support walls.
- Exterior glazing will consist of aluminum storefront system with 1"-thick insulated low-e glazing. Upper panels will incorporate translucent film.

In addition to the greenhouse and headhouse structures the Botany site will include a 2,400 sf pre-engineered open shade structure. The aluminum framed structure will be 10 foot high with a translucent fabric roof covering.



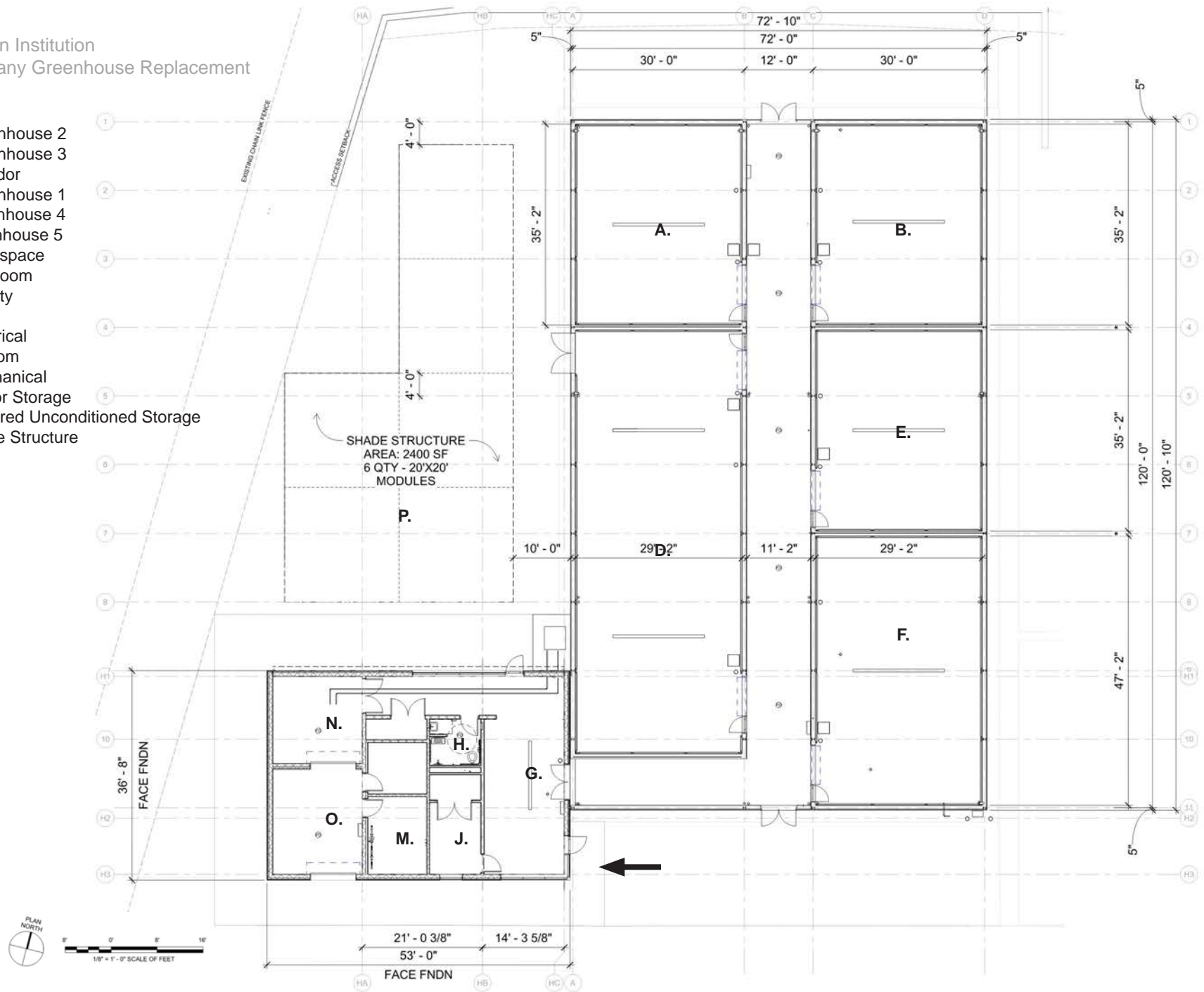
Exterior View of Proposed Botany Greenhouse and Headhouse, Looking Northwest



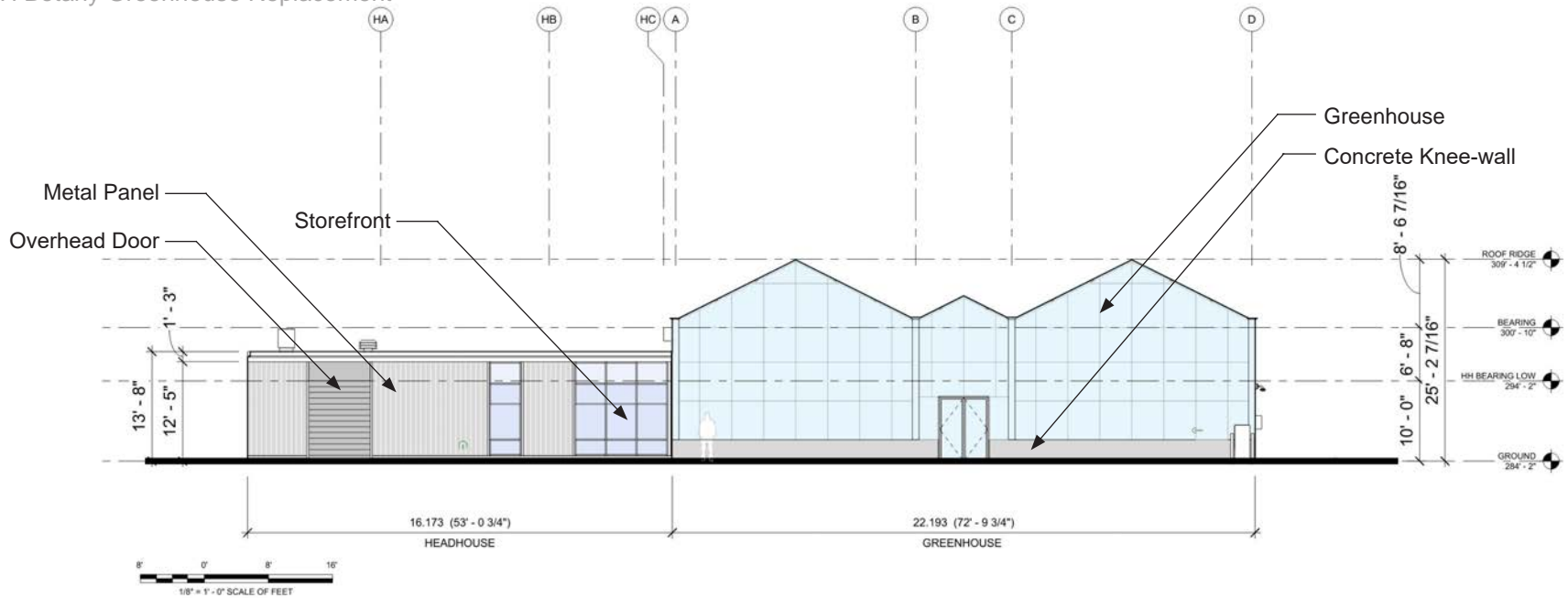
Typical Pre-engineered Greenhouse

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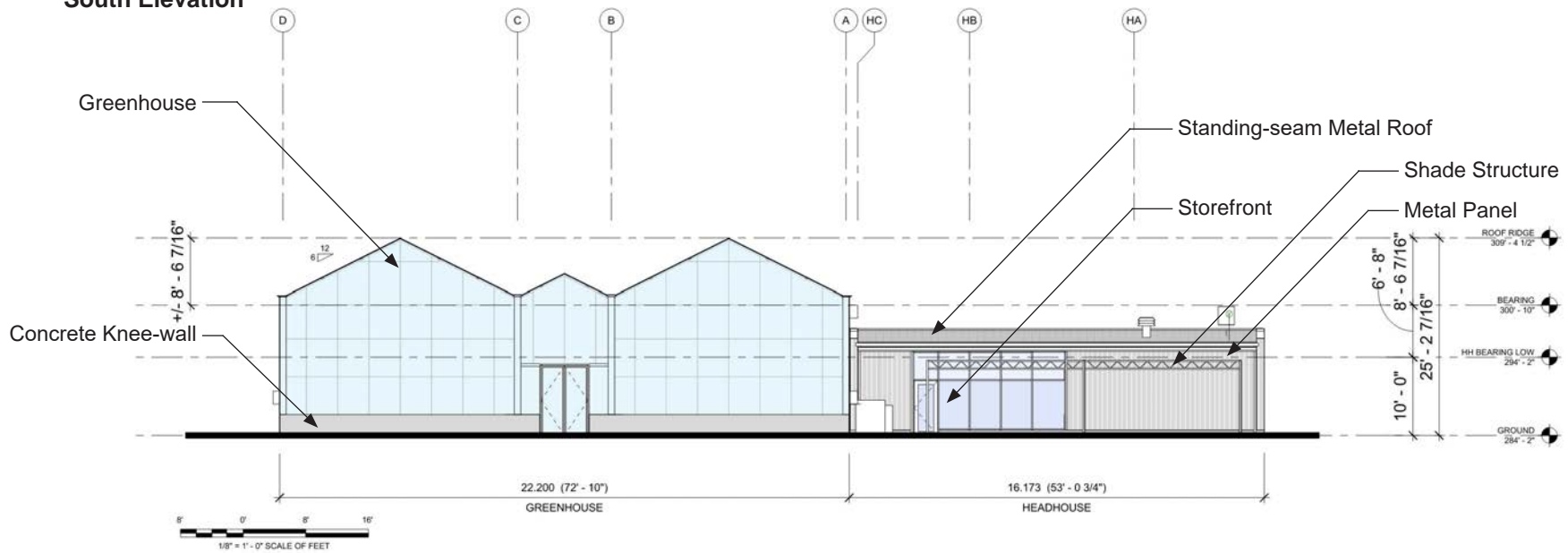
- A. Greenhouse 2
- B. Greenhouse 3
- C. Corridor
- D. Greenhouse 1
- E. Greenhouse 4
- F. Greenhouse 5
- G. Workspace
- H. Restroom
- I. Security
- J. Office
- K. Electrical
- L. Telecom
- M. Mechanical
- N. Indoor Storage
- O. Covered Unconditioned Storage
- P. Shade Structure



**NMNH Botany Greenhouse and Headhouse Plan**

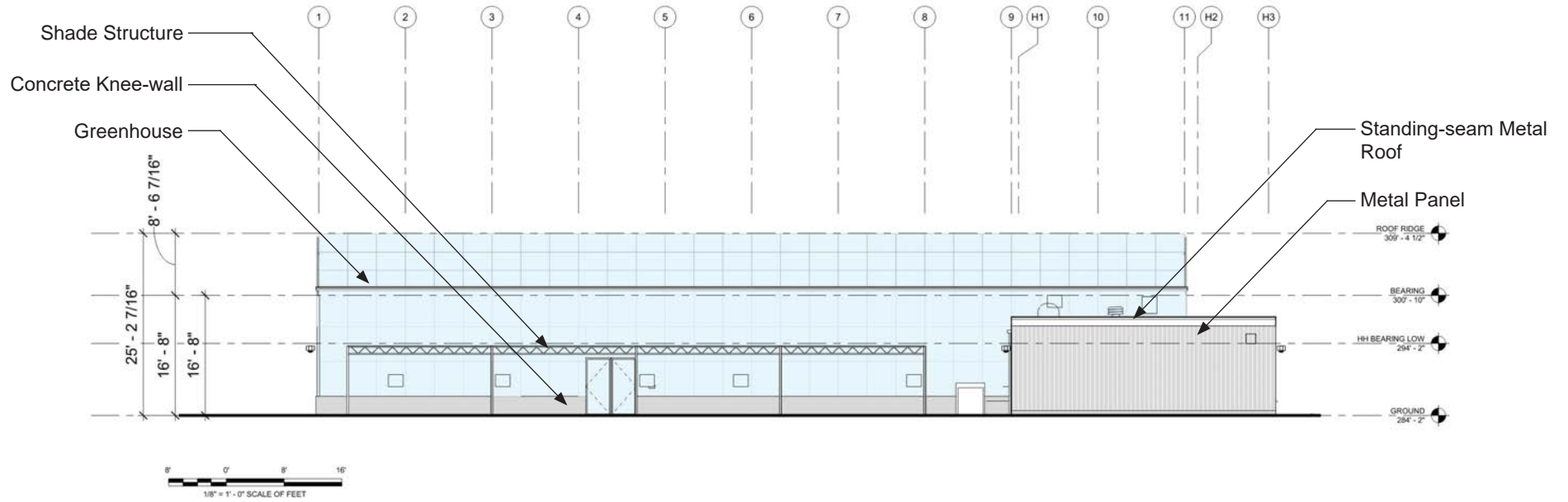


South Elevation

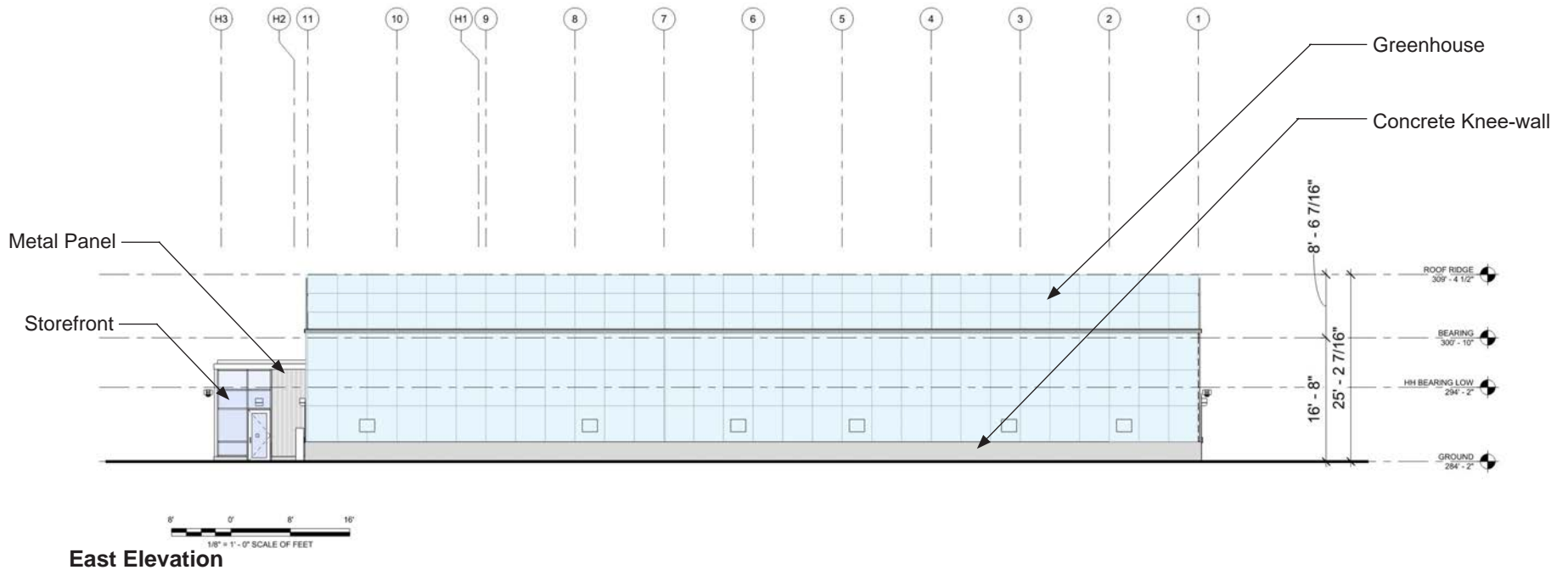


North Elevation

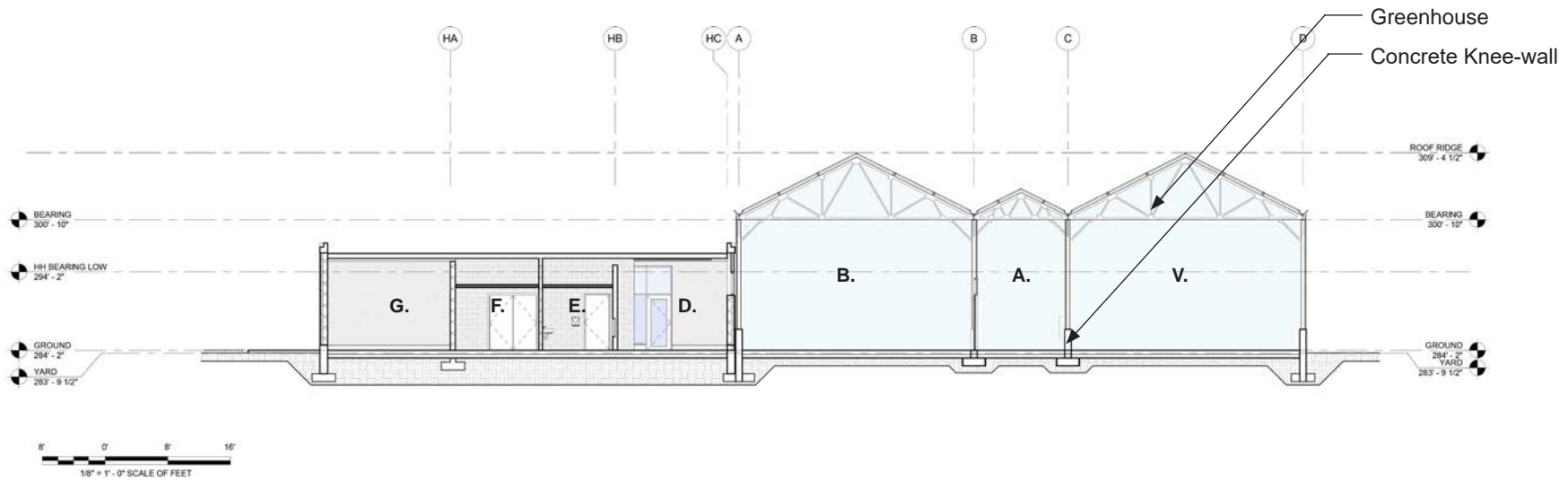
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West Elevation



East Elevation



**Transverse Building Section**

- A. Corridor
- B. Greenhouse 1
- C. Greenhouse 5
- D. Workspace
- E. Restroom
- F. Electrical
- G. Indoor Storage

## Environmental and Historical Considerations

### Historic Preservation

As noted in the SCC Masterplan, there are no local, state or federal designated historic resources located within the Suitland Collections Center and the proposed Botany Greenhouse site. The Suitland Parkway, adjacent to the northern edge of the project site, is listed in the National Register of Historic Places and recorded as PG:76A-22 in the Maryland Inventory of Historic Properties.

Views of the Botany Greenhouse building through the forest will be limited.

### Natural Resources

The woods on the north side of the Botany Greenhouse site create a visual and physical buffer to the Suitland Parkway. A chainwire security fence prevents access from the site into the woods. The dense forest helps to preserve and enhance the landscape adjacent to the Parkway.

The woods are comprised of deciduous canopy trees including yellow poplar (tulip poplar), black cherry, red maple, white oak, northern red oak, sycamore, and American beech, as well as understory trees such as magnolia and serviceberry. Intermittent streams run through the northern woodland along steep slopes and are used as outlets for detention ponds collecting stormwater from the site. Many of the trees have significant height (75 feet +/-) and limited tapers.

Consistent with NCPC and Smithsonian policies for forest preservation, efforts will be made to avoid tree removal to the extent practicable. An inventory has been conducted of the larger trees adjacent to the fence. The closest are approximately 8 ft.—10 ft. from the perimeter fence and approximately 42 ft. from the north façade of the greenhouse structure.



A. North Side of Site

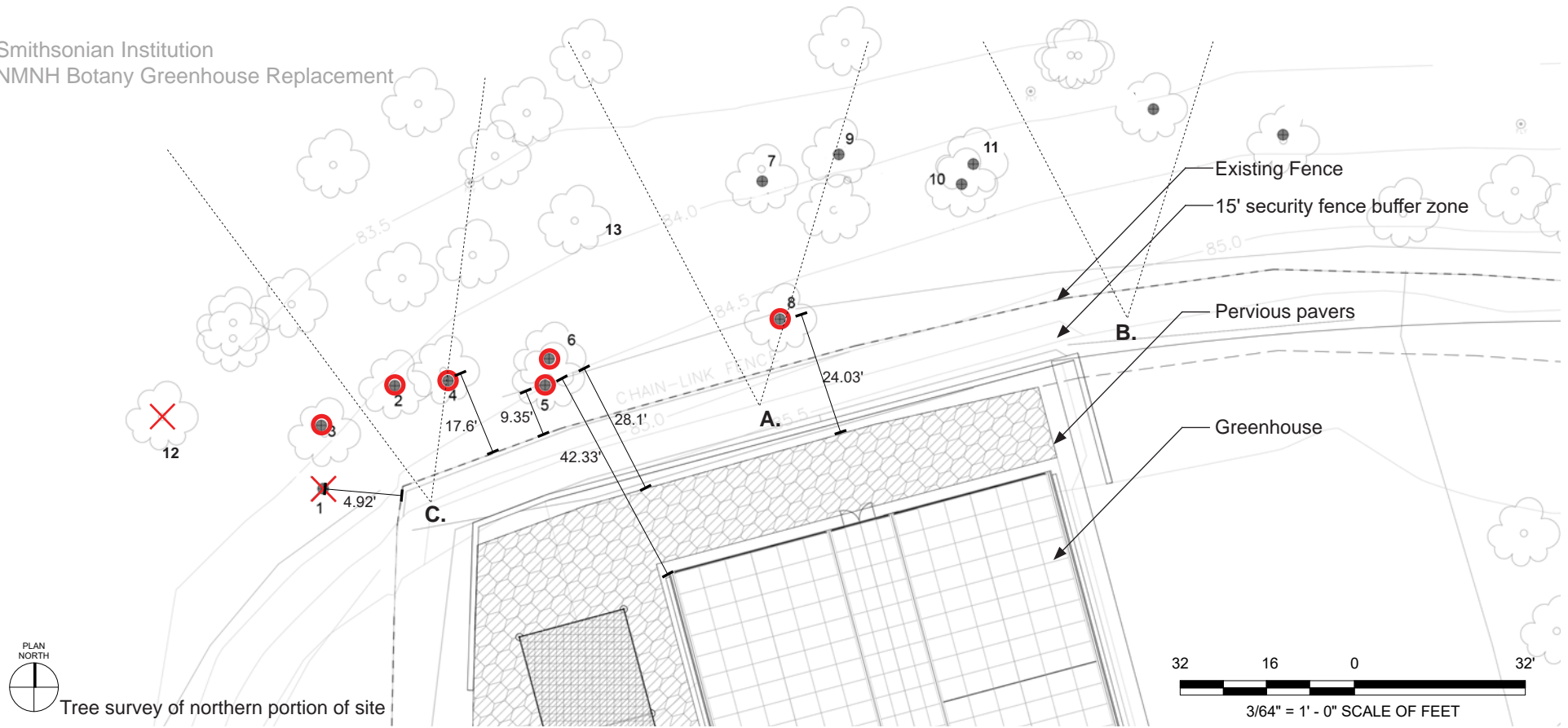


B. Northeast Corner of Site



C. Northwest Corner of Site

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The Smithsonian's preliminary assessment of the trees beyond the north edge of the site, indicates that some of the trees show signs of damage due to previous construction. Up to six (6) trees may need to be removed to prevent any damage to the new Botany facility. The removed trees will be replaced 2:1, with species that include native redbud and dogwood understory trees as well as evergreen American holly trees. Trees will be replaced at 2.5 caliper size. The understory trees added will further screen the limited views of the transparent greenhouse structure.

A tree protection plan will be implemented during construction.

1. Dead Tree
2. Sweetgum tree, in fair condition
3. Tuliptree, in fair condition. Damaged by previous construction
4. Tuliptree, in good condition
5. Tuliptree, in good condition. Damaged by previous construction
6. Tuliptree, in good condition. Damaged by previous construction
7. Tuliptree, in excellent condition
8. Sweetgum tree, in good condition. Likely damaged by previous construction
9. Tuliptree, in excellent condition
10. Red maple, excellent condition
11. Red maple, excellent condition
12. Dead Tree
13. Tuliptree, in excellent condition

○ - Tree to be removed

✕ - Dead tree

## Site Topography

A topographic survey of the site was completed in October 2016 under a previous iteration of this project to document existing site conditions and utilities. The site is generally flat (1-2%) and slopes down towards the north. The drop increases beyond the northern edge to 5-10% slopes outside the fence line and approaches 2:1 in the viewshed between the project site and the Suitland Parkway.

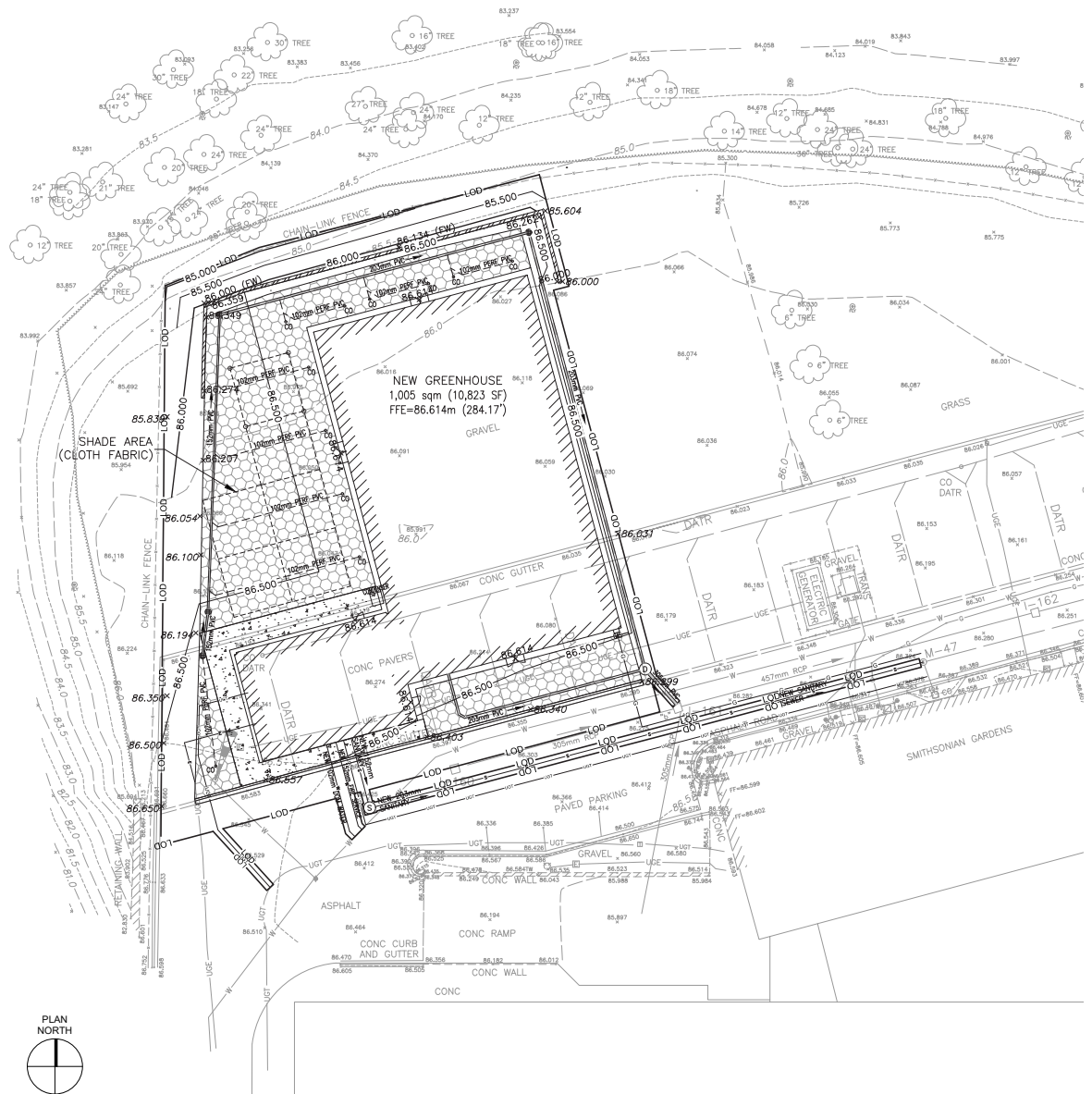
The majority of the project site generally drains to the north towards the tree line. The runoff from the flatter pervious paved areas infiltrates into the ground. A low retaining wall will be constructed at the edge of the pervious paving.

## Flooding

Per FEMA Map 24033C0230E, this project is outside the limits of the 0.2% Annual Chance Flood Hazard zone. It will have no impact to the existing floodplain.



Proposed Pervious Paver by Pavedrain

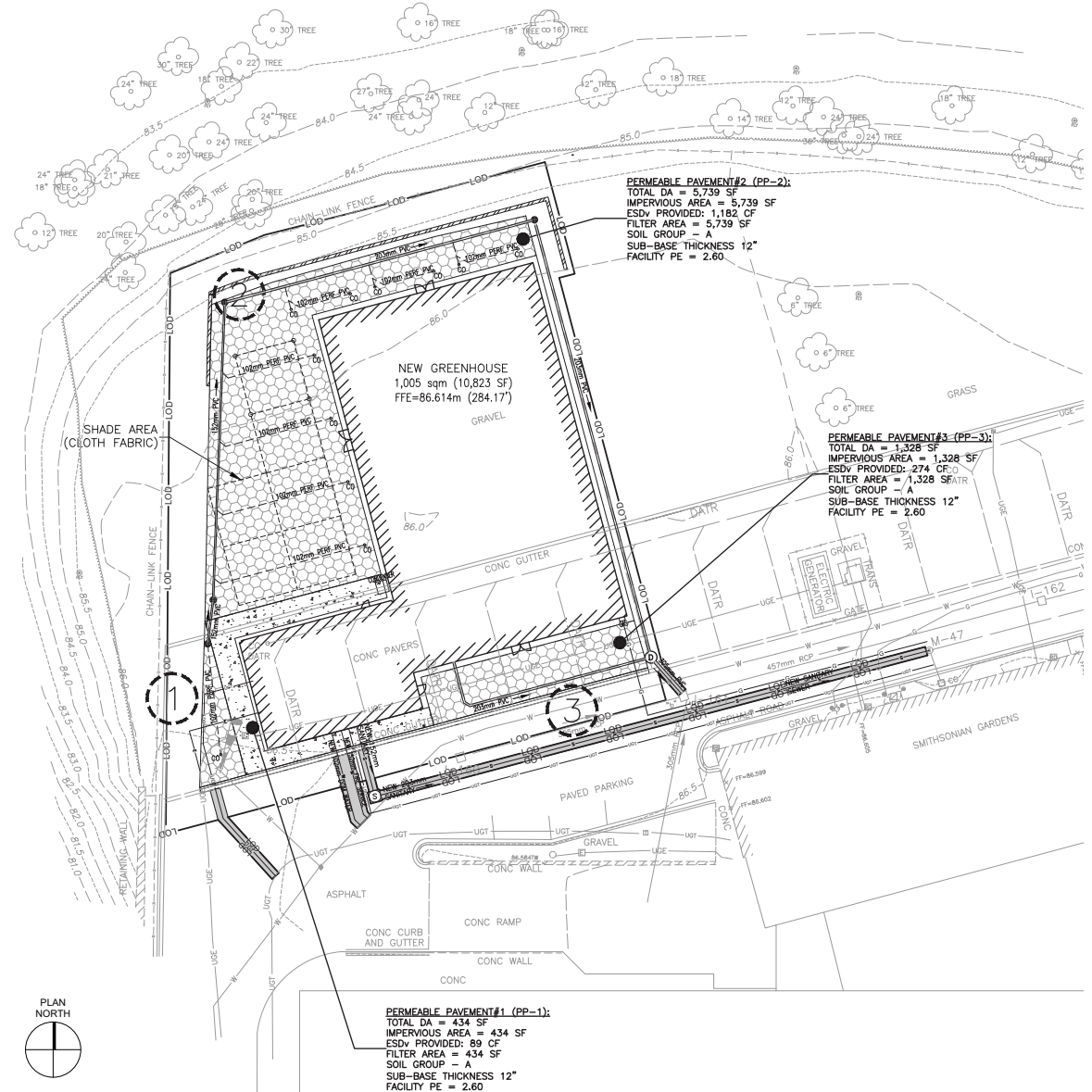


Civil Grading Plan

## Stormwater Management

This project requires compliance with MDE's stormwater management requirements and the Energy Independence and Security Act of 2007 (EISA). Compliance with EISA has resulted in a shift in stormwater methodology to a focus on measures to retain runoff on-site. The design approach is to use alternate surfaces such as pervious paving in outdoor laydown areas in order to meet the full SWM requirement for the site.

A site with at least 40% impervious area allows the project to be classified by the Maryland Department of the Environment (MDE) as a redevelopment project. This classification results in a significant reduction in the amount of water quality treatment required for stormwater management (SWM). The new Botany greenhouse site is composed of previously disturbed land which would qualify the project as a redevelopment one. The ability to retain stormwater runoff on-site and to use infiltration practices is dependent on on-site soil testing and geotechnical borings. Geotechnical and infiltration testing were performed at the site and the results will be sent to MDE for their review and approval of the proposed SWM strategy.



Civil Stormwater Management Plan