

National Zoological Park Elephant Yards Stormwater Mitigation Repair

3001 Connecticut Avenue, NW, Washington DC

Approval of Preliminary and Final Site Development Plans

Smithsonian Institution

Project Summary

Commission Meeting Date: October 9, 2025

NCPC Review Authority: 40 U.S.C. § 8722(b)(1) and (d)

Applicant Request: Approval of Preliminary and Final Site Development Plans

Session: Executive Director

NCPC Review Officer: Stephanie Free

NCPC File Number: 8702

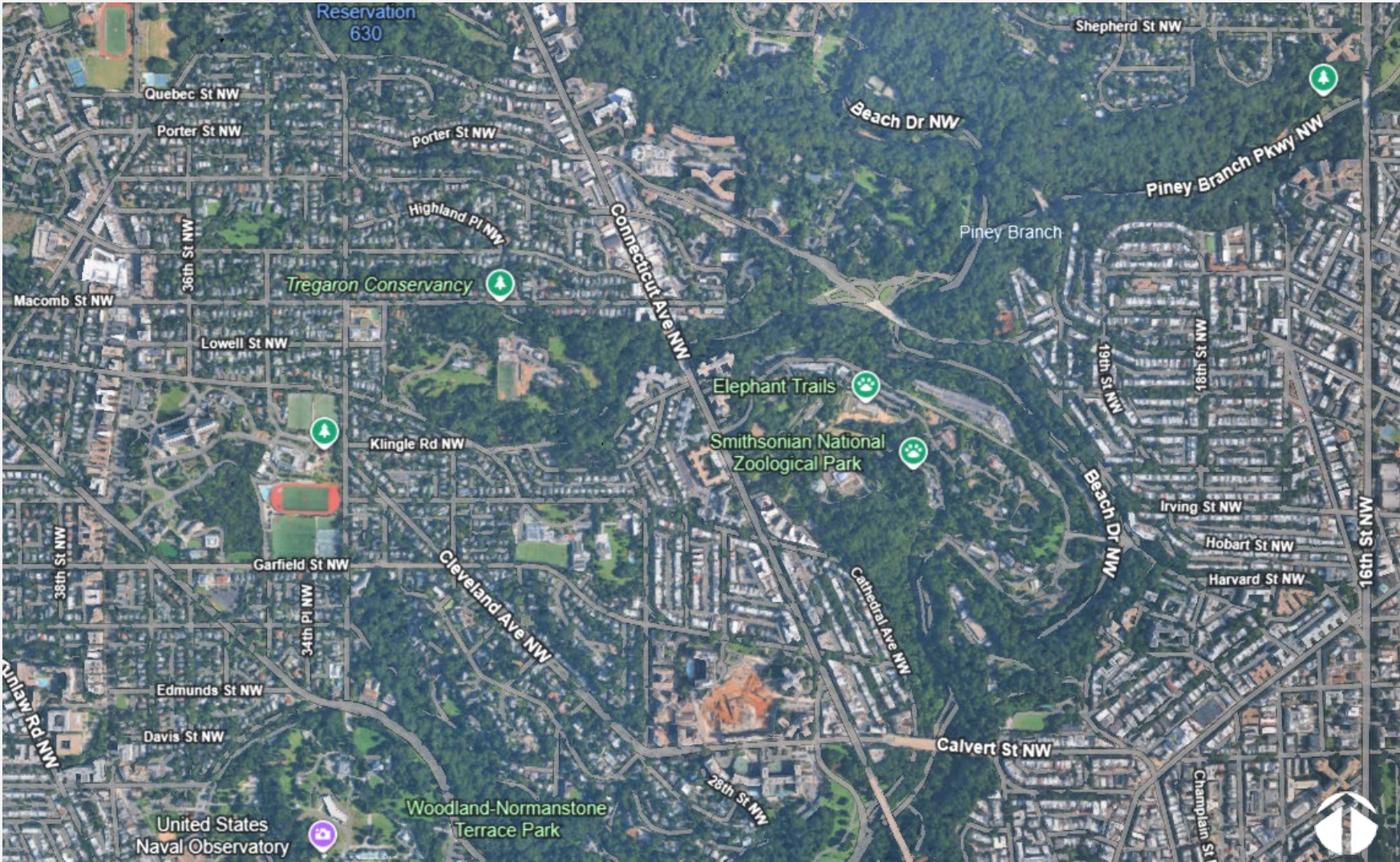
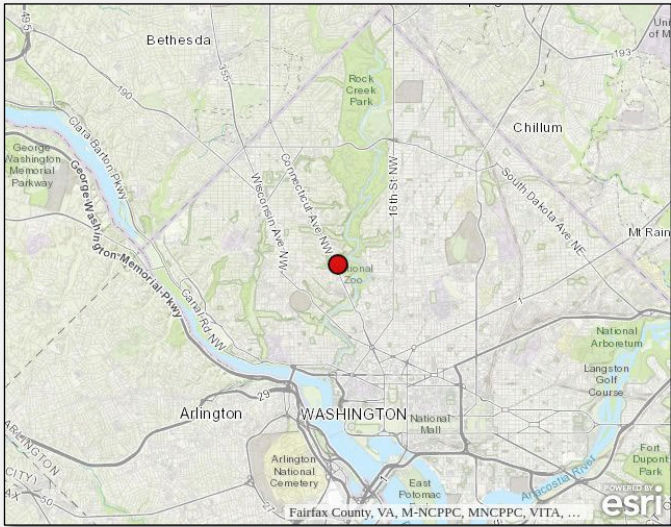
Project Summary:

The Smithsonian Institution submitted preliminary and final site development plans to address stormwater runoff and erosion problems within the National Zoological Park's outdoor elephant exhibit yards (Yards 1, 2, and 4). The Elephant House was constructed in 1937 and is a contributing element of the National Zoological Park Historic District listed in the National Register of Historic Places. An addition to the Elephant House was constructed in 2008 along with the current configuration of the outdoor elephant yards creating an exhibit area called the Elephant Trails.

Rain events are creating erosion gullies and sand migration due to steep slopes (up to 25%) in the yard exhibits. The project proposes to regrade Yards 1 and 4 to reduce runoff and erosion issues and direct water into improved stormwater management infrastructure. Additional improvements to support animal care and maintenance within the yards are also proposed, including modifying an existing pool in Yard 1 to reduce runoff and improve animal access; infilling an existing pool in Yard 2; and planting turf grasses and shade canopy trees in Yard 4.

No new structures or buildings are proposed and existing buildings and viewing areas will not be modified.

Site Location



Location Map

Site Context



Site and Yards
Exhibit spaces are enclosed with a steel bollard and high tensile wire barrier system and with artificial rock concrete wall systems topped with angled steel bollards and high tensile wire barrier systems. Most visitor viewing locations for exhibit spaces consist of asphalt paving, decorative low plantings and guardrail systems to prevent visitors from accessing the elephant barrier systems.

Yard 1



A
Photo of Yard 1 visitor viewing location and exhibit pool and barrier system.

- Steeply sloped at approximately 10%
- Fully enclosed
- Concrete exhibit pool with curbed edge at the bottom of sloped space
- Stormwater runoff carries sandy substrate downslope and into the pool

Yard 2



B
Photo of visitor viewing location of Yard 2 from Elephant House interior.

- Gently sloped at approximately 7%
- Fully enclosed
- Concrete exhibit pool located on southern edge of the exhibit

Yard 3



C
Photo of visitor viewing location on the east side of Yard 4.

- Steeply sloped at approximately 10%-15%
- Fully enclosed
- Rain events cause sand migration and creates erosion gullies

Proposed Improvements

Project Area

The total area of the site being impacted is 65,466 SF (1.5 acres), divided between the yards as follows:

- Yard 1: 25,334 SF (0.58 acres)
- Yard 2: 11,178 SF (0.26 acres)
- Yard 4: 28,954 SF (0.66 acres)

No proposed work will increase or decrease the current extents of the elephant yards. All land use will remain unchanged, dedicated to animal holding and associated maintenance and access uses.

Project Scope

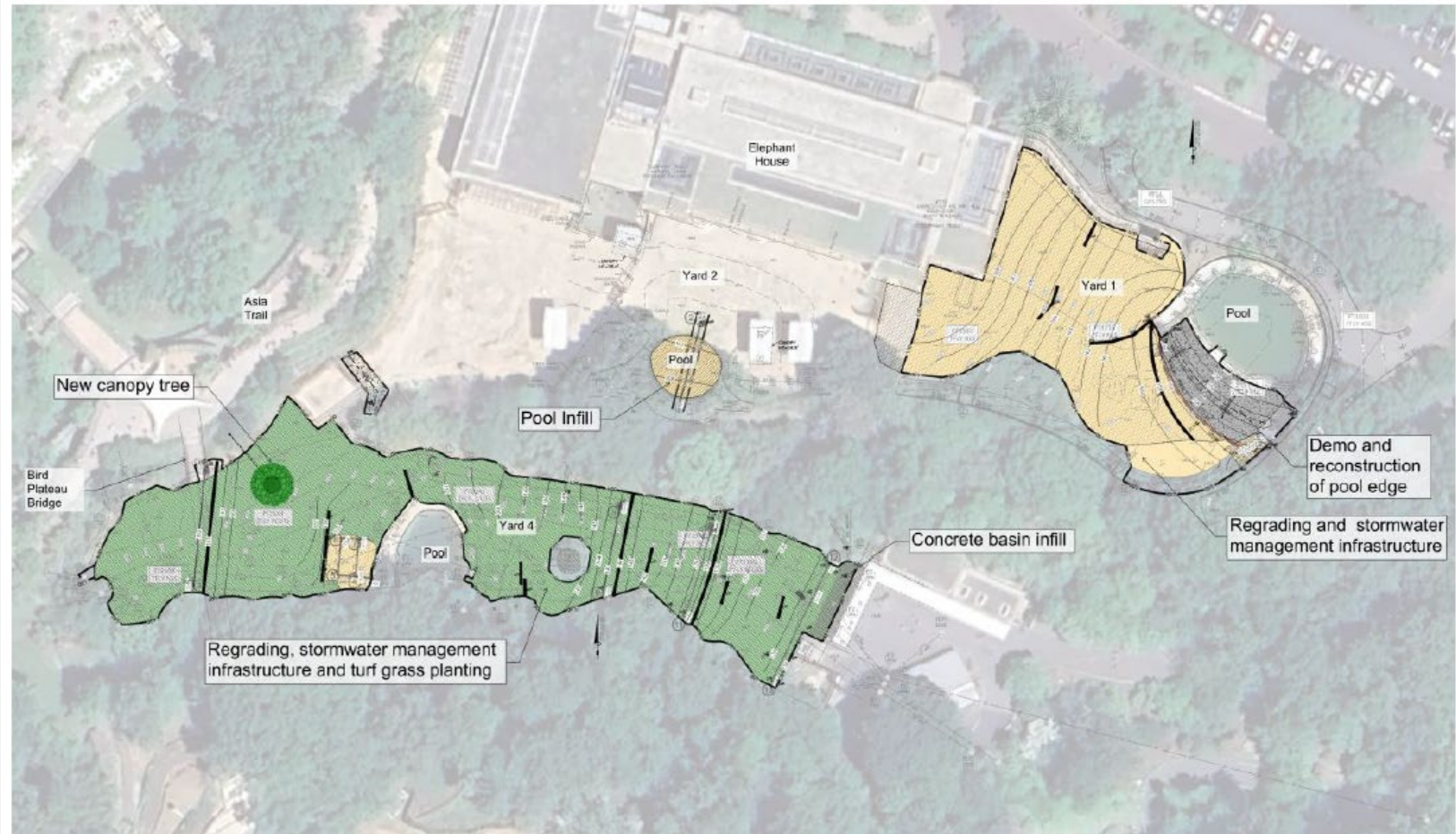
The base scope of the project includes the following work:

- Re-grading of Yard 1 and Yard 4, to reduce observed runoff and erosion issues and direct water more efficiently into improved stormwater management infrastructure.
- Planting of new turf grasses and a new canopy tree within Yard 4.
- Demolition and reconstruction of the Pool 1 perimeter within Yard 1, to reduce stormwater runoff into the pool and to make the pool more accessible for both animals and staff.
- Infill of Pool 2 in Yard 2 to create a clay bath for the elephants, including associated drainage and stormwater improvements to prevent ponding of water.
- Infill of an existing and unused concrete basin at the bottom of Yard 4, including associated drainage modifications and landscaping to improve maintenance access and visitor viewing experience.

An Add/Alternate was included in the construction documents for potential selection dependent on funding availability. That Alternate includes the following work:

- Correction of Pool 1 leaks by demolition and replacement of failed concrete, drain line, and waterproofing materials.

No new buildings or structures are proposed as part of this project.



Site Plan

Proposed Work – Yard 1

Re-grading and stormwater management

Yards 1 and 4 each undergo grading adjustments to correct existing channels created by erosion and animal movement, and re-direct stormwater flow to new underdrains.

Yard 1: Topographic setlines in Yard 1 are drawn to start and end in the same locations as the existing grade but in between are smoothed and adjusted to help properly direct water flow down the yard. Semi-buried retaining logs are placed in key locations where sediment runoff has been observed, particularly around sandier areas to prevent sand transfer into Pool 1. Where the slope of the yard meets the edge of Pool 1, a swale has been created with an underdrain below, capturing any runoff and directing it to a nearby existing drain.



Photo of Yard 1 displaying ponding and runoff after a rain event.



Yard 1 Grading Plan

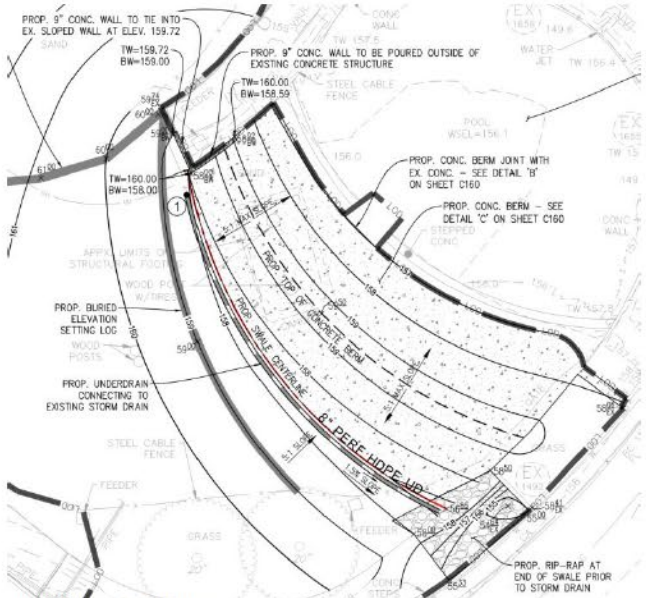
Proposed Work – Yard 1

Animal care and visitor experience improvements

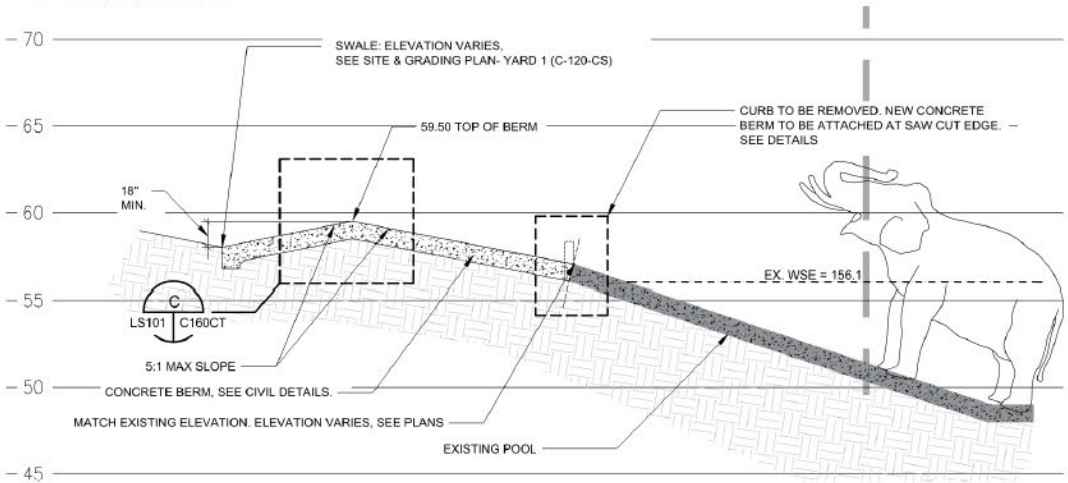
Yard 1: The Pool 1 perimeter will be partially demolished, removing a concrete curb and a steep skid-steer ramp. The perimeter is then reconstructed as a rolled-edge apron, terminating at the bottom of the new swale. This modification makes the pool more accessible for both animals and staff by creating a more gradual slope into the water, and helps the proposed swale divert stormwater runoff away from the pool.



Photo of existing Pool 1 edge.



Pool 1 proposed plan.



Pool 1 proposed section.

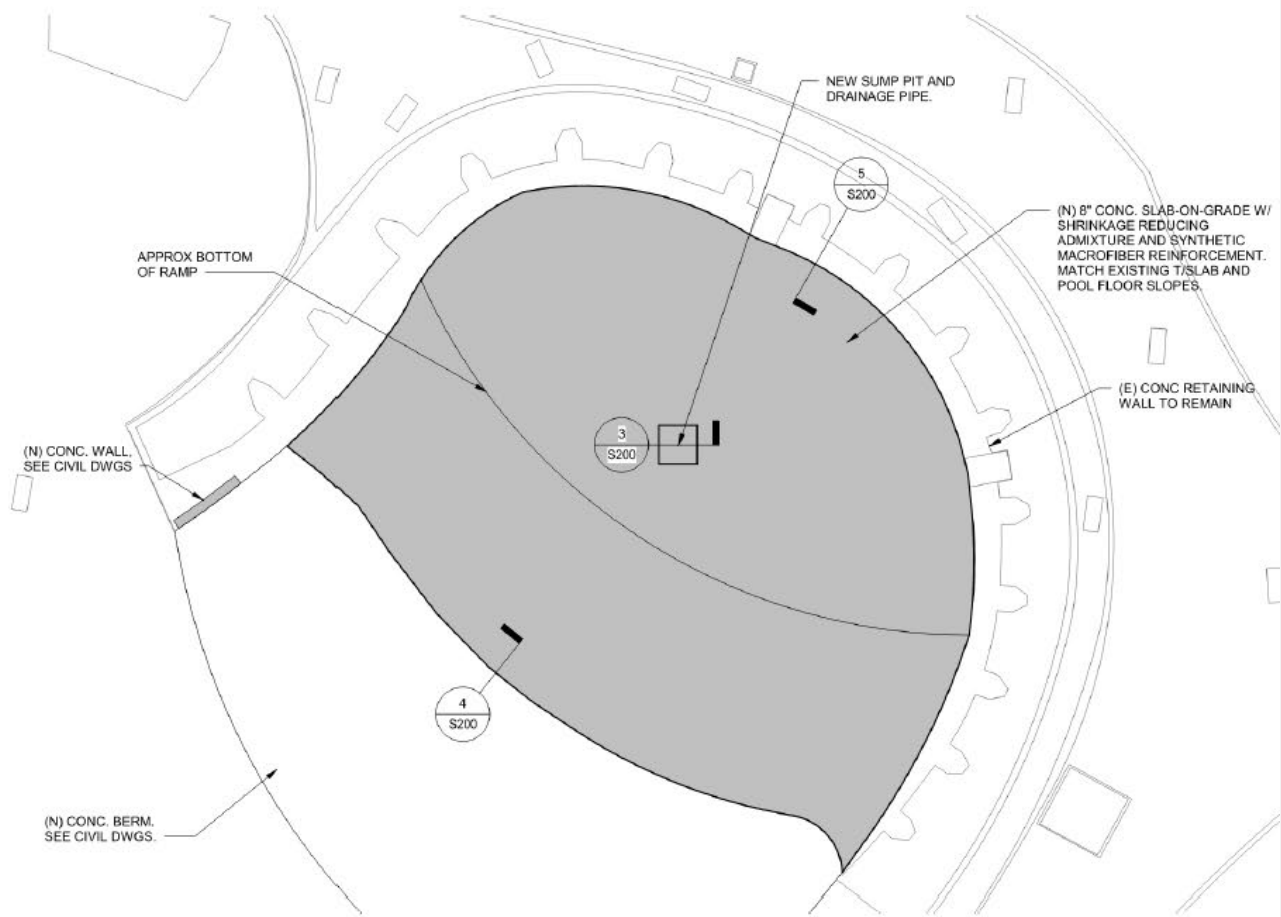
Proposed Work – Yard 1 Add/Alternate

Add/Alternate 3 scope as designed includes the following work, budget dependent.

Pool 1 in Yard 1 will be partially demolished, including the removal of the concrete ramp and floor, sump pit, drain line, and waterproofing materials. A new drain line is run to the nearby vault, and the ramp, sump pit and floor will be re-poured with appropriate detailing and waterproofing to prevent future water loss.



Photo of existing Pool 1 exhibiting concrete spalling.



Proposed plan of Pool 1 Add/Alternate 3 scope, showing extents of ramp and floor reconstruction.

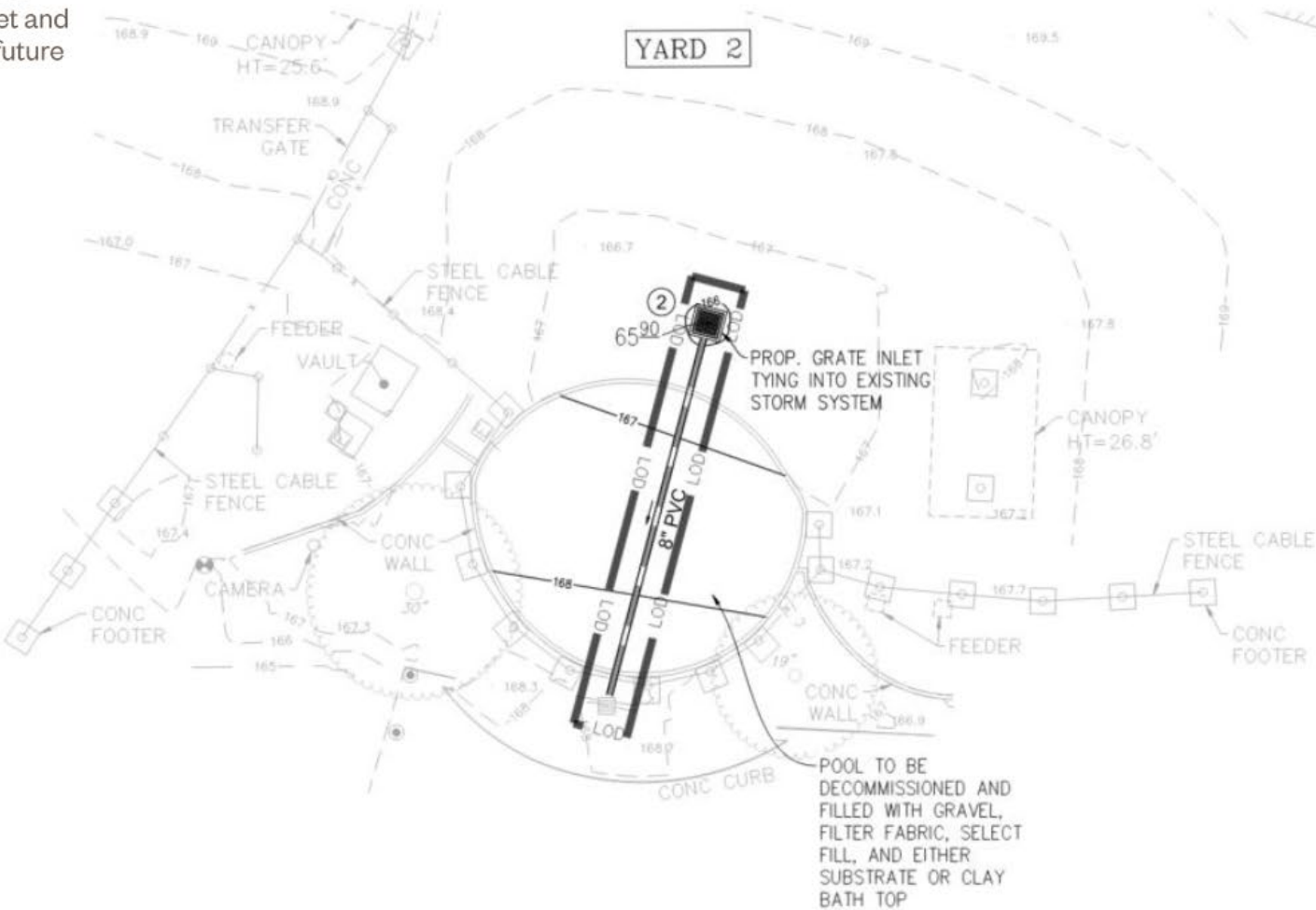
Proposed Work – Yard 2

Animal care and visitor experience improvements

Yard 2: Pool 2 will be decommissioned and filled with gravel, filter fabric, and substrate to allow more walkable space for the elephants. A new grate inlet and drainage line connecting into a nearby existing storm structure prevents future ponding of water around the infilled pool.



Photo of existing Pool 2.



Pool 2 proposed plan.

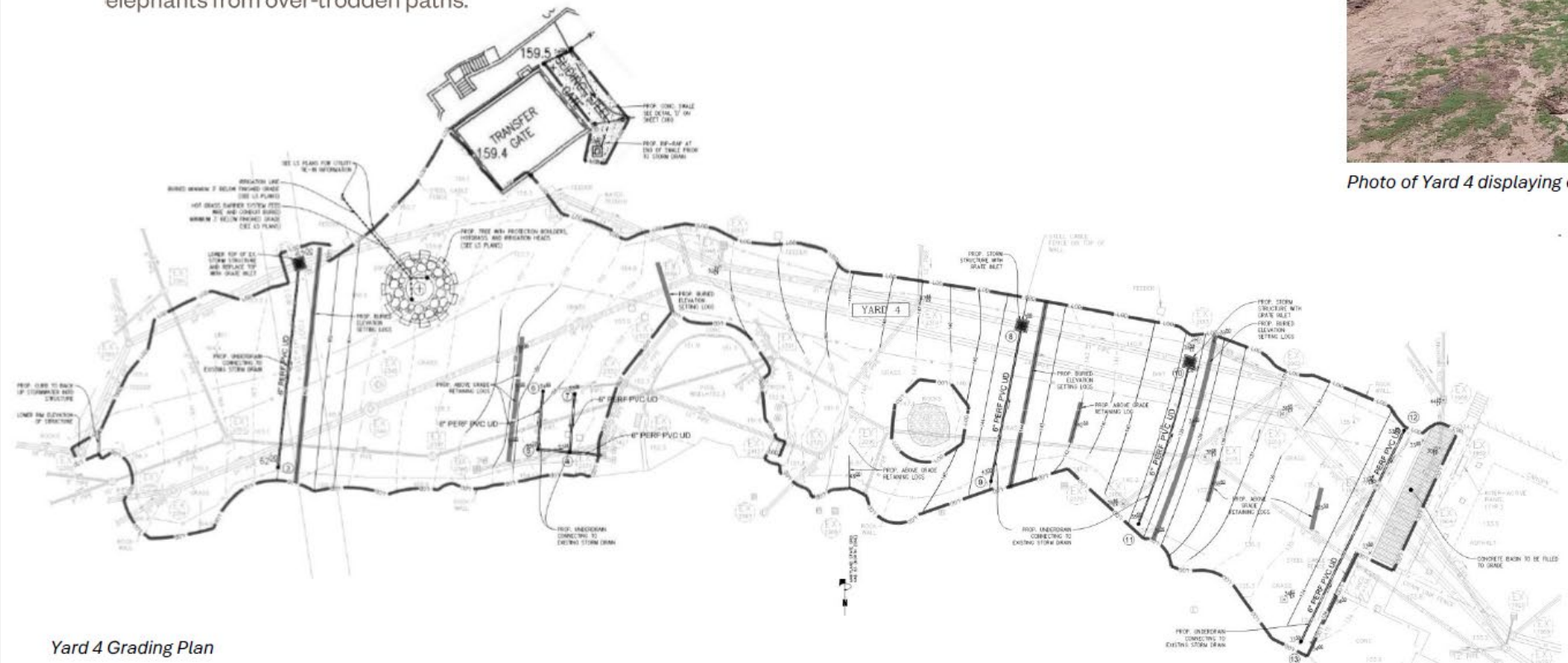
Proposed Work – Yard 4

Re-grading and stormwater management

Yard 4: Re-grading in Yard 4 is limited to areas where animal movement and erosion has created channels in the substrate, and where new swales and berms are created to direct water flow. These new swales, paired with underdrains and elevation-setting logs, occur at intervals along the downward slope of the yard, capturing overland flow of water and directing it toward nearby existing drainage structures. Additional above-grade retaining logs and underdrains are distributed throughout the yard, helping hold back areas prone to erosion, reduce ponding of water, and re-direct elephants from over-trodden paths.



Photo of Yard 4 displaying erosion after a rain event.

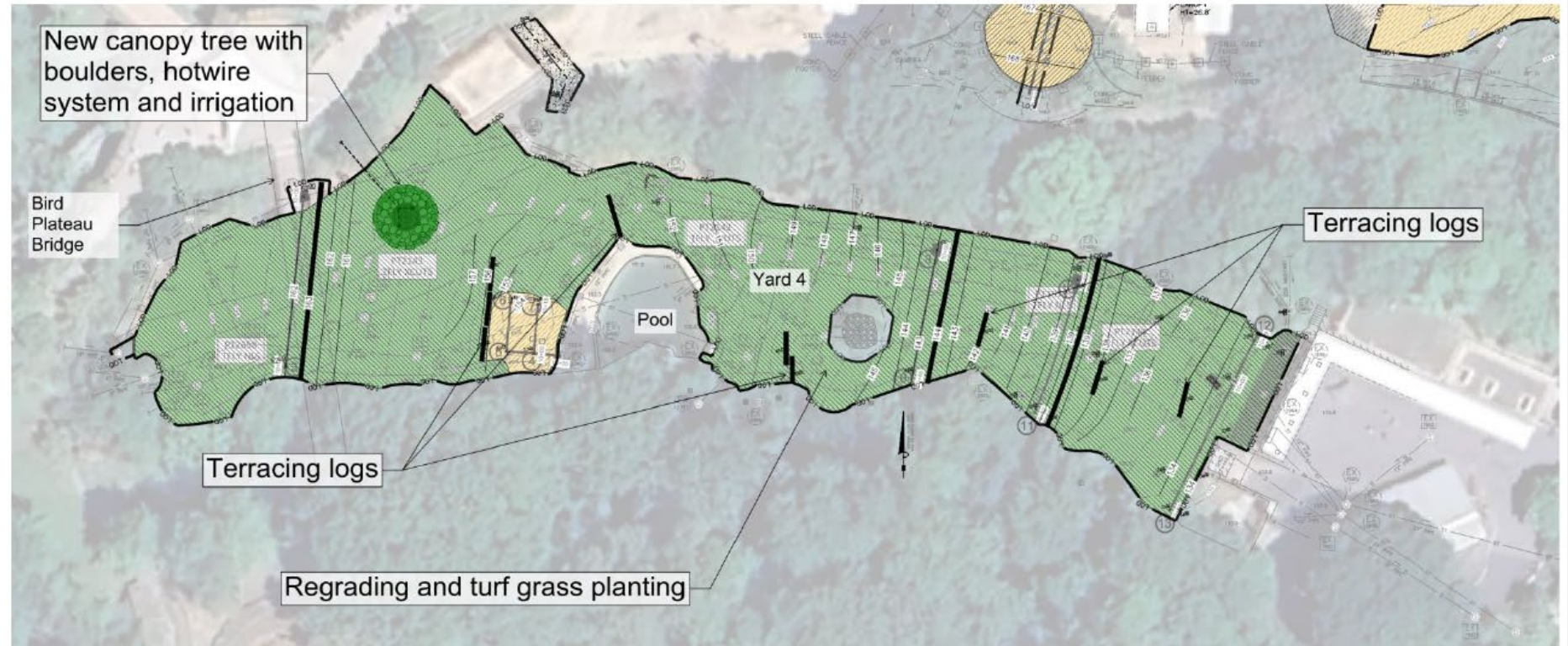


Yard 4 Grading Plan

Proposed Work – Yard 4

Animal care and visitor experience improvements

Yard 4: Worn-down areas of Yard 4 will be re-seeded with a turf grass seed mix. A new canopy tree will be planted within Yard 4, creating a new shade element for the elephants. At the lower end of the yard, outside of the containment fence, an existing unused concrete basin is infilled with permeable fill and substrate materials, bringing the surface to grade and allowing stormwater to drain through to an existing storm structure below.

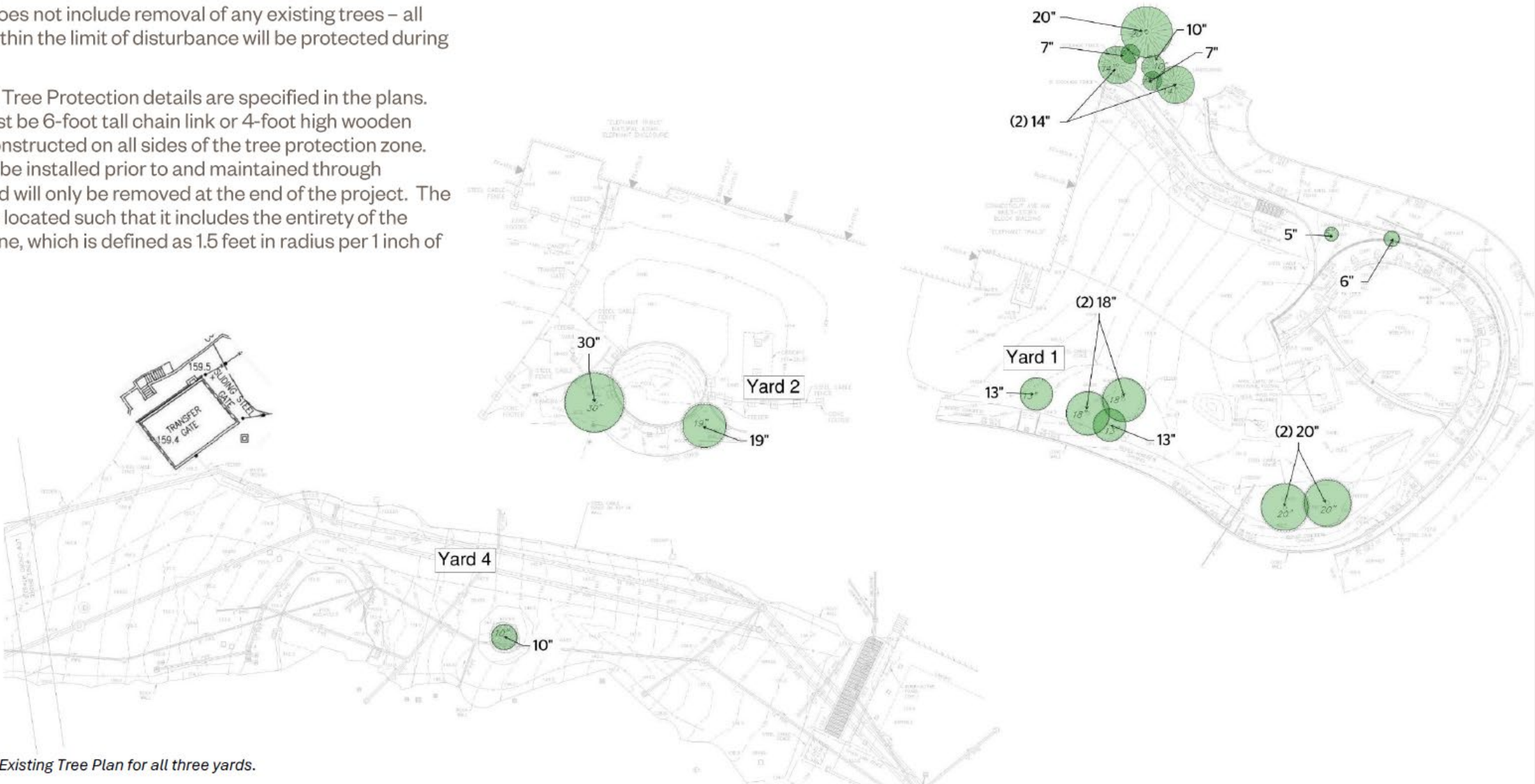


Yard 4 Landscape Plan

Tree Preservation Plan

Project scope does not include removal of any existing trees – all existing trees within the limit of disturbance will be protected during construction.

DOEE standard Tree Protection details are specified in the plans. The fencing must be 6-foot tall chain link or 4-foot high wooden snow fencing constructed on all sides of the tree protection zone. The fencing will be installed prior to and maintained through construction and will only be removed at the end of the project. The fencing must be located such that it includes the entirety of the Critical Root Zone, which is defined as 1.5 feet in radius per 1 inch of tree diameter.



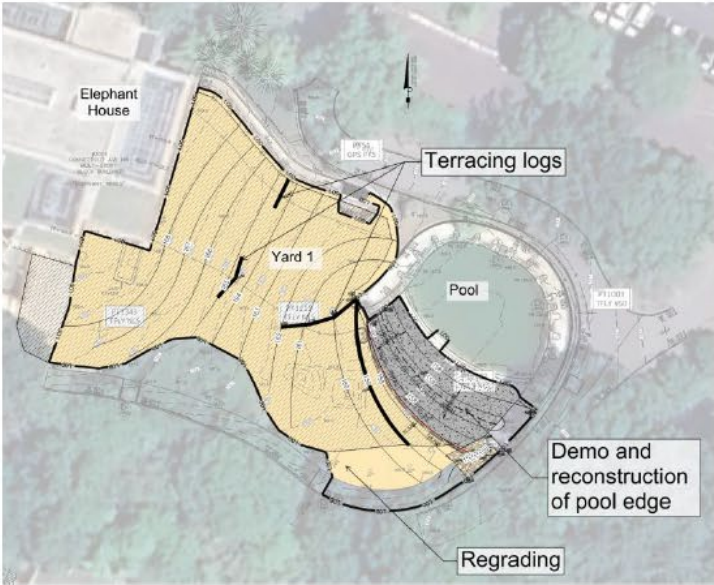
Existing Tree Plan for all three yards.

Proposed Landscape Plan

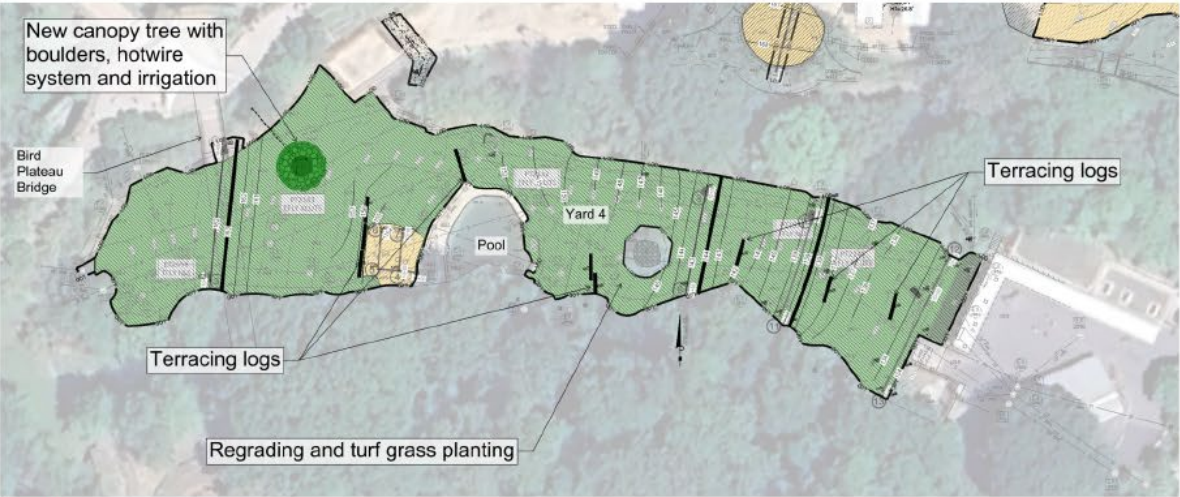
Proposed improvements within the exhibit spaces (Yards 1 and 4) include grading improvements and the addition of logs inset at grade to reduce impacts of erosion and create a terraced landscape in the exhibit spaces. No improvements are proposed to any of the visitor viewing areas, however, exhibit improvements will be visible from viewing areas.

Yard 1: Yard improvements include the grading and retaining strategies previously mentioned and improvements to the exhibit pool edge. Pool edge improvement includes the removal of the curb edge and replacement with a gently sloping cast in place concrete pool edge to improve elephant pool access and to reduce sand migration into the pool. The proposed pool edge will increase concrete coverage in the exhibit space and will aesthetically blend the pool edge with the sandy substrate.

Yard 4: Yard improvements include the grading and retaining strategies previously described, replanting of the yard with turf grass, and the addition of a new canopy tree on the west side of the exhibit. Turf grass plantings in Yard 4 aim to restore all greenspace lost to construction and past erosion and stabilize substrates on the steeply sloped site. The canopy tree will include a boulder and hotwire system, to prevent elephants from accessing the tree, and irrigation heads. The tree's location in the exhibit minimizes impacts on animal care staff access to the yard and on visitor views from the pedestrian bridge to the Bird Plateau.



Yard 1 Landscape Plan



Yard 4 Landscape Plan

Additional Considerations

DOEE Coordination

A meeting was held with the District Department of Energy and the Environment on September 18th, 2024, to discuss the project scope and confirm stormwater management requirements. Per DOEE guidelines, this project will not include more than 2,500 square feet of new impervious land cover. There are also no building renovations or additions proposed with this project. As a result, no additional post construction stormwater management measures are required. DOEE confirmed that the project will be only be reviewed for Erosion and Sediment Control permitting.

Flooding

The project site is not located within a floodplain.

Historical Considerations

Although the Elephant House is a contributing element, its surrounding exhibit yards are non-contributing to the National Zoological Park Historic District. This project will not result in visual impacts or changes to the character and uses of the exhibit yards. Work is contained within existing construction, and there is no potential to encounter undiscovered archaeological resources. A determination of No Adverse Effect on historic resources was submitted to the DC State Historic Preservation Office.