CALH – CONSTRUCT ARABIAN LEOPARD HABITAT

CFA CONCEPT SUBMISSION

March 19, 2026

Smithsonian Institution

PROJECT OVERVIEW

PROJECT PURPOSE AND NEED

Arabian Leopard Conservation Program

- The Smithsonian Institution's NZCBI has entered a partnership to advance Arabian Leopard conservation efforts with the Royal Commission of AlUla (RCU).
- Facility will provide year-round public viewing of adult and cub leopards to support conservation education.
- The habitat needs to accommodate a minimum of (2) full-time animals with the capacity to support additional animals on a temporary basis.
- There are strict animal care requirements to ensure these animals adapt and thrive in the new habitat.

Smithsonian
National Zoological Park
Conservation Biology Institute

الهيئة الملكية لمحافظة العلا
ROYAL COMMISSION FOR ALULA

PROJECT PURPOSE AND NEED

Arabian Leopard Program Requirements

Care Building:

- Animal Care Building needs to support staff requirements for animal care integral to the animal habitat. There is no public access to the care Building
- Total Care Building Space Requirements – 2,500 SF
  - Day Room (Public Viewing) (500SF)
    - Must have 20 feet of clear height space
  - Animal Holding Areas (Off Public View):
    - 3 Animal Dens (150SF each)
    - 1 Quarantine Den (100SF)
    - 1 Cubbing Den (100SF)
    - Transfer Chutes (6'8" clear height space)
- Staff Areas
  - Animal Care Staff Working Area (450SF)
  - Prep Kitchen, Restroom, Workspace (300SF)
  - Mechanical/Electrical/Security/IT Room/Smoke Evacuation (500SF)

Enclosure:

- Fully enclose, vertical volume to enable critical behavioral opportunities such as climbing, elevated resting, and territorial observation. Arabian Leopards prefer to be elevated and visually above their territory.
- Total Animal Yard Space Requirements – 10,000 SF:
  - 2 Public Viewing Yards (4,000 and 5,000 SF)
  - 1 Off Exhibit Habitat (1000 SF)
  - 1 Pool and waterfall (100SF per habitat)
  - Faux Trees (2 per habitat w/ 1 heated limb minimum)
  - Heated Dens (1 per habitat)
- Maximum height of 35 feet for the habitat enclosure
  - Usable volume of 20 feet clear height required above exhibit furnishings

SITE LOCATION

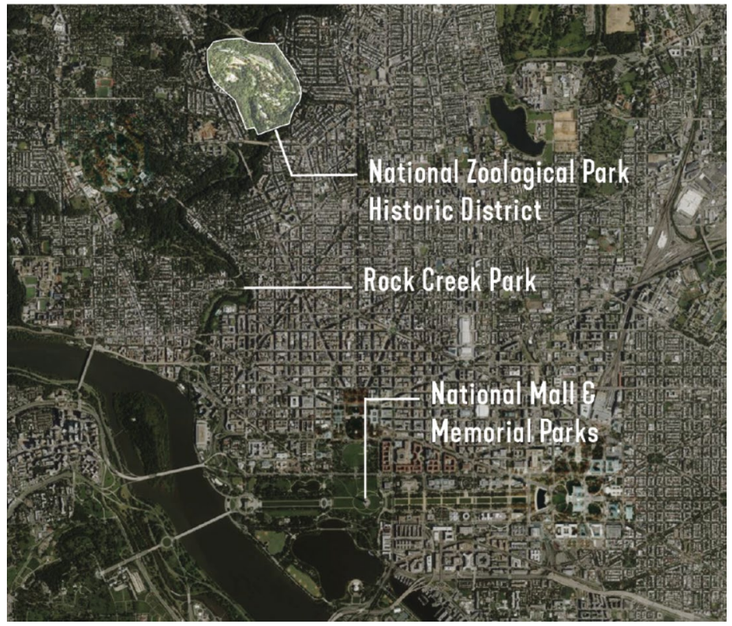
Location of project is within the National Zoo and Conservation Biology Institute (NZCBI)

- Located at 3001 Connecticut Ave, NW
- Within the National Zoological Park Historic District

Zoo in Your Backyard and Unoccupied American Bison Exhibit

- Location is adjacent to Asia Trail, relating thematically to the Arabian Leopard's natural habitat
- Adjacent to high traffic visitor areas
- Unoccupied animal exhibit
- Existing topography replicates the mountainous terrain of the Arabian Peninsula

SITE LOCATION



AERIAL VIEW OF VICINITY

Figure 2.1.1: National Zoological Park Project Location

NATIONAL ZOOLOGICAL PARK BOUNDARY

OLMSTED WALK

Smithsonian Institution

EXISTING PROJECT SITE

SITE BOUNDARY

OLMSTED WALK

ZOO IN YOUR BACKYARD EXHIBIT

BISON EXHIBIT AND HABITAT

CHARACTER DEFINING FEATURES

Olmsted Walk

- **Buffers and Berms** separate walk from exhibits
- **Portals and Entries** to exhibits sensitively designed
- Robust **Tree Canopy** shades walk
- **Stone** is use in landscape features and buildings
- **Roofs** along the walk are significant contributors to overall structure
- The **Paving** of the path defines the walk and changes mark exits from it
- **Features and Furnishings** define places for pause and reflection

EXISTING CONDITIONS

EXISTING CONDITIONS – TOPOGRAPHY

- The existing site slopes downward from west to east along Olmsted Walk
- Grade difference from top to bottom is approximately 20’

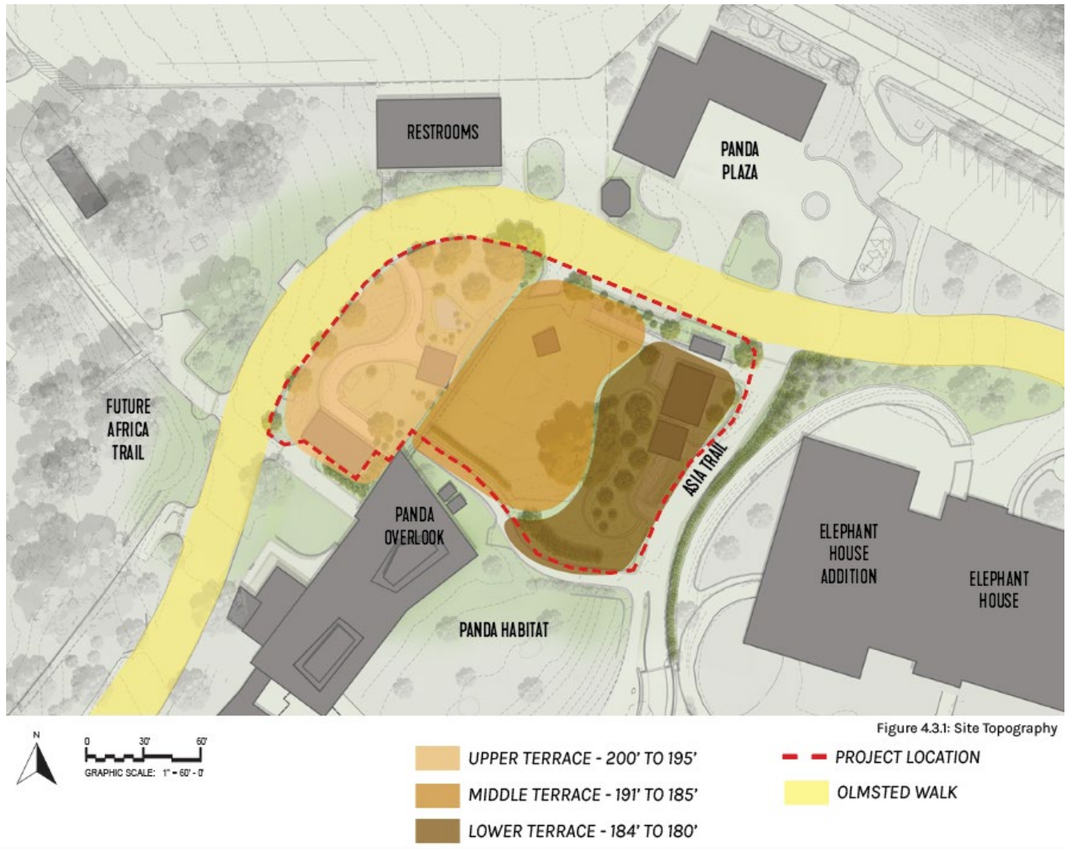
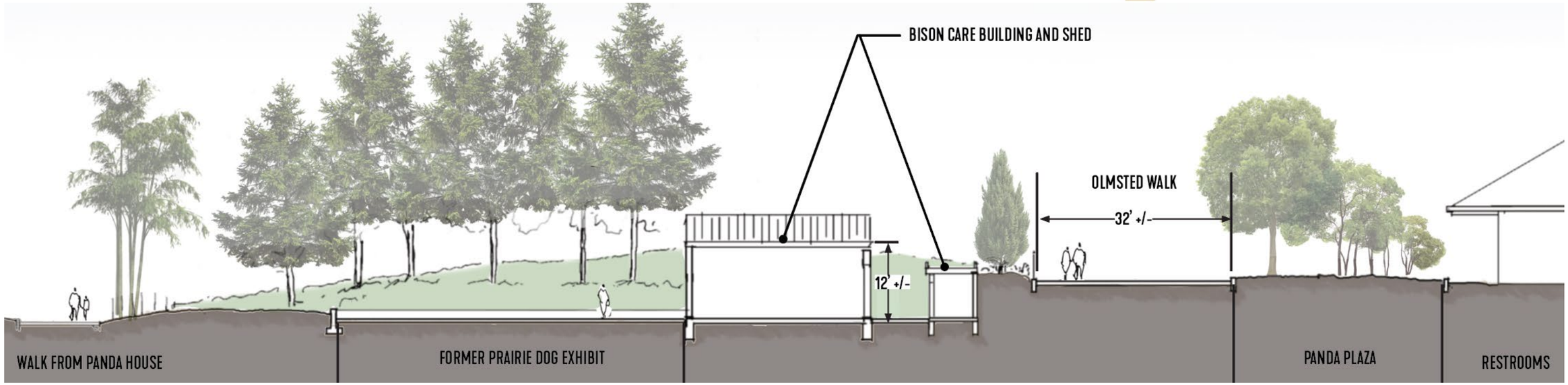
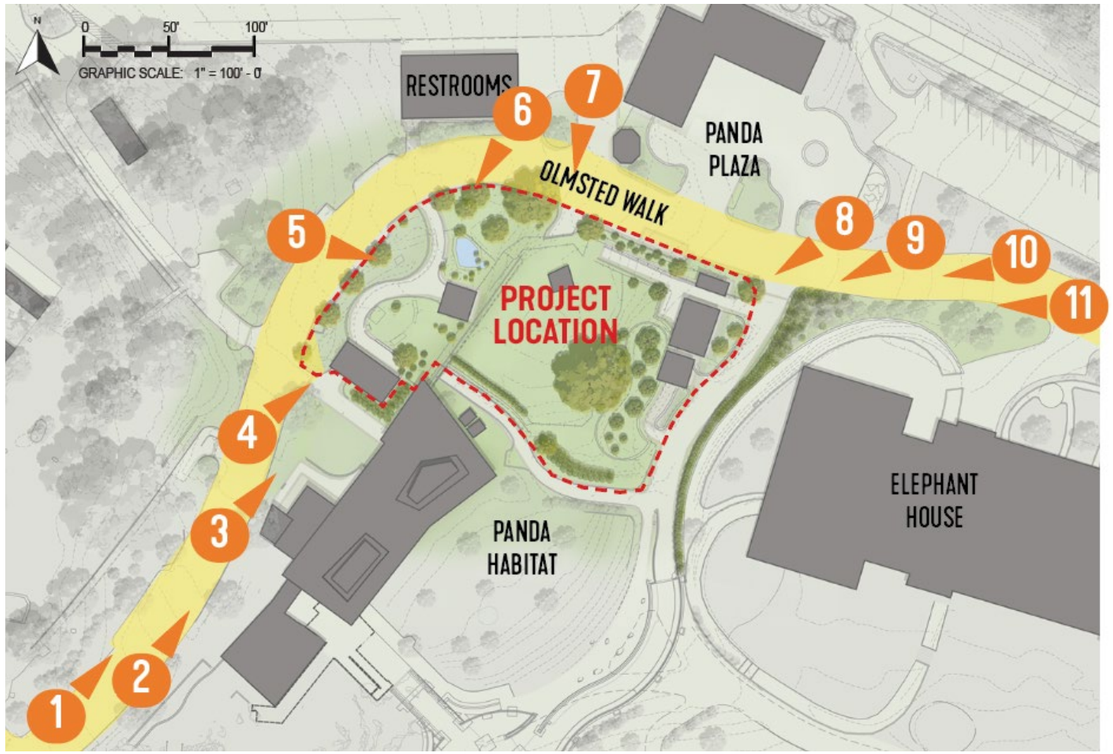


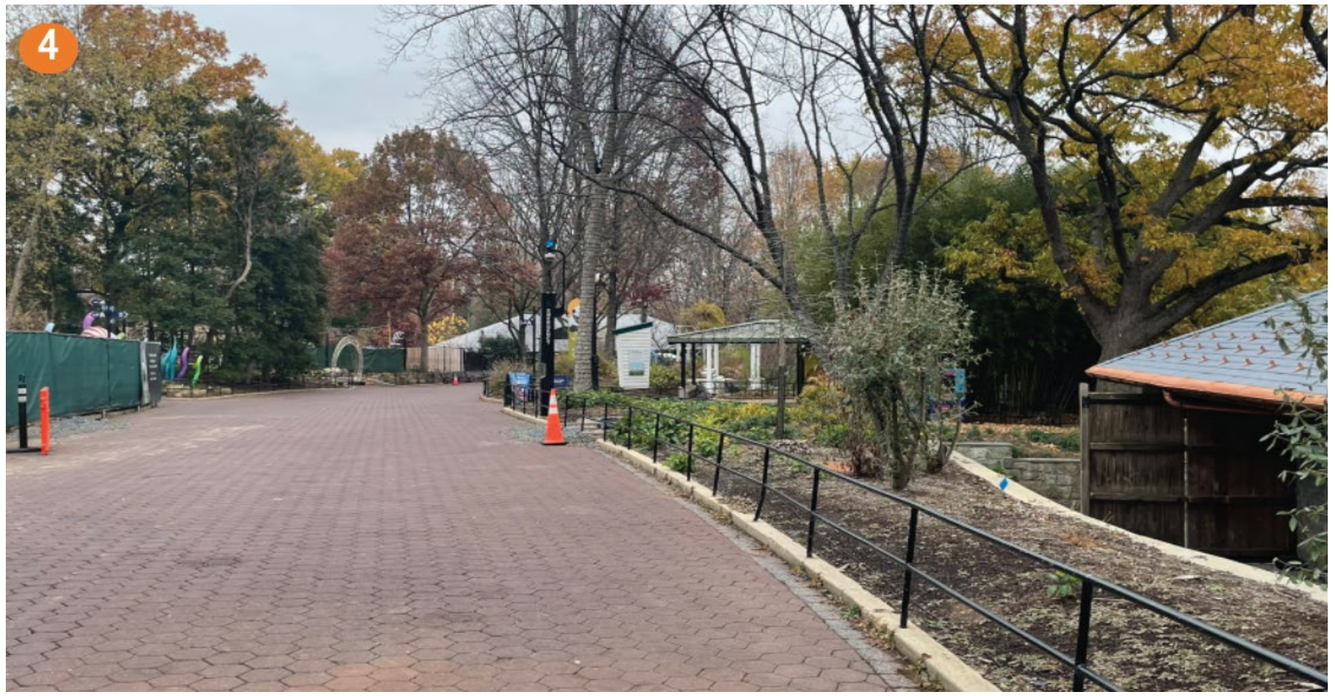
Figure 4.3.1: Site Topography



EXISTING CONDITIONS – SITE VIEW PHOTOGRAPHS

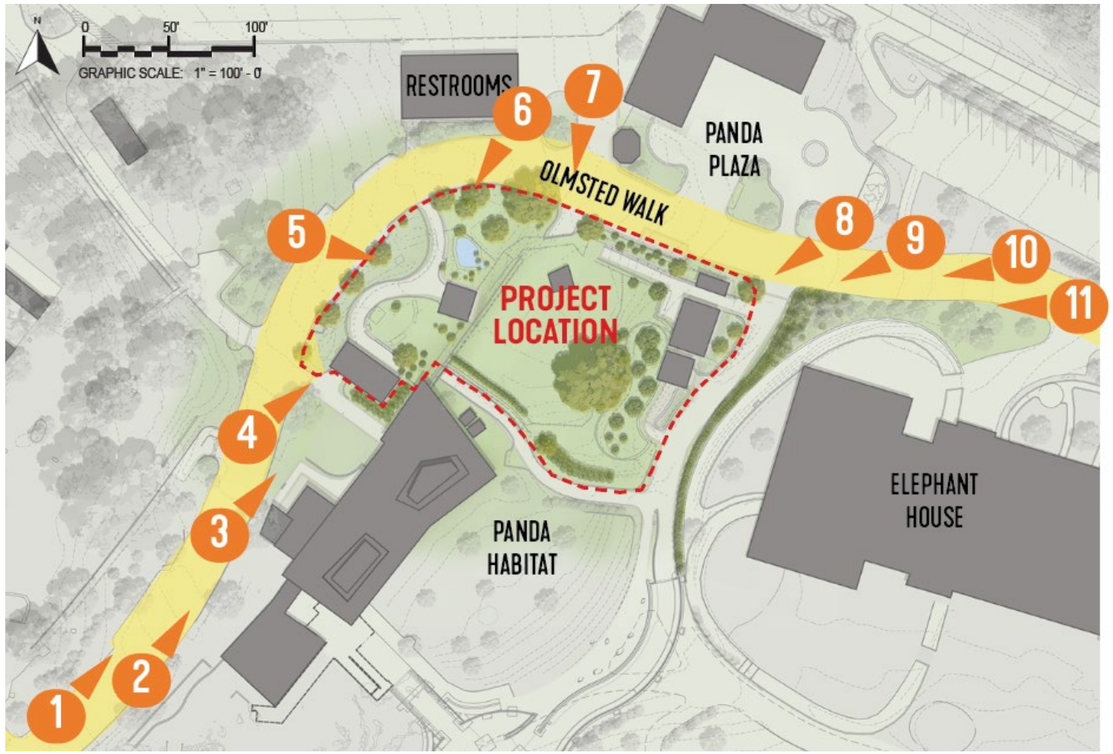
Along Upper Olmsted Walk





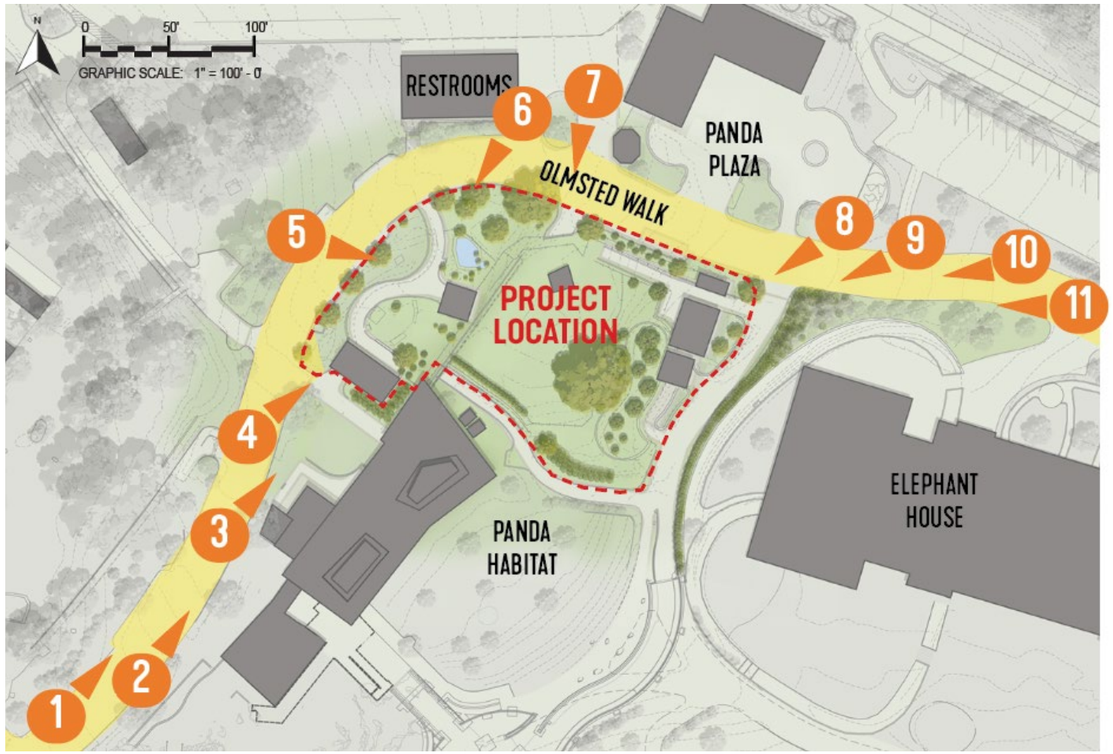
PROJECT SITE VISIBILITY FROM OLMSTED WALK

Along Upper Olmsted Walk – Zoo in Your Backyard



PROJECT SITE VISIBILITY FROM OLMSTED WALK

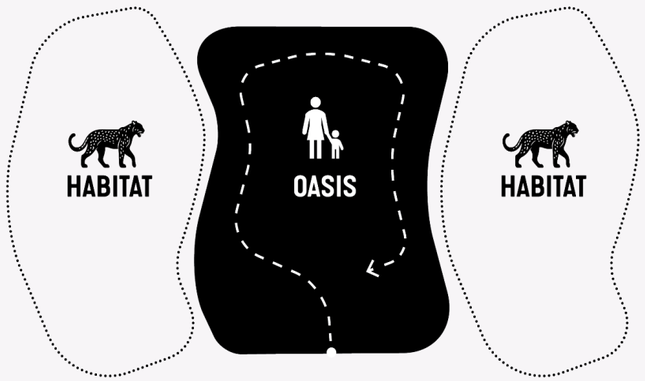
Along Lower Olmsted Walk – Elephant House Loading Dock and Asia Trail Entry



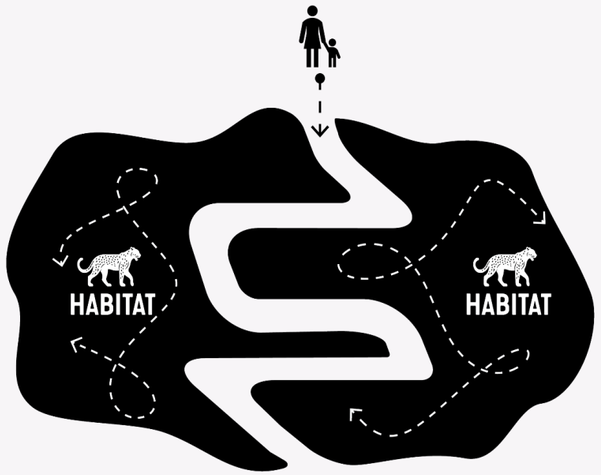
CONCEPT DESIGN

SITE ORGANIZATION CONCEPTS

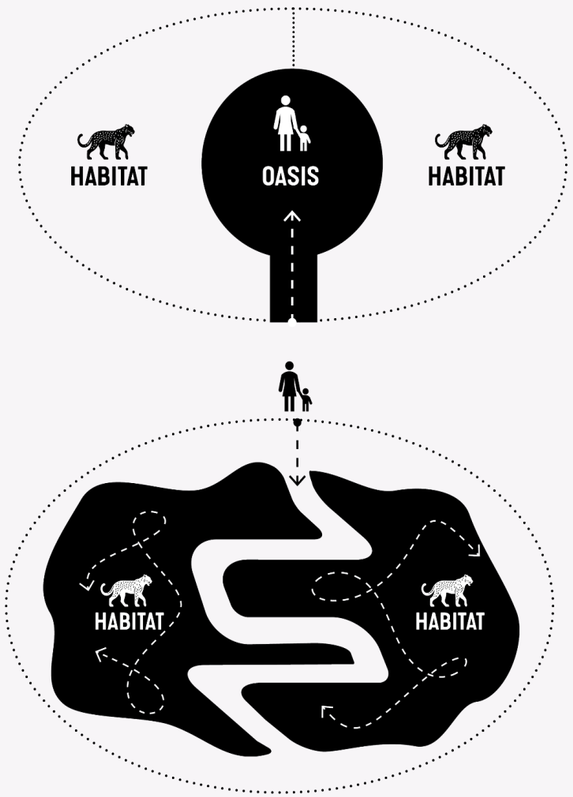
Concepts Considered



OASIS:
- SEPARATE HABITAT ENCLOSURES
- SINGLE POINT OF ENTRY BUILT AROUND CENTRAL FEATURE POINT



WADI:
- SEPARATE HABITAT ENCLOSURES
- MULTI POINT ENTRY BUILT AROUND LINEAR JOURNEY THROUGH SITE

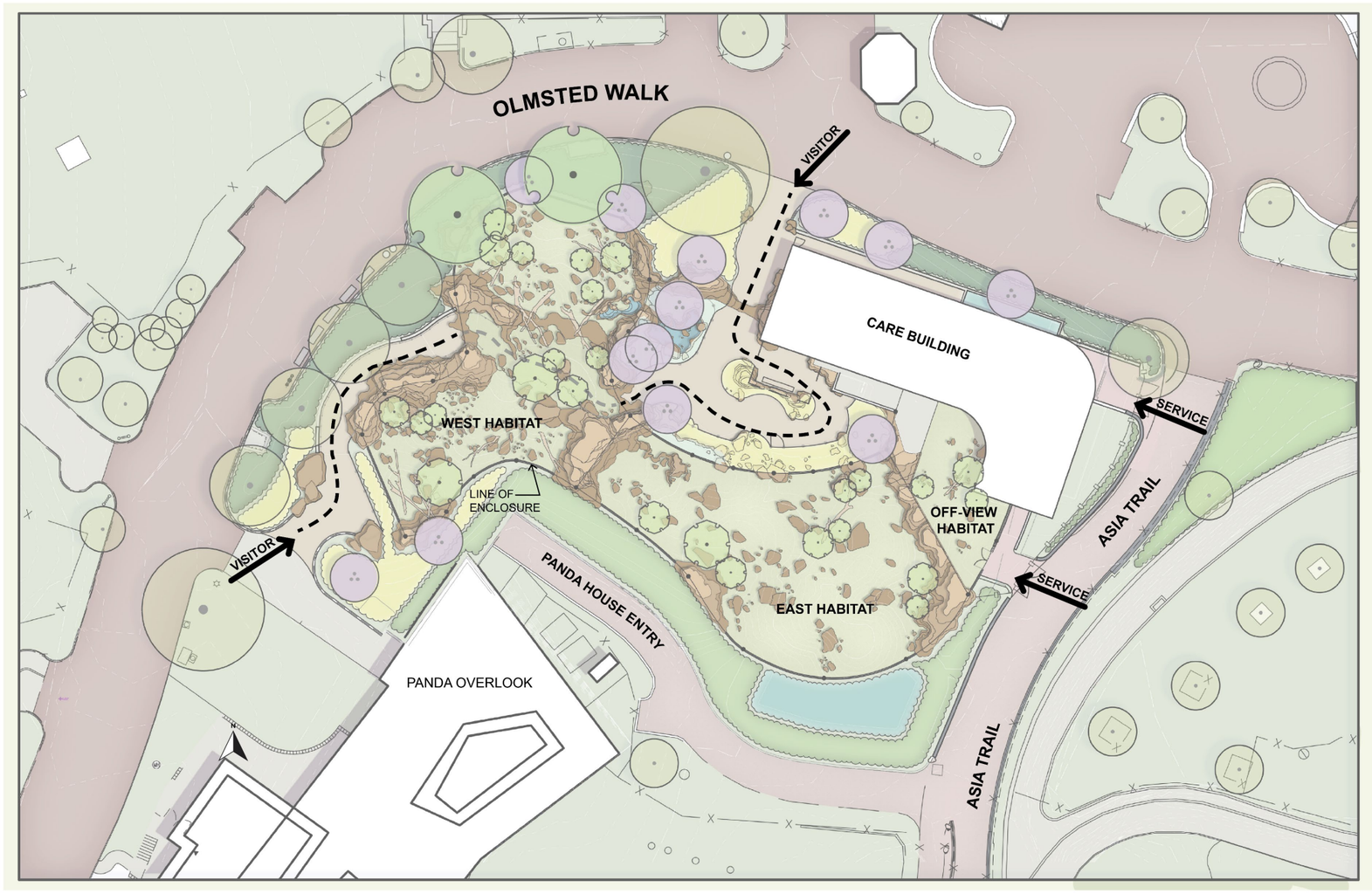


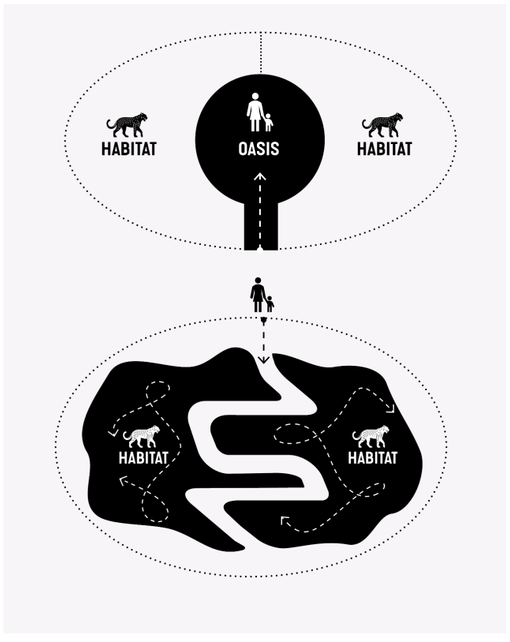
OASIS WADI COMBO:
- SINGLE HABITAT ENCLOSURE
- MULTI POINT ENTRY BUILT AROUND CENTRAL FEATURE POINT

SITE ORGANIZATION CONCEPTS

Proposed Site Scheme – Oasis Wadi Hybrid Combo

- Multiple visitor vantagepoints throughout exhibit via accessible paths:
  - Olmsted Walk viewing
  - Under tunnel within exhibit
  - Within Oasis Area
- Flexibility for animal placement and movement





PROPOSED CONCEPT SITE PLAN

Features List:

1. West Entrance to Arabian Leopard Exhibit
2. North Entrance to Arabian Leopard Exhibit
3. New Arabian Leopard Care Building (one-story plus basement)
4. New Arabian Leopard Habitat with Custom Faux Rockwork
5. New Off-view Arabian Leopard Habitat
6. New Pedestrian Tunnel through Exhibit, with Poured-in-place Rubber Surfacing
7. New Pedestrian Pathway with Exposed Aggregate Concrete Pavement
8. New Retaining Wall
9. New Habitat Enclosure
10. New guardrail
11. Existing Benches and Niche to Remain
12. New Urban Planter
13. New Service Access, Existing Curb Cut and Service Access
14. New Screen Fence
15. New Service Access, Existing Curb Cut
16. New Bioretention
17. Existing Retaining Wall

Figure 5.4.4.1: Proposed Concept Site Plan - Features

DESIGN INSPIRATION

Architecture in Service to the Landscape – Key Contextual Principles

- **Materiality**:

  Natural stone, brick, cast concrete, wood, and terracotta tile

- **Form**:

  Building masses are simple and articulated to reduce visual bulk, often setback or screened by vegetation to maintain the continuity of the pedestrian experience

- **Roofscape**:

  Often the most visually prominent element when viewed from the winding grades of Olmsted Walk. Historic rooflines are typically pitched or hipped, clad in clay tile or slate

- **Building Hierarchy**:

  Supporting structures—restrooms, concessions, maintenance—are utilitarian and recessive while exhibition buildings are more expressive

MATERIALS PRECEDENTS WITHIN HISTORIC DISTRICT

Material Precedent – Brick, Green Colored Roof, Natural Stone

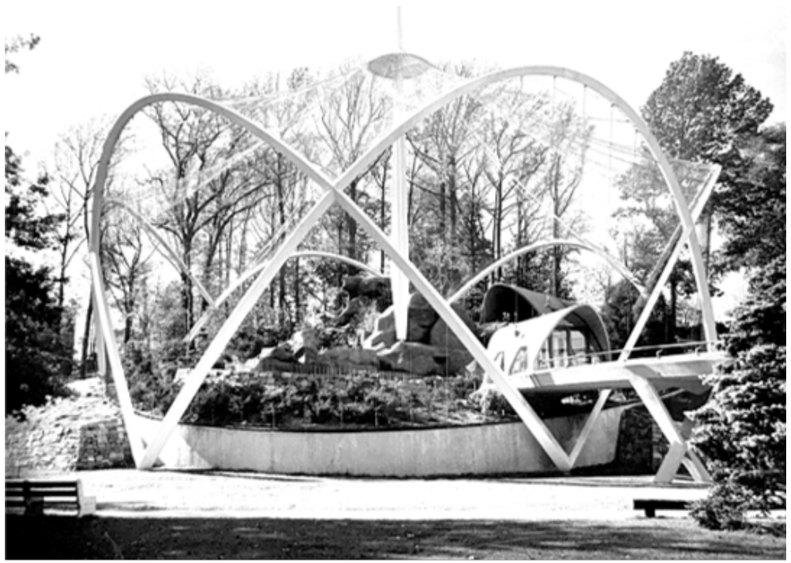
Reptile Discovery Center

Think Tank

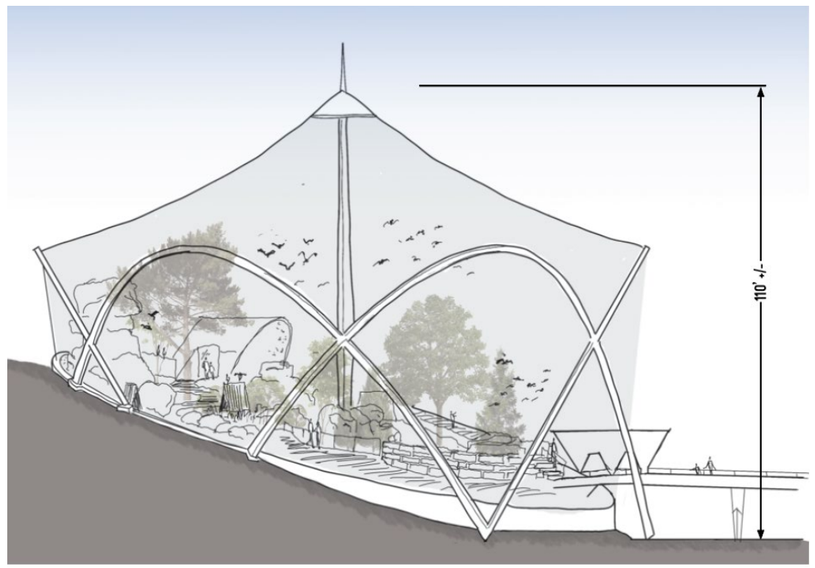
Elephant House

EXISTING ANIMAL HABITAT ENCLOSURES

Existing Habitat Enclosures – Great Flight Aviary and Gibbon Exhibit



Great Flight Aviary, 1965
Photo 1978
Tensile steel structure
with central mast



0 15' 30'
GRAPHIC SCALE: 1" = 30' - 0"

Figure 4.7.1: Existing Conditions Section - The Great Flight Aviary

0 10' 20'
GRAPHIC SCALE: 1" = 20' - 0"

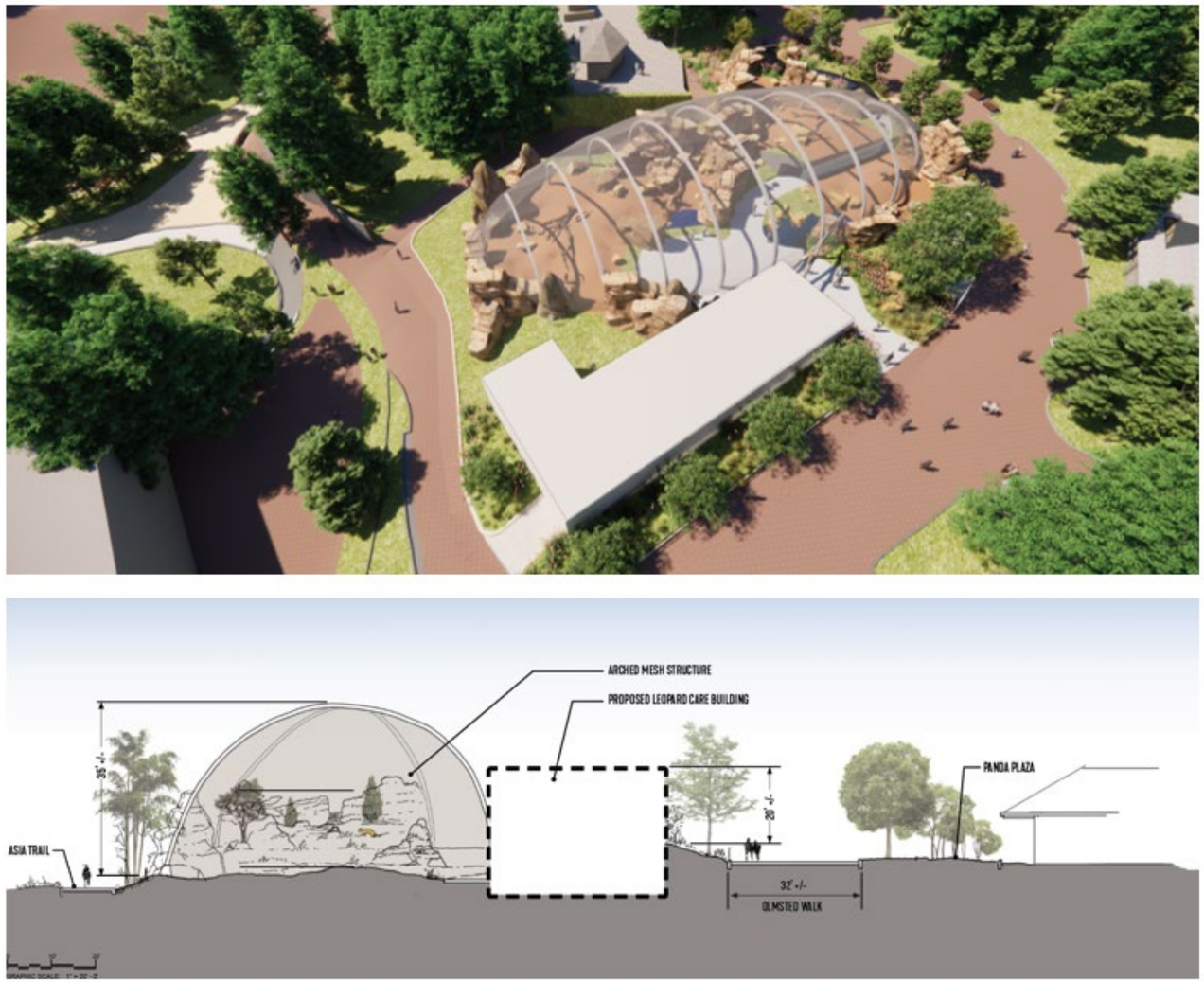
Figure 4.7.2: Existing Conditions Section - Gibbon Habitat Enclosure

Gibbon Ridge Exhibit, c.1963
Photo 1978
Mesh enclosure with multiple posts
for support and climbing
opportunities for the animals.

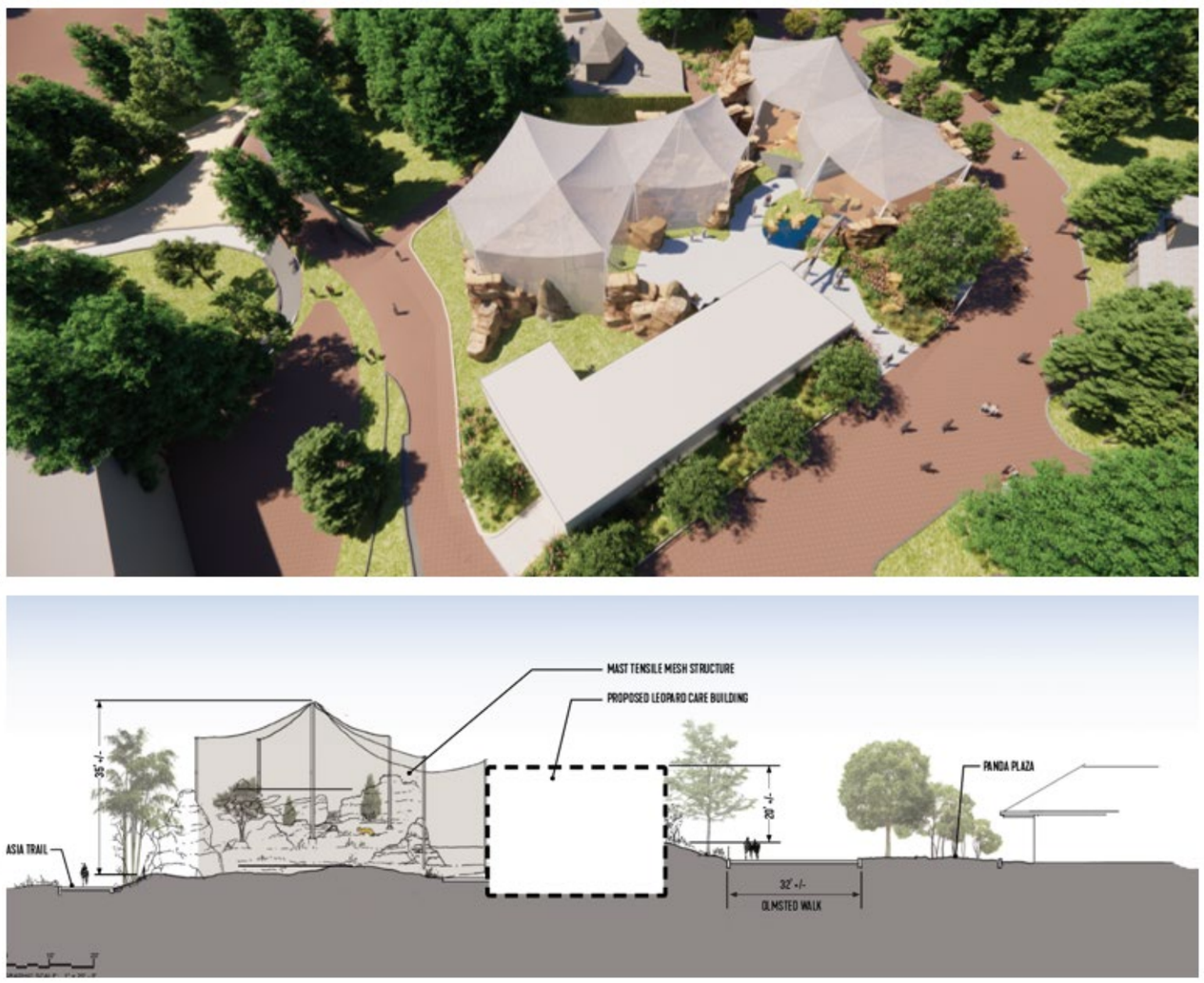
HABITAT ENCLOSURE CONCEPTS CONSIDERED

Overview of Options

ARCHED MESH STRUCTURE (PROPOSED CONCEPT)

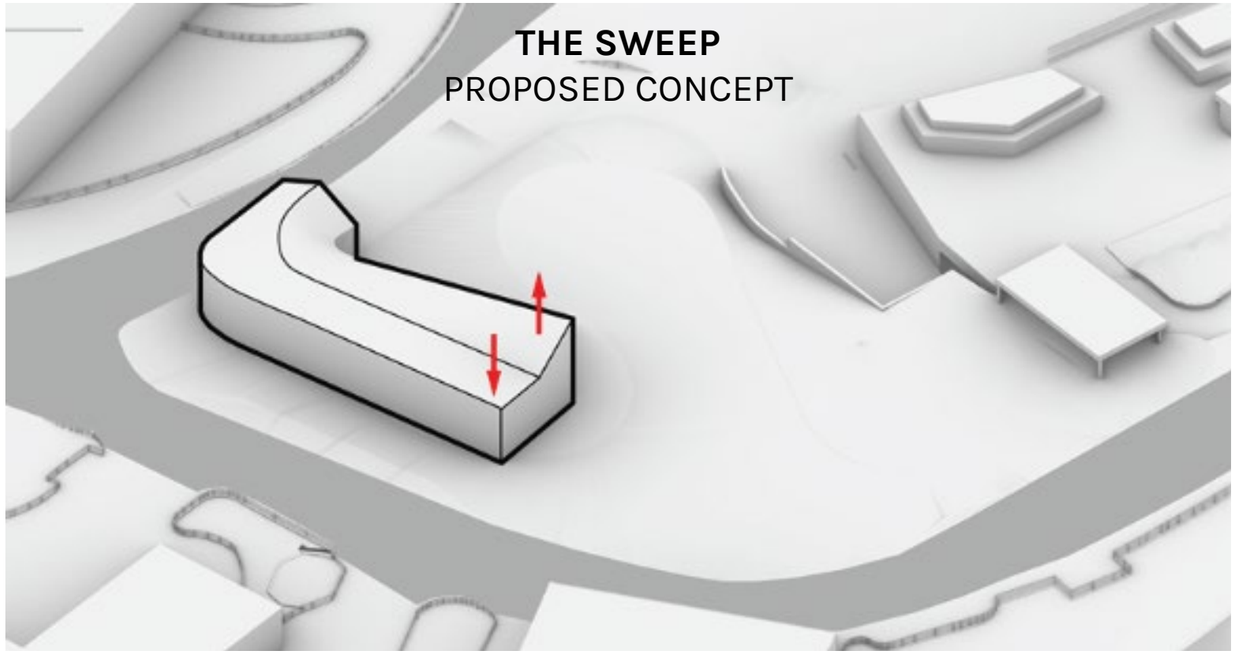


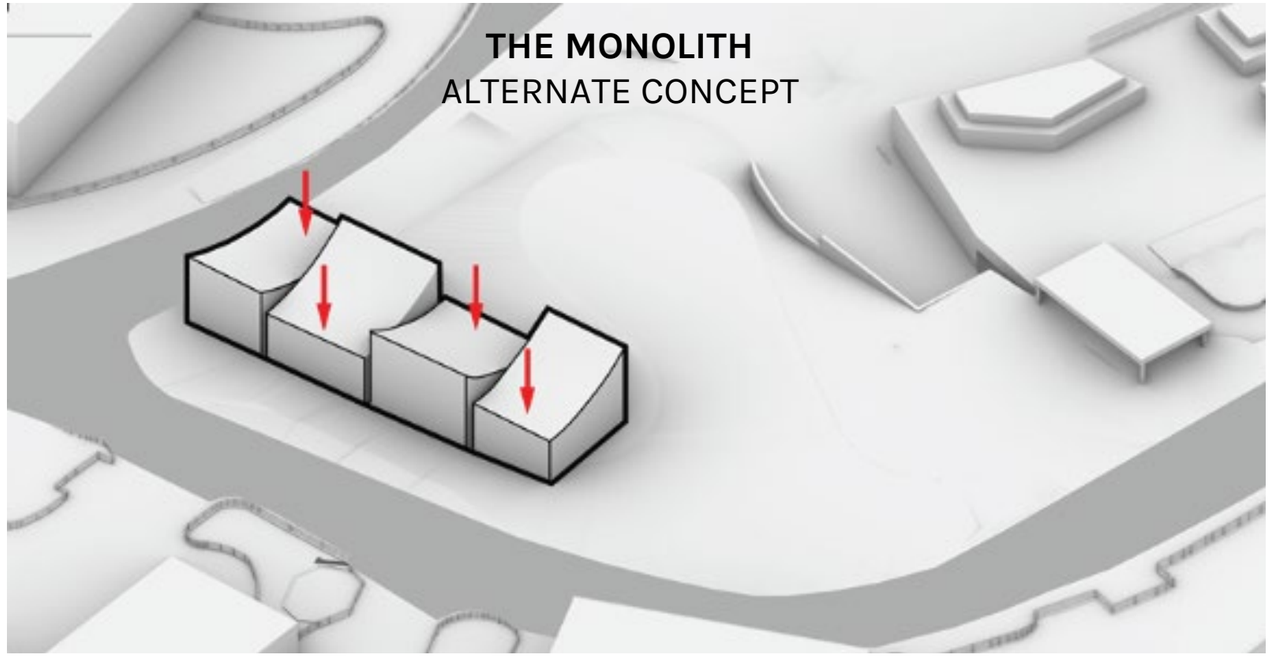
MAST TENSILE MESH STRUCTURE



ANIMAL CARE BUILDING CONCEPTS CONSIDERED

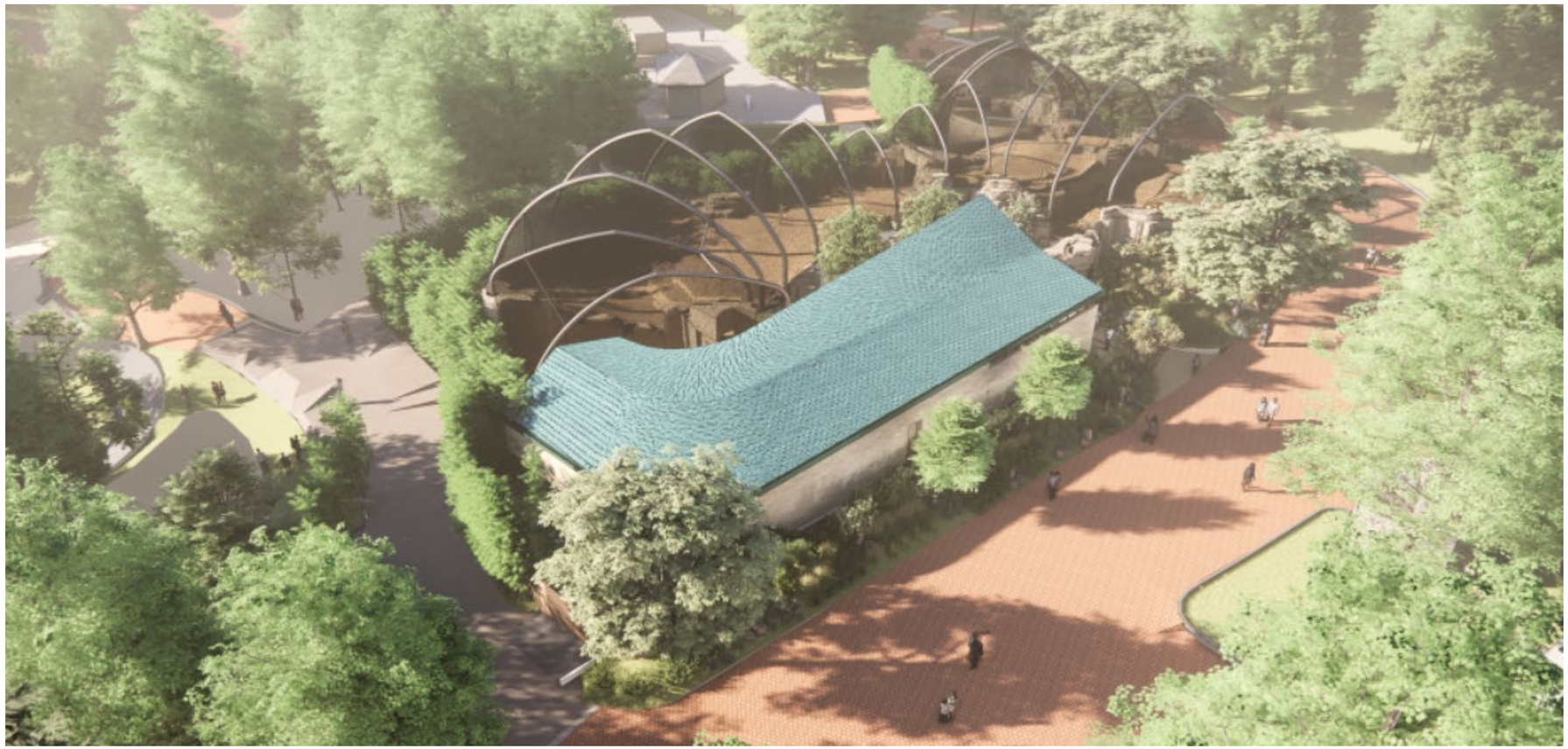
Overview of Options

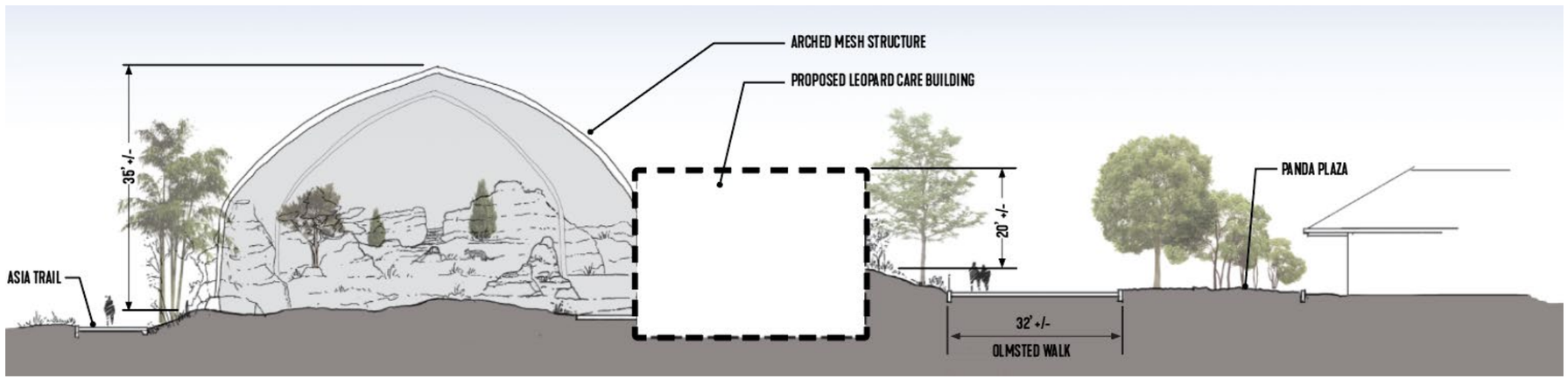




PROPOSED CONCEPT

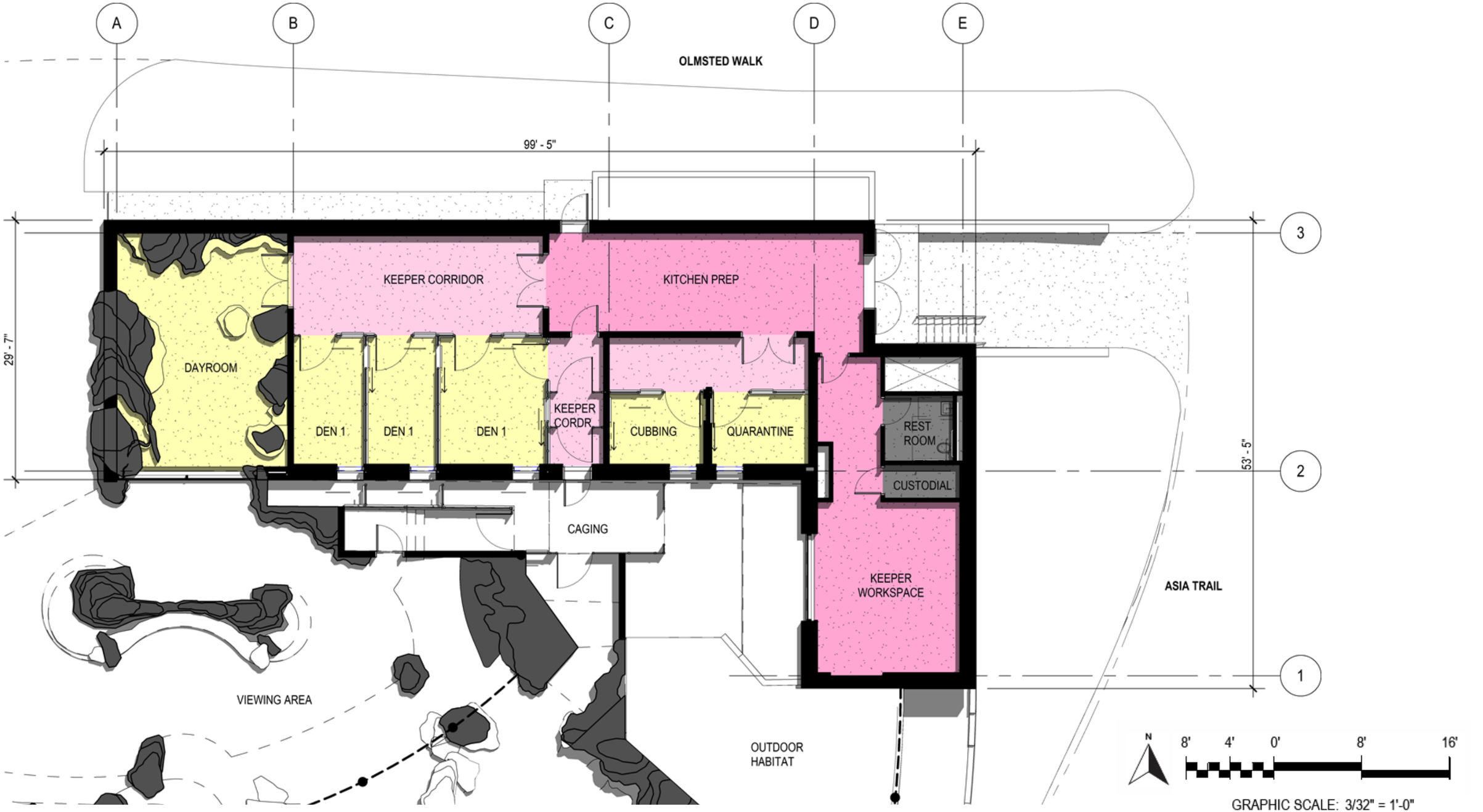
Animal Care Building and Habitat Enclosure





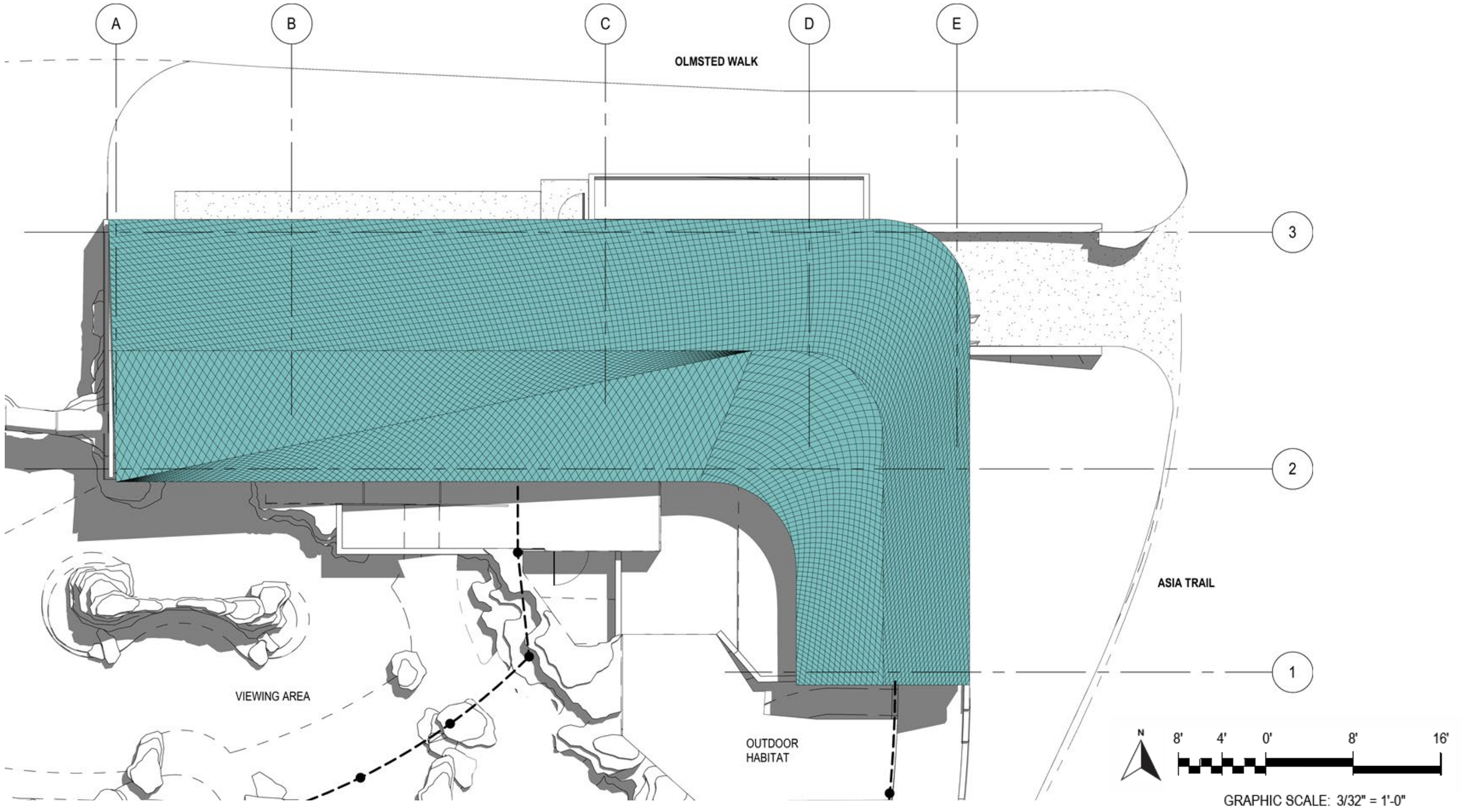
PROPOSED CONCEPT

Animal Care Building Floor Plan – Level 1



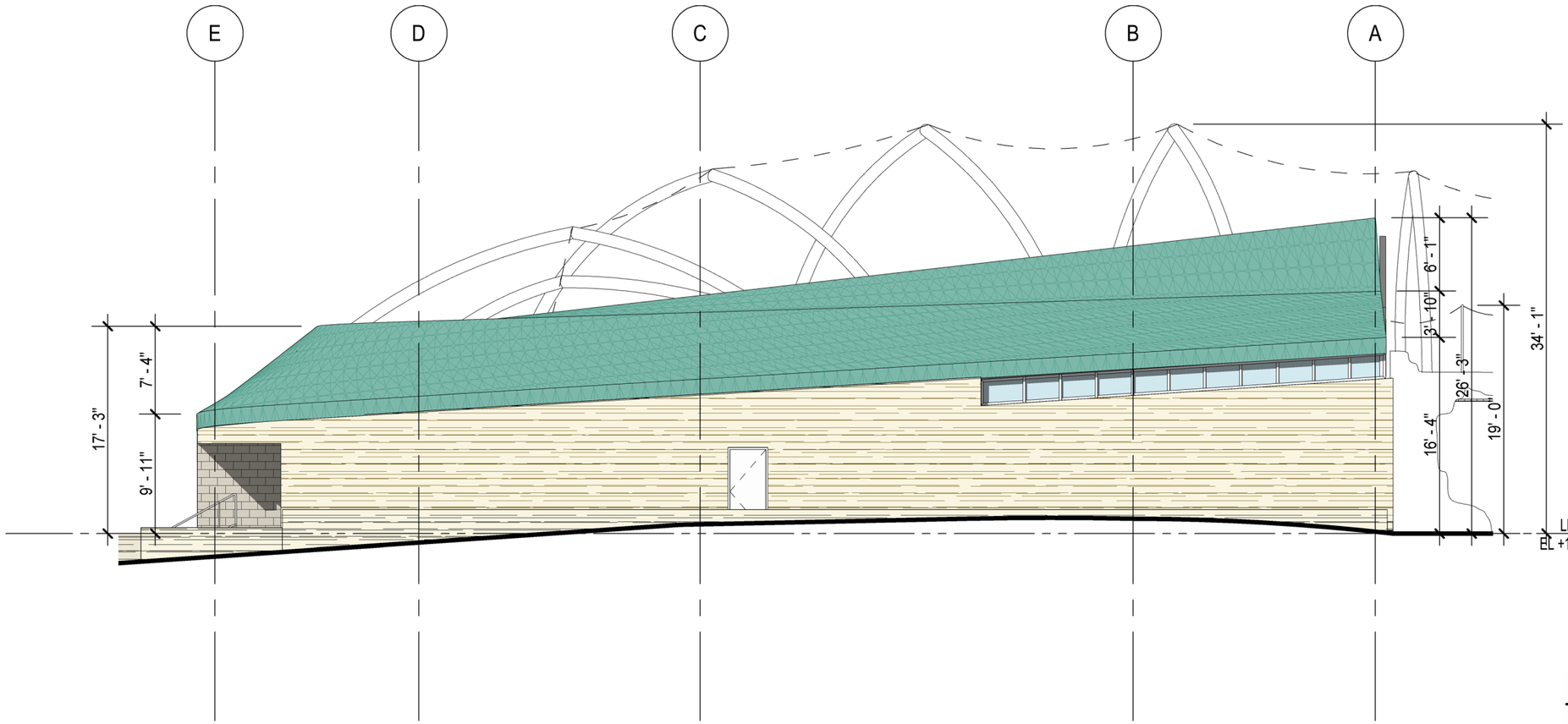
PROPOSED CONCEPT

Animal Care Building Roof Plan



PROPOSED CONCEPT

Animal Care Building Elevations - North

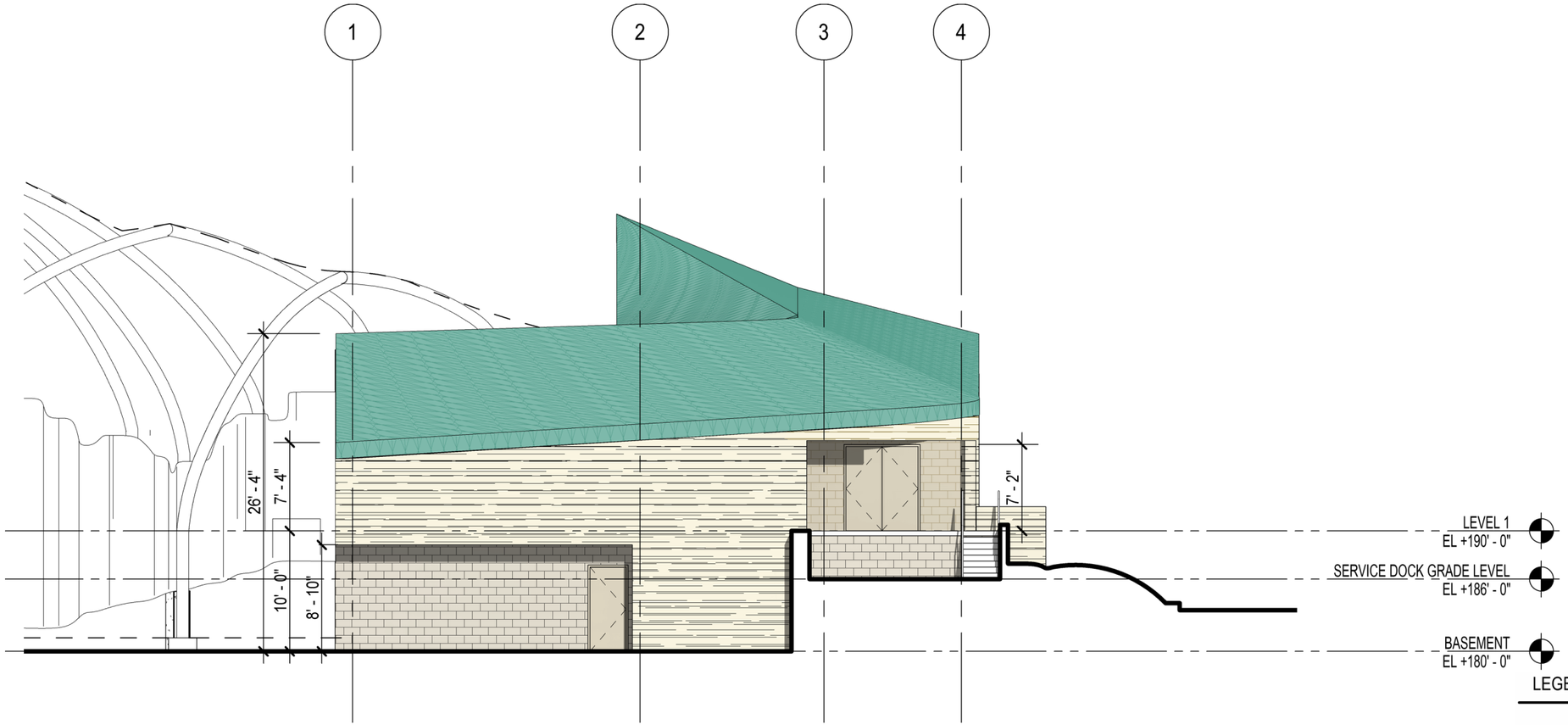


LEGEND

- PREFORMED INTERLOCKING METAL ROOF
- BUTT GLAZED WINDOW SYSTEM
- DIMENSIONED LIMESTONE FACADE
- GLAZED CMU FACADE

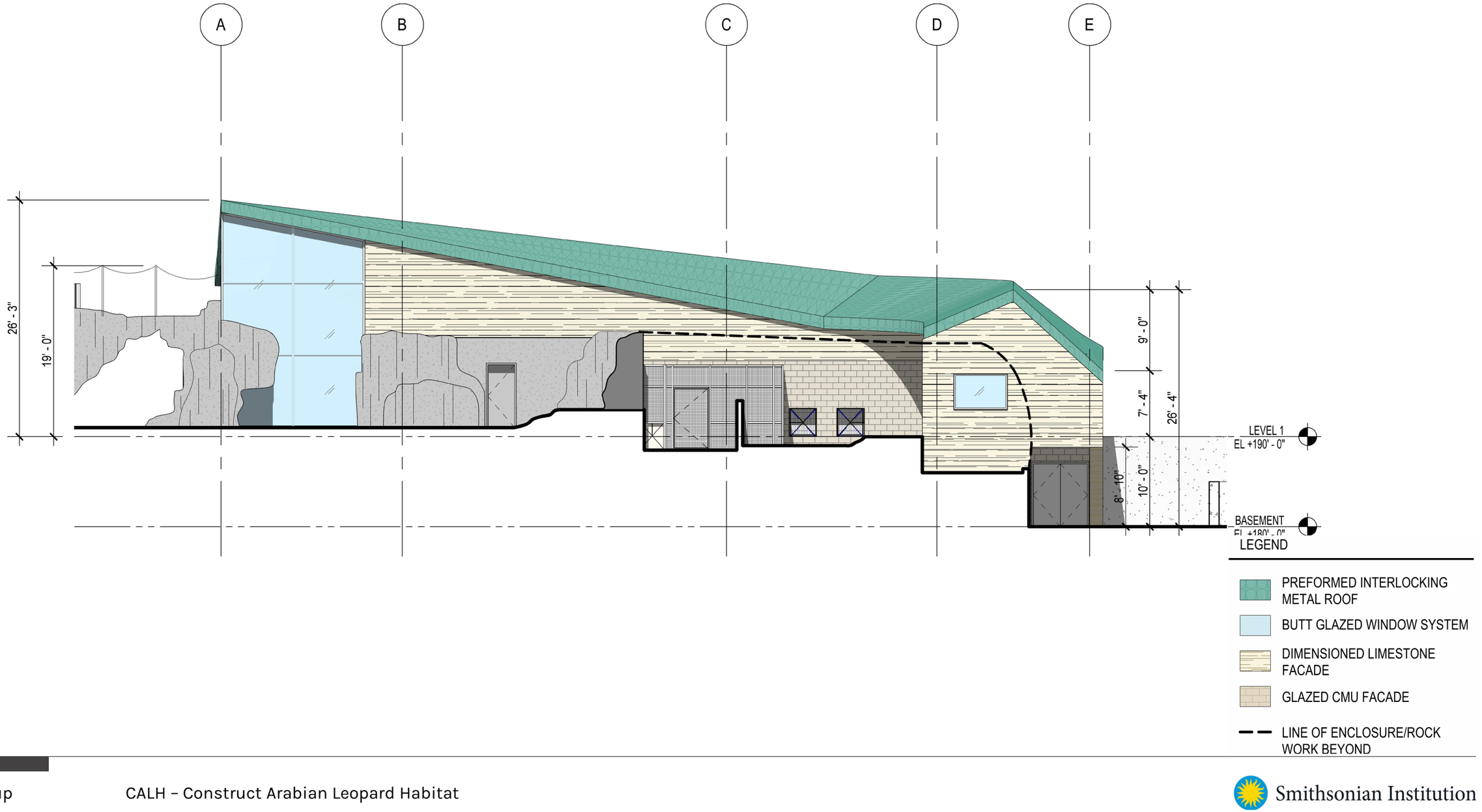
PROPOSED CONCEPT

Animal Care Building Elevations - East



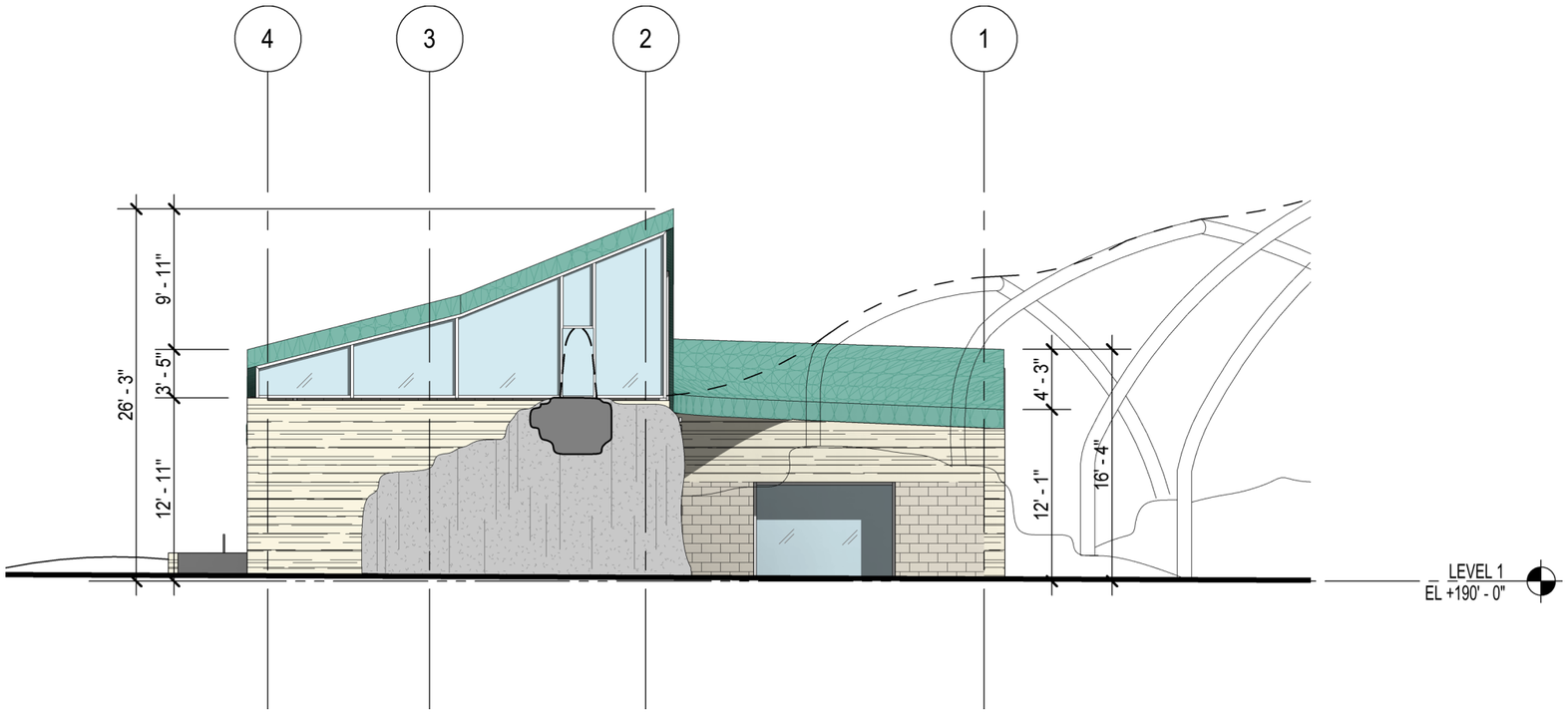
PROPOSED CONCEPT

Animal Care Building Elevations - South



PROPOSED CONCEPT

Animal Care Building Elevations - West



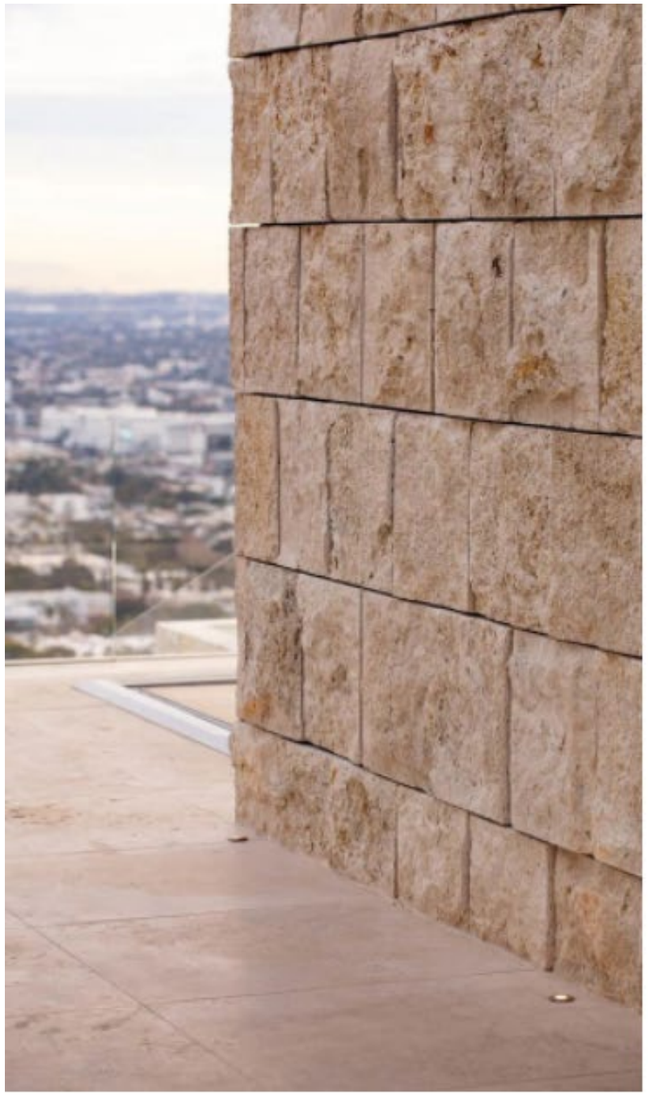
LEGEND

- PREFORMED INTERLOCKING METAL ROOF
- BUTT GLAZED WINDOW SYSTEM
- DIMENSIONED LIMESTONE FACADE
- GLAZED CMU FACADE

PROPOSED ANIMAL CARE BUILDING MATERIALS

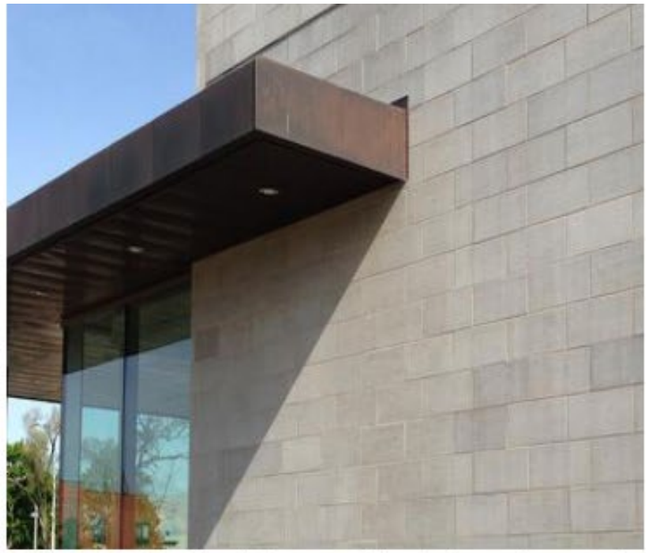
Natural Stone:

Dimensional stone is proposed with a common running bond pater inspired by the uniformity of the many brick facades within the historic district.



Dimensional Limestone, Split Face, 1-Size

Dimensional Limestone, Split Face 2-Sizes,



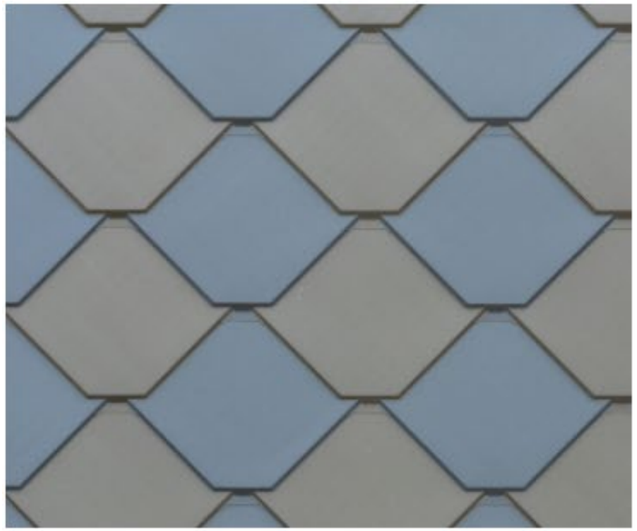
Dimensional Limestone, Thin Clad, Smooth Face, 1 Size

Elephant House Featuring Natural Carderock, Ashlar

PROPOSED ANIMAL CARE BUILDING MATERIALS

Green Colored Roof:

Metal green roofing is being considered for the Care Building to establish a strong connection with other buildings that have green roofs along Olmsted Walk



Interlocking Metal Roofing

Scalloped Slate Shingle

Figure 5.2.2.2: Think Tank Featuring Green Terracotta and Glass Tile Roof

PROPOSED ANIMAL HABITAT STRUCTURE MATERIALS

- **Superstructure :**
  - To minimize the superstructure of the enclosure, members vary in size from 6" diameter for the shorter arches to 12" diameter for the taller arches. The diameter is consistent throughout each arch and does not taper.
  - This approach maintains overall proportionality of the superstructure arches compared to utilizing a uniform dimension that work create disproportionate forms.
  - The recommend color for the habitat enclosure structure is gray
- **Enclosure Mesh:**
  - 2”x2”x1/8” programmatic requirement; driven by animal size
  - Both black and stainless steel were considered for the enclosure mesh with a recommendation to use black to minimize visual impact when viewing the animals

Stainless Steel Clear Finish Mesh

Stainless Steel Black Oxidized Finish Mesh

RECOMMENDED CONCEPT

Upper Olmsted Walk Looking East

NOTE: Exhibit structure to viewer's left is the existing Cheetah Conservation Station

RECOMMENDED CONCEPT

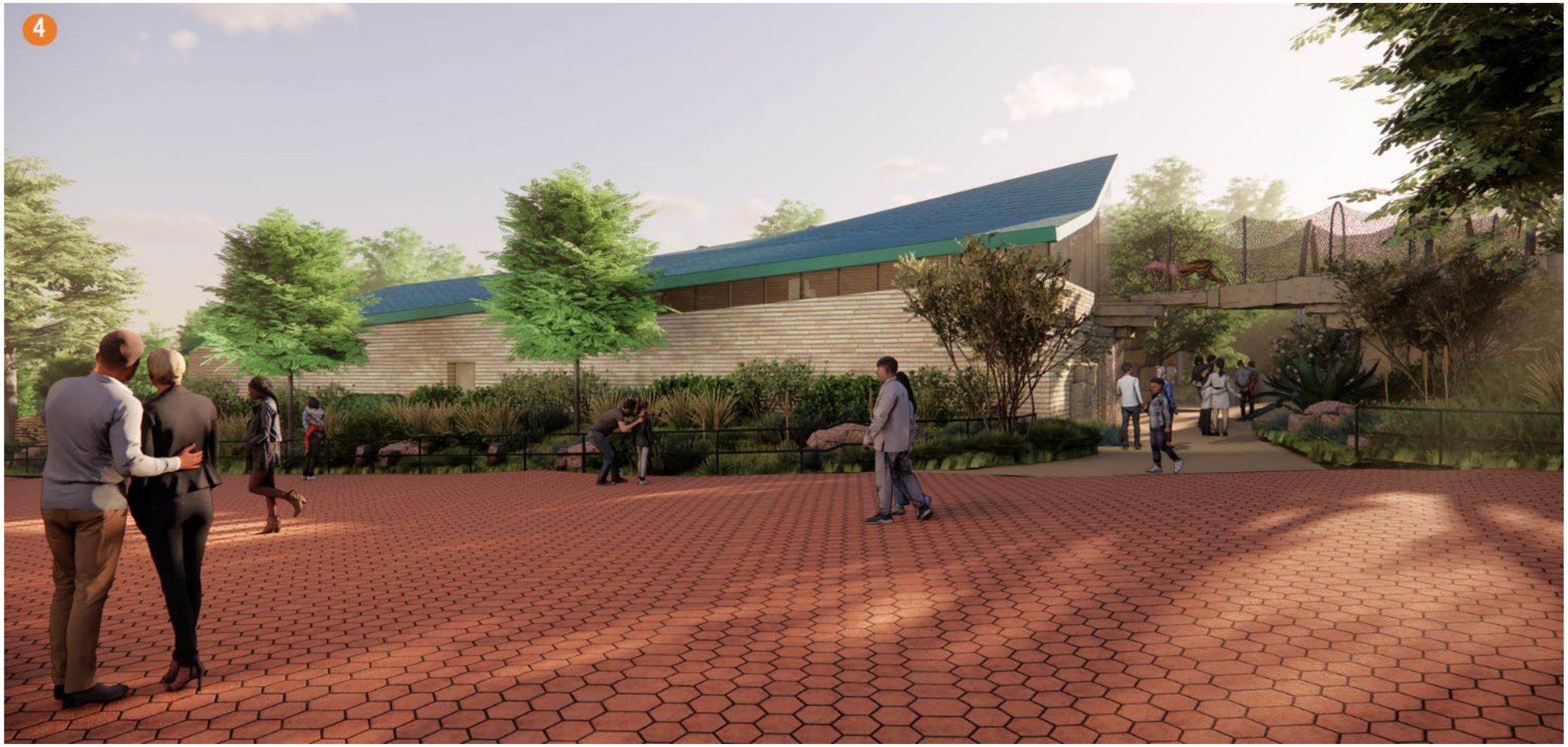
Upper Olmsted Walk Looking East at Panda Overlook – Site Entry

RECOMMENDED CONCEPT

Olmsted Walk Looking South at Care Building/Day Room – Site Entry

RECOMMENDED CONCEPT

Olmsted Walk Looking South at Care Building/Day Room – Site Entry from Kiosk



RECOMMENDED CONCEPT

Lower Olmsted Walk Looking West – Asia Trail and Panda Plaza

RECOMMENDED CONCEPT

Lower Olmsted Walk Looking West – Elephant House

PROPOSED LANDSCAPE PLAN

Features List:

1. Existing Tree to Remain
2. New Canopy Tree
3. New Understory Tree
4. New Habitat Tree
5. Olmsted Walk Planting Palette
6. Wadi and Oasis Planting Palettes
7. Bioretention Planting Palette
8. Asia Trail Planting Palette

Figure 5.4.4.1: Proposed Concept Site Plan - Features

PROPOSED PLANTING PALLETTE

OLMSTED WALK

ECOSYSTEM ANALOGUE

PLANT PALETTE

GLEDITSIA TRIACANTHOS

DRYOPTERIS ERYTHROSORA 'BRILLIANCE"

HAMAMELIS VIRGINIANA

RHUS AROMATICA 'GRO-LOW'

CAREX LEAVENWORTHII

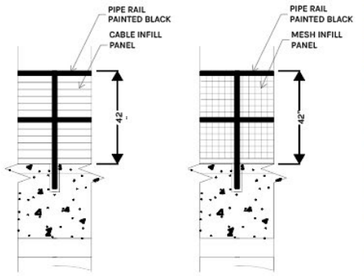
CAREX PLANTAGINEA

SPOROBOLUS HETEROLEPIS

CHASMANTHIUM LATIFOLIUM

	SCIENTIFIC NAME	COMMON NAME	DEER RESISTANT	POLLINATOR	NATIVE
TREES	*Gleditsia triacanthos*	honey locust	X	X	X
	Carpinus caroliniana	American hornbeam	X	X	X
SHRUBS	*Hamamelis virginiana*	witch hazel	?	X	X
	Ilex glabra 'Densa'	inkberry holly	X	X	X
	Rhus aromatica 'Gro-Low'	gro-low sumac	X	X	X
	Sarcococca hookeriana var. humilis	dwarf sweet box	X		
PERENNIALS	*Athyrium filix-femina*	lady in red lady fern	X		X
	Dryopteris erythrosora 'Brilliance'	brilliance autumn fern	X		X
	Carex leavenworthii	Leavenworth's sedge	X	X	X
	Carex plantaginea	plantain-leaf sedge	X	X	X
	Chasmanthium latifolium	sea oats	X		X
	Sporobolus heterolepsis	prairie dropseed	X	X	X

PROPOSED SITE RAILING PLAN



Modified Olmsted Rail (Cable) Modified Olmsted Rail (Mesh)

Olmsted Rail

Bamboo Landscape Rail

Wood Screen Fence

Bamboo Arch

Carderock Wall

MODIFIED OLMSTED RAIL

OLMSTED RAIL

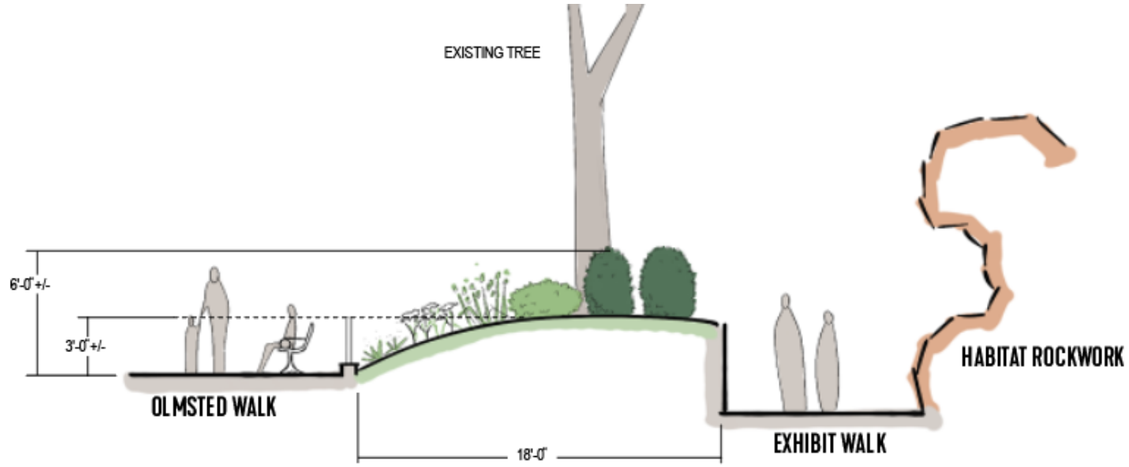
BAMBOO LANDSCAPE RAIL

BAMBOO ARCH

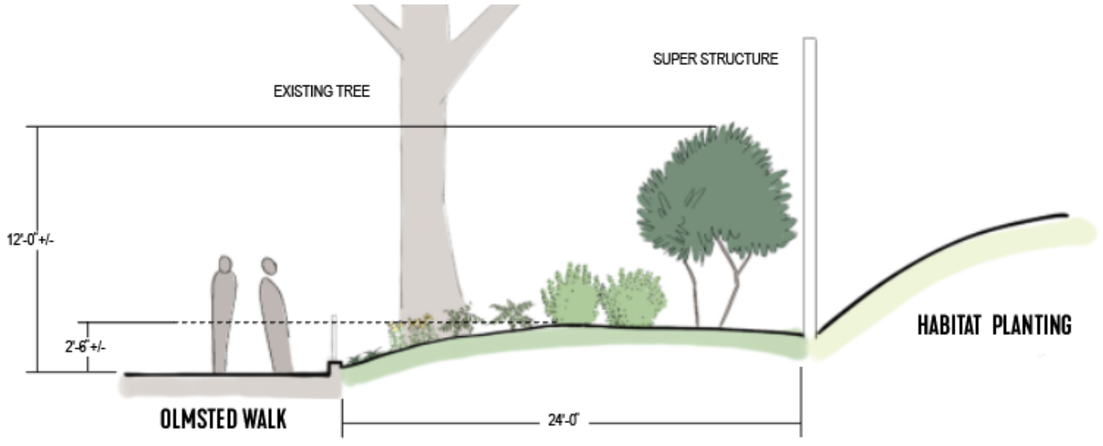
WOOD SCREEN FENCE

CARDEROCK WALL

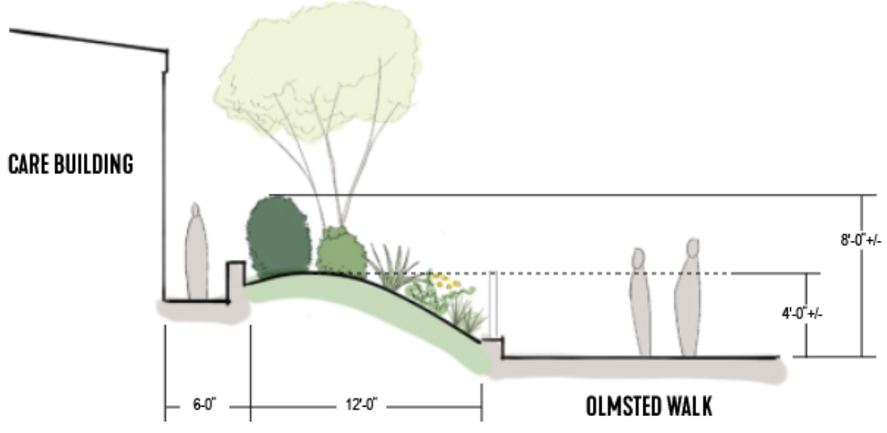
PROPOSED BERM CONDITIONS



Section A: Through Olmsted and Habitat



Section B: Through Olmsted and Habitat

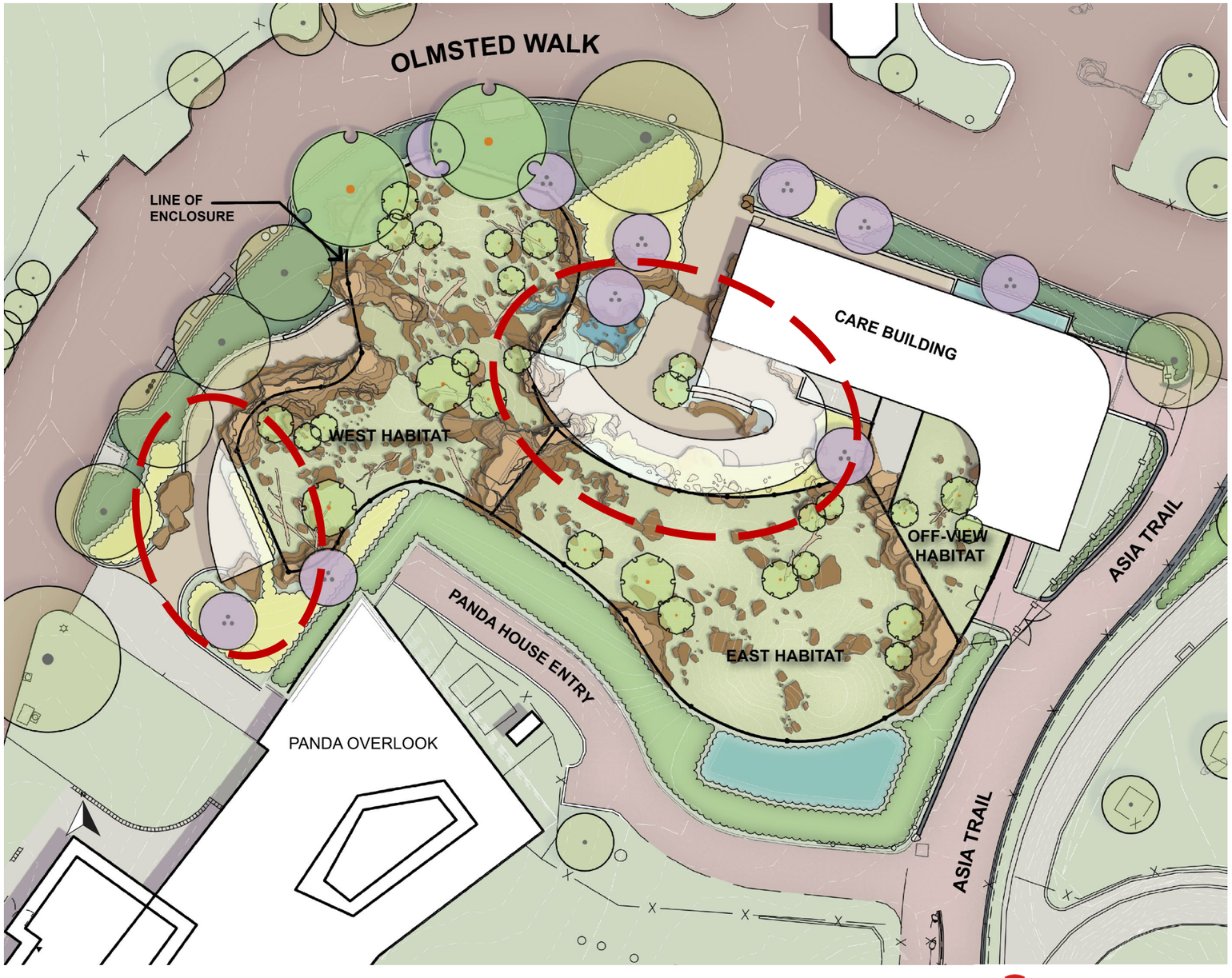


Section C: Through North Berm

SHADE CONCEPT REFINEMENTS

VISITOR SHADE CONCEPT

Creating pattern with light and geometry



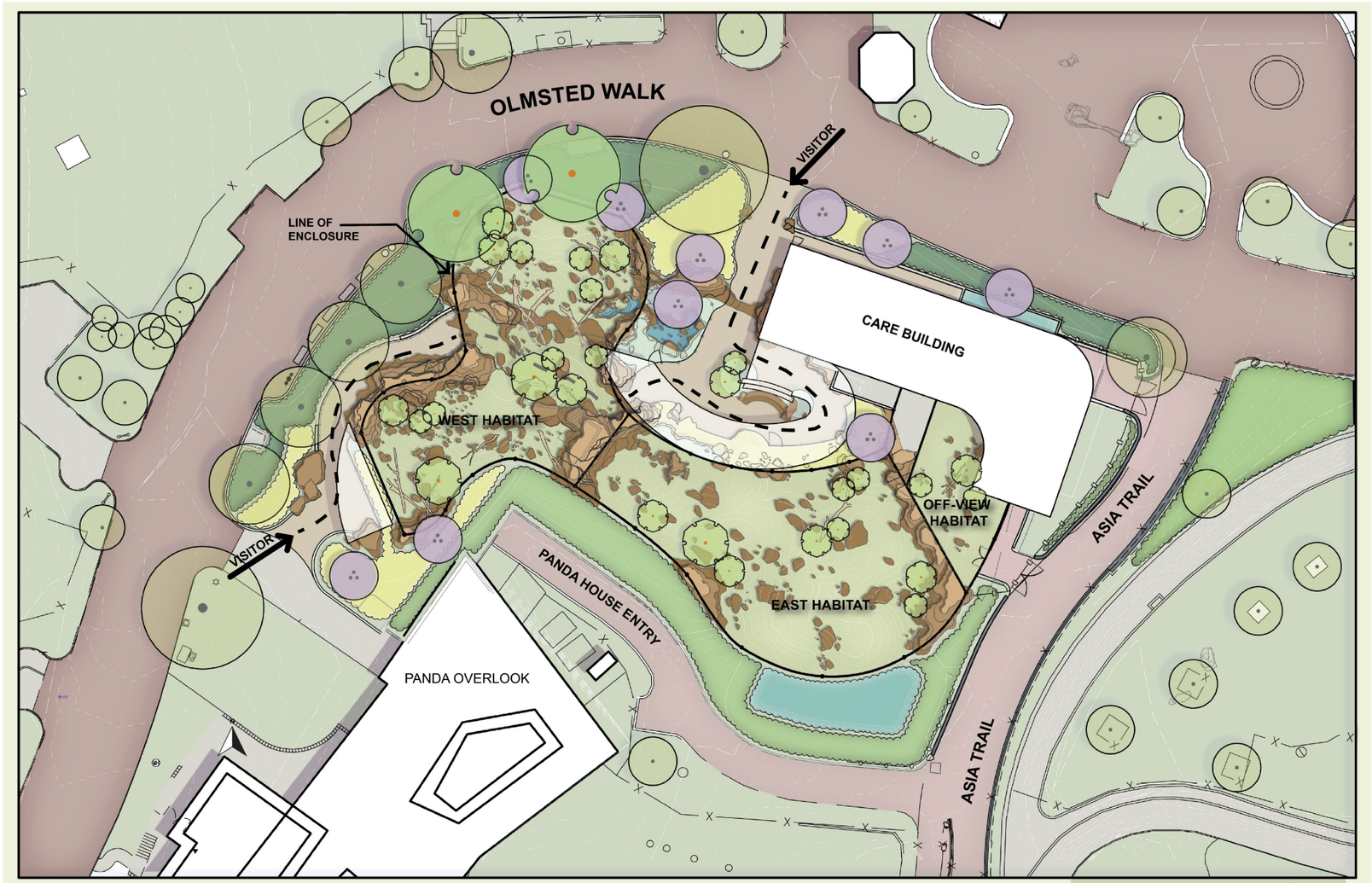
PROPOSED SHADE STRUCTURE LOCATION

SHADE CONCEPT

Perimeter Mounted Shade

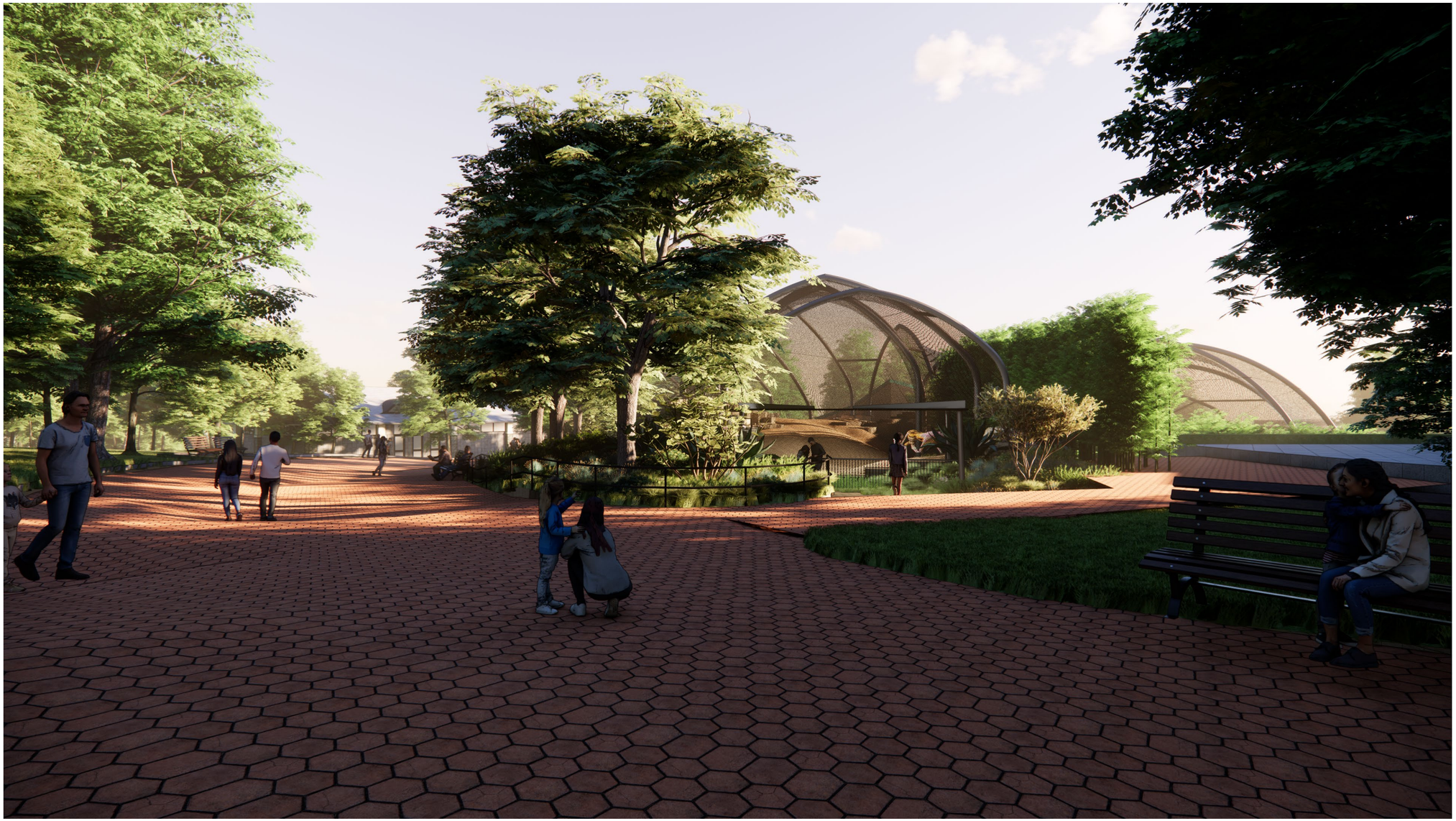
Features:

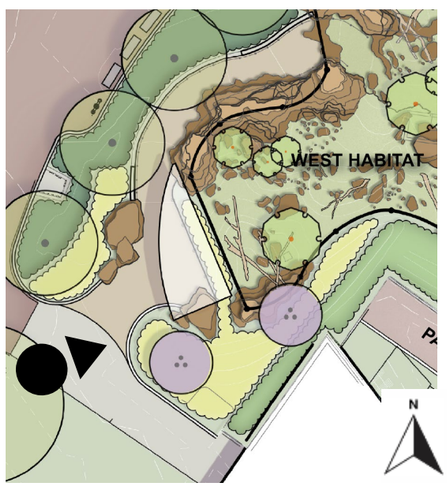
- Full shade at Day Room for viewing, partial shade throughout remaining canopy area
- Perimeter shade location provides more shade during hot summer sun as this is south facing portion of visitor path.
- Provides a visual to visitors indicating areas of viewing and promotes wayfinding.



PERIMETER MOUNTED SHADE

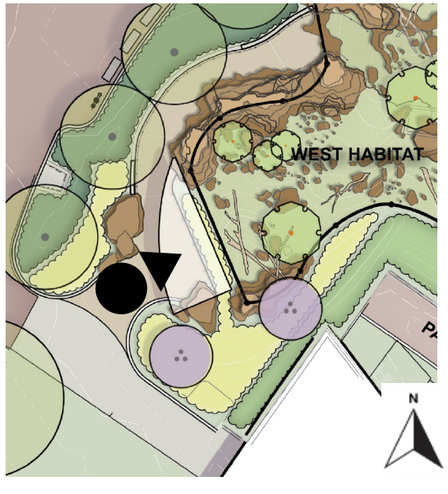
View from Upper Olmsted Walk at Panda Overlook Entry





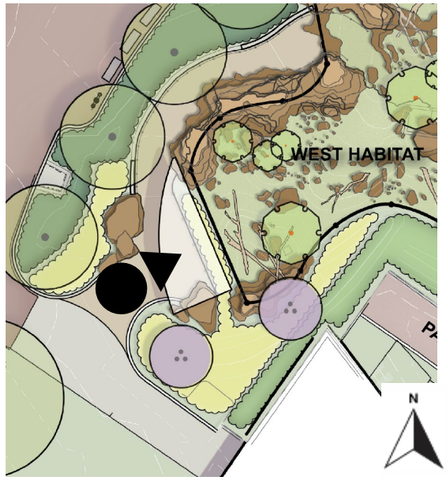
CANOPY MATERIALITY

View at Northwest Entry
Canopy Material – Perforated Metal Panel (Recommended)



CANOPY MATERIALITY

View at Northwest Entry
Canopy Material – Metal Slats



SHADE CONCEPT

Oasis Plaza – Perimeter Mounted Shade