

rasha lama *select work*

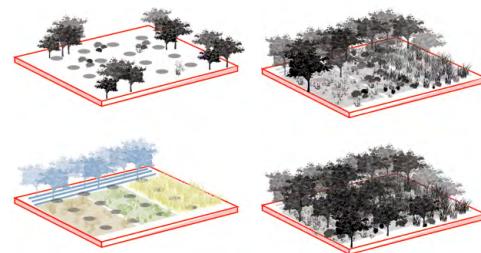
2025 Summer Internship — Landscape Architecture @ Sasaki, Boston, MA

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³ Vertebrae Cove

Biomimetic Modular Seawall Infrastructure
India Point Park, Providence, RI



⁷ Project 09 Burn Pit Area

Phytoremediation for Ecological Succession
Ninigret National Wildlife Refuge, RI



¹² Strata & Phenomena

Deep Time at Allens Ave
Providence, RI



¹⁹ The Backyard

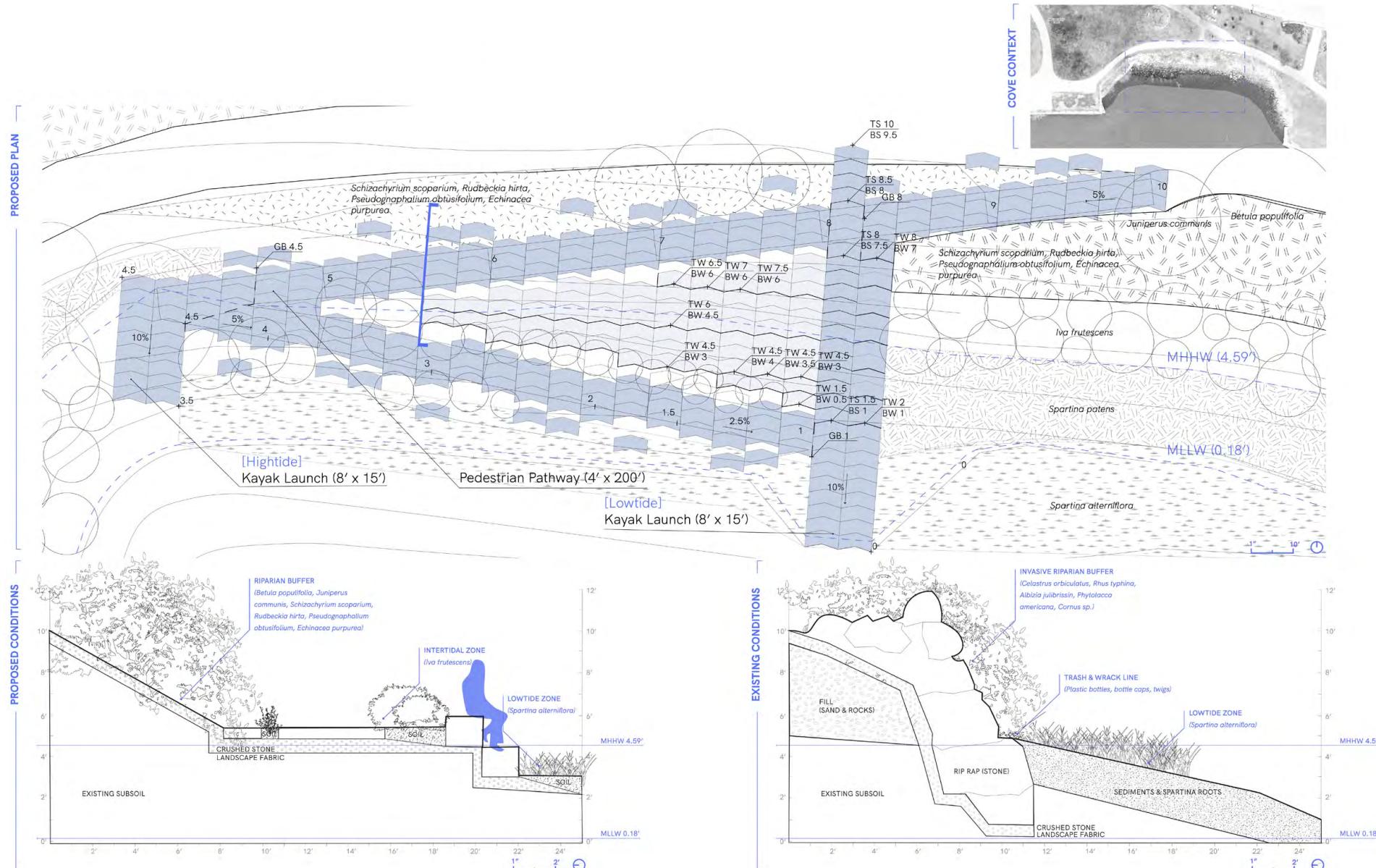
Reintroducing the Residential Neighbourhood
New London, CT



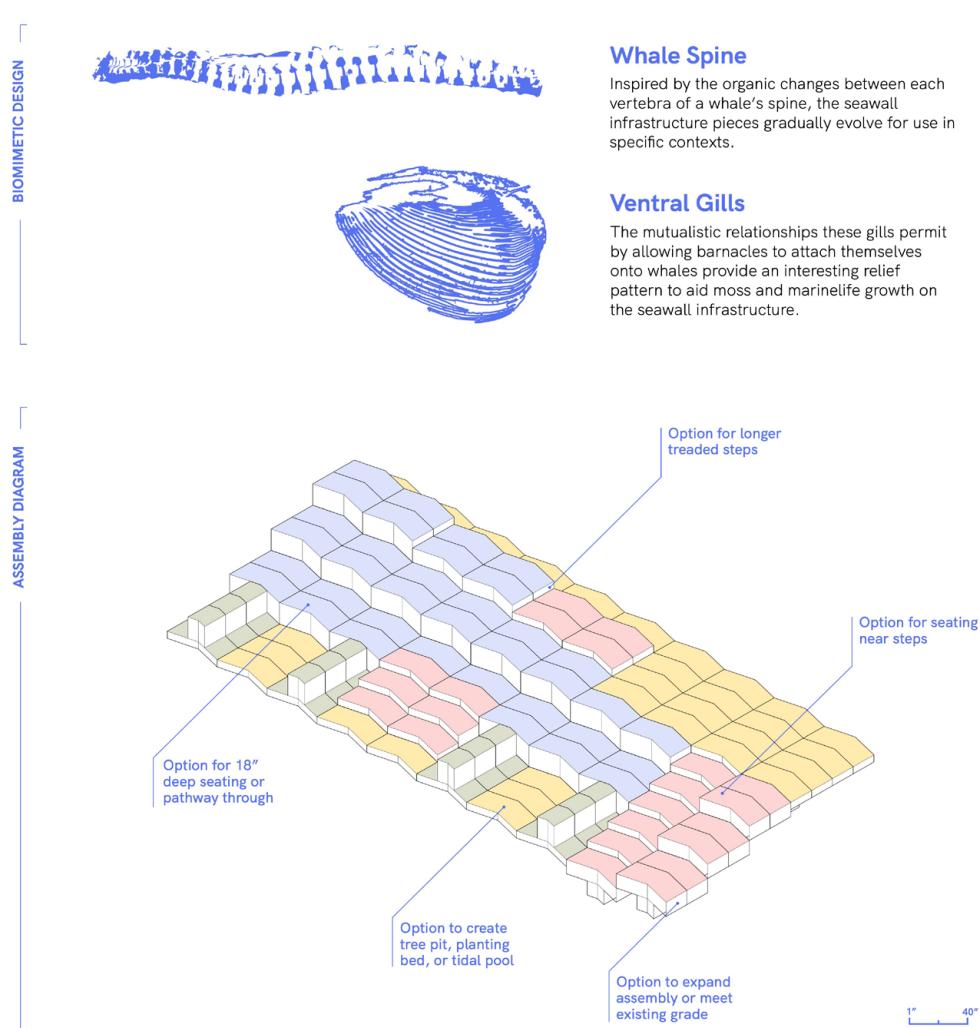
Lowtide Kayak Launch Model (1:2)

Vertebrae Cove
Biomimetic Modular Seawall Infrastructure
India Point Park, Providence, RI

Fall 2024
Material Tests
Sara Cohen & Adrian Fehrmann



Proposed Plan (1:10) & Site Condition Sections (1:2)

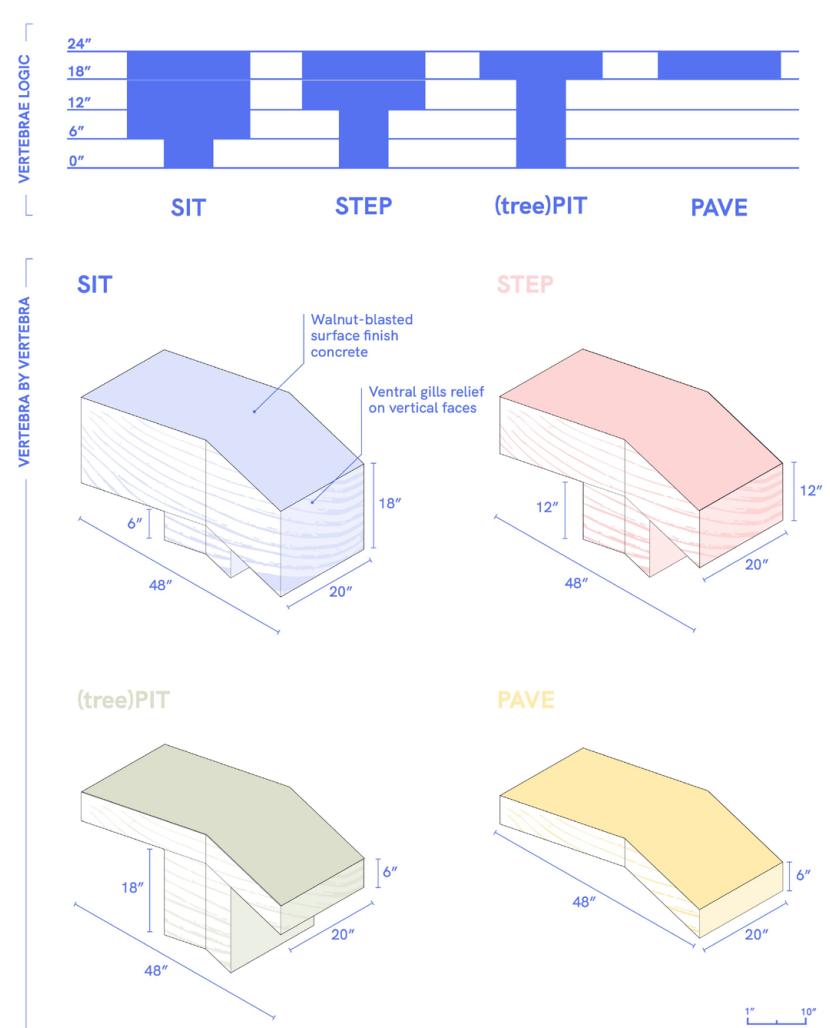


Whale Spine

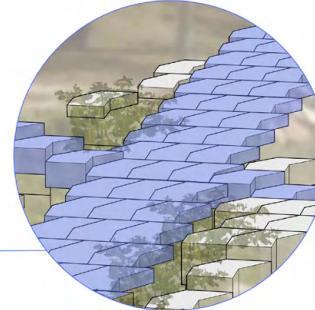
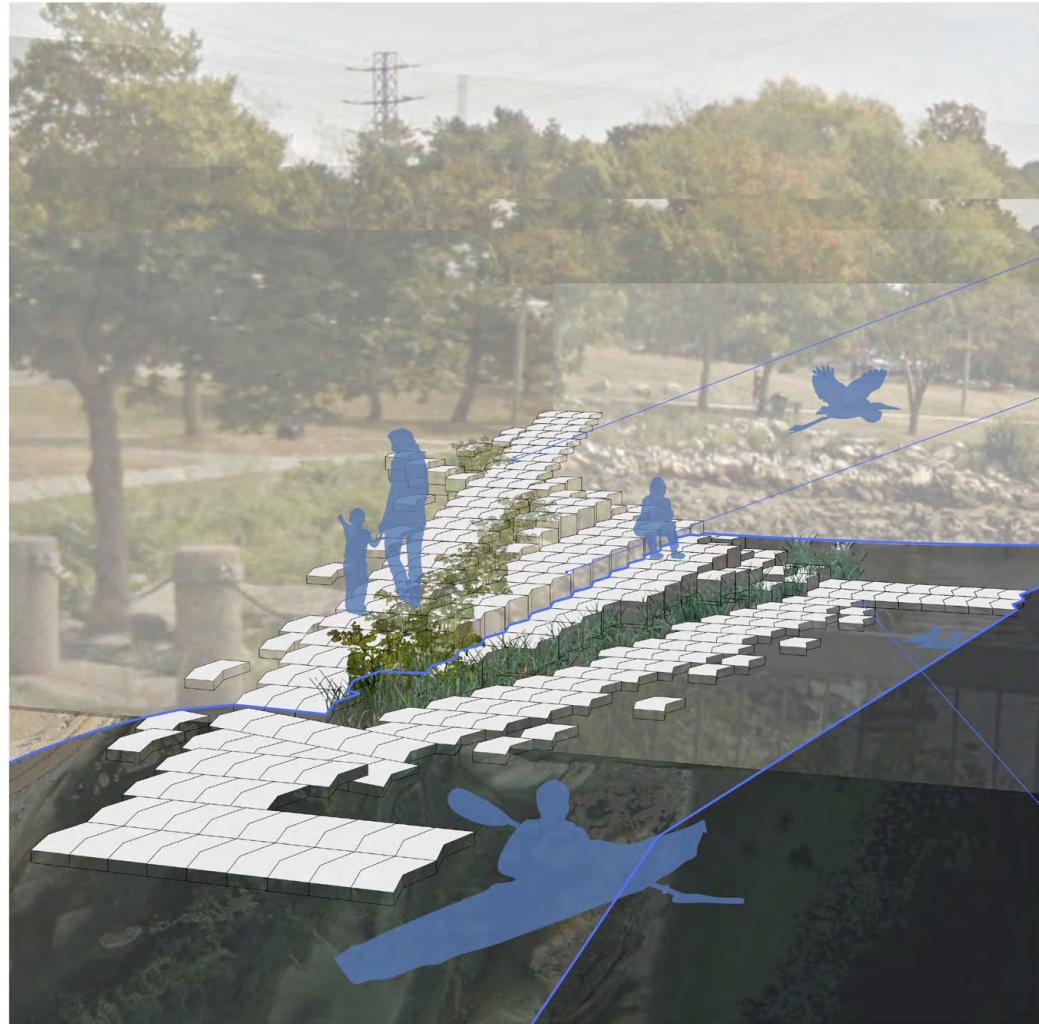
Inspired by the organic changes between each vertebra of a whale's spine, the seawall infrastructure pieces gradually evolve for use in specific contexts.

Ventral Gills

The mutualistic relationships these gills permit by allowing barnacles to attach themselves onto whales provide an interesting relief pattern to aid moss and marinelife growth on the seawall infrastructure.

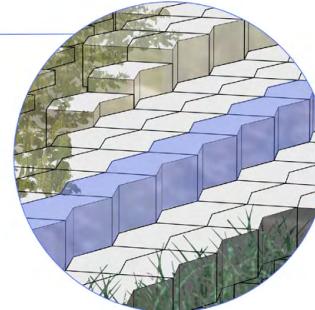


INSTALLATION VIEW



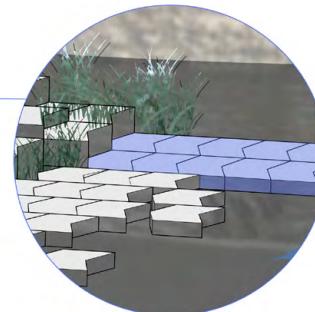
ADA-Accessible Path & Shortcut Steps

A continuation of India Point Park's existing pathways, the ADA-accessible path leads down to both kayak launches and through the intertidal zone. For a shortcut, steps lead directly from the top of the path to the lowtide kayak launch.



Intertidal Seating

Interspersed between the upper and lower pathways are the intertidal seats. Depending on the time of day, these seats might offer an intimate view of the water, or they might completely disappear. The dynamic temporal change makes this an intriguing phenomenon to experience.



Hightide & Lowtide Kayak Launches

Adapting to the twice-daily tidal changes of the Providence River, two kayak launches allow kayakers, canoers, and perhaps adrenaline-filled swimmers to launch and dock at the Vertebrae Cove. Both kayak launches are 8' by 15' and are graded at a 10% slope.

Project 09: Burn Pit Area
Phytoremediation for Ecological Succession at Ninigret National Wildlife Refuge
Rasha Lama / Fall 2024

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CONCEPTUAL SITE PLAN

SOIL TESTING RESULTS

Site-Specific Phytoremediation

The selected phytoremediation techniques specifically target the site's soil and groundwater contaminants as specified in the publicly accessible 6,000+ page Army Corps Environmental Report by the Army Corps. Various phytoremediation methods were chosen in response to the most critical contaminants, the site's characteristics, and its future human disturbances. This research cites *PHYTO* by Kate Kemen and Niall Kirkwood as its main reference.

BRIEF STATEMENT

Formerly known as the Burn Pit Area, this area was used for naval training purposes between 1950s to 1970s. At time of transfer from the Navy to the U.S. Fish and Wildlife Service to serve as the Ninigret National Wildlife Refuge, the asphalt runways were removed while keeping the gravel aggregate below. Due to the park's history, an active remedial investigation is currently underway by the Army Corps.

Specifically, our site is referred to as "Project 09: Burn Area Pit" as it was previously used to simulate crashed aircraft fire trainings including metals and chemical contaminants have been found on site including burning metallic debris, black ash, and aircraft pieces.

Due to the active investigation, our site was most recently cleared between October 2021 and October 2022 for soil sample and well location installation. Therefore, any planting strategy for ecological succession must account for the planned human disturbances to investigate the potential contamination of the surrounding region and groundwater source.

CONCEPTUAL TIMELINE

YEAR 0-8 / Active Sampling

Existing conditions remain dormant throughout Army Corps investigation period. Monitoring will occur every 2 years for continuous access to soil and well monitoring. Vegetation cover will continue uninterrupted along site's southern & eastern edges.

YEAR 8-10 / Active Phytoremediation

Multiple phytoremediation projects will be implemented to treat the site's extract, and degree contaminated organic contaminants found in the soil and groundwater. A 10-year trench planting for groundwater migration and removal of organic contaminants will continue through phytoremediation, *phytostabilization*, and *phytovolatilization*.

YEAR 10-20 / Monitoring

Continued monitoring for phytoremediation, hydrogeology through soil and groundwater sample testing, vegetation cover studies, and regular monitoring of the site's condition will be implemented in other phytoremediation projects to ensure ecological success in the National Wildlife Refuge. Vegetation cover will provide a seed source for Runway 30.

YEAR 20+ / Self Managed Succession

Success of phytoremediation techniques could permit the Army Corp's investigation to conclude and allow "Project 09: Burn Pit Area" as a safe and restored habitat for human disturbance of ecological clearing and restoration. A 20-year self-managed path corridor. Vegetation cover continues to be the primary indicator of ecological health. Site-managed successional growth to take place allowing for patch reduction from perimeter edge.

KEY

- Groundwater Migration Tree Stand
- Plant Stabilization Mat
- Organic Mulch
- Extractive Pots
- Phytostabilization
- High Priority Infiltration Species
- Total Petroleum Hydrocarbons
- Arsenic
- Cadmium
- Copper
- Manganese
- Selenium
- Zinc

FUNGI, LICHEN, & MOSS

- Chlorococcum
- British soldier
- Cladonia rangiferina
- Cladonia millepora
- Physciella corymbosa
- Physciella tenuis
- Ascodonium
- Earth-star
- Lecanora thysanophora
- Thuidium tamariscinum
- Polytrichum commune
- Hypnum revolutum

NORTHERN CITRUS
Clementine Orange tree

SECTION
CLIFF
WALL
WIND
ED BANK

WATER TYPES

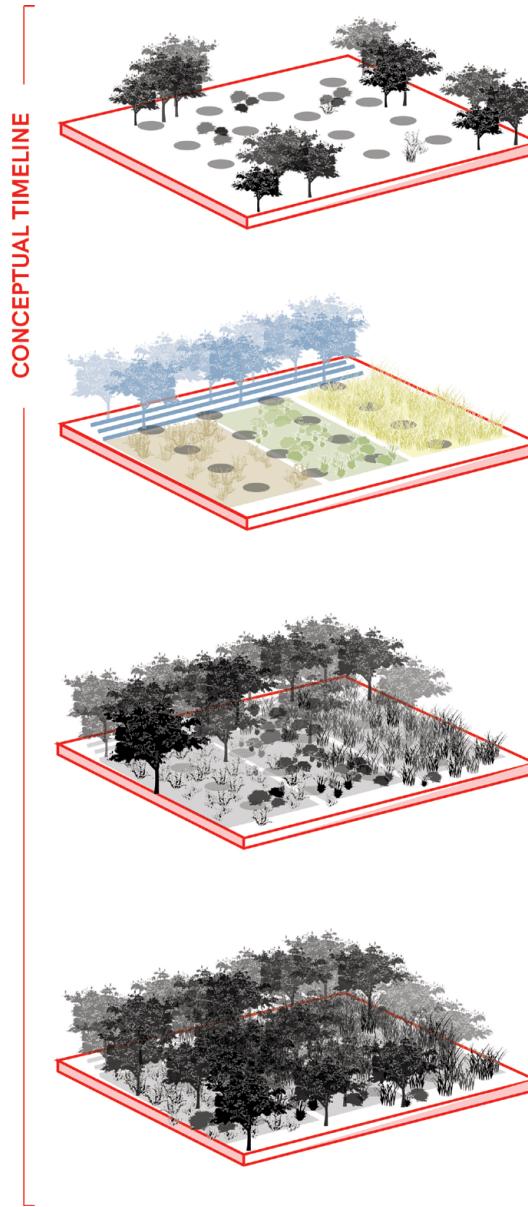
- Interior vines
- Yellow bellied chat
- Metaplexus melospiza
- Song sparrow
- Sturnus vulgaris
- Douglas fir

PLANT

- Solidago latissima
- New England coastal

WETLANDS OF RUNWAY 30

Project Boards (ARCH D, 24" x 36")

**YEAR 0-5 / Active Sample Site**

Existing conditions remain dormant throughout Army Corps investigation period. Vegetation clearance occurring every 2 years for continuous access to soil and well monitor stations. Ecological succession continues uninterrupted along site's southern & eastern edges.

YEAR 5-10 / Active Phytoremediation

Multiple phytoremediation projects are installed across the site to treat stabilize, extract, and degrade organic and inorganic contaminants found in the soil and groundwater. Main activities include trench planting for groundwater migration and harvesting planted biomass embedded with contaminants through **phytohydraulics**, **phytostabilization**, **phytodegradation**, and **phytoextraction**.

YEAR 10-20 / Monitoring

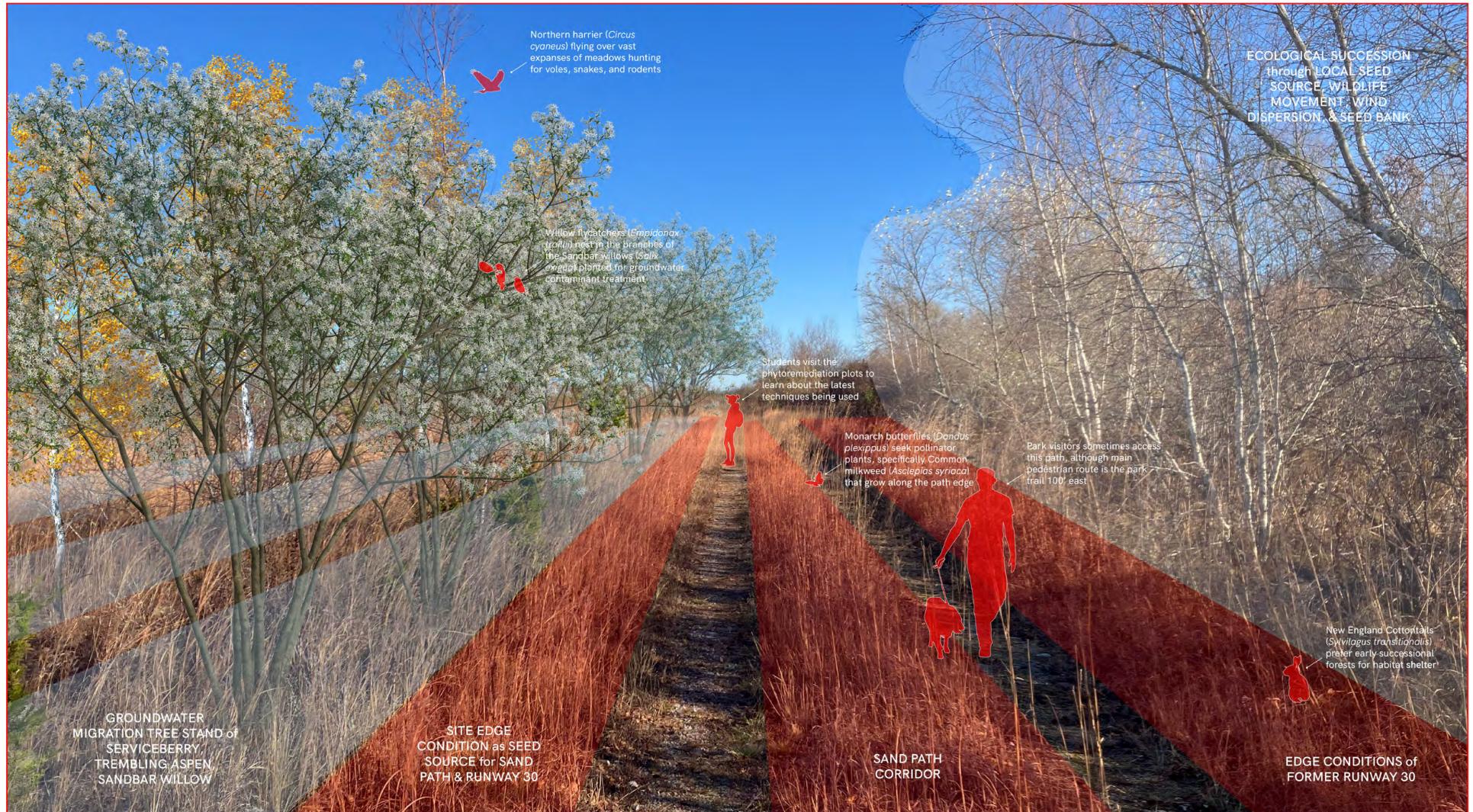
Constant monitoring of phytoremediation technologies through soil and groundwater sample testing, vegetation cover studies, and wildlife transect counts. Results and lessons to be implemented in other phytoremediation projects of contaminated sites at Ninigret National Wildlife Refuge. Vegetation cover will provide a seed source for Runway 30.

YEAR 20+ / Self-Managed Succession

Success of phytoremediation technologies could permit the Army Corps' investigation to conclude and release "Project 09: Burn Pit Area" as a safe and renaturalized site. Human disturbance of vegetation clearing and sampling will cease reducing the sand path corridor. Vegetation cover continues to be a seed source for Runway 30 north of the site. Self-managed successional growth to take place allowing for patch reduction from perimeter edge.

Site History

Formerly known as the Charlestown Naval Auxiliary Air Station, the Ninigret National Wildlife Refuge currently has multiple active remedial investigations led by the Army Corps. Specifically, our site is referred to as "Project 09 Burn Area Pit" as it was previously used to simulate crashed aircraft fire trainings including dousing airplane fuselages in combustible liquids and igniting.



Perspective Render During Year 5-10: Active Remediation Stage



Phytohydraulics: Groundwater Migration Tree Stand
Trench planting to access groundwater 8-10.5' bgs by cracking asphalt up to 2' deep and inserting dormant plant cuttings or bare root vegetation with 10-12' spacing. Phreatophytes and high evapotranspiration species selected to treat groundwater contamination including Serviceberry, Trembling aspen, and Sandbar willow.

Phytostabilization: Planted Stabilization Mat
Excluder species to contain contaminants in place and minimize soil and wind erosion. Functioning similarly to a traditional clay cap, the mat is planted in soils typically too toxic for many plants to establish. Species include Bentgrass, Red fescue, and Wild mustard.

Phytodegradation: Degradation Cover
Thick, deep-rooted herbaceous species with fibrous root zones to remove Total Petroleum Hydrocarbons (TPH) contaminants in surface soils up to 5' deep including Indiangrass, Little bluestem, Switchgrass, Goldenrod, and Sandbar willow.

Phytoextraction: Extraction Plots
Hyperaccumulator species to remove inorganic contaminants in surface soils up to 3' deep. Harvesting biomass must occur before the plants dieback, performed with protection wear, and disposed of in a regulated area or phytomined out of the biomass such as nickel. Hyperaccumulator species include Spring sandwort (Cadmium & Zinc) and Hairy goldenrod (Nickel).

(mg/kg)	Human Health				Ecological		Sample Sites		
	RIDEM DEC Residential	USEPA RSL Residential	RIDEM GA Leachability	USEPA SSL	USEPA Eco SSL	USEPA Region 5 ESL	SS-BP-2	SS-BP-5	SS-BP-6
Aluminum	None	7700	None	3000	None	None	5320	14100	6440
Arsenic	7	0.68	None	0.0015	18	5.7	0.92	7.7	1.9
Barium	5500	1500	-	16	330	1.04	10.2	22.8	14.2
Cadmium	39	7.1	-	0.069	140	0.00222	0.38	0.34	0.48
Chromium	390	0.3	-	0.00067	26	0.4	33.8	12.2	19.9
Cobalt	None	2.3	None	0.027	13	0.14	1.2	3	1.6
Copper	3100	310	None	2.8	80	5.4	7.1	66.3	19.1
Iron	None	5500	None	35	None	None	7850	14200	8900
Lead	150	400	-	None	1700	0.0537	5.1	9.5	7.4
Manganese	390	180	None	2.8	450	None	139	86.4	113
Nickel	1000	150	-	2.6	280	13.6	3.1	6.1	3.6
Selenium	390	39	-	0.052	4.1	0.0276	0.2	0.62	0.19
Vanadium	550	39	None	8.6	7.8	1.59	15.4	21.3	15.3
Zinc	6000	2300	None	37	120	6.62	14.8	15.8	19.6
Total Petroleum Hydrocarbons	500	None	500	None	None	None	1350	18.3	1010
4,4'-DDT	None	1.9	None	0.077	0.021	0.0035	0.0082	0.0036	0.0092



Site-Specific Phytoremediation

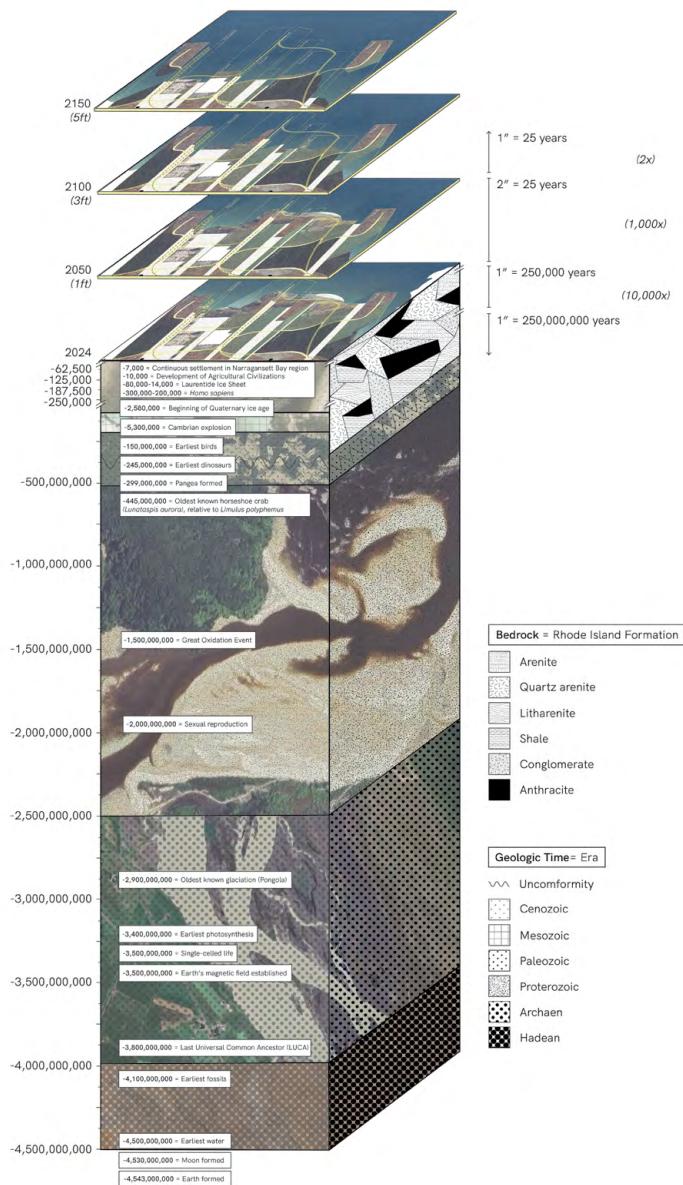
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Site Model (1:60)

Strata & Phenomena
Deep Time at Allens Ave
Providence, RI

Spring 2024
Site, Ecology, Design Studio
Emily Vogler & Fatema Maswood



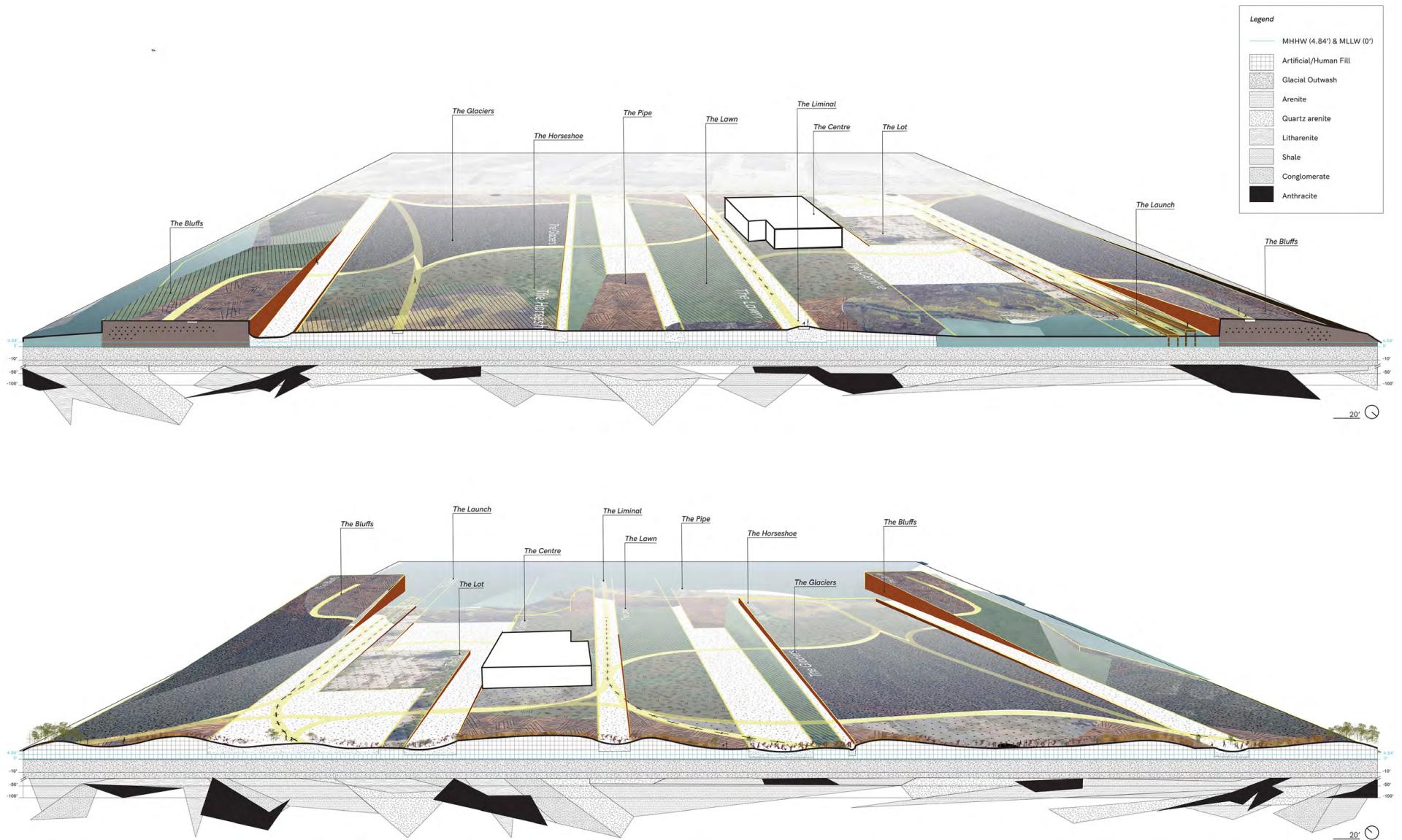
Concept Drawing (1:60)

Program

Strata & Phenomena invites local communities and residents to learn about Providence's history through an experiential park and community learning centre. Specific programmatic functions include:

- Indoor venue to host yearlong programming for kids (K-8), teenagers, families, and adults/elderly,
- ADA-accessible pedestrian pathways throughout the site informed by the placement of the existing non-operative railroad tracks,
- Bicycle and running circuit with waterfront access,
- Kayak launch with vehicular access and parking,
- Stormwater management and BMPs in the "unconformities,"
- 2.5 acres of salt marsh habitat.







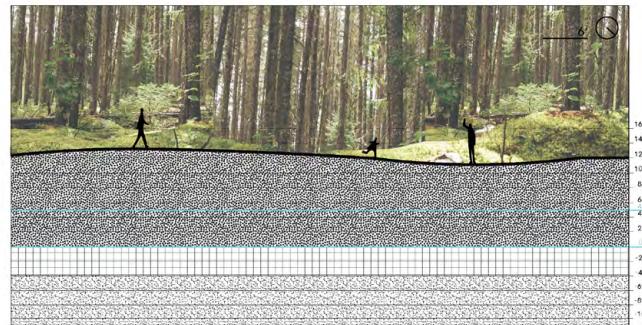
Zones of Phenomena Models (1:8)

Zones of Phenomena

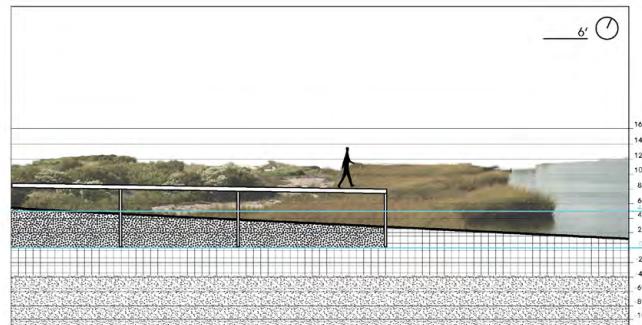
Inspired by geologic strata and the site's vast industrial history, the site's organization allows for a self-guided exploration through various programmatic zones grouped by phenomena.

These zones expand knowledge into a sensorial exploration of phenomena of differing scales: "The Bluffs" highlight the Bank swallows' bi-annual migration; "The Liminal" reveals Narragansett Bay's 3- 4 daily tidal changes; "The Glaciers" showcase drumlins and erratics similar to those deposited during the glaciation period; and "The Horseshoe" gathers community in a coastal amphitheatre where humans can witness the Horseshoe crab phenomena during the specific spawning season of May and June.

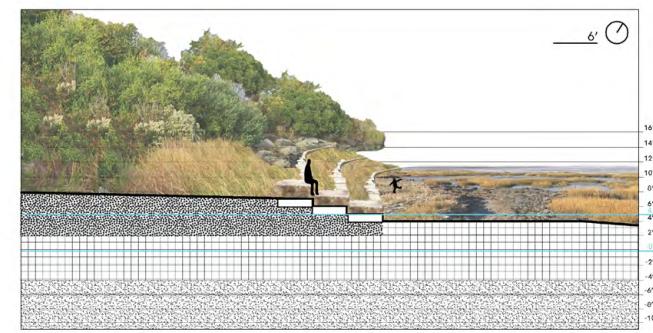
THE GLACIERS



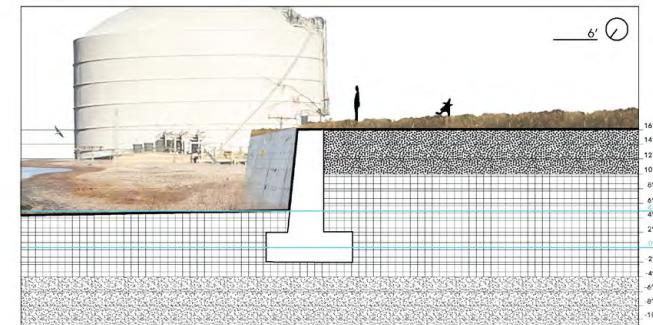
THE LIMINAL



THE HORSESHOE



THE BLUFFS



*Artifacts Case (18" x 24" x 3")*

Unconformity

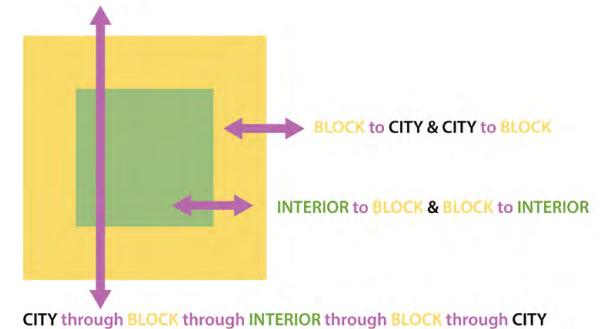
Between each stratum exists the “Unconformity:” the strips of time erased in earth’s history. On the coastline exists various intriguing artifacts of past uses, stories, and histories of this site. By filling the “unconformities” with these artifacts, visitors have an opportunity to discover this site in its originally found condition at time of design (discarded, misused, and forgotten) and set a new datum in its place.



Detailed Model View of The Sanctuary lawn roof & urban plaza (1:8; 3' x 5' model)

The Backyard
Reintroducing the Residential Neighbourhood
New London, CT

Fall 2024
Constructed Landscapes Studio
Jacob Mitchell & Gabriel Vergara Gajardo

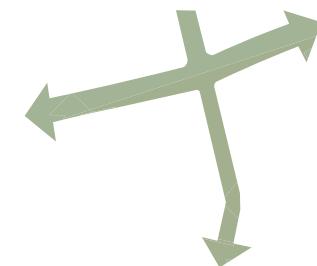


Concept

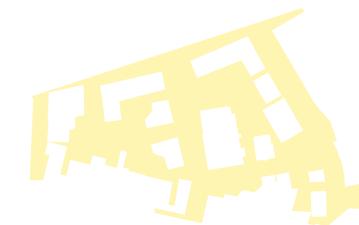
A neighbourhood proposal organizing mixed-use affordable housing and a variety of public spaces that encourage connection, spontaneity, and livability within the historical civic region of New London, Connecticut.

Strategy

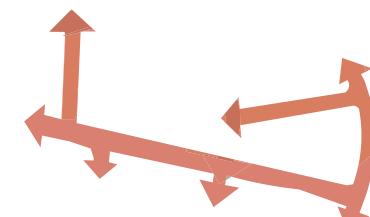
Build the block by **densifying** the building footprints with residential and commercial spaces, **enclosing** an interior for public-access parks and plazas, and **improving** transportation infrastructure for an interconnected neighbourhood within the city's grid.



Mixed (Winthrop Greenway & Union Promenade)

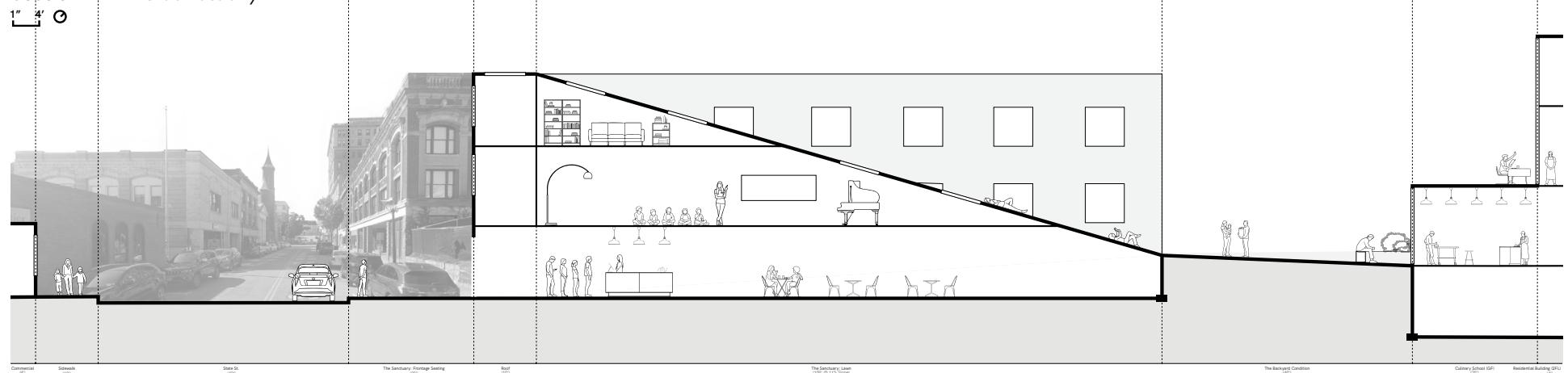


Passive (The Backyard)

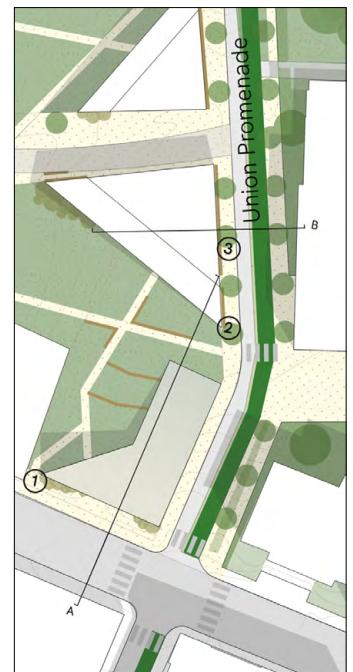
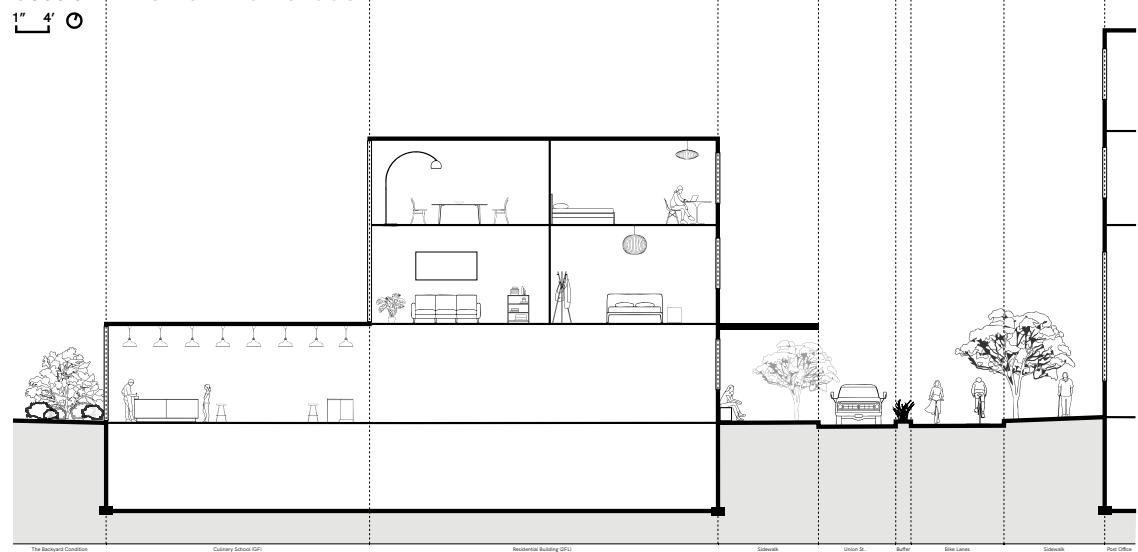


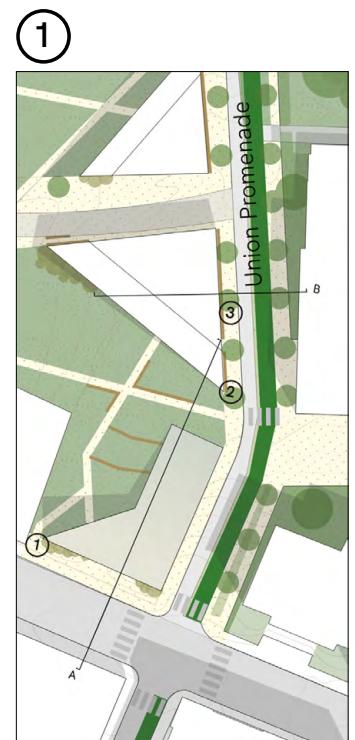
Active (State, Meridian, & Masonic St Retail)

Section A - The Sanctuary

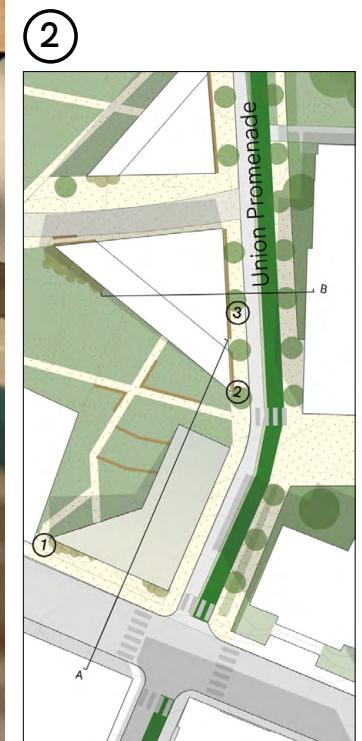


Section B - Union Promenade

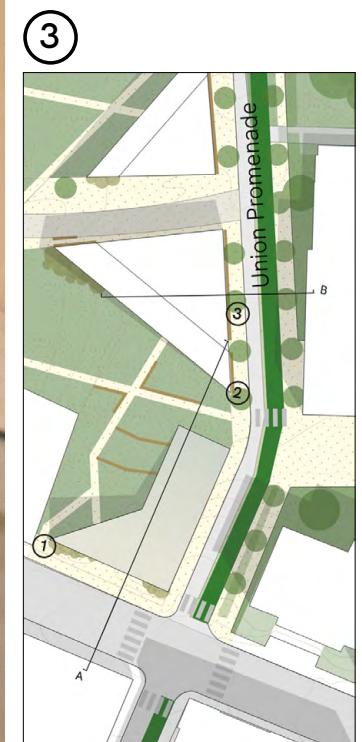




Model Perspective Shot: A neighbour's view of The Sanctuary's lawn (1:8)



Model Perspective Shot: Looking north, seating under building's awning on Union Promenade (1:8)



Model Perspective Shot: Looking south, The Sanctuary's lawn roof at Masonic St. x Union Promenade intersection (1:8)

TransPlus Trans Select waybill

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