

## ABSTRACT

Title of Thesis: Anacostia's Nature Discovery Center on Kingman Island

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Thesis directed by: Associate Professor Amy Gardner, AIA

This thesis proposes to use built form to bridge the increasing divide between youth and the natural world. Through tectonics, it demonstrates that architecture functions as a physical and metaphorical gateway for urbanites to be re-introduced to nature. The renewed relationship with local bio-diversity will enrich the lives of users, and foster environmental stewardship.

Kingman Island is located in eastern Washington D.C.. It's overgrown and undeveloped condition has potential to serve the dense urban neighborhoods in its proximity. The site is accessible to local communities by Metro, bus, as well as automobile. It benefits from neighboring assets such as the National Arboretum and the Kenilworth Aquatic Gardens.

The proposed nature learning center is the focal point of the development, serving as the connection between local neighborhoods and Kingman Island through urban, architectural and landscape design.

ANACOSTIA'S NATURE DISCOVERY CENTER  
ON KINGMAN ISLAND

by Florence Kit Ming Ho

Thesis submitted to the Faculty of the Graduate School of  
the University of Maryland, College Park in partial fulfillment  
of the requirements for the degree of Master of Architecture  
2008

Advisory Committee:

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Professor of the Practice Peter Noonan

Professor Karl Du Puy, AIA

## DEDICATION

This thesis is dedicated to the following people,  
without whose help, it would not have been possible:

Professor Karl du Puy, AIA

Professor of the Practice Peter Noonan, AIA, LEED AP

Associate Professor Amy Gardner, AIA

Distinguished University Professor Richard Etlin, Ph.D., FAAR

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I would like to thank the following people  
for their patience, love + prayers:

my church family +  
my family +  
friends+  
classmates



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## INTRODUCTION

This thesis was inspired by the book ***Last Child in the Woods***, by Richard Louv. The book captures the concern for the youth of this generation's waning interest towards nature. This is best captured by the following quote:

"I like to play indoors better 'cause that's where all the electric outlets are."

-a fourth grader in San Diego

Instead of being encouraged to roam and explore at free will, the notion of play has been modified into supervised and structured recreation; all this done with the best intention to keep our children safe and in efforts to maximize their time. In turn, nature has become mystified, seemingly unpredictable, and a source of trepidation.

This alienation is part of the cause of the rift between civilization and its respectful treatment of nature. Stewardship requires a relationship, so if our relationship with nature is tenuous, it is clear our stewardship towards nature is also strained.

This thesis is developed in 3 scales:

**1. Urban scale of the neighborhood** – connecting the neighborhoods on both banks of the Anacostia, taking first steps to re-knit the urban fabric in a way that commuters and daily users benefit from the amenity of Kingman Island.

**2. Situation of the buildings on the island** – working with topography, solar and wind orientation to maximize natural ventilation, solar gain while minimizing impact on existing conditions of the island.

**3. Tectonics of the building** – using construction systems that enable fluid interplay of outdoor and indoor space, choosing materials from stock-sizes to minimize carbon footprint, composing them in a way fitting and responding to the landscape.

By testing out ideas at these 3 scales, this thesis will demonstrate that built form can be the tool that brings the urban, nature relationship closer.

**SITE**

Where the Sidewalk Ends

There is a place where the sidewalk ends  
And before the street begins,  
And there the grass grows soft and white,  
And there the sun burns crimson bright,  
And there the moon-bird rests from his flight  
To cool in the peppermint wind.

Let us leave this place where the smoke blows black  
And the dark street winds and bends.  
Past the pits where the asphalt flowers grow  
We shall walk with a walk that is measured and slow,  
And watch where the chalk-white arrows go  
To the place where the sidewalk ends.

Yes we'll walk with a walk that is measured and slow,  
And we'll go where the chalk-white arrows go,  
For the children, they mark, and the children, they know  
The place where the sidewalk ends.

Shel Silverstein

Figure 1. Where the Sidewalk Ends

[Shel Silverstein]





Figure 2. Aerial photograph of Kingman Island, Children's Island

[District of Columbia Office of Planning]



# History of Kingman Island

Kingman Island and Heritage Island are located across from RFK Stadium in East Washington DC. In 1916, the Army Corp of Engineers dredged the Anacostia River to create the two islands with the intention of providing a place of recreation for the surrounding neighborhoods. Unfortunately, this plan never came into being, and the islands were left idle. They were used as a dumping ground and gathering place for the homeless and miscreant.

The Northern half of Kingman Island owned by the Park Services, is home to Langston Golf Course. The Southern half of the island had been handed over from the U.S. Department of Interior to the District of Columbia in December 2000. There have been a series of plans for Kingman Island's development, including a proposal for a runway for small planes, as well as a proposal for an amusement park.

More substantially, the Anacostia Waterfront Corporation's ideas for the site included a proposal for a 9/11 memorial grove of trees, an ecological education center as well as recreational parkland. The Anacostia Waterfront Corporation has now been dissolved. It is unclear whether the group's efforts involving partner organizations, Living Classrooms National Capital Region (LC-NCR) and the Earth Conservation Corps (ECC) to rehabilitate the island will continue. The island is currently gated and closed to the general public.

Most recently, the Washington Post had reported on Living Classroom's involvement with the Island's cleanup as well as using the site to host educational programs.

Figure 3. History of Kingman Island

[flickr images - LilySusie]

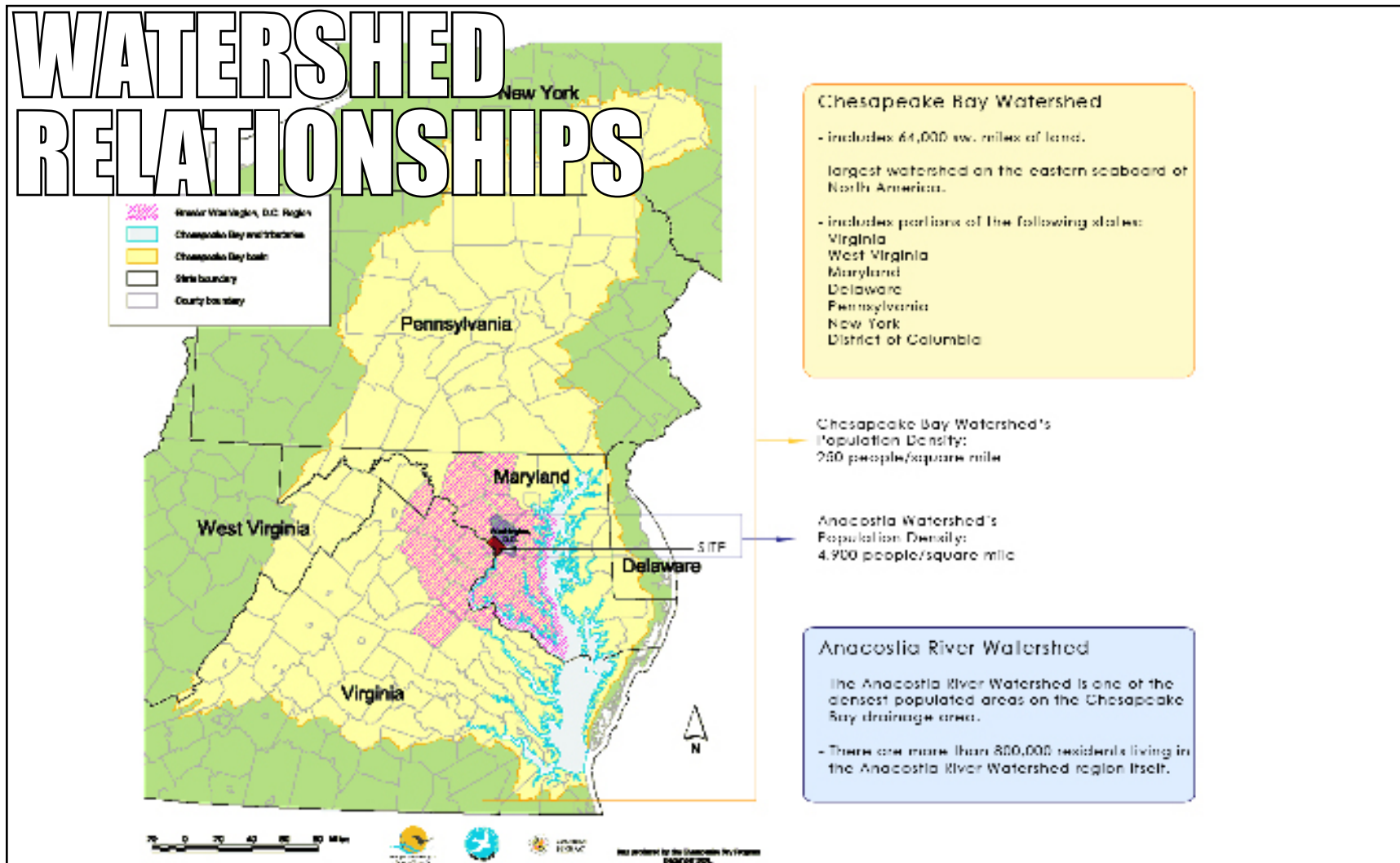


Figure 4. Watershed Relationships

[Chesapeake Bay Foundation]

# Hydrology of the Anacostia River



- includes 176 square miles of drainage area.
- includes portions of 3 political jurisdiction:
  - D.C. = 30.2 sq. miles
  - Montgomery = 60.8 sq. miles
  - Prince George = 85.2 sq miles
- > 344 miles of streams.
- 3 principal sub-drainage areas.
- land uses in watershed:
  - residential, commercial, agricultural
- main sources of pollution:
  - combined stormwater and raw sewage runoff from impervious surfaces



Figure 5. Hydrology of the Anacostia River

[Chesapeake Bay Foundation,  
National Geographic, USGS]



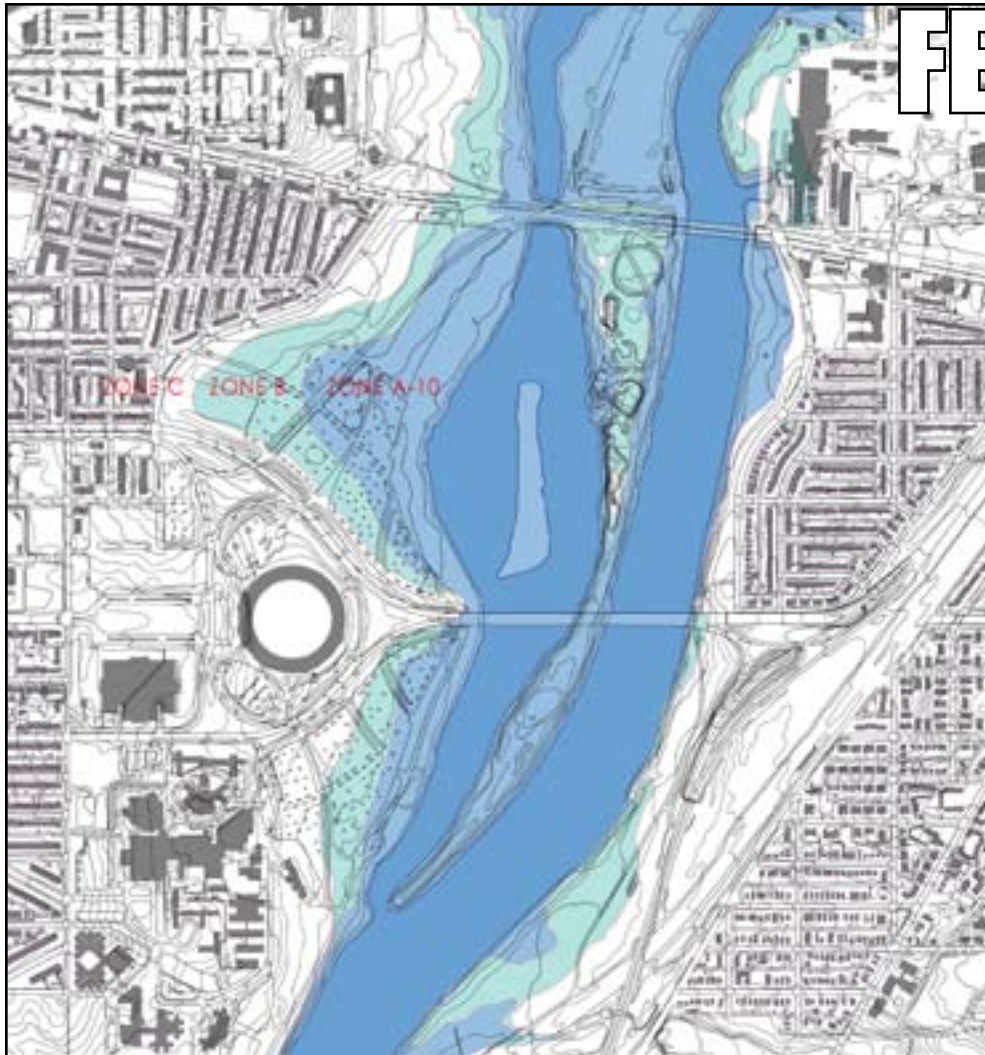


“Historically, the Anacostia estuary was a fully functional freshwater tidal marsh comprising several thousand acres that provided considerable food and habitat for wildlife and consequently served as an invaluable support resource for native Indians and subsequent colonists. Towards the end of the nineteenth century as sewage pollution, agriculturally derived sediments, surrounding development and disease threats increased in the Anacostia, intense pressure developed to remove the problematic wetlands. In the 1980s park planners and resource managers began to envision the opportunity of restoring areas like Kenilworth Lake as a vestige of the once productive wetland habitat. Following a long series of planning and technical evaluations Kenilworth Marsh was reconstructed by the COE for the NPS as a freshwater tidal marsh (32 acres) in the highly urbanized Anacostia watershed in 1993. A similar reconstruction of tidal wetlands at the Kingman Lake site began during the spring of 2000 also using pumped dredge material from the Anacostia channel. Monitoring of various aspects of the restored wetlands at the Kingman site was conducted over a 5-year period (2000-2004).”

Richard Hammerschlag, US Dept. of the Interior, U.S. Geological Survey, Patuxent Wildlife Research Center.

Figure 6. Anacostia's Freshwater Tidal Reconstructed Wetland

[Patuxent Wildlife Research Center, USGS]



# FEMA Floodplain

The FEMA Floodplain determines how closely the development of each shore can reach to the river. It is evident that the floodplain adjacent to RFK stadium is hindering further urban development along the coast line.

The use of the land adjacent RFK Stadium needs to be re-evaluated. Its current state of use being asphalt parking lot leaves a lot to be desired. The massive amount of impervious surface causes irresponsible amount of stormwater runoff that goes straight into the Anacostia River.

Figure 7. FEMA Floodplain

[Florence Ho]



Figure 8. Local Neighborhoods

[Florence Ho]



# Blocks



The systematic urban fabric abruptly stops at a far distance from the waterfront on the west bank of the Anacostia. This is explained by looking at the diagram of the 100 year FEMA floodplain that reaches to the edge of buildings seen in the figure ground.

The street system also fails to knit the two shores of the Anacostia together. The only streets connecting the two shores at this section cross over Kingman Island. This is a great opportunity for Kingman Island to be involved in the re-knitting of the two shores.

Figure 9. Blocks

[Florence Ho]

# Metro + Bus Lines

There is currently very poor public transportation infra-structure for visiting the Kingman Island area. The closest Metro stop at Naval Archives serves RFK Stadium. It require pedestrians to walk for more than a 1/4 mile - and mostly next to fast-moving vehicles.

The bus system seem to provide more accessible stops, even so, they are intended to provide transportation to the residential neighborhoods growing towards the edge of the Anacostia waterfront.

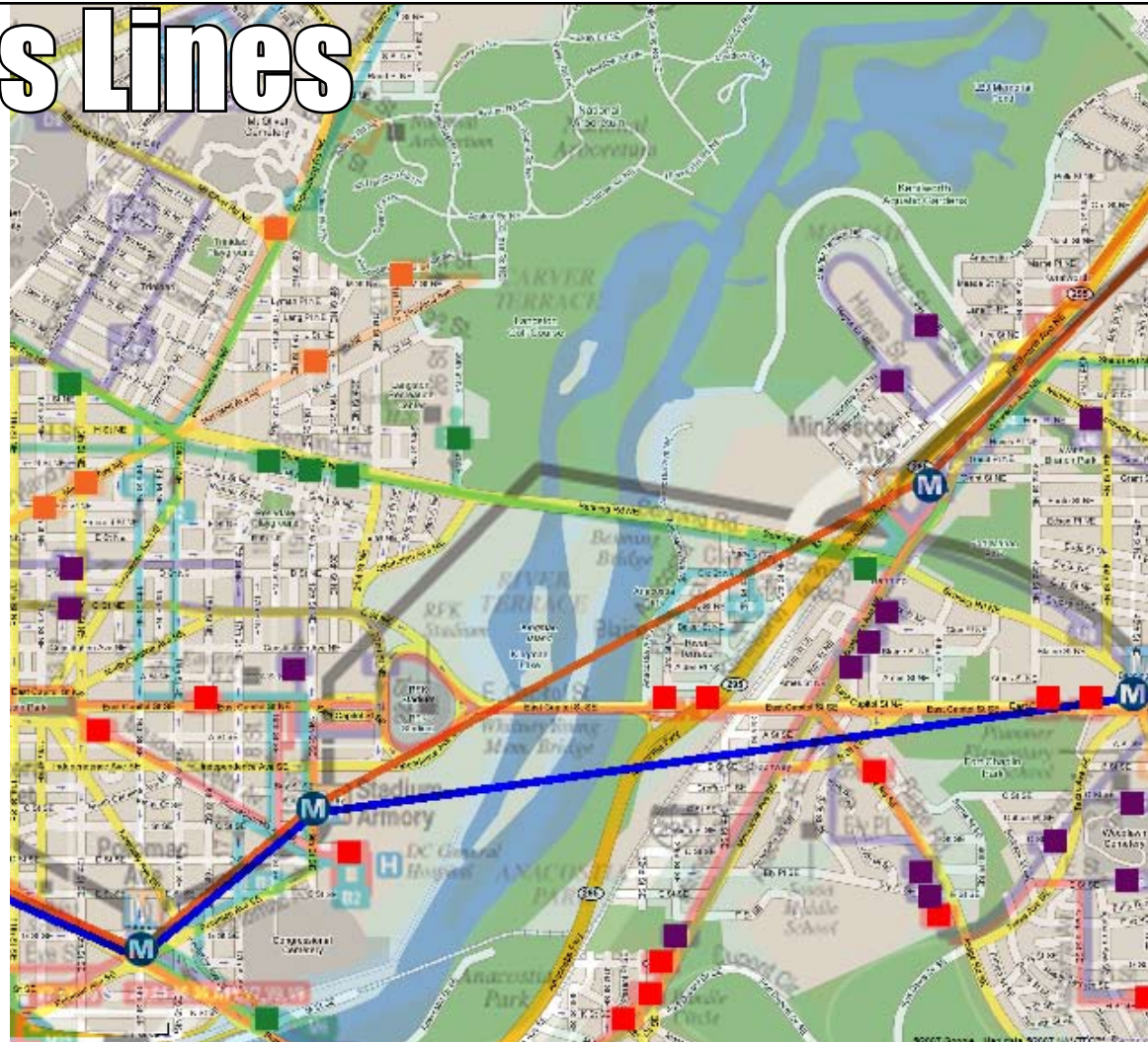
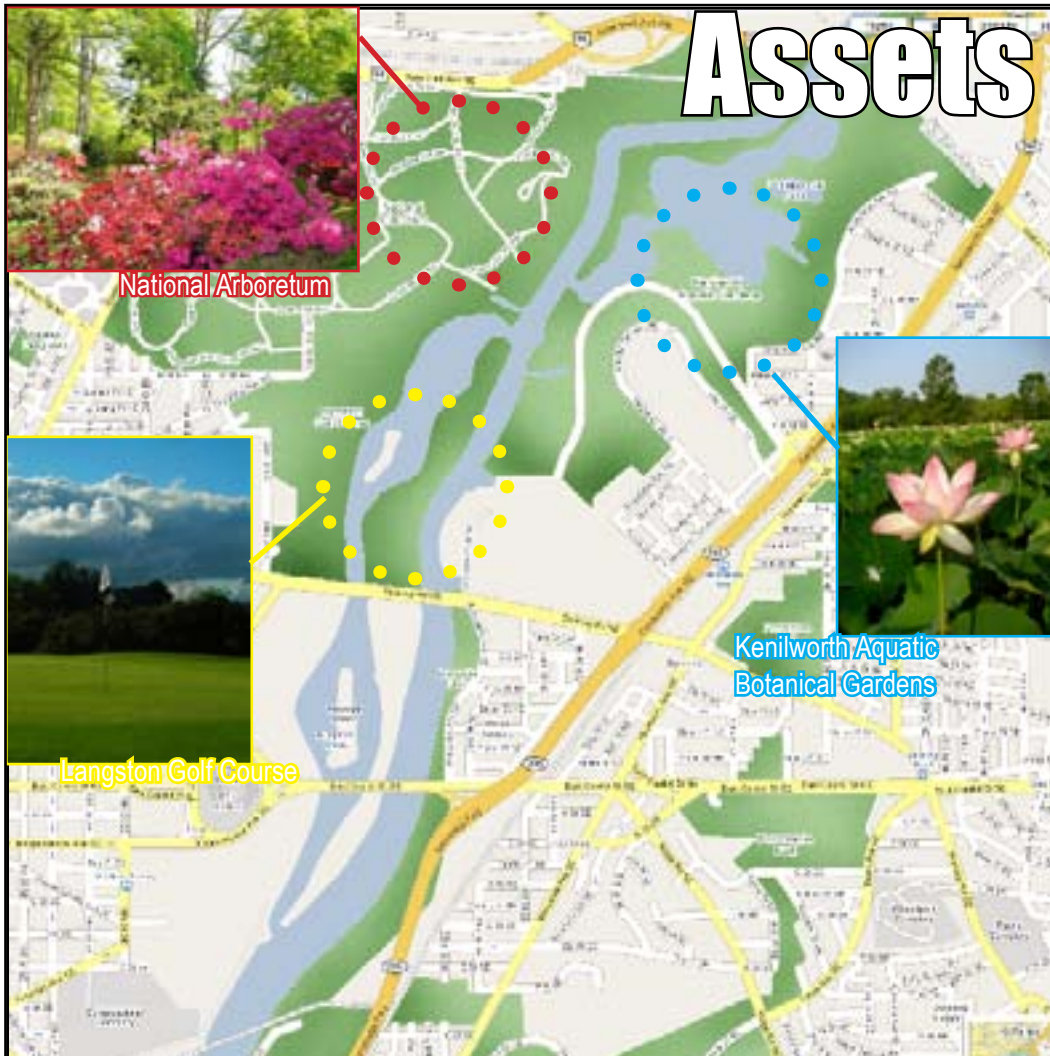


Figure 10. Metro and Bus Lines

[Florence Ho]



# Assets + Landmarks



Kingman Island is located downstream from the National Arboretum, the National Aquatic Botanical Gardens and Langston Golf Course.

Located to the East of the National Mall, this abundant natural resource on the Anacostia River can contribute towards Washington D.C. as an attraction towards ecological tourism.

The addition of a nature learning center that focuses on the characteristics of the Anacostia River located on Kingman Island will provide

Figure 11. Assets and Landmarks

[Florence Ho]

# Access Points



Figure 12. Access Points

[GoogleEarth]



Figure 13. Problematic Conditions

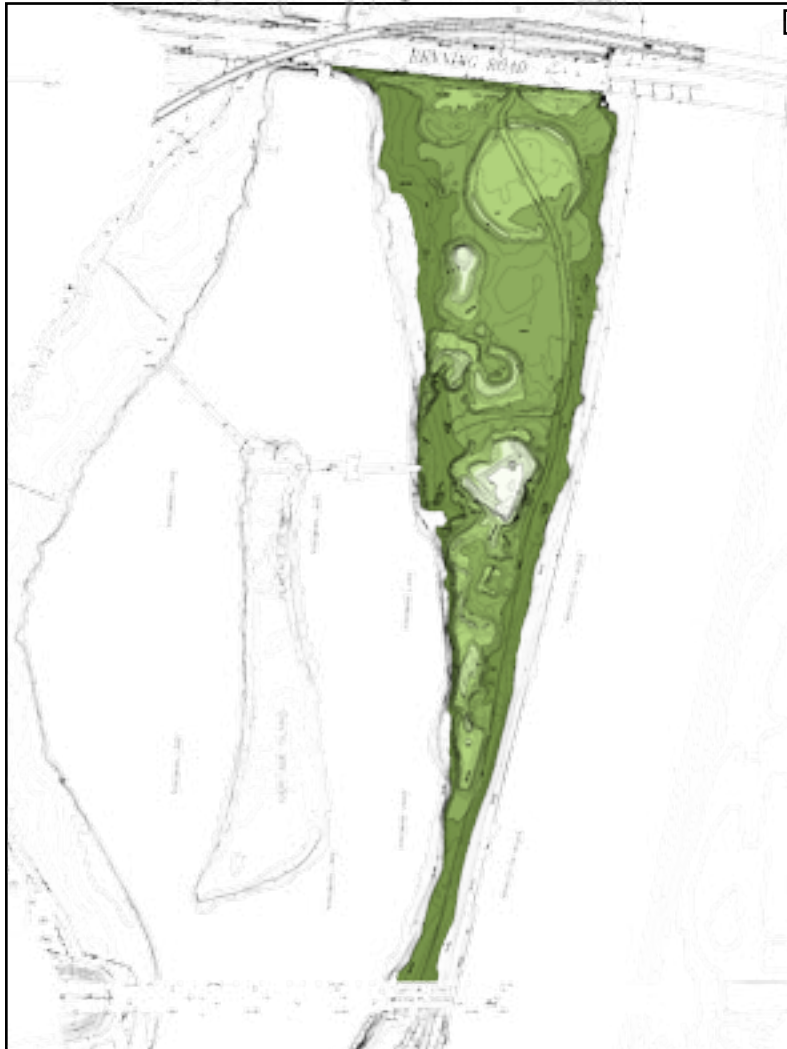
[Florence Ho]



Figure 14. Sun and Wind

[Florence Ho]

# Topography + Soil



As an artificial island, Kingman Island and its neighboring Heritage Island consists of predictably mixed soil types generally in the loamy category. Loamy soil is characteristic to be ideal for plants to thrive as it retains nutrients and water well, while still allowing water to drain freely. Loam is composed of sand, silt and clay in relatively even approximately 40:40:20 ratio. It is considered ideal for gardening and agricultural uses.

Soil maps and information provided by the Natural Resource Conservation Service label Kingman Island as U1 – udorthents. This type of soil generally applies to soil found in areas of cut and fill. It is soil similar to the substratum of adjacent soils but is of more variable characteristics because of its source from the subsoil and substratum of nearby soils.

The makeup of loamy soil is not able to support shallow foundations without shifting, so piles to bedrock is required.

Figure 15. Topography and Soil

[Florence Ho]



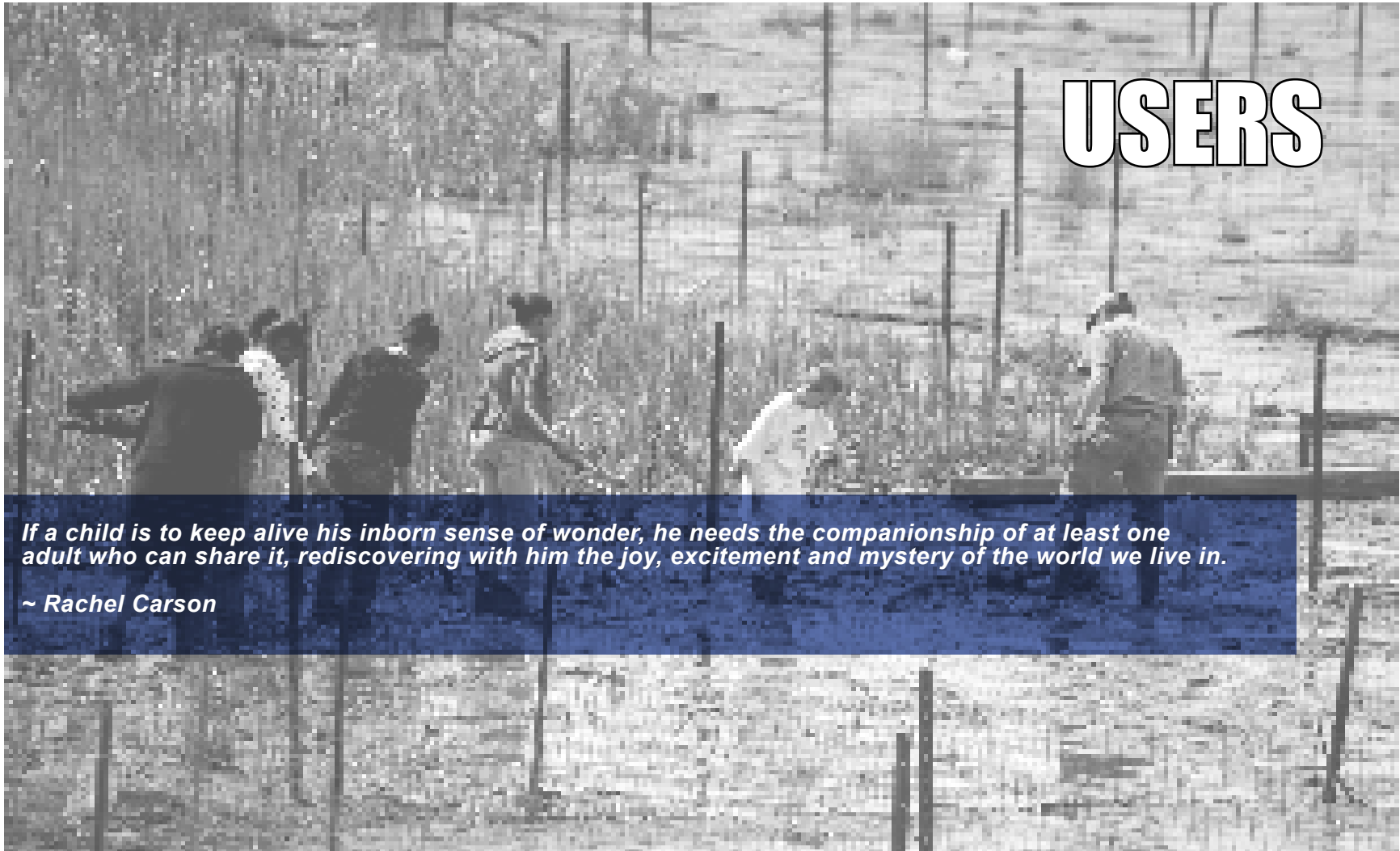
# Kingman Island's Vegetation



The vegetation on Kingman Island consists of native and invasive species of trees, shrubs and ground covering. Due to a lack of development since its making in the early 20's, the island had been allowed to grow at its own pace and will, becoming the wilderness it is today. The island and its wilderness is now home to many bird species indigenous to the Anacostia Watershed, as well as mammals and reptiles such as beavers and turtles.

Figure 16. Kingman Island's Vegetation

[Florence Ho]



# USERS

*If a child is to keep alive his inborn sense of wonder, he needs the companionship of at least one adult who can share it, rediscovering with him the joy, excitement and mystery of the world we live in.*

*~ Rachel Carson*

Figure 17. Users

[flickr images - LilySusie]





Figure 18. Educational User

[Chesapeake Bay Foundation, Living Classrooms]



## CONNECTION

providing pedestrian and cycling friendly paths across the Anacostia River for the Kingman Park (West bank of Anacostia) and River Terrace + Benning Heights (East bank of Anacostia) neighborhoods.



Figure 19. Commuter User

[Florence Ho]



# RECREATION

canoe rental  
trails + park space  
wildlife observatories

providing outdoor recreation for local communities and the region.

Figure 20. Recreational User

[flickr images]

# PROGRAM



## *The Bridge*

*This bridge will only take you halfway there  
To those mysterious lands you long to see:  
Through gypsy camps and swirling Arab fairs  
And moonlit woods where unicorns run free.  
So come and walk awhile with me and share  
The twisting trails and wondrous worlds I've known.  
But this bridge will only take you halfway there-  
The last few steps you'll have to take alone.*

*by Shel Silverstein*

Figure 21. Program

[flickr images - LilySusie]

# pavilion: Treehouse

## TREEHOUSE

treehouse classroom  
observing deck

Location: high topography  
orientation: West

Adjacency: access through trail

Access: public -  
recreational + educational users

Materiality: wood/ steel connection

Systems: lighting, unconditioned

Occupancy: 20 persons

Square Footage: 800 s.f.



Figure 22. Program for Treehouse

[Baumraum Architects, Florence Ho]

# Treehouse

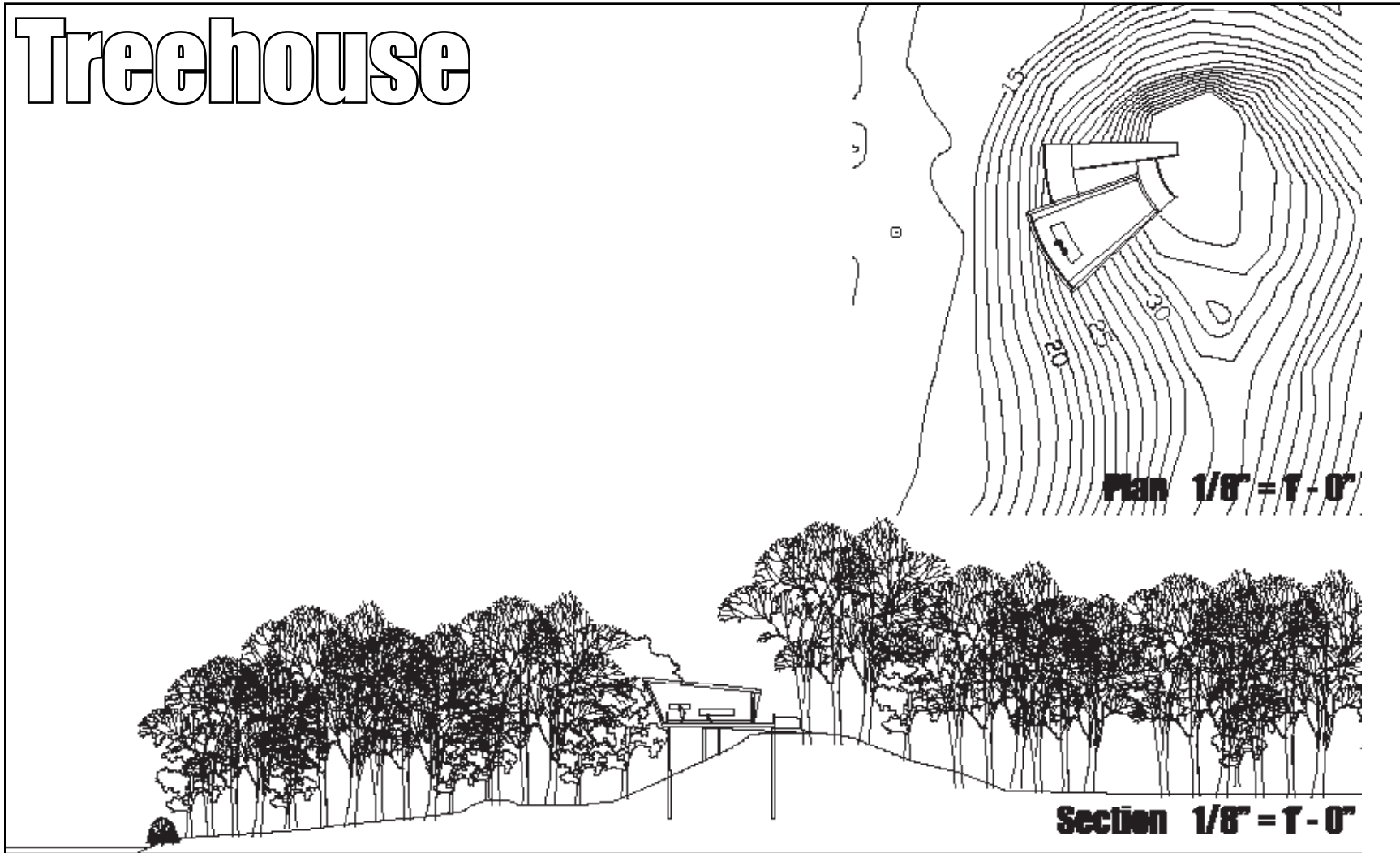


Figure 23. Plan and Section of Treehouse

[Florence Ho]





Figure 24. Perspective Sketch of Treehouse

[Florence Ho]

# pavilion: Wetland Lookout

Wetland Lookout

wetland observation area

Location: looking at Kingman Lake  
wetlands under water-level

Orientation: West

Adjacency: access through trail

Access: public -

recreational + educational users

Materiality: concrete, wood, steel

Systems: lighting, unconditioned

Occupancy: 30 persons

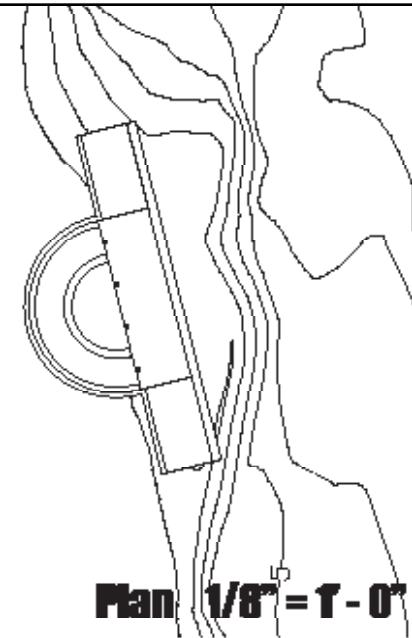
Square Footage: 1,000 s.f.



Figure 25. Program for Wetland Lookout

[Florence Ho]

# Wetland Lookout



**Plan 1/8" = 1'-0"**

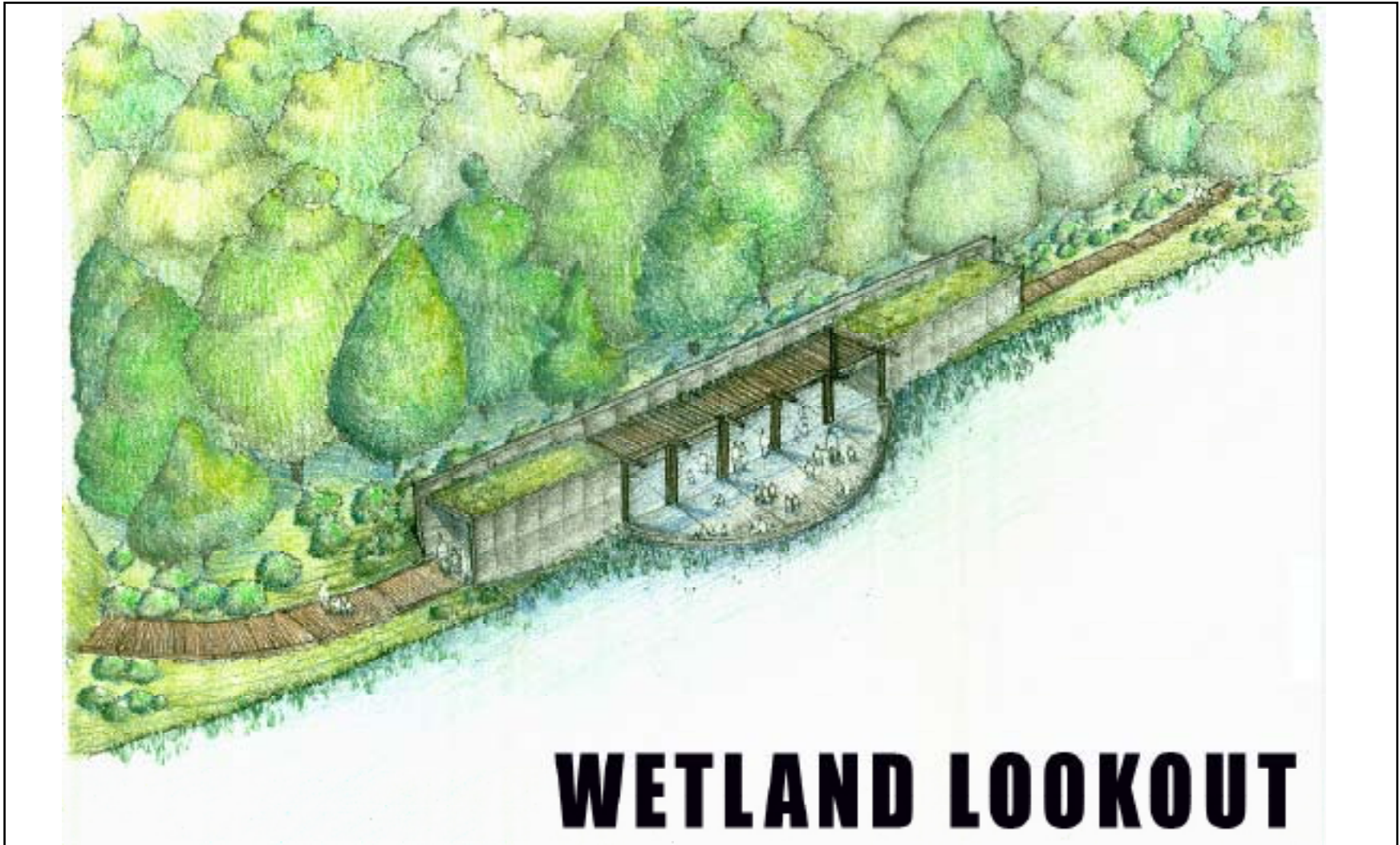


**Section 1/8" = 1'-0"**

Figure 26. Plan and Section of Wetland Lookout

[Florence Ho]





# WETLAND LOOKOUT

Figure 27. Perspective of Wetland Lookout

[Florence Ho]

# pavilion: Boathouse

## Boathouse

rental office  
boat maintenance + storage  
deck

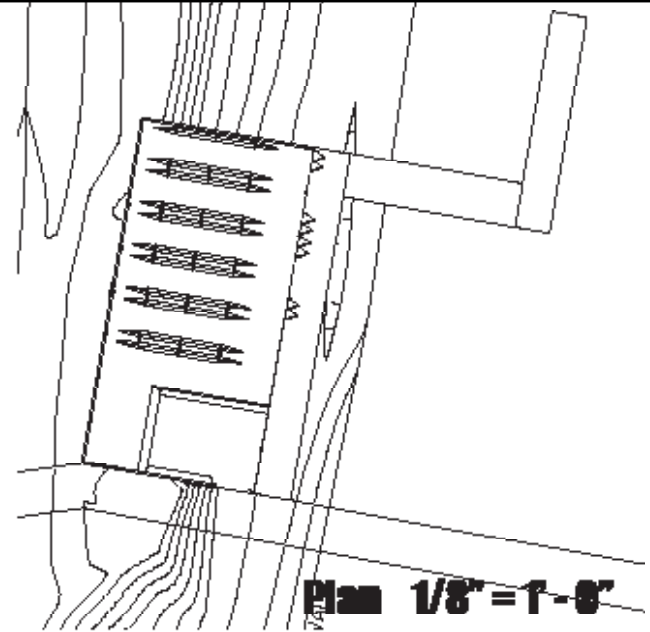
Location: East bank of Kingman Island  
Orientation: East  
Adjacency: access through trail  
Access: public -  
recreational + educational users  
Materiality: wood, steel  
Systems: lighting, unconditioned  
Occupancy: 20 persons  
Square Footage: 3,200 s.f.



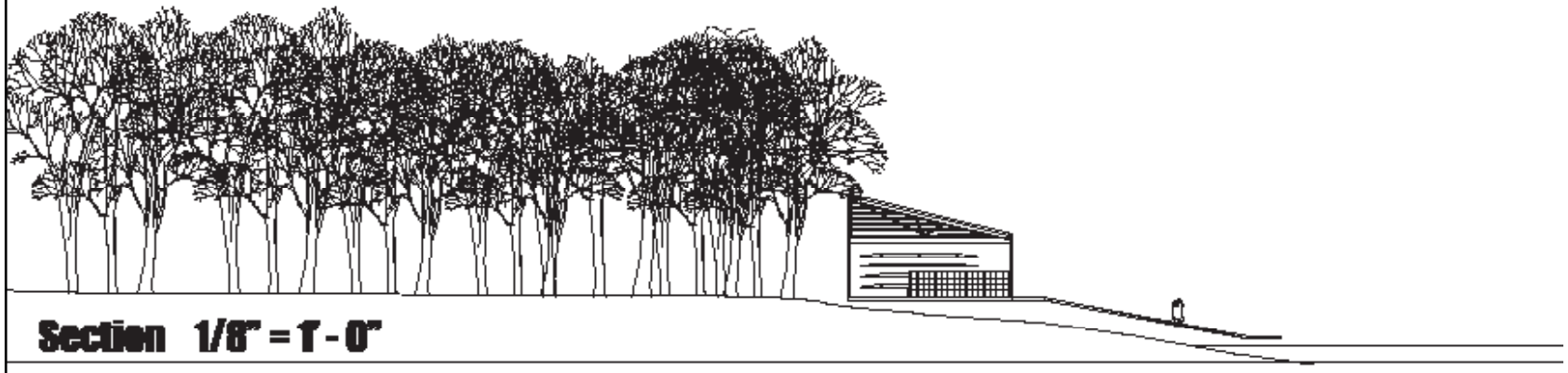
Figure 28. Program for Boathouse

[Florence Ho]

# Boathouse



**Plan 1/8" = 1'-0"**



**Section 1/8" = 1'-0"**

Figure 29. Plan and Section of Boathouse

[Florence Ho]



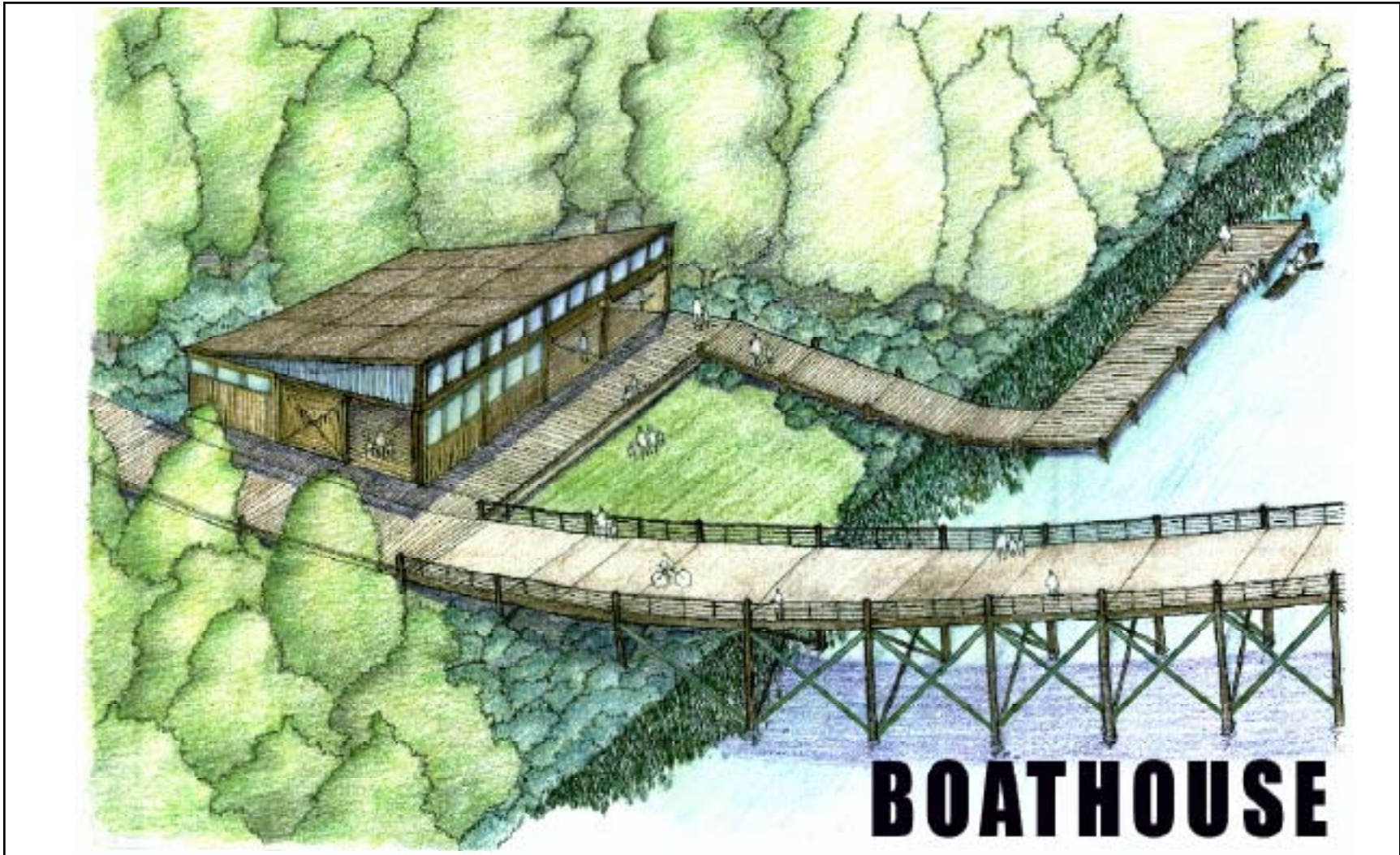


Figure 30. Perspective Sketch of Boathouse

[Florence Ho]



# camp: Library + Seminar

## Library

library + reading room  
librarian's office  
computers

Location: above FEMA floodplain  
Orientation: West  
Adjacency: Dining Room  
Access: private - educational users  
Materiality: wood, steel  
Systems: lighting, HVAC, conditioned  
Occupancy: 75 persons  
Square Footage: 3,600 s.f.



Figure 31. Program for Library

[Alsop Architects]

# camp: Library + Seminar

## Seminar Room

lecture hall  
multi-function flexible space

Location: in Library building

Orientation: West

Adjacency: Dining Room

Access: educational users

Materiality: wood, steel

Systems: lighting, HVAC, conditioned

Occupancy: 75 persons

Square Footage: 800 s.f.



Figure 32. Program for Seminar Room

[Alvar Aalto, Googleimages]

# Library + Seminar Rm.



**SOUTHEAST ELEVATION**

**1/4" = 1' - 0"**

Figure 33. Southeast Elevation of Library and Seminar Room

[Florence Ho]

# Library + Seminar Rm.

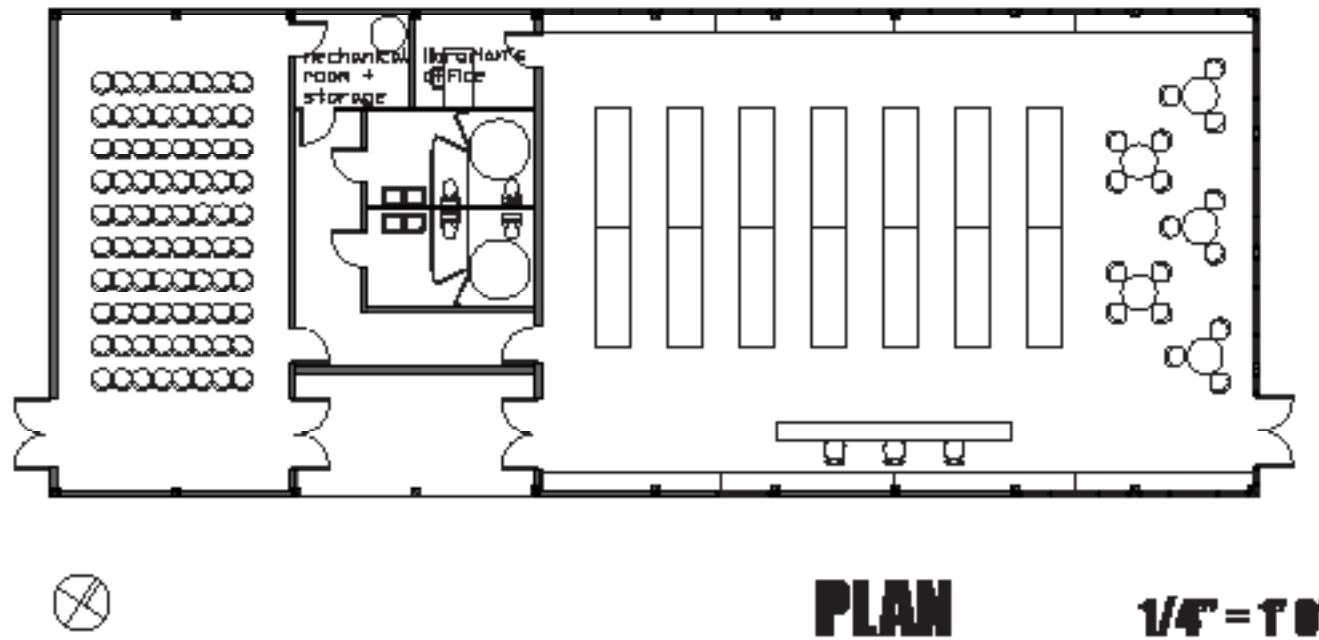
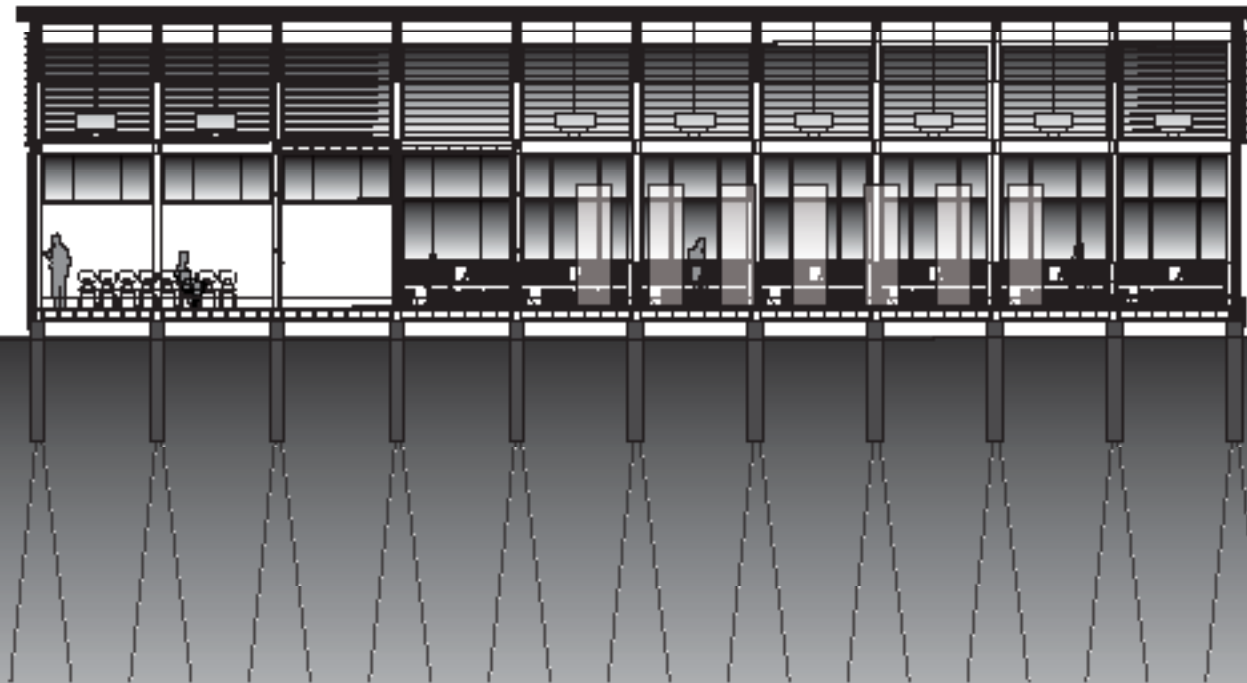


Figure 34. Plan of Library and Seminar Room

[Florence Ho]



# Library + Seminar Rm.



**LONGITUDINAL SECTION**

**1/4" = 1' - 0"**

Figure 35. Longitudinal Section of Library and Seminar Room

[Florence Ho]



Figure 36. Aerial Perspective of Camp Buildings

[Florence Ho]

# Camp: Dining Room

## Dining Room

Dining/ gathering space  
Kitchen

Location: above FEMA Floodplain

Orientation: West

Adjacency: Library + Seminar Rm.

Access: educational users

Materiality: wood, steel

Systems: lighting, HVAC, conditioned

Occupancy: 80 persons

Square Footage: 3.600 s.f.



Figure 37. Collage of Program for Dining Room

[Florence Ho]

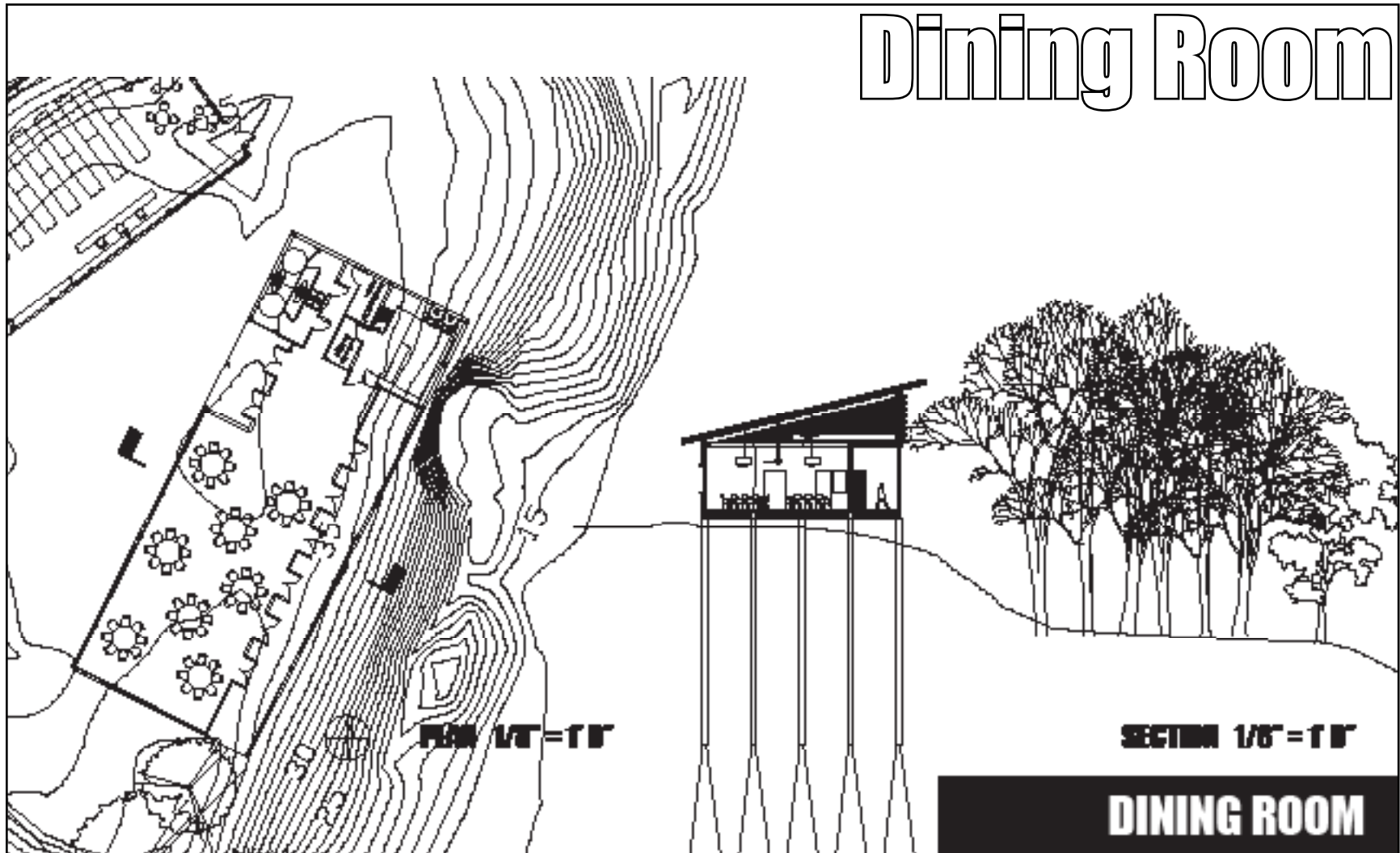


Figure 38. Plan and Section of Boathouse

[Florence Ho]



# Camp: Laboratory Classroom

## Laboratory Classroom

Research + Study in association with  
Greenhouse + Research Garden

Location: above FEMA Floodplain

Orientation: West

Adjacency: Library + Seminar Rm, Dining Rm.

Access: educational users

Materiality: wood, steel

Systems: lighting, HVAC, conditioned

Occupancy: 30 persons

Square Footage: 800 s.f.



Figure 39. Laboratory Classroom

[Florence Ho]

# Laboratory Classroom

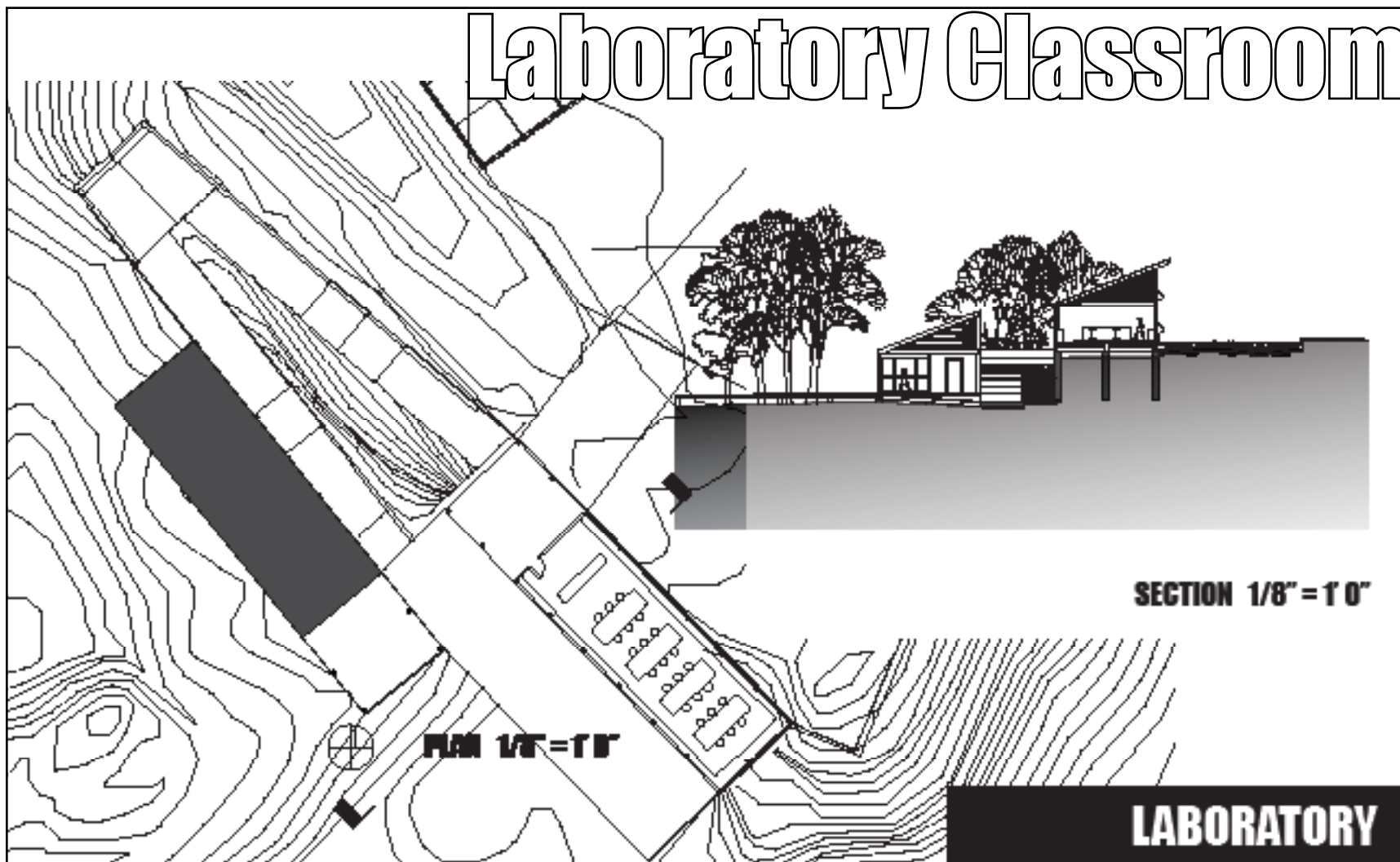


Figure 40. Plan and Section of Laboratory Classroom

[Florence Ho]

# camp: Greenhouse

## Greenhouse

indoor cultivation of indigenous plants  
potting shelves, sinks

Location: above FEMA floodplain

Orientation: Long-side South facing

Adjacency: Laboratory Classroom

Access: educational users

Materiality: concrete, wood, steel

Systems: lighting, HVAC, unconditioned

Occupancy: 30 persons

Square Footage: 800 s.f.



Figure 41. Program of Greenhouse

[flickrimages]



# camp: Research Garden

## Research Garden

outdoor cultivation of indigenous plants

Location: flat topography

Orientation: South facing

Adjacency: Laboratory Classroom +  
Greenhouse

Access: educational users

Materiality: n.a.

Systems: n.a.

Occupancy: 20 persons

Square Footage: 800 s.f.



Figure 42. Program of Research Garden

[Living Classrooms Foundation]



# Greenhouse + Research Garden

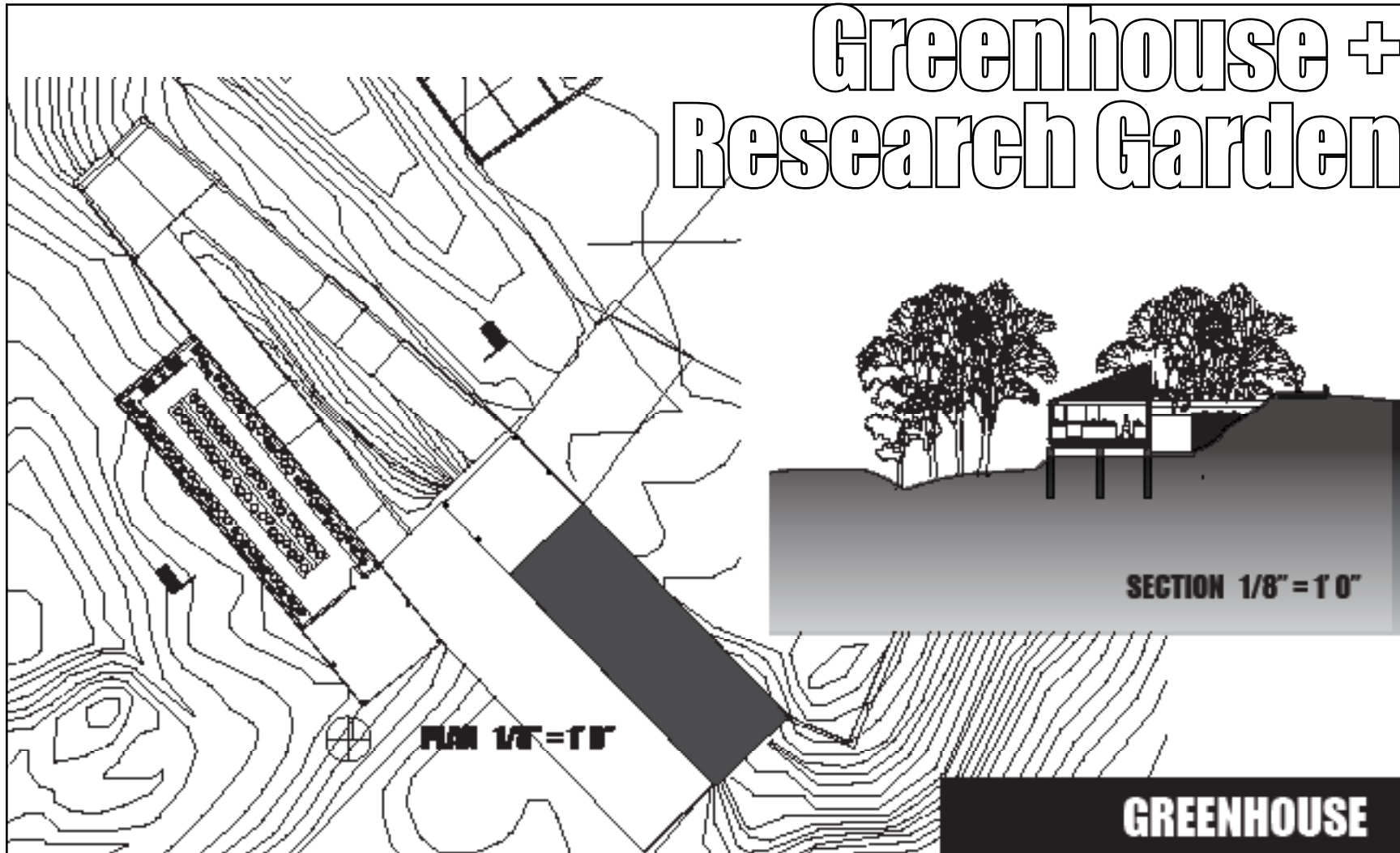


Figure 43. Plan and Section of Greenhouse + Research Garden

[Florence Ho]

# camp: Living Quarters

## Living Quarters

lodgings + sleeping quarters

Location: above FEMA floodplain

Orientation: West

Adjacency: camp buildings

Access: educational users

Materiality: concrete, wood, steel

Systems: lighting, HVAC, conditioned

Occupancy: 80 persons

Square Footage: 1,600 s.f. each



Figure 44. Program of Living Quarters

[Living Classroom Foundation, flickrimages]

# Living Quarters



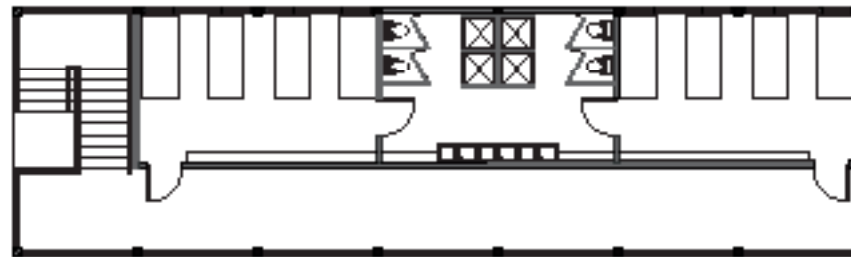
**EAST ELEVATION**

**1/4" = 1'-0"**

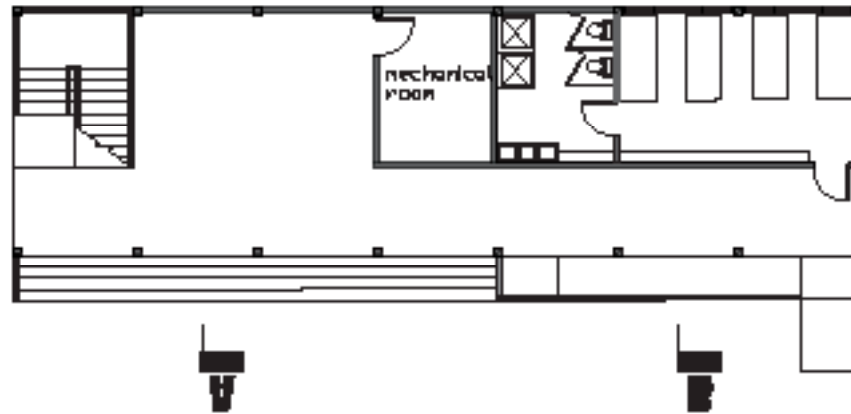
Figure 45. East Elevation of Living Quarters

[Florence Ho]

# Living Quarters



**UPPER LEVEL**



**GROUND LEVEL**

47

Figure 46. Ground and Upper Floor Plans of Living Quarters

[Florence Ho]



# Living Quarters

48

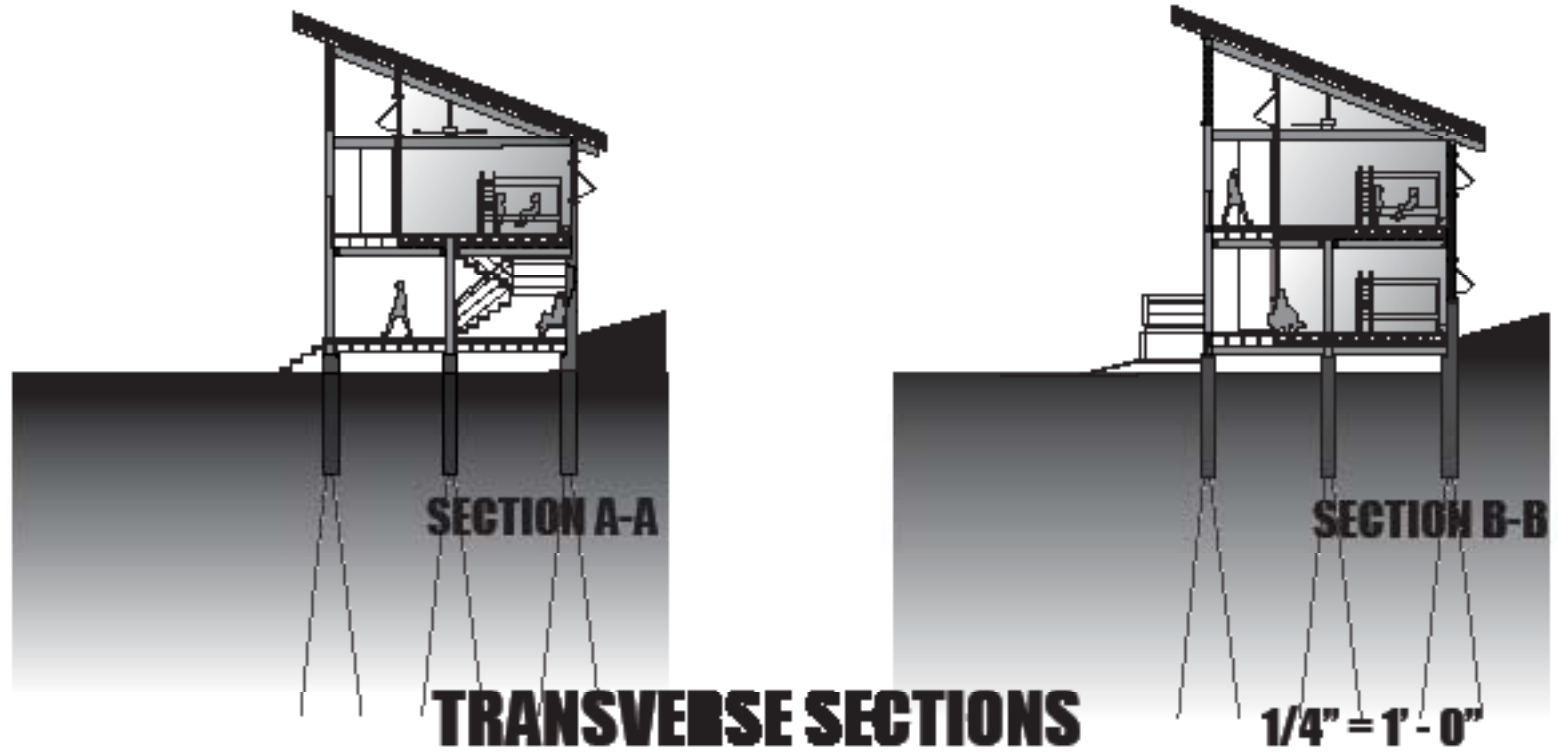


Figure 47. Transverse Section A-A and B-B of Living Quarters

[Florence Ho]

# connections: Trestle Bridge

## Trestle Bridge

connecting mainland with  
Kingman Island + Heritage Island

Location: connection points between  
mainland and island

Orientation: n.a.

Adjacency: Boathouse

Access: public - commuter, recreational +  
educational users

Materiality: wood, steel

Systems: unconditioned

Occupancy: n.a.



Figure 48. Program for Trestle Bridge

[flickrimages - ecstaticist - on holiday]

# connections: boardwalk paths

## Trails + Lookouts

elevated boardwalk paths

Location: throughout island

Access: public - commuter, recreational +  
educational users

Materiality: wood, steel

Systems: lighting



Figure 49. Program of Trestle Bridge

[Florence Ho]



Figure 50. Site Plan

[Florence Ho]





Figure 51. Entering Meadow Circle

[Florence Ho]



Figure 52. View in Meadow towards Benning Road

[Florence Ho]



Figure 53. On Trestle Bridge Looking Towards Boathouse

[Florence Ho]



Figure 54. View from Elevated Pedestrian Bridge

[Florence Ho]





Figure 55. View from Canoe on Anacostia River

[Florence Ho]



Figure 56. View of Typical Boardwalk Path

[Florence Ho]



Figure 57. View Towards Outdoor Reading Room in Library

[Florence Ho]



Figure 58. View from Rain Garden towards Library

[Florence Ho]





Figure 59. Planted Space between Library and Dining Room

[Florence Ho]



Figure 60. View from Outside Laboratory towards Camp

[Florence Ho]

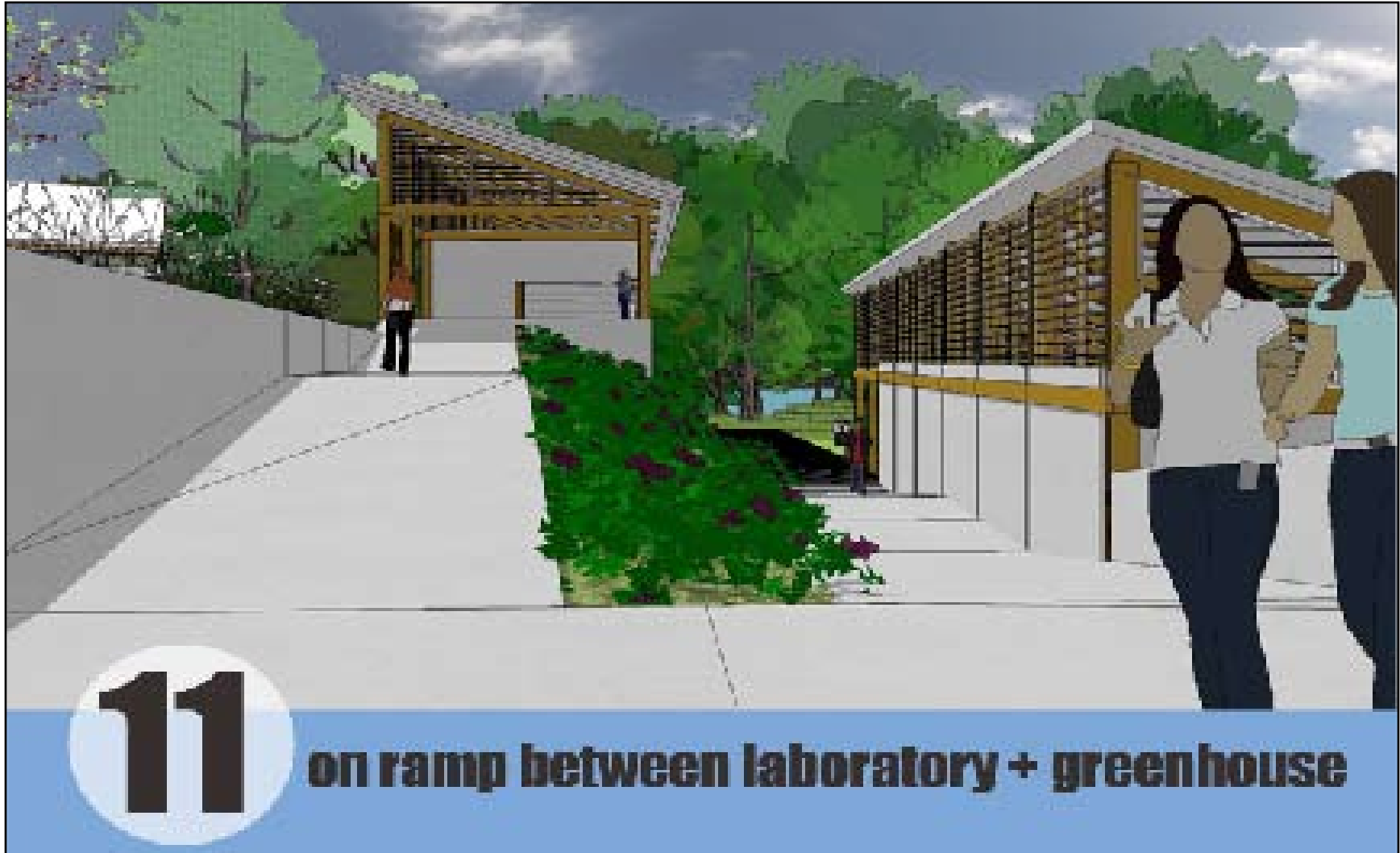


Figure 61. On Ramp between Laboratory and Greenhouse

[Florence Ho]



Figure 62. View from Research Garden towards Ramp

[Florence Ho]



Figure 63. View from Inside the Greenhouse

[Florence Ho]



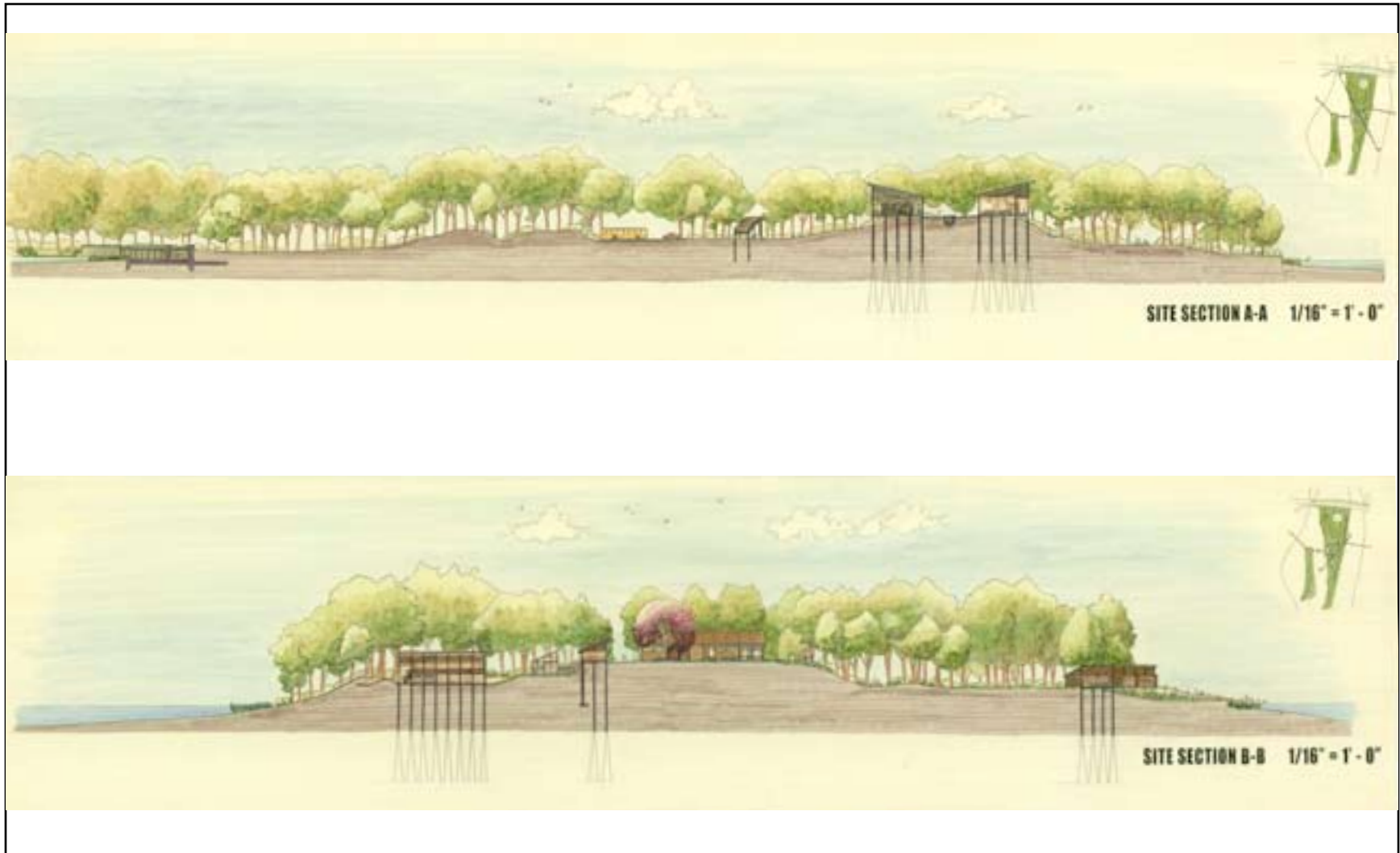


Figure 64. Site Sections A-A and B-B

[Florence Ho]

# Design Principles

BUILDINGS AS VEHICLE TO EXPERIENCE ALL ASPECTS OF NATURE: *Water, Earth, Sky*

BUILDING MODESTLY AND RESPONSIBLY  
*Promoting Respect and Stewardship of nature*

DRAWING CONNECTION BETWEEN URBAN AND NATURE *in 3 scales:*

1. *everyday living - commute*
2. *weekend recreation*
3. *educational retreat*

1. *urban scale - connecting Kingman Island to DC*
2. *site - fitting buildings on site*
3. *tectonics - relationship of buildings to the ground*

Figure 65. Design Principles

[flickr images - LilySusie]

# PRECEDENT + FRIENDS

*There is no first world and third world. There is only one world, for all of us to live and delight in.*

*~ Gerald Durrell*

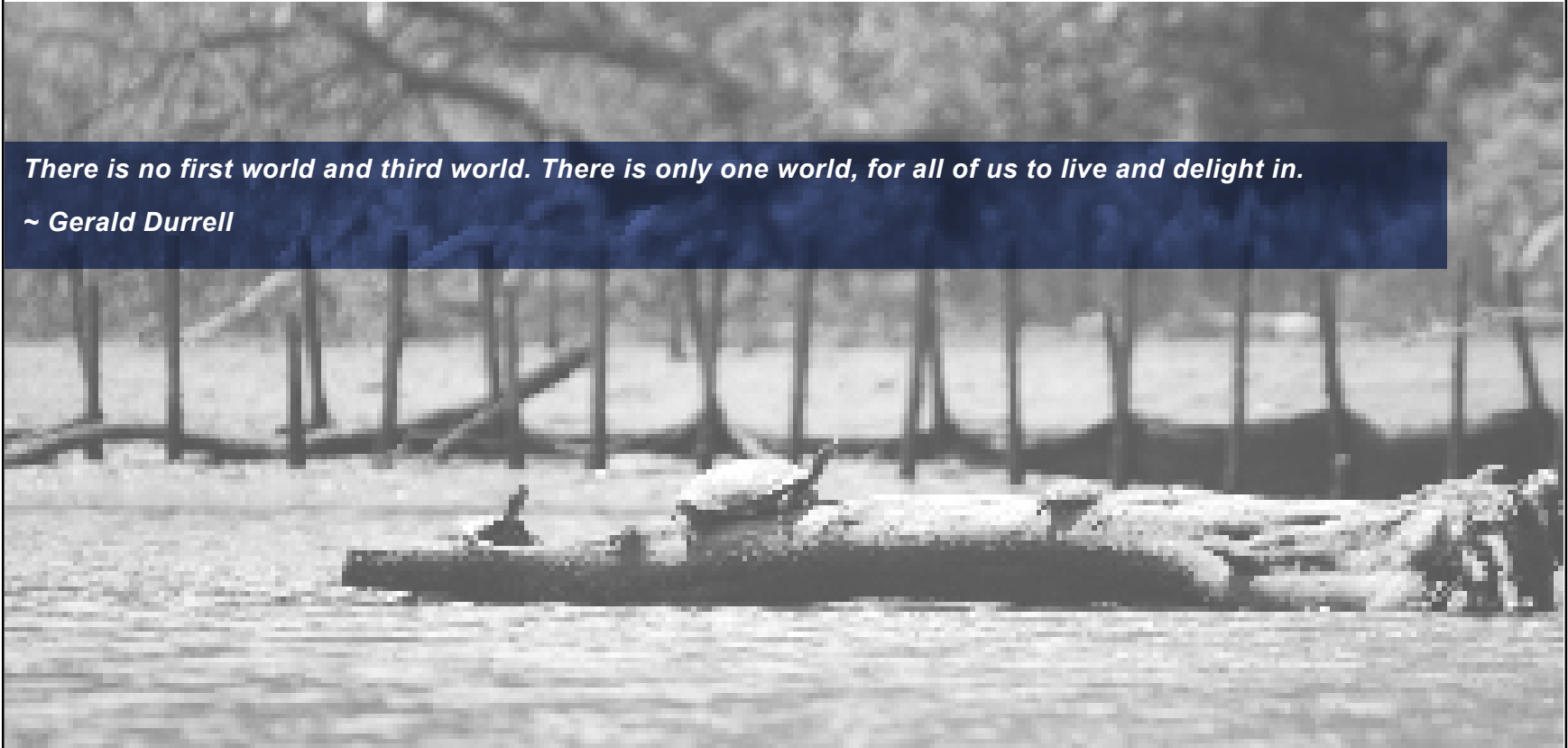
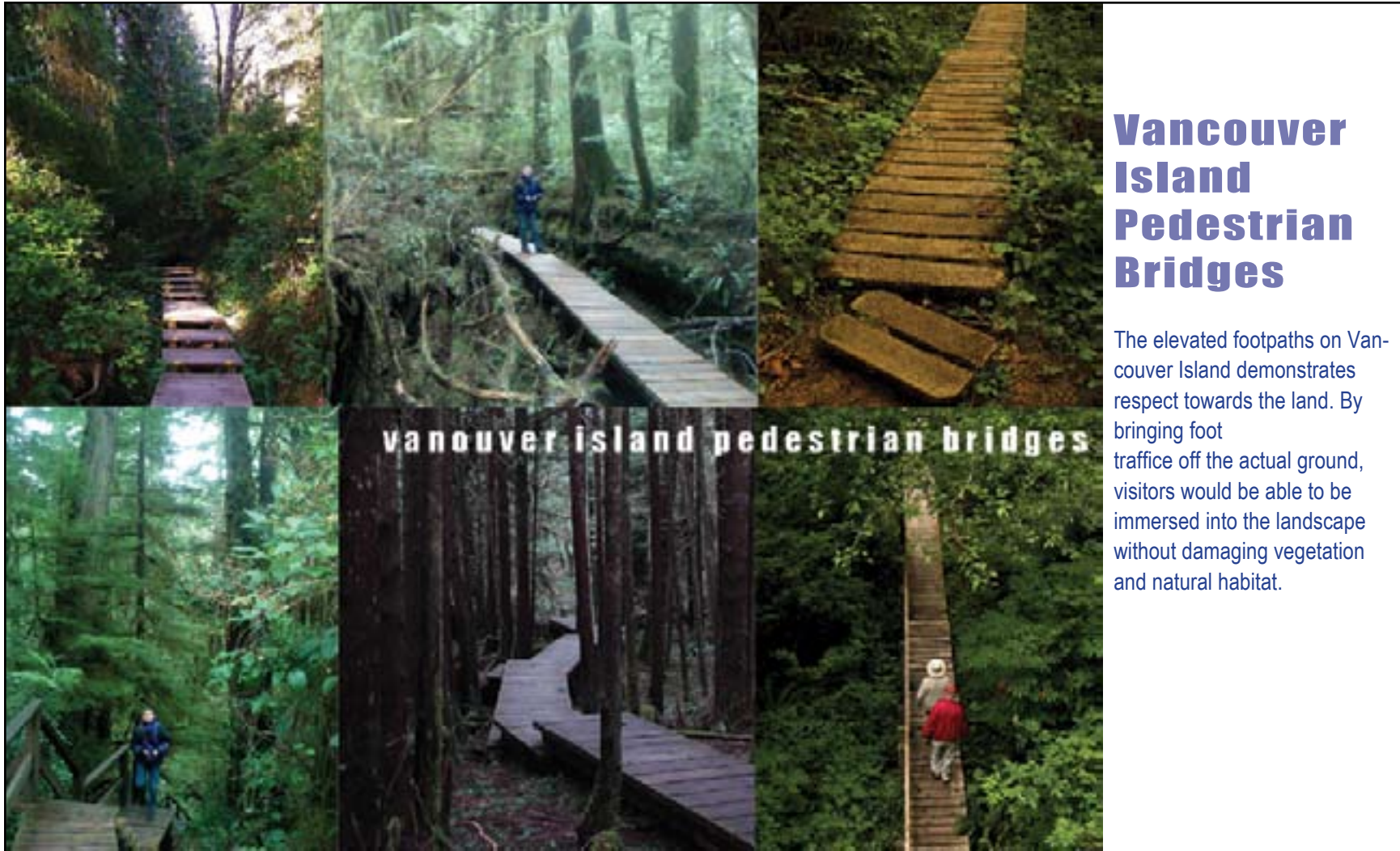


Figure 66. Precedent and Friends

[flickr images - LilySusie]



## Vancouver Island Pedestrian Bridges

The elevated footpaths on Vancouver Island demonstrates respect towards the land. By bringing foot traffic off the actual ground, visitors would be able to be immersed into the landscape without damaging vegetation and natural habitat.

Figure 67. Vancouver Island Pedestrian Bridges

[Prof. Amy Gardner, Google Images]





## Vancouver Island Pedestrian Bridges

The wooden boardwalk footpaths are able to traverse diverse topography, providing gradual gradient change, making it a less strenuous walk around the site, catering to hikers of varying skill levels and abilities.

These footpaths can be built in 6' - 0" to 12' - 0" modules. Construction and maintenance of the pathways are facilitated by using a modular system, with add ons such as ramps, stairs and stilted walkways.

Figure 68. Vancouver Island Pedestrian Bridges

[Google Images]



## **Pedestrian Bridge by Miro Rivera Architects**

This private pedestrian bridge's design was inspired by the reeds growing in the span of water which the bridge spans. It is made of steel re-bars bent to wrap on the abutments, providing a light and textured aesthetic, so that the bridge looks part of the organic plant life along the banks of the water. The simple use of recycled rebars is effective and sustainable.

Figure 69. Pedestrian Bridge by Miro Rivera Architects

[Miro Rivera Architects]



## Selkirk Waterway Trestle Bridge Victoria, B.C.

The Selkirk Waterway Trestle Bridge spans the Gorge Waterway in Victoria, B.C. in Canada. Originally used for trains, this bridge has been converted for use by pedestrians and cyclists.

Its generous width and stable structure adapted from previous use is most suitable for public recreational purposes.

Figure 70. Selkirk Waterway Trestle Bridge, Victoria B.C.

[Flickr Images - ecstaticist - on holidays, Google Images]

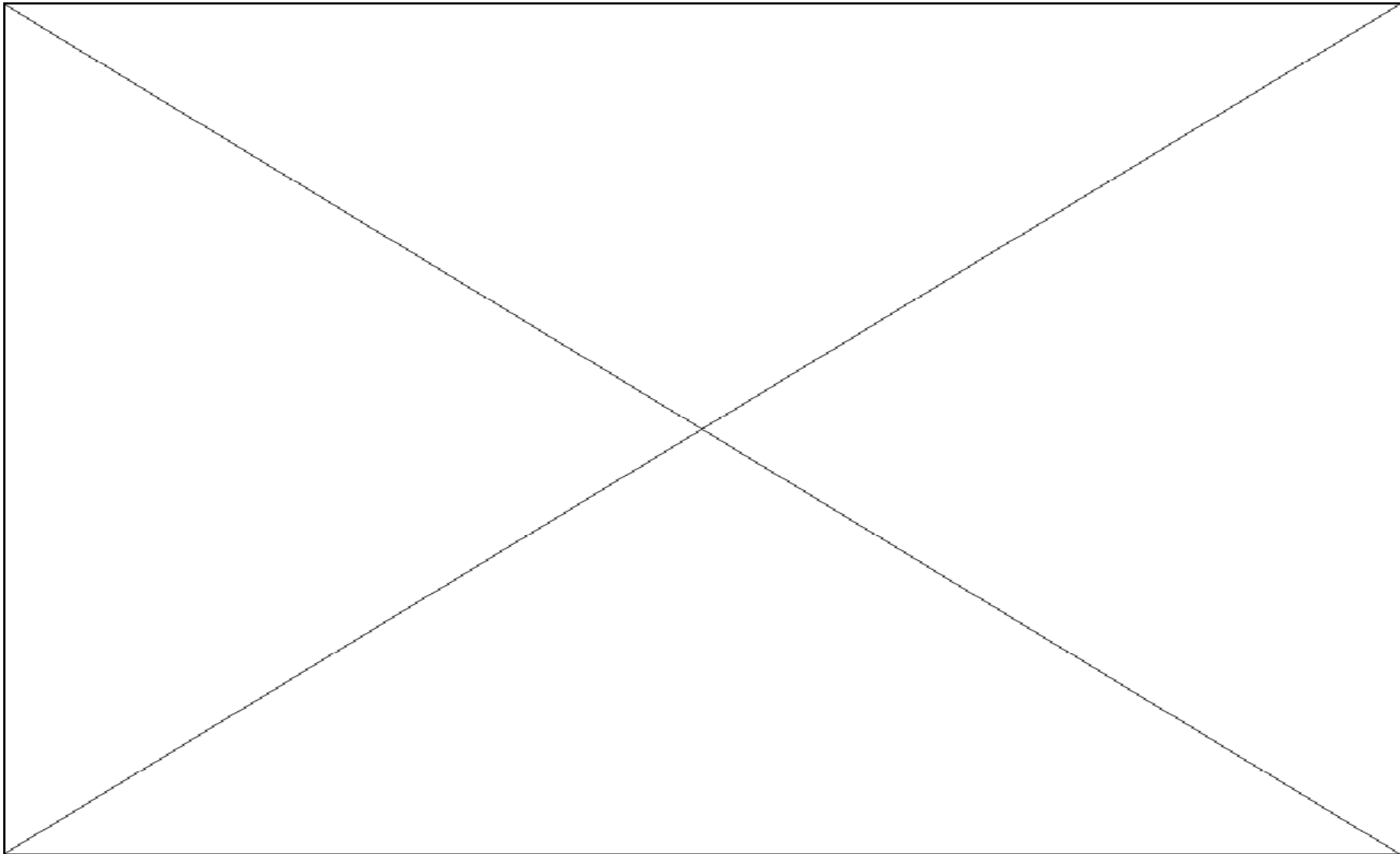


Figure 71. Atlantic Center for the Performing Arts, Thompson and Rose Architects

[Thompson & Rose Architects]

The Atlantic Center for the Performing Arts is located on an ecological preserve at Tumbull Bay, New Smyrna Beach, Florida. This artist's retreat includes art studios, dance studios, a library, and a black box theater.

Each programmatic function is housed in its own building. The complex of buildings are joined by a series of wooden footpaths as illustrated in the plans on the previous page. The angled footpaths vary in width, providing points of gathering where benches have been provided. The relatively flat topography of the site provides for ease of linkage between each building. The architect takes the opportunities of the varying angles to provide sun exposure depending on the function of the space while incorporating interesting indoor and outdoor interchange of spaces in many of the buildings.

**Atlantic  
Center for the  
Performing  
Arts  
Thompson +  
Rose Architects**

Figure 72. Atlantic Center for the Performing Arts, Thompson Rose Architects

[Thompson and Rose Architects]

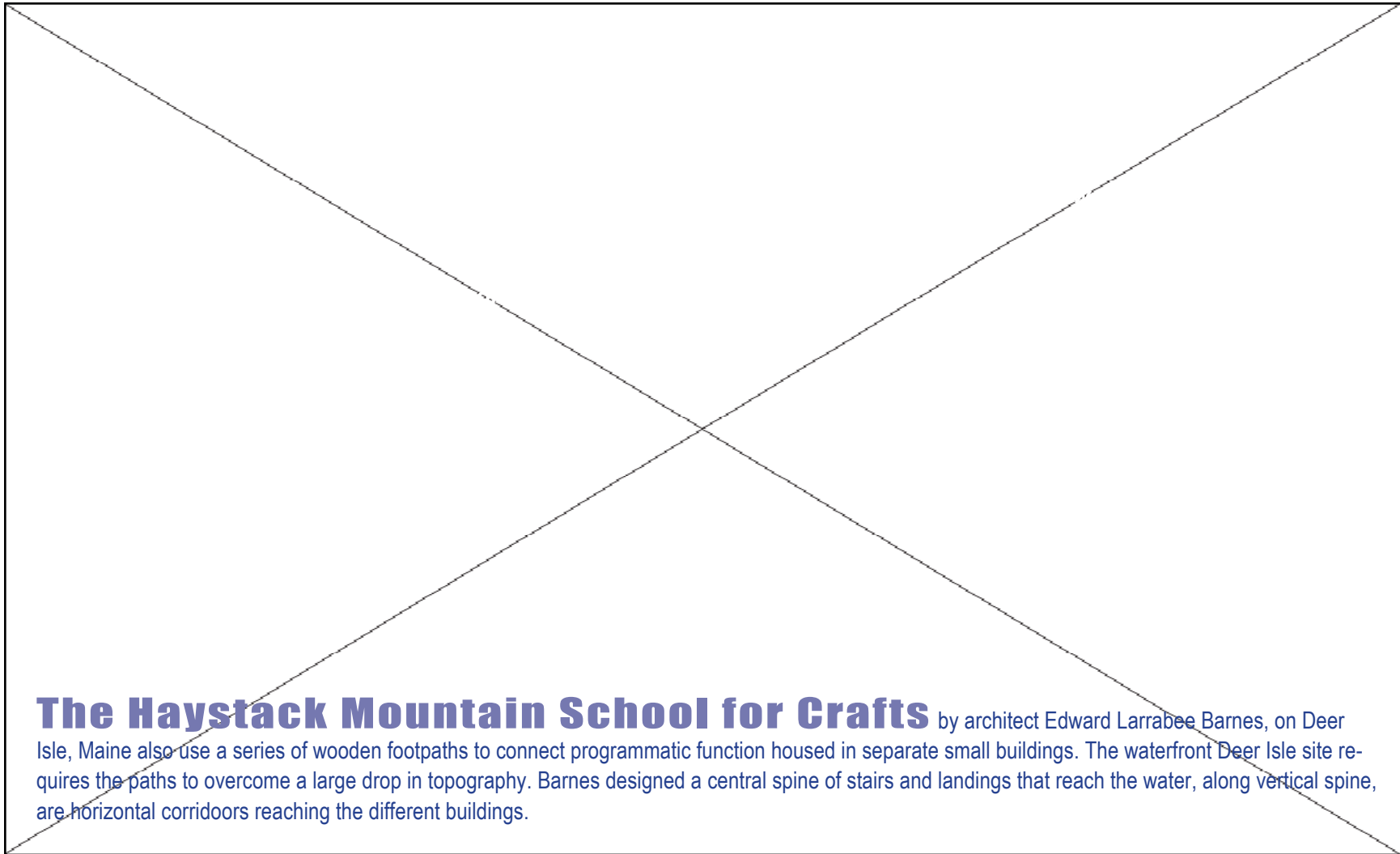


Figure 73. Haystack Mountain School of Crafts, Edward Larrabee Barnes

[Edward Larrabee Barnes]





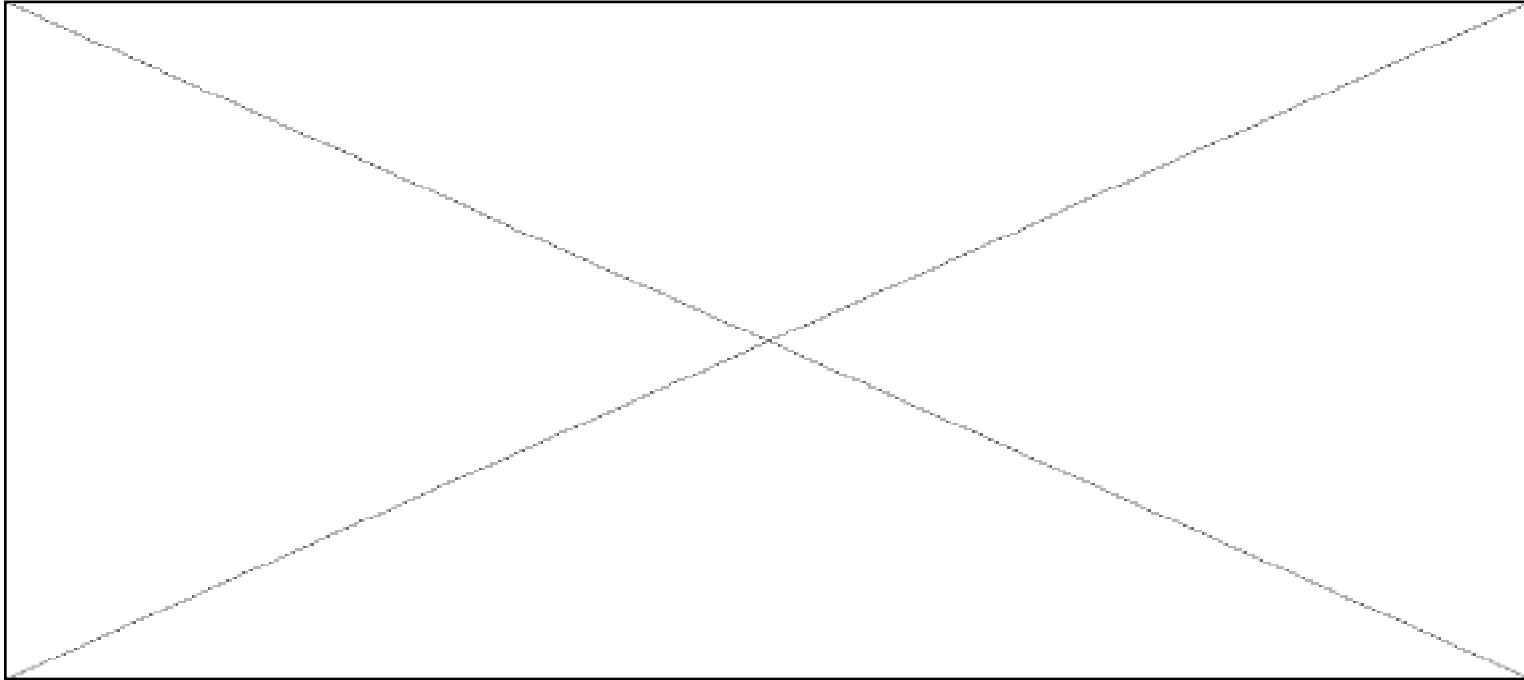
## Treehouses

Treehouses are magical structures, often associated to childhood, it is a place of security, where imagination is allowed to roam free.

These treehouses demonstrate many different construction types and materials. They also demonstrate different attitudes towards co-existing with nature. While Lukasz Kos's treehouse is angular in shape, its delicate wood slats tie it to its neighboring trees. Dustin Feider's treehouse for O2 Treehouse while using recycled materials, is distinct from its habitat.

Figure 74. Treehouses

[zegarkus.com/]



## **Rio Grande Nature Center, Albuquerque, New Mexico** **Antoine Predock Architects**

Antoine Predock's Rio Grande Nature Center is sited on a major migratory flyway. The building is a permanent viewing blind set up to view the natural habitat. One never truly see the large elevation of the building captured above, as one's view is purposefully pointed towards nature. Instead, the visitor is invited to participate as one with the local fauna, particularly displayed in the choice of entrance via a giant duct shown in the photograph on the bottom right. The spirit of the nature learning center upholds nature as the main attraction, taking a backseat with the building, using it as a vehicle for visitors to experience the environment.

Figure 75. Rio Grande Nature Center, Antoine Predock Architects

[Antoine Predock Architects]



Figure 76. Moorelands Camp Dining Hall, Shim-Sutcliffe Architects

[Shim - Sutcliffe Architects]



The Merrill Center's design was focused mainly on sustainability. The building incorporated solar panels on the South facing facade as shown in the images above, and rain storage barrells collecting stormwater runoff from the roof, located on the North face of the building.

The long bar shape of the building helps maiximize solar gain in the winter, windows placements and sled roof towards prevailing winds allows for natural ventillation. The large amount of glazing in addition to adequate sunshading allows for filtered natural light to penetrate through the width of the building.

## **Chesapeake Bay Foundation's Merrill Center Annapolis, Maryland . SmithGroup, Inc.**

Figure 77. Chesapeake Bay Foundation's Merrill Center, SmithGroup Inc.

[Florence Ho]



### **Composting Toilets**

The Merrill Center uses composting toilets on site to minimize contributing towards sewage waste that goes into the Chesapeake Bay. The waste is composted on site.



### **Native Vegetation + Rain Garden**

The Merrill Center preserves the native environment by keeping the landscaping on site to native vegetation that is friendly to local wildlife. Rain barrels also irrigate a sample rain garden, demonstrating the capabilities and potential of installing rain gardens in their own homes.



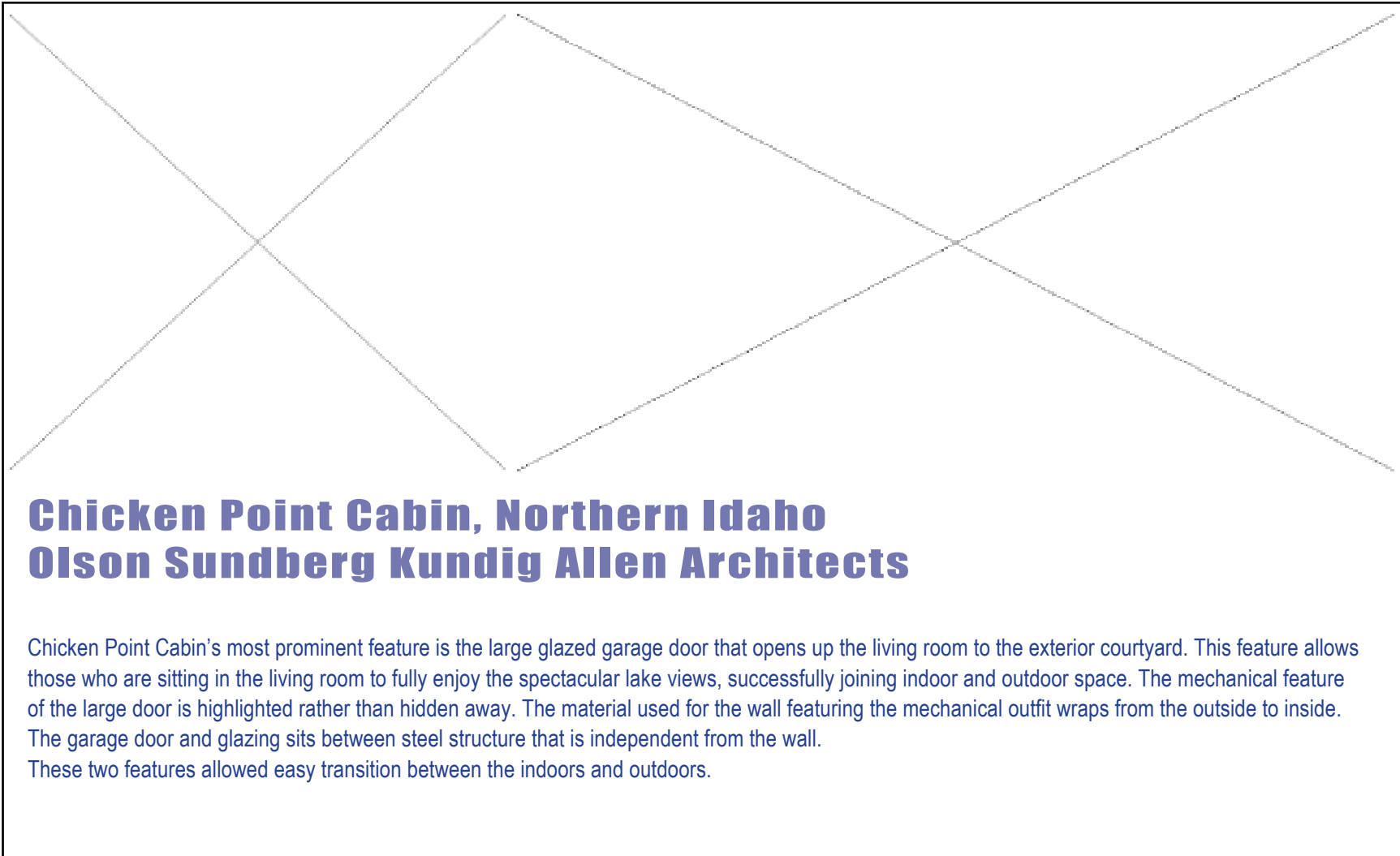
### **Site Conservation + Runoff Control: Bioswale**

In order to ensure site conservation and to control storm-water runoff from the site, especially on open surfaces like the parking lot, the Merrill Center employ impervious surfaces for the parking, and bioswales as illustrated in the photograph to the left to filter and prevent runoff that contains environmental pollutants from entering waterways such as the Chesapeake Bay.

Figure 78. Composting Toilets, Native Vegetation + Rain Garden, Site Conservation + Runoff Control: Bioswale

[Florence Ho]





## **Chicken Point Cabin, Northern Idaho** **Olson Sundberg Kundig Allen Architects**

Chicken Point Cabin's most prominent feature is the large glazed garage door that opens up the living room to the exterior courtyard. This feature allows those who are sitting in the living room to fully enjoy the spectacular lake views, successfully joining indoor and outdoor space. The mechanical feature of the large door is highlighted rather than hidden away. The material used for the wall featuring the mechanical outfit wraps from the outside to inside. The garage door and glazing sits between steel structure that is independent from the wall. These two features allowed easy transition between the indoors and outdoors.

Figure 79. Chicken Point Cabin, Olson Sundberg Kundig Allen Architects

[Olson Sundberg Kundig Allen Architects]

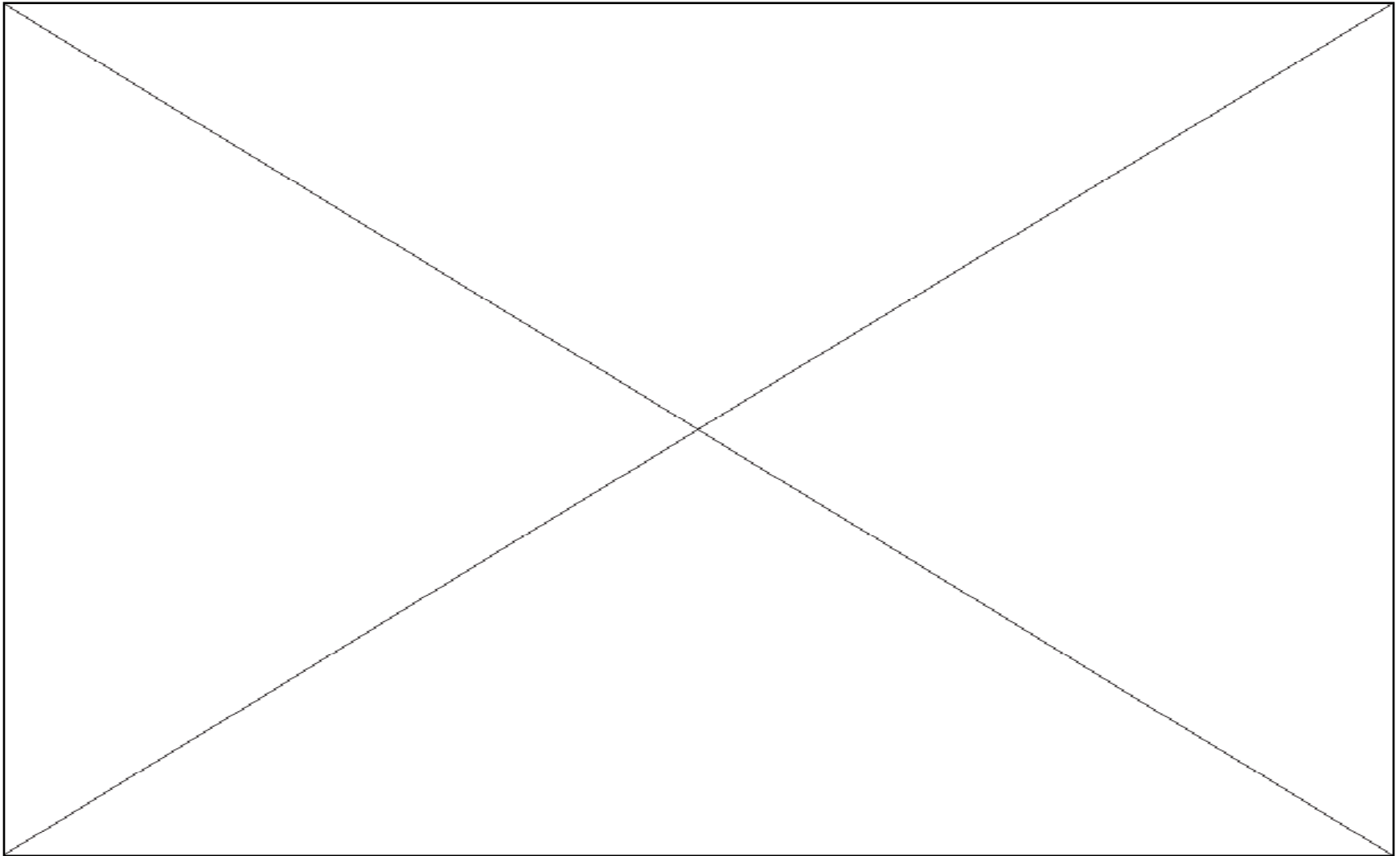


Figure 80. Michael Vergason Landscape Architects

[Michael Vergason Landscape Architects]

# CONCLUSION

## Forgotten Language

Once I spoke the language of the flowers,  
Once I understood each word the caterpillar said,  
Once I smiled in secret at the gossip of the starlings,  
And shared a conversation with the housefly  
in my bed.  
Once I heard and answered all the questions  
of the crickets,  
And joined the crying of each falling dying  
flake of snow,  
Once I spoke the language of the flowers. . . .  
How did it go?  
How did it go?

by Shel Silverstein

Figure 81. Conclusion

[Shel Silverstein]

## CONCLUSION

This thesis set out to use architecture as a bridge between city and the wilderness with aspirations to foster a better relationship between today's urban youth and nature. Buildings are situated within the site to promote the user's experience with the different characteristics of the Anacostia River: the trees/sky, the earth, and the wetlands and water.

This thesis investigates and addresses design that impacts the perception of the user of the site at three incremental scales:

1. the urban scale (including the River Terrace, RFK and Benning Heights neighborhoods)
2. scale of the site (the topography and soil of Kingman Island and the place making of buildings)
3. tectonic scale (structure and construction of a building, how each piece of material is joined to its neighbor, and how the building meets the ground)

While developing the design at urban scale was not the central focus of the project, proposal of the wetland restoration in the RFK Stadium parking area provides amenity and improved environmental conditions for immediate neighborhoods as well as the greater Anacostia Watershed area.

In order to re-knit the urban fabric on the two shores of the Anacostia, this thesis also proposes a series of wooden trestle footbridges that allow safe and scenic pedestrian access across the Anacostia River between the pedestrian-unfriendly zones of Benning Road and East Capital Street. These footbridges provide the commuters with daily encounters with wildlife, so that the seasonal changes and patterns of Kingman Island no longer go unseen. The improved pedestrian environment hopes to promote neighborhood residents to use alternate transportation from cars for their daily commute.

Kingman Island's unique location on axis to the Capital Mall, linked by major roads running through Washington DC, its proximity to developed urban neighborhoods as well as its mature wilderness is ideal for testing out the hypothesis stated in this thesis – architecture and built form works as facilitators to recreate connections between city and nature.

The site holds a series of challenges in its loose soil make-up, varied and haphazard topography, and its location within the FEMA 10-year floodplain. These conditions bring forward questions of permanence and construction of structures. In keeping with the design principles set forth in the beginning of this thesis, it was important to be respectful of the existing conditions of the island. Moving forward with the intention of treading lightly on the land, design decisions were made aimed to not only minimize impact but harmonize with the site.

There are two categories of buildings on site: the stand-alone pavilion and the camp buildings.

The stand-alone pavilion category includes the tree-house, the wetland lookout, as well as the boathouse. These buildings are unconditioned, and are intended for recreational, as well as camp users. As the visitor is taking in the many wonders of nature as they enter Kingman Island, these pavilions are placed along different geographical points along the boardwalk path to act as vehicles and agents to emphasize and amplify the sky and trees, relationship of earth to water, and the wetland in the tree-house, the boathouse and the wetland lookout respectively. The goal of these buildings is to inspire the user to experience each characteristic of the Anacostia River.

The bulk of the investigation in tectonics occurred at the camp. Through the research and design of the island, it was logical that in order to preserve and respect the natural habitat, the construction process must be as non-invasive as possible. That would mean using minimal heavy machinery and sizing the building material in a way manageable by several persons and light machinery. This led to the development of a kit of parts grouped from smaller and lighter stock-item building materials to construct both short span and long span heavy timber structures.



The vocabulary for the camp architecture evolved from this kit of parts: the columns, beams and trusses are entirely load-bearing, so the design of in-fill (walls, openings, louvers and rain-screen cladding) is intentional in displaying the juxtaposition and interplay of the diametric properties of skin and structure. The skin of the building is pulled away at strategic corners to demonstrate structural columns in their true form.

As the skin was able to function independently from the structure, there was opportunity to extend the building into the landscape as extensions functioning as structural outdoor spaces. In the pushing and pulling of the structure into landscape by enveloping or revealing the structure by its skin, the buildings were able to dialogue with nature, providing fluid views, movement and sense of place with the landscape.

Much time was spent on this thesis developing a sense of place on the camp, being investigating through topographic chip-board models, perspective drawings, and finally realized through digital modeling and vignettes produced from said model. Sentiments on fluent dialogue between building and landscape are best demonstrated in this quote from Charles Moore's *The Place of Houses*, in the chapter titled "Fitting the house to the land." (p. 188 - 201)

*"Assembling the rooms and machines into a coherent pattern for a house provides only the beginnings. As you examine the basic combinations we have set forth, you must also consider the special opportunities and problems posed by the site you have, and understand the ways a house can fit the land. Then the real shape of the house can emerge, taking its special place in the landscape or on a street. Houses exist in a bewildering variety of sites and environmental conditions, of course, and these affect the house you build. Nevertheless, we can still identify just four ways to fit a house to the land: by merging, claiming, enfronting, and surrounding..."*

*The four ways of fitting a house to the land – merging, claiming, enfronting, and surrounding – provide broad categories into which all the good houses we know can be classified. Often, though, a house will do several things at once as it sits on the land, and some memorable houses are combinations of more than one way of siting."*

This thesis tested out ideas of "merging, claiming, enfronting as well as surrounding" mentioned by Moore in the above quoted article. The final solution is an amalgam of all four forms of building in the landscape. With the idea of fitting the building into landscape also follows the idea of the site as wilderness and its relationship with the greater city that surrounds it. When walking through dense vegetation on the island, it is easy to forget that the city is only less than a mile away. Because this thesis' emphasis is on

re-enforcing the relationship between city and wilderness, design choices were made not to drown out or hide the island's urban neighbor, but to frame views of the city with the placement of buildings and landscape.

The goal was not only to reconnect city with nature, but also to re-introduce urban youth to nature through their experience on Kingman Island. Just as the buildings and landscape was designed to frame views of the city, rooms and public spaces for the campers were designed to have dialogue between what is man-made and what is natural. By designing spaces that mingles the indoor and outdoor experience, the architecture on the island eases the user from what is structured, commonplace and within their comfort zone in the urban environment into the foreign world of trees, rocks, river and wetland. Through a series experiences on the footpaths, pavilions as well as camp buildings, children and adults who visit the camp re-establish a healed relationship with nature.

Finally, this thesis could benefit a broader audience by having greater urban connections with the major axes to Washington D.C.'s hub and city center. Future development for this project could involve re-enforcing this axis, so that the Kingman Lake, National Arboretum and National Aquatic Botanical Gardens may form an ecological tourism destination, contributing towards Washington D.C.'s monumental attractions.

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*"The public library is the most dangerous place in town."*

*~ John Ciardi*



Figure 82. Bibliography

[flickr images - LilySusie]

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