

Welcome!

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Thank you for coming!

My name is Sean Murphy

My thesis is an Adaptive Learning Center in Rocky Mountain National Park, CO

Problem Statem. / Theor. Prem.

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How can architecture respond to the natural environment?

Nature must be understood in order to create architectural forms that provide for human needs, but also exist in harmony with the environment.

Project Justification

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Lasting buildings are often a result of conforming to their natural environment.

It is essential to understand the relationship between nature and architecture and its implications in order to create better buildings.

Client & Users

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The National Park Service is the client.

Both visitors and NPS employees use the building.

All designs must feature sustainable aspects, utilize local styles and materials, and have a low visual and physical impact.

Client & Users

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The center will have a high turnover of visitors with most staying a half hour or less at the center.

At its peak during the summer season, it could have up to 2,000 visitors daily.

Typology

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I researched three visitor centers.

Eielson Visitor Center - Healy, AK

Beaver Meadows Visitor Center - Estes Park, CO

Aldo Leopold Legacy Center - Baraboo, WI

Typology

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Common threads included:

Size and spatial arrangements - Under 15,000 sq. ft.

Local materials are most commonly used

Aesthetics and siteing are a priority

The Site

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The site was chosen because of its location at the center of several attractions and its proximity to the highway and transportation.

It is also a heavily impacted site from sporadic use over the past 100 years.

The Site Conditions

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DESCRIBE THE QUALITIES OF THE SITE

Location, topography, climate, plant cover, human interaction, soil, water, utilities.

18.77 acres in size

Plants and Animals

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Rocky Mountain National Park has a wide variety of species.

1100 Different Plants

380 Different Animals

Many are present on the site or pass through the site.

Idea

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Walking down a trail through a pine forest.

A meandering path that moves gracefully through a vertical landscape with the topography.

It is a design that seeks to adapt to the natural environment surrounding it.

The design also draws inspiration from:

The surrounding mountains.

Western building types ranging from the tepee to the log cabin.

Process 13

The process behind the design arose from blending inspirational elements into a design that satisfied all requirements.

TALK ABOUT CONTRASTS:

Vertical/Horizontal, Solid/Void, Light/Heavy

Original Site Design Decisions

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Unobstructed sunlight throughout the year for daylighting and passive heat.

Utilizing the topography of the site, it cuts into the hill to minimize its visual impact on this sensitive site.

It exploits beautiful mountain views to the northwest of the site.

Original Site Design Decisions

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The site is located at a strategic place on the west end of Horseshoe Park.

Creating a trail junction at the site was important to link nearby trailheads and to serve as an introduction to the park.

The design meets client requirements including:

50 Parking Spaces

Bus Parking for the Park's system

Creation of Garden and Public Spaces

Minimal Impact

Natural & Historic Architecture

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The HPELC relates directly to much of the sustainable and natural architecture that the National Park Service “Rustic” style abides by.

Natural, local materials and building techniques.

Aligns with the rest of the park’s historic architecture.

It fits in with local styles while having its own identity.

Form 18

The HPELC takes form from the inspirational curves and lines of the mountain landscape as well as the vertical lines of the lodegpole pine.

The object was to create an interior space that connected with the exterior world and created the monumental feel of being in an old growth forest.

Form 19

At the same time, creating a subdued form that would not take away from the natural environment was also important.

Program

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Typology research led to a program consisting of the following elements.

LEARNING:

Interpretive and Classroom Spaces,

SUPPORT:

Circulation Space, Lobby Space, Entry Space, Public Restrooms, and a Gift Shop

Program

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SUPPORT:

Storage & Mechanical Spaces

ADMINISTRATION:

Information Desk, NPS Employee Offices, NPS Multi-purpose Space, Break Space, and Restroom

Spaces were designed by function and proximity to the entrance.

Functions primarily break down between administration, support, public, and learning spaces and are located in the order of use.

Space 23

Heavily used spaces are primarily around the main atrium while the learning spaces exist beyond the core of the building.

Open learning areas

Flexibility to alter the exhibits and the experience of the Horseshoe Park ELC to the client's wishes.

Movement 24

Movement emerges from following the natural intersection of nearby trails focusing on the atrium.

Spaces fall around this intersection of the exterior and interior environment

This arrangement enhances movement rather than obstructing it.

Sustainability 25

The center focuses on sustainability in a number of ways.

Most of the building's materials and structures are from the site and nearby locations.

Wood components of the structure would be collected locally outside the park, using beetle-killed lodgepole pine that would otherwise rot or be burned.

Sustainability 26

Much of the rammed earth structure would come directly from the site and its excavation during the building process, reusing resources.

The center would also implement single stream recycling to reduce waste once the building is in use.

Sustainability 27

Water is a large concern in Colorado and the building seeks to mitigate its needs utilizing several strategies.

The center has a rainwater collection system on much of its roof surface.

Low flow toilets and faucets would reduce water demands even further.

Sustainability 28

The site is xeriscaped with native species to reduce runoff and eliminate water demands.

The building's solar orientation and passive systems will also reduce energy needs to a minimum.

All of these qualities make the center an excellent candidate for future LEED certification.

Accessibility

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Accessibility and universal design aspects are very important in the center's design.

The entire building and its exterior spaces are on the same level and have no elevation changes.

ADA standards are implemented throughout.

Environmental Systems

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The center utilizes both active and passive systems for its environmental systems.

The solar orientation satisfies most of the building's lighting needs and supplements its heating system.

An open floor plan and windows offer ventilation throughout the structure.

Environmental Systems

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Active heating, ventilation, and air conditioning systems would run primarily through a utilitarian basement below much of the structure to venting locations along the exterior walls.

These active systems would only be used as needed.

Structural Systems

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The Horseshoe Park ELC for the most part is a post and beam timber structure based on an 8 ft. grid to simplify construction.

Rammed earth, load-bearing walls also support much of the central atrium space and support areas of the building. All of this rests on a concrete foundation.

Structural Systems

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One of the main components of the structural design was that it was necessary to have an open and light structure that allowed for daylighting and views of the surrounding area.

Glass walls envelope most of the building and allow for a very free and open space that reminds one of the connection they have to the outdoor environment.

There are multiple strategies to adapting to the natural environment.

Utilizing impacted sites.

Using local resources.

Minimal design.

Conclusions

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Understanding environmental conditions.

Giving back to the site.

Going beyond LEED standards.

Questions? **36**

Questions?

Thank You!