Thesis submitted to the faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of

Master of Architecture

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This book is dedicated to my mother Connieann and my brother Rhett.
4 ELEMENTS OF DEER FIELD INN

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Architectural orientation of wood surfaces is the primary study of this thesis. To understand different wood surfaces, they are ordered into 4 elements of Architecture; Earth, Air, Fire, Water. This thesis is structured from these 4 elements in a simple legible form. Deer Field Inn would serve the local communities of Ritchie County, West Virginia for family, social, and organization gatherings.
Understanding the properties of a material used in what we create is fundamental in architecture. A place where there is human interaction with the surfaces of the material must reflect on the use of the surface. For instance, a log that was sawed into lumber creates a board with three different surfaces: transverse/cross-sectional (commonly known as ‘end grain’), tangential, and radial surfaces.

To understand wood, we must first look at the material’s structure. There are two categories of trees in North America, each with a distinctly different structure: deciduous and conifers. Deciduous trees have leaves that are lost during a dormant stage, and conifers have needles that are lost throughout the year.

When a cross section is looked at under a microscope, the creation of the material is revealed. Rings are formed from the yearly growth of a tree. Early wood ring growth is during spring and summer. Latewood growth is produced during the dormant state in the fall and winter months. The cross-section changes from different species and regions in the country. For example, in comparing red oak and southern yellow pine, red oak’s early wood pores are more dormant than southern yellow pine.

The orientation of the material is very important to understanding the system of ordering the 4 elements; Earth, Air, Fire, & Water. When a building material is ordered into 4 core elements, an Architectural thought is created.
Southern Yellow Pine Cross Section

- **Earlywood**: 4
- **Sapwood**: 6
- **Heartwood**: 5
- **Pith**: 4
- **Radial Surface**: 3
- **Tangential Surface**: 2
- **Transverse/Cross-Sectional Surface**: 1

**Note**: Storage Cubes on Left & Divider on Right.

- **Southern Yellow Pine / Pinus spp.**: 8

Interior Sketch of Deer Field Inn Sleeping Area.

Note: Storage Cubes on Left & Divider on Right.
Background Photo: Construction of the Dam for the North Fork Hughes River Water Shed Project.
The construction of the dam for the North Fork Hughes River Watershed Project created the opportunity to develop the local economy. Currently, North Bend State Park desires more rooms for tourists. Due to current funding, these needs cannot be met. Future development of the Harrisville Recreational Center would address this need.

Ritchie County is rich in natural resources. Asphalt once mined locally was used to pave Pennsylvania Ave in Washington, DC. Timbering of local forests produced lumber for past covered bridges, oil wells, railroad ties, and hunting cabins. By understanding the natural resources, Architectural elements can be developed.
Swimming.
North Fork of Hughes River at Love Camp.

Timber operation.
Location near North Fork of the Hughes river.
Note: Currently site of North Bend State Park.

Picnic at Cokley Grove May 25th, 1915.

Oil Well.
Site unknown.
Note: Structure of timber framing.

Harrisville Southern.
 Engine #100.
Note: Baltimore & Ohio main line in foreground.

Harrisville Southern.
Note: Location near current lake formation.
Picnic at Cokley Grove May 25th, 1915.
The site is located just north of the town of Harrisville. The state of West Virginia purchased the land for the Hughes River Watershed Program for recreational use. Preliminary planning proposed the site for picnic’s, swimming, fishing and family gatherings. The site has unique qualities with access to the lake, but far enough up stream to be quiet & remote.

Before the purchase, this property was used for farmland. With the creation of the dam, this site currently lies in the 100 year flood plain. Placement of Deer Field Inn along the existing forest line leaves most of the site untouched and above the 100 year flood plain. Thus leaving the fields for cultivation of hay during the summer months.

The intention of Deer Field Inn at the Harrisville Recreational Center will provide rooms for guests, while ordering the 4 elements in context with the culture of Ritchie County.
W. G. Clark’s Middleton Inn divides the forest and river by a large masonry mass. This masonry core creates a barrier between the entrance side of the inn and the sleeping side facing the river. The masonry core provides a connection to the earth and is where the change of material begins.

Due to flooding at the site, the need to raise the units above the ground line was reviewed. Deer Field Inn’s use of a cast-in-place concrete base elevates the units, protecting them from water damage. The core divides the screened units facing the lake and the sleeping rooms with small horizontal openings facing the forest creating public, semi-private, and private layers.

The earth core develops a hierarchy for the project. This creates a platform for the sleeping rooms, screened units, stairs, and outdoor hot tubs to be placed. The core includes all support items: mechanical needs, stairs, main entrance to each unit, bathrooms, changing areas, and fireplace.
Cast-in-Place Concrete Earth Core.
Concrete Detail Above Showing Rough Cut Horizontal Formwork.

w/ Sleeping Area & Roof Terrace.

Screen Facade.

EARTH

23 Final Model of DPI.
II. Air. Screen. Element for shading and natural air circulation.

Renzo Piano’s Cultural Center of the Kanak People used vertical screen elements to blend into the existing culture. This element was integrated for natural ventilation from the lagoon. The concept of the screen is realized from the interior to the exterior. Deer Field Inn uses horizontal screen boards for shading and natural air circulation.
Note: Contrast Between Weathered Wood and Nature.

Existing Cultural Elements.

Site Plan of Lagon.
Section A Through the Culture Center.
Figures Table

Figure 1: "perfect square" four equal sides and four right angles.

Figure 2: "sesquisquare" square and a quarter.

Figure 3: "sesquitertia" square and a third.

Figure 4: "diagonal proportion" golden section.

Figure 5: "sesquialtera" square and a half.

Figure 6: "superbipartiens tertias" three equal parts and two parts added to it.

Figure 7: "double" two perfect squares.

Serlio’s Seven Principal Proportions.
By using a very strong horizontal element, a system of proportions is carefully followed to order the facades. Serlio clearly outlines fundamental components for proportional relationships. He defines seven proportions that are used for many applications (see figure table A). The proportion of a square is a very simple geometry. The understanding of complexity based on a simple geometry must be in the Architect’s way of thinking & working.

Deer Field Inn’s façade was developed from a previous lamp study of proportions. Deer Field Inn and the lamp are both designed using 1:1, 1:2, & 1:4 proportional relationships, thus comparing two different scale objects, but using the same method of proportions. Serlio states that an Architect must fundamentally understand the basic proportional units.

“There are many rectangular proportions... however, the seven principal ones which the architect can make use of for various things and adapt to many situations”

Serlio - Book I : On Geometry
James Cutler’s guest house was designed along an extensive cast-in-place concrete wall that forms the backdrop for the guest house. The placement of the fireplace composed into the wall creates a place for gathering. This place of interaction between humans, to enjoy watching a log burning into ashes, becomes the final life cycle of the material. Fireplaces in Deer Field Inn create three different spatial relationships for gathering: the hot tub changing area, each unit, and roof terrace.
Earth Core w/ Fireplace
Cast in Place Fireplace w/ Sand Stone Blocks
Sketch of Fireplace w/ Built-in Seating & Wood Storage

Final Model of DFL 52

Each unit facing the lake will weather similar to existing exposed siding on barn structures in the area, then becoming similar to the existing culture in the area. Each sleeping room facing the forest will be sealed to protect the original finish of the wood, showing the material in a natural state in comparison to the forest. Siding and screen elements applied in a horizontal format, protect the boards from rotting. If the boards are placed in a vertical format, the end grain has a natural tendency to absorb water and cause decay.

Circular volumes of water are placed at the core of each unit, inside and outside in the form of the hot tub. The exterior hot tub unit is a large volume for hot air to rise and fresh air to circulate into the volume.
100 Year Flood Plain
Frank Lloyd Wright's method of thinking as an architect was developed as a child. He played with Froebel blocks known as 'gifts'. When assembled, the gifts would create different proportional and space relationships. Throughout his early career, this same system of thinking is applied. Figure 1 shows this thinking in plan and perspective views.

My thinking as a child by assembly of plastic airplane model kits. Each kit needed assembly to create a representation of an object. Closely paying attention to the details would create a very accurate representation of the object.

Assembly of the Deer Field Inn model uses the same techniques of study similar to the models built as a child. Understanding the details helps to order the material in the thesis, protecting different surfaces and the interaction of different elements with that material.
In conclusion, the thesis Deer Field Inn was a series of investigations about a basic material commonly known as wood. By understanding the properties, orientation, and building techniques of the material, the 4 Elements of Architecture ordering system was developed. This system was created for my understanding of Architecture.
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This thesis is dedicated to my mother Connieann and my brother Rhett.
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Education

- 98-04 Virginia Polytechnic Institute and State University
  Master of Architecture
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Experience

- 02-04 MS Consultants, Inc.
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- 01-02 GTA at Virginia Polytechnic Institute for Input/Output Devices Lab for Prof. William Galloway & Prof. Heinrich Schnoedt
- 01 Architectural Solutions
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- 99-01 GTA at Virginia Polytechnic Institute for Wood Shop
  for Prof. Robert Durye & Prof. Mitzi Vernon

Awards

- 4/02 Exemplary contribution to the Graduate Program at Virginia Polytechnic Institute
- 4/02 3rd prize in Virginia Concrete Masonry Association Design Competition/Deer Field Inn
- 10/99 AIA-WV Scholarship
- 5/93 McCullough Rogers Funeral Home Scholarship