I, William Dominic Loomis, hereby submit this as part of the requirements for the degree of:

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Approved by:

David Niland

Michael McInturf
APPRENTICESHIP
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By

William Dominic Loomis

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Thesis Chairs:
David Niland
Michael McInturf
Abstract

The current trend in the education of young architects is moving from the handi-craft based apprenticeships of the past toward the theoretical and the “idea” and has created a professional perception that shies away from the construction aspect of building. In the United States, there is no longer a reverence for materials and their connections like that in Europe. Handi-crafts such as woodworking and metalworking are now seen as manual labor and are no longer seen as a beneficial component of architectural education. The field of architecture is at a point of stagnation, the popularity of architects is reaching high levels and the visibility has grown considerably, yet the focus of design is still on the overall concept and not on how the building is to be constructed. Only by teaching and experiencing construction and its techniques will the profession make progress toward a more critical building process.
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Introduction

So I have grave concerns about architectural education. I have grave concerns on another level as well, is that I don’t think that you can design anything unless you know how to make it. I think that’s the wonderful thing about architecture, it’s a made thing.¹

In a profession in which the built product is entrusted to someone who must interpret the designer’s drawings into reality, a gap has become apparent in an architects education. This gap, construction knowledge, begins in school and is carried through to the professional life of many. It is helped along by the perception of architecture as a noble profession. The portraying of the profession as an elite job in the eyes of the public, unfortunately, has led the professionals themselves to elevate their ego and perception of their duties.

In the early Renaissance, architecture emerged as a profession and was considered the highest form of art. This meant that those who were practicing at the time were knowledgeable in all the arts; sculpture, drawing and painting. Michelangelo, Leonardo da Vinci, and Bramante all garnered projects in the architecture field. This knowledge allows for the architect, or artist, to achieve a level of work that will test the design and construction of

the project in all aspects whether it is decoration, ornament, or structure.

This form of learning continued until the start of the Beaux-arts education, with all sixteen schools of architecture in the United States patterning their education in the same manner. This created a standardized education for young architects and initiated the decline of apprenticeship. Architectural education became more intellectual during this time, neglecting apprenticeship. Since then, reinterpretations of the handcrafts as an important factor in education emerged through both the Arts and Crafts movement and the Bauhaus. With the introduction of governing bodies of accreditation and licensure, apprenticeship has once again declined.

By introducing apprenticeship, through the handcrafts, back into the education of architects, there will be an appreciation gained by young architects for materials and how those materials work together. This knowledge is readily apparent in the work of European architects that have benefited from an apprenticing opportunity, such as Peter Zumthor, Eero Saarinen, and Mies van der Rohe. Their mastery of different materials shows a
complete knowledge and understanding of their craft.

The translation of this knowledge into architecture can be utilized in the connections and joints of buildings. The joints whether on the large scale or the minute, can have a immense affect on the overall project. The construction of boats is one way to learn the connections necessary for the translation of craft into architecture. Richard Leplastrier, a highly acclaimed architect and boat builder from Australia, has largely been influenced by his experiences designing and building skiffs. They translate into his buildings in the form of the elegance of the lines in designing boats and the economy of materials used.\(^2\)

The Rockland Apprenticeshop is one aspect of apprenticeship opportunities afforded the field of architecture. Through the Apprenticeshop one can learn the intricacies of wood joints and the limitations of the properties of wood. An appreciation for craft and the people who utilize it will come naturally once one understands the patience and care inherent in craft. The

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Apprenticeshop is a positive step for the future of architecture.
Architecture *n.* 1. The science, art, or profession of designing and constructing buildings or other structures.\(^3\)

Apprentice *n.* 1. One who is bound by a legal agreement to serve another for a fixed period of time in order to learn a trade or business.\(^4\)

Throughout history apprenticeship has been the normal means of communicating knowledge. The apprentice (the one learning) observed the master (teacher) and then mimicked the actions until the apprentice learned the trade.

Apprenticeship was once a widely accepted means of passing on a trade or profession. It was an ancient legacy of sorts. In the eighteenth century B.C., the Laws of Hammurabi of Babylon, artisans were required to teach their craft to their young sons. Even in the fifth century B.C., apprentices were considered a high commodity and contracts were at a premium for their services in sculpture and painting.\(^5\) In times of antiquity, there was an appreciation for the knowledge and reverence of craft that was gained through apprenticeship.

Apprenticeship eventually evolved into the medieval guilds of the 15\(^{th}\) and 16\(^{th}\) centuries and

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\(^3\) The Readers Digest Great Encyclopedic Dictionary (Pleasantville, New York: Readers Digest, 1975) 76.


\(^5\) Gerry Williams, Apprenticeship in Craft (Goffstown, NH; Daniel Clark Books, 1981) 113.
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became a highly organized system of learning. These guilds took full control of their respective trade and standardized everything from tools being used to the skill of new members to the guild. This was the first hint of what would later become the unions that the United States knows today.6

These guilds usually began training new members at an early age, but today, with the standardization of secondary schools in the United States, the chance for an early start to apprenticing is not easily achieved. Unlike Europe, where the schooling is more specialized to cater to the individual students, the American schooling system believes in an equal education system where every student is treated the same irrelevant of their aspirations or abilities.

In Denmark, a leader in the European apprenticeship system, students are separated in secondary schools according to what they will pursue later in life. Students that are intending on furthering their education in a University, attend the upper level Gymnasium (high school), while those

6 Williams, 113.
intending on entering the labor market enter a technical or vocational school.\textsuperscript{7}

In response to the success of the European models of the beginning stages of apprenticeship and higher education, former Maine Governor John R. McKernan Jr. proposed a Youth apprenticeship program for the state. His solution to the problem of the lack of skilled entry-level employees, was to create a coalition of schools, businesses, and government institutions that will give high school students the edge they need to compete in today's tough job market. With the large number of high school graduates not attending college, McKernan created an apprentice system that would benefit from an additional year added to secondary education. This created the ability to get students into the labor market earlier. The student would still earn the customary high school diploma after 12 years of schooling, but with the additional year of apprenticeship/schooling, they would receive a one-year technical certificate as well as a certificate of skills mastery.\textsuperscript{8} This program is at the forefront of the education reform that this country is in


\textsuperscript{8} John R. McKernan Jr., \textit{Making the Grade} (Little, Boston: Brown and Company; 1994) 132
desperate need of to compete with the rest of the world.

With the opening of the Ecole des Beaux Arts in Paris, the design student was encouraged to create an esquisse, or concept drawing, that would drive the project throughout the design. Tectonics were rendered in highly detailed drawings and watercolors. ⁹ The basis for all designs of the students there was classical architecture. Students began with the facades, and then progressed from simple buildings to massive and more complex buildings. This education was one of a kind, and was soon imitated by all sixteen American schools of architecture.¹⁰ This move of the architectural education can be seen as the downward turn of apprenticeship in the profession.

In 1485 A.D., in one of the seminal books in architecture history, Leon Battista Alberti’s “On the Art of Building in Ten Books” states his definition of Architecture in the prologue:

Before I go further, however, I think I should explain exactly whom I mean by architect: for it is no carpenter that I would have you compare to the greatest exponents of other disciplines; the

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¹⁰ Lawrence Woodhouse, Marian Moffett, A History of Western Architecture (Mountain View, California:Mayfield Publishing Company; 1989) 368.
carpenter is but an instrument in the hands of the architect.\textsuperscript{11}

The Beaux Arts education is a prime example of the ideas of Alberti that the Architect should only be concerned with the concept, and should use the carpenters and builders as tools in the construction. While it can be said that the skill of the craftsman at the time of the start of the Ecole des Beaux Arts far exceeds what skill is currently in the field of construction, the attitude that the contractor is beneath you as an architect only creates problems in the end. On the contrary, the contractors should be used as a tool in the design process and knowledge gained from these professionals of the building trades should be implemented for a more critical architectural experience.

At the opposite end of the educational spectrum was the Bauhaus (1919-1933), under the direction of Henry Van de Velde, Walter Gropius, and Mies Van Der Rohe. These masters in their own right set out to reinvigorate the profession through the teaching of a complete education. They were looking for a complete work of architecture, one that displayed the all-inclusive “total work of

\textsuperscript{11} Carpenter, 2.
The model used in the design of the education was that of the medieval guilds. The students of the Bauhaus were called apprentices and they graduated with a journeyman’s certificate.\textsuperscript{12} The leaders of this school were looking to bring back the scattered knowledge and “hands on” approach to design. They incorporated sculpture, photography, printmaking and painting back into the apprentices training to give them a more well rounded education.\textsuperscript{13}

The focus of the Bauhaus education over the years as it matured, turned away from the idea of art as a handcraft and moved toward the notion of handcraft as a means for the prototypes of mass production. This was seen as the primary challenge of the designer in the twentieth century.\textsuperscript{14}

This reinvigoration of apprentice programs was needed in large part due to the decline of apprenticeships during the industrial revolution. During this time the attitude toward the training of skilled labor changed dramatically. The machines that were being used to create the mass produced

\textsuperscript{12} Woodhouse, 456.
\textsuperscript{14} Woodhouse, 457.
parts were calling for a large influx of un-skilled labor and thus diminished the need for and the interest in apprentice training. The government of the United States gave most of its support to industrial crafts and left the handcrafts to fend for themselves. Because of this, craft training has found its way into the schools and Universities to be taught by intellectuals in a studio environment\(^\text{15}\).

This integration of art and machine in the industrial revolution period was in direct conflict with the thoughts and teachings of John Ruskin and that of the Arts and Craft movement. Ruskin was in full belief that the industrial revolution was a grievous mistake and a return to handicraft was needed. He found beauty in the work produced that reflected the craftsman that made it. Ruskin was vehemently against anything deemed industrial or the teaching of industrial design to students:

\begin{quote}
The tap-root of all this mischief is in the endeavor to produce some ability in the student to make money by designing for manufacture. No student who makes this his primary objective will be able to design at all; and the very words “School of Design” involve the profoundest of all art fallacies. Drawing may be taught by tutors, but design only by heaven; and to every scholar who
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Ruskin’s principles of design were very influential to William Morris, who abandoned theology after encountering his writings. As a result of the practice of Ruskin’s belief, Morris created a firm based on honest craftsmanship as an alternative to the mass-produced elements created by workers that had no interest or influence on what they were producing. Of course due to the time that these handcrafted objects were taking to produce, the intended consumers were not able to afford them because of the low output. This aside, the firm was the first to attempt solving the problem of the inferior quality of mass produced goods. While this attempt was unsuccessful, it influenced many people within the profession.

One such person was a German by the name of Herman Muthesius. After reporting on the state of English design, Muthesius was appointed head of the Prussian Board of Trade. In this role, he was responsible for the selection of designers to teach in the Prussian schools of arts and crafts. These schools are seen as the forward motion of

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16 Woodhouse, 390.
17 Woodhouse, 391.
the foundation of the Bauhaus. What is interesting is the fact that the arts and crafts movement, the total abstention of the industrial revolution and mass production, would be the catalyst for the Bauhaus, an education process that would gradually integrate art and industry into one. Not only would the Bauhaus take the principles against mass production, but they would also integrate an education through a scattered knowledge.

This approach of scattered knowledge and hands on approach has benefited architects of many different styles and periods. Some of the great architects of the past century have benefited from advantages presented to them through apprenticeship. Whether through a wood working apprenticeship or a glassblowing apprenticeship, the knowledge and reverence gained about materials and construction is invaluable.

Ludwig Mies van der Rohe, arguably one of the greatest architects of the last century, benefited from not one but two apprenticeships before beginning his architecture career. Not only did he grow up in the family of a stonemason where he would help his father with construction jobs, but he was also fortunate enough to apprentice for the Art Nouveau furniture designer, Bruno Paul in addition
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to serving as a draftsman for architectural firms. Having never had a formal education in architecture, he is credited as the only modern architect who formulated a genuinely contemporary and universally applicable architectural standard, which is mimicked in office buildings throughout the world.\textsuperscript{18}

Born twenty-four years after Mies, Eero Saarinen, not only benefited from the constant education of his father, but also from his brief education as a sculptor. Eero’s quest for the perfect form of a building spanned the utilization of many materials and styles. Through the exploration of technology, he was able to improve the glass curtain wall with the use of neoprene washers, and build full-scale mock-ups to test the durability of materials and their reaction to the environment.\textsuperscript{19}

Through explorations like this and his constant exploration of design, he was able to achieve a simplistic architecture that contained a complexity. He believed that each space should be designed for the space that encloses it. It is ideas like this that test the limits of architecture and design.


\textsuperscript{19} Allan Temko, \textit{Eero Saarinen} (New York: George Braziller; 1962) 25.
The architect Peter Zumthor, originally trained as a cabinetmaker, believes that architecture is about the entire experience and the combination of the five senses. In an interview at the Berlage Institute in Amsterdam, Zumthor stated his position towards architecture and theory:

Basically I’m not interested in architecture as a profession on paper. I’m just saying this because many architects are not so interested in the real building, they are more interested in the theory of the building or only in some aspects of the building. I’m concerned about the material, how things are put together, not the way it looks, but the way it is. I’m interested in the building itself, how you see it, how it is made, the building as a body.

Zumthor’s position on architecture is in direct accordance with that of the teachings of the Bauhaus in the fact that he states the essence of the building is more important than its appearance. This goes along with the stated purpose of creating the total work of art that is for all of the senses. Whether it is the feel or sensuousness of a wood connection or the smell of flower petals in one of the baths at Vals creating a sensory induced memory, the architecture is the experience. This experience is what Zumthor strives to achieve in his

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21 Peter Zumthor, interview, Berlage Papers 22 August 1997.
design and he has been recognized as one of the leading architects in the field for his “Experience Architecture.”

Due to the lack of apprenticeship in American architectural education today young architects are lacking in the skills and knowledge needed to create architecture that stirs the soul. There have been attempts to supercede this gap in education with influence even from Gropius, who is credited for the greatest influence on the students of the Bauhaus. He created a curriculum that would not only challenge the formal aspects of design, but also the craft needed to carry out those designs. His curriculum was set up in two parts, the study of form and the study of craft. The two different studies would then reinforce each other. Linked to this curriculum is a list that Gropius himself presented to the Association of College Schools of Architecture in 1959:

1. The architect should be a person of vision and of professional competence, whose task it is to coordinate the many social, technical economic and formal problems which arise in connection with building. He must realize the impact of industrialization and explore the new relationships dictated by social and scientific progress.

2. In an age of specialization, method is more important than information. Training should be concentric rather than sectional with an emphasis on relations.

3. Three-dimensional conception is the basic architectural discipline.

4. Knowledge will only come by individual experience.
5. At the start, basic design and shop practice combined should introduce to the students the elements of design, surface, volume, space, color, and simultaneously the ideas of construction, of building by developing three-dimensional exercises to be carried out with materials and tools.

6. In succeeding years of training, the design and construction studio, supplemented by field experience during summer vacations will coordinate further experience with the broadening of knowledge.

7. Construction should be taught as part of design, for they are directly interdependent.

8. The students should be trained to work in teams—also with students of related techniques—in order to learn the methods of collaboration.

9. History studios should be studied in later years, rather than the first, to avoid imitation and intimidation.

10. Teachers should be appointed only after sufficient practical experience of their own, both in design and building.²²

In the list, Gropius is pushing for a system of education that will teach by doing and by making mistakes. If a student learns how to properly lay stone during a summer between sessions, the next time that the student details stone, he will understand the patterns and the construction issues far better than a student that has never laid a brick. By building mock-ups and large-scale models, a student can learn the proper construction

²² Carpenter, 17.
and that knowledge will enhance any design in the future. Also, by knowing how a material reacts in certain situations will allow for the maximum potential of the said material. This knowledge and reverence of material is an aspect of the architectural education that is lacking today.

Since 1940, with the founding of the National Architectural Accrediting Board (NAAB), the majority of architectural education has been formatted to fit a rigid mold that supposedly turns out students that are well prepared to enter the field. While on the contrary, students are misinformed as to the importance of construction-based knowledge. The emphasis is put on theory and design knowledge rather than construction knowledge. While the theory-based knowledge is a good tool to have when trying to back up your design to other professionals and the public, the knowledge needed to create the building itself is the most valuable. The NAAB, the sole agency authorized to accredit United States professional degree programs in architecture, requires an accredited program to produce graduates who:

Are competent in a range of intellectual, spatial, technical, and interpersonal skills; understand the historical, sociocultural, and environmental context of architecture; are able to solve
architectural design problems, including the integration of technical systems and health and safety requirements; and comprehend architects' roles and responsibilities in society.  

While the NAAB maintains that architecture schools must fulfill a working knowledge of 37 different criteria to be accredited, ranging from Fundamental Design Skills to The Legal Context of Architectural Practice, the enforcement of these criteria is based upon visits set up every four to six years. In these visits, each criteria is linked to specific classes that are intended to cover the topic. The accreditation team, in the form of syllabi and minimal student work, only views these specific classes. There is no regulating force within the classes themselves as to what is being taught and to what extent of detail there is. Out of 37 criteria only two have to do with the understanding of construction knowledge and materials; Building Materials and Assemblies and Detailed Design Development. Even with these two requirements in place, schools must only show that they are teaching the topics in some way.

Figure 2.20

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While the NAAB has these standards that need to be in place for a curriculum to be accredited, The Cranbrook Academy of Art in Bloomfield Hills, Michigan has rebuffed the current trends in the education process of a conceptual approach to design. They have decided to root their educational process in the construction and the actual building process. Some of the basic skills that the students of the academy must acquire are pouring concrete, welding metals, and stacking wood. By learning these aspects of construction, the students find new meaning for the advice of John Ruskin to “keep your hands on the plough.” They have also realized that the only way to assure that the quality of the architecture remains, one must stay close to the work.25

It is in this tradition that Samuel Mockbee; the late co-founder of the Rural Studio (a construction based program thru the University of Auburn), believed that one of the greatest lessons that an architecture student could receive was to build what they had designed. To actually take what they had drawn on paper and see how they would build it is a lesson in itself. Also, he believed that the experience gained from conversing with the

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25 Carpenter, 37.
professionals from the construction trades was more valuable for the students than a possible internship in an office environment, where the student would only do what the firm would tell them to do.26

It is this type of thinking that the architecture world needs. So many current graduates are going into the market for jobs with little or no construction knowledge. They are taking jobs in which they sit at a desk and learn by drawing in two-dimensions rather than seeing how to build in three-dimensions. Most of the time what they are drawing is the regurgitation of past projects and older construction techniques. They are only fixing past details to fit the current project and a majority of the time the wrong detail is being used to only save time.

While school is the major proponent of a young architect’s education, students today are getting into the job-market earlier and more often then ever before. They are taking internships at firms throughout the country and abroad, gaining valuable office experience and learning the basics of practice. These internships are showing students what they are lacking in architectural knowledge

and what they can expect in their future career. Even though they are working in this environment, they are not receiving enough introductions to the field of construction and construction knowledge. Whether this knowledge comes from fieldwork or detail work, the student needs to explore and learn by doing, similar to Gropius’s list to the ACSA in 1959.
In no way is this thesis to be taken as an attack on the technology and theory of the time. Theory is still a vital part of any project and is required to make a building or project of any substance. Technology is an ever-changing variable in design and construction that needs to be integrated to keep up with the times. Only when technology, theory and an understanding of the construction and materials of the project come together can there be a progression in architecture.

It follows, therefore, that architects who have aimed at acquiring manual skill without scholarship have never been able to reach a position of authority to correspond with their pains, while those who only relied upon theories and scholarship were obviously hunting the shadow, not the substance. But those who have a thorough knowledge of both, like men armed at all points, have the sooner attained their object and carried authority with them.27

Just concentrating in one area, does not make an exceptional architect. One must be willing to gain knowledge in all aspects to compete today. Even with a great knowledge of the handi-crafts, one cannot fully garner an art without technology and theory. By continuously creating the same product over and over with great attention to the craft of the product doe not make it art. It is said

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that there can be craft without having art, but there is no art without craft.

This understanding of craft as a tool in design is a skill that needs to be taught in the design school as part of the curriculum. To understand the inherent properties of materials and their connections can benefit all aspects of design, from conceptual ideas to detailing. This understanding, which is readily taught in Europe, is what is missing in America. In order to compete with the architecture that is created in Europe, the integration of the apprentice in architecture must also occur in the United States.
The apprentices at the Rockland Apprenticeshop are trained for two years in all aspects in the construction of boats. The craft needed to accomplish a boat of any size is a skill that can only be learned over time. Each process in the construction is a meticulous activity that requires precise measuring and cutting. The lofting of the design, or the drafting of the design drawings at full scale, is a meticulous task that must be drawn exact to get the correct shapes for the form of the boat. Once the lofting is complete, the structure for the boat is fabricated using the lofted lines as templates. As the construction progresses, more attention is place in the joining of materials to create the watertight effect. The one thing that separates well crafted boat, i.e. “floats”, and a boat that sinks, is the craft and care taken in the connections and joints. Without this attention to detail, there is no craft, and without craft there is no art.

As with any of the handicrafts, whether it is metalworking of furniture construction, the joint is the most critical detail. There is nothing more beautiful than a well-executed weld or a mitered dovetail joint on a piece of furniture. Craftsmen are constantly searching for new methods of joining
Relationship to the Building

materials via mechanical fasteners or chemical bonds. These connections become the focus of their projects and usually the most scrutinized aspect. When translating the joint into architecture, there are basically two ways of looking at it. There is the joint as a detail within the architecture and the joint as the idea behind the architecture.

The joint as a detail within a building can be developed as a simple joining of materials, or the connection of pieces of the architecture. The material connection can be as simple as the meeting of the floor and wall, or as complex as creating a hidden hinge point between two materials. The care is taken in defining the parts as they relate to the whole. In the Apprenticeshop, the focus of the connection is the transition halls from one pavilion to another. By raising the floor level in the transition space, there is a greater sense of movement. Also the extents of the connectors extend into the pavilions to give credibility to the joint. Not only does this show attention to the joint, but it also shows the importance of the transition from one pavilion to the other.

The large-scale relationship of the building and thesis deals with an overlapping joint of the land and the water. Within woodworking, when a
butt joint is used and carries any load, an overlapping sectional joint is used to reinforce the connection. The Apprenticeshop in this instance acts as that joint, creating an overlap between the land and water. The separate pavilions of the complex act as fingers that allow both the land and water to penetrate each other and disintegrate the hard edge.

The craft used with the boat construction is one that is intended to transfer in the construction of the building. With an understanding of the craft necessary, an architect can translate it into the construction of the building. With the Apprenticeshop, the early construction of the boat is emulated. The roofs of the pavilions create containers for the construction of the shell of the boats by wrapping and enclosing each space. This relationship of container and contained allows for the building to act as an indicator of the craft contained within on the larger scale.

Once the shell of the boat is constructed, the vessel is turned over to work on the interior. At this point the boat creates a space, and creates two spaces that are overlapping. This condition is manifested in the construction of the transitional hallways between the pavilions. Each of the
instances links the building back to apprenticeship in some form, whether in a literal or abstract sense.
The Apprenticeshop, founded by Lance Lee, has served close to 10,000 people of all ages. From interns to apprentices to volunteers, the shop has cultivated an understanding and appreciation for boat building and seamanship through teaching, sailing and community involvement. Striving to bring alive the traditions of the Rockland coast, the Apprenticeshop teaches traditional wooden boat building in the form of a two-year apprenticeship.

The Atlantic Challenge Foundation is a not-for-profit educational institution whose mission is to develop the individual and the community through the experience of apprenticeship and the practice of traditional skills. Established ten years ago, the Foundation carries forward the philosophy of education that began with the first Apprenticeshop thirty years ago.

“If, along the way, you can make a living by starting to use your hands, learning boatbuilding, you can then make anything from a split-rail fence to a violin, depending on your temperament. The compound curve and changing bevel in boatbuilding provides the disciplines along the route to the point of which you no longer have to worry about whether you can do something.”

Lance R. Lee

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Founder of the Apprenticeshop and the Atlantic Challenge Foundation

The new building will be designed to house the Apprenticeshop as well as the Atlantic Challenge Foundation (ACF) under one roof. Not only will the construction of boats be taking place in this new facility, but it will also serve as an education center for the community. Along with the normal apprentices and interns, the shop educates middle school students and volunteers about construction aspects of boats and seamanship.

The Apprenticeshop, currently run by Michael Newmeyer, will house 14 apprentices at its maximum capacity. This is to ensure quality instruction and interaction with the instructors. The range of boats produced at any one time can vary from a 24 ft. Carney Lobster boat to a 7 ft. Skiff produced by middle school students. The shop must have the flexibility to arrange the shop floors to accommodate the current workload. The most accommodating layout would be to have large open spaces to allow for the interaction of the apprentices.
Facility Program

Apprentice Shop floor

The shop floor is the main space of the complex. The current shop floor is spread out over three floors and interaction of apprentices is lost. The new floor should be one space that allows for the collaboration and interaction of the apprentices.

Equipment needed:
- The shop floor should be large enough to accommodate six lofting tables that range in size from three feet wide up to 6 feet wide and reaching up to lengths of 40 feet.
- Each apprentice will be allocated his own personal workspace to store personal tools and drawings. This workspace should be large enough to allow for the apprentice to layout drawings and to set up their personal workspace.
- Hand tools shall be kept within close proximity to the lofting tables

Adjacencies
Power tool shop, restrooms, director’s office, tool crib, wood storage, and intern shop
Intern shop floor

The intern shop floor is the second most important space of the complex. The interns spend six weeks learning about and constructing a small wooden craft. The new floor should be one space that allows for the collaboration and interaction of the interns present and with the apprentices.

Equipment needed:

- The shop floor should be large enough to accommodate four lofting tables three feet wide and reaching up to lengths of 20 feet.
- Each intern will be allocated his own personal workspace to store personal tools and drawings. This workspace should be large enough to allow for the intern to layout drawings and to set up their personal workspace.
- Hand tools shall be kept within close proximity to the lofting tables

Adjacencies

Power tool shop, restrooms, director’s office, tool crib, wood storage, apprentice shop floor
Power tool shop

The shop will include all large power tools needed in the construction of the boats. Each tool shall have the necessary safety zones and clearances around it according to safety standards set by the state.

Equipment needed:
- Table saw
- Band saw
- Planar
- Jointer
- Drill press
- Lathe (2)
- Sanders (Belt and Spindle)
- Grinders (3)

Adjacencies
Tool crib, Wood storage, Apprentice shop floor, Intern shop floor
Facility Program

Tool Crib

The tool crib will be the storage for all hand held power tools as well as overflow hand tools that are in excess.

Equipment needed:
- Shelving Units for Power tools (2)
- Drawer units for hand tools (2)
- Drawer units for hardware (2)
- Tables

Adjacencies
Wood storage, Apprentice shop floor, Intern shop floor, Glue Stations
Wood Storage

Wood Storage is needed to allow wood to dry indoors and to provide easy access for the interns and apprentices during the construction of boats.

Equipment needed:
- Shelving Units for Wood (4)

Adjacencies
Apprentice shop floor, Intern shop floor, Glue Stations, Power tool shop, tool crib

Glue Stations

Glue stations are needed to allow for the fumes to be vented. Each station shall have an eye wash station within close proximity.

Equipment needed:
- Glue Table
- Vent system
- Eye wash system

Adjacencies
Apprentice shop floor, Intern shop floor, Wood storage, Power tool shop, and Tool crib
Interactive Kiosks
Kiosks shall be place throughout the build alerting the visitors to the shop about the processes involved in the construction of boats.

Equipment needed:
N/A

Adjacencies
Located throughout the building

Sail Loft
The sail loft will be used for the sewing of sails and for the storage of sails. This space can also be used to allow sails to dry

Equipment needed:
- Sewing Machines (placed within the floor)
- Shelving unit for storage of sails (1)
- Layout tables (2)

Adjacencies
Apprentice shop floor, Intern shop floor,
Director’s Office
The director of the Apprenticeshop needs an office to conduct the business side of the shop. The office should be private and allow for the director to get work done without being interrupted by the construction of the boats.

Equipment needed:
- Computer
- Desk and Chair
- Table and (2) comfortable chairs for informal meetings

Adjacencies
Apprentice shop floor, Intern shop floor

Restrooms (2)
The restrooms are for the use of the apprentices and interns as well as the visitors to the shop.

Equipment needed:
- Toilet
- Sink

Adjacencies
Apprentice shop floor, Intern shop floor
Finish Room

The finish room by code must not be adjacent to the rest of the building. The room will house a paint/finish booth large enough or the finishing of all boats produced in the shop.

Equipment needed:
- Finish Sprayer
- Ventilation System
- Sink
- Eye wash station

Adjacencies
Apprentice shop floor, Intern shop floor
Atlantic Challenge Foundation

Gallery

The gallery will hold a rotating display of nautical themed art as well as samples of the work produced in the Apprenticeshop. The gallery should have plenty of natural light.

Equipment needed:
- Free Standing Display systems

Adjacencies

Souvenir store, entrance, meeting room

Souvenir Store

The souvenir store will allow for visitors to the shop to buy educational material and memorabilia of the shop.

Equipment needed:
- Free standing display systems

Adjacencies

Gallery, entrance, meeting room
Facility Program

Atlantic Challenge Foundation

Meeting Room
The meeting room will be used for large gathering and activities. Board meetings and conferences will be able to be held here.

Equipment needed:
- Tables
- Chairs
- AV Equipment

Adjacencies
Souvenir store, entrance, gallery, library

Library
The library will house the many books on woodworking and the construction of boats owned by the foundation.

Equipment needed:
- Free standing shelving units

Adjacencies
Gallery, entrance, meeting room
Atlantic Challenge Foundation

Kitchen
The administrators of the Atlantic Challenge Foundation will use the kitchen for the preparation of lunches and the storage of food products.

Equipment needed:
- Microwave
- Sink
- Refrigerator

Adjacencies
Offices, Conference Room, Meeting room

Storage
The storage will be used by the ACF to store items for the store as well as activities and books.

Equipment needed:
- Shelving Units

Adjacencies
Offices, Conference room
Atlantic Challenge Foundation

Offices

The administrative staff of the ACF for day-to-day operations will use the offices.

Equipment needed:
- Free Standing Display systems

Adjacencies
Souvenir store, entrance, meeting room

Conference Room

The conference room will be used for small meetings and gatherings concerning the operations of the ACF and the Apprenticeshop

Equipment needed:
- Free standing display systems

Adjacencies
Gallery, entrance, meeting room
Atlantic Challenge Foundation

Lunch Room
The lunchroom is for the use of the administrators of the ACF to hold lunchtime meetings and for the overflow of offices duties.

Equipment needed:
- Small Table
- 6 Chairs

Adjacencies
Kitchen, Offices, Conference Room

Supply Room
The supply room will be used to store supplies for the offices of the ACF.

Equipment needed:
- Shelving Units

Adjacencies
Offices, Conference Room, Kitchen
Atlantic Challenge Foundation

Restroom

The restrooms are for the use of the administrators of the ACF and their guests.

Equipment needed:
- Sink
- Toilet

Adjacencies
Offices, Conference Room, Kitchen
Exterior Space

Dock

The dock is existing. However, to allow for more public gatherings, parts of the dock may need to be replaced and/or widened.

Equipment needed:
- Cleats for mooring boats
- Storage shed on end of dock for safety equipment

Adjacencies
N/A

Boat launch ramp

The ramp is new and will remain unchanged.

Equipment needed:
N/A

Adjacencies
N/A

Figure 5.7
### Facility Program

#### Exterior Space

##### Interactive Kiosks

Kiosks should be placed at various locations on the site to allow for visitors to learn about sailing and the history of the site.

**Equipment needed:**

N/A

**Adjacencies**

N/A

#### Boat Storage

Storage for the Rockland Yacht Club as well as the boats used by the foundation and shop are kept on site and should interspersed as to not create a large parking lot.

**Equipment needed:**

N/A

**Adjacencies**

N/A
Facility Program

Exterior Space

Parking

Parking should interspersed as to not create a large concrete surface. Possible materials include gravel and grass-crete.

Equipment needed:
- 20 Parking Spots For Vehicle
- 15 Parking Spots for Boats

Adjacencies

N/A
**Site**

The site for the Rockland Apprenticeshop is the current location for their facility. Located along Main Street just north of downtown Rockland, the site offers access directly to Rockland Harbor. One of the sites amenities includes a boat launch and existing dock. Access to the site for vehicular travel is via the north, with the possibility of a southern access point.

The current surrounding buildings are not close enough to the buildable area to have any major impact on the design of the building. The major factors that will have to be considered are the flood plains, the prevailing winds from the southeast, the views of downtown, and the locations of the boat launch and dock.30

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Bibliography


