Integration through application

by

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This is to certify that the master's thesis of

Zane Nicholas Muntz

has met the thesis requirements of Iowa State University

Signatures have been redacted for privacy

This thesis is dedicated to my family;

Suzanne Elizabeth,
Cruz Nicholas,
Zander Joshua,
Zoey Christine,
and Mazey May,

and

in memory of those who inspired me growing up;

Sam Allums,
Andrew Mathias,
Edmund "Sonny" Rider.

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INTRODUCTION

Through their own efforts and imagination, students create something wonderful—architecturally, socially, politically, environmentally, esthetically. That's the mission of the Rural Studio. And once they've tasted that, it's forever there. It may go dormant for a while, but at least they've experienced and created something that they're not going to forget.[1]

This thesis began, not with a question of what it could do for me, but one that would gratifyingly embody a more holistic purpose, "What can this thesis do for someone else?"

An architectural thesis is in part a cause and effect philosophy that formulates a problem and has a designed response. It is an opportunity to create an instrument for achievement. All these ideas as well as the opening quotation from Samuel Mockbee have led to the culmination of the thesis idea and project.

Instead of formulating a problem, I sought a "real" one that required a "real" design solution. It would lend itself to become an instrument for "achieving 'real goods'- those things which are good for man by virtue of their supporting life and personal growth physically, emotionally, psychologically, intellectually and/or spiritually,"[2] and could satisfy a social need with its built response. Most communities are in need of some architecturally designed work. It is this social-architectural-need relationship this also explores.

The educational value lies not only in the design process, but begins in project selection and continues through construction a demonstration of "real" pedagogical value. It is the "innovative, stirring and valuable,"[3] dynamic character of this project that requires more "mental acuity, imagination, and conviction"[4] than the typical studio.

It is my passion this project would (that would have normally been given no architectural designed intervention but been left to be more mundane) enhance someone else's experience. This initial research led to discovering that "real" problems existed and designed solutions were being created and constructed to help others.

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[1] Dean, Andrea Oppenheimer and Hursley, Timothy. "Rural Studio-Samuel Mockbee and an Architecture of Decency."

[2] Lucas, John. "What is Architectural Thesis?"

[3] IBID

[4] IBID

Ultimately, the thesis was chosen "to achieve certain focused intentions."[5] These pedagogical goals are:

1. Provide a more integrated approach to architecture to prepare for practice.
2. To better understand the multiple roles architects can play in practice.
3. Reinforce the idea of community service (social awareness).
4. Increase knowledge of other design phases.
5. Increase communication and collaboration skills through interaction with clients, public, users and consultants.
6. Reinforce the connection between planning, design, landscape, construction process, materials, built and living environments.
7. Reinforce the idea that architecture is not a solitary action or created in a vacuum.
8. Bring legitimacy to education by experiencing the pleasure and frustration of completing a task.

It will be looked at through a "hands-on" experience with aspirations of learning more about architecture and the role of architects from engaging the Design/Build process. The project was grounded in research of historical, theoretical and pedagogical precedents and is as inspirational as informational.

[5] Lucas, John. "What is Architectural Thesis?"

CHAPTER I: INTELLECTUAL CONTEXT

The "hands-on" nature of the design/build process is instrumental to the pedagogical aspirations of the project. Hands-on or active learning is an educational tool used to gain "real" experience on a subject so participants are more familiar with situations where those experiences can be drawn from. Researching the role design/build has played throughout history is key to understanding the success and failures of the process. The following provides the foundation from which these initial ideas and theories of integrating education through applying it in a "real" project began.

Historically, the use of construction in architectural education will be discussed from the German Bauhaus, to Jefferson's Monticello, to medieval times. In ancient Greece and Egypt the role the architect played was as a "master-builder". In Greece, the "term architekton meant, at least initially, nothing more than master-carpenter."[6] During the Renaissance, there was a break in the spectrum of the architect's role with it leaning more towards the theoretical side. In the academy, to some degree, that schism remains today and only in the last few decades has there been a major shift towards repairing it through design/build.

There are several hands-on architectural education models that have been published and have received peer praise including Samuel Mockbees' Rural Studio; Cranbrook Academy of Art; the University of Washington; and Yale University.

Using such writings as those by Henry David Thoreau, Michael Pollan and Jody Proctor as well as political philosopher Jean-Jacques Rousseau, I will show how the theory of learning through doing has developed in prose and philosophy. The theory of making as part of the design process will also be examined by discussing artists such as Richard Serra and architects Le Corbusier, Frank Lloyd Wright and Walter Gropius.

Historical Precedents

As discussed earlier, there remains a schism in the academy between an architect's roles from pure theory to the practicality of construction. Only recently has there been a surge in which architects, architectural firms and schools have begun to bridge the break through hands-on learning or design/build. Design-build is an accepted practice at some architectural schools

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[6] Kostof, Spiro. "The Architect- Chapters in the History of the Profession."

and firms and was widely the main educational tool for those in ancient history. It was during the Renaissance period when the break occurred, which led the architect as a master-builder away and more towards the theoretical. This discussion will lead us through the historical role architect's have provided through time and more importantly the use of construction in architectural education.

Using Spiro Kostof's, "The Architect" as a guide, we are taken on a journey through time of the profession of the practice. Kostof says, throughout history, "architects have been associated with the rich and the powerful."[7] This is due to the need for specialized buildings that require a certain degree of thought and planning. This remains true today, but those who have a need for a specialized building are not always of the wealthier classes. How are they to fulfill their needs, when we are not affordable? We will return to this idea later, in discussing architectural education precedents. However, these statements are true and led to a hierarchy that remains today.

Discussing this hierarchy Kostof writes, it "set them apart from the laboring classes. They were not workmen but rulers of workmen, as Plato puts it; they contributed knowledge, not craftsmanship."[8] He continues about Egypt by saying,

> *The principal deity of architecture and reckoning was the goddess Seshat, known as 'Lady of the builders, of writing, and of the House of Books.' She assisted the king in the laying out of new buildings, through the ritual act of driving a tall stake into the ground with a mallet. She was sometimes replaced by Thot, the god of science, or Ptah, the god of crafts: a constellation that neatly scans the total scope of architecture from pure theory on the one hand to the practical know how of construction on the other.*[9]

He goes on to discuss the role that the state architects of Egypt had and how their "professional title denotes 'master builder' and 'overseer of works.'"[10]

In discussing Greece, Kostof makes more specific claims to the architectural profession and their background because of greater informational sources. He writes, "He was rather a master craftsman, like the shipwrights responsible for the Greek triremes. Indeed, the Greek term

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[7] Kostof, Spiro. "The Architect- Chapters in the History of the Profession."

[8] IBID

[9] IBID

[10] IBID

architekton meant, at least initially, nothing more than master-carpenter; it was in this sense, rather than master-designer, that it was used to refer to shipwrights and temple-builders alike."[11] This example also shows that among Greek architects there remained a very construction heavy influence. In architectural books up through the fourth century, they "dealt both with theory-that is, the proportions and properties of the Orders, ornament, and the like-and with the technical matters of construction."[12] In discussing state architects of Greece, Kostof writes, "In a number of cases, it seems that the would-be architect started off in one of the arts or building crafts, in which he might continue even after the shift to architecture. Skill in carpentry was specifically looked for in the salaried state architects of cities like Athens and Delos."[13]

William MacDonald writes about Roman times in Kostof's, "The Architect." Using the remains of major buildings standing today as his source of knowledge of the profession; MacDonald writes, "And as a fully trained Roman architect was also expected to be expert in construction, hydraulic engineering, and surveying and planning, the profession was obviously a significant and influential one."[14] He explains their training through "three avenues to professional status."[15] All of which have some element of service in construction, whether through an established master, a private career; through the military; "or an ascent through the graded levels of the imperial service."[16] He describes in detail, the career of Vitruvius and how he was able to grow to his status through his work with the military. In discussing Vitruvius', Ten Books on Architecture, he writes, "and it quickly becomes evident that he had had a great deal of experience with every aspect of design and construction. This extensive practical material is quite distinct in tone from his exposition of rules and theory."[17] Following is an excerpt from Vitruvius' writings:

> *The architect should be equipped with knowledge of many branches of study and varied kinds of learning, for it is by his judgment that all work done by the other arts is put to the test. This knowledge*

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[11] Kostof, Spiro. "The Architect- Chapters in the History of the Profession."

[12] IBID

[13] IBID

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[15] IBID

[16] IBID

[17] IBID

> *is the child of practice and theory. Practice is the continuous and regular exercise of employment where manual work is done with any necessary material according to the design of the drawing. Theory, on the other hand, is the ability to demonstrate and explain the productions of dexterity on the principles of proportion [1.1.1].*[18]

Kostof provides a description of both the eastern and western architect during the Middle Ages. He writes about the Christian architect,

> *The fact is that the term architectus fell into disuse precisely because the Classical concept of the architect as it is represented in Vitruvius faded and was replaced by something else: the architect as a master-builder. For Vitruvius, the theoretical aspects of the profession and a thorough grounding in the Liberal Arts were as important to the architect as expert knowledge of building technology. Not so in the case of the medieval architect, who rose from the ranks of the building crafts, carpentry or the working of stone or commonly both, and took part in the actual process of construction alongside the building crew as one of their own.*[19]

The Muslim architect was trained much like the aforementioned Christian architect of the Middle Ages, with training beginning;

> *In one or more crafts-masonry, cabinet-making, faience, metalwork, and the like. In an architectural tradition that thrived on decorative effects, this early training made good sense. Yet for all the splendid ornament that sheathes the palaces, mosques, and tombs of Persia, Egypt, North Africa, and Spain, the structural stability of the frame was a chief obligation of the architect. Buildings like the mosque of Sultan Hassan at Cairo or the tomb of Oljeitu in Sultaniya cannot have been achieved without seasoned, albeit entirely empirical, experience in construction.*[20]

In the early fifteenth century, Italy was becoming the epicenter for the widening gap between architects as a combination of knowledge in practice and theory. Until now, the role of the architect seemed to be an evolution that led to the Vitruvian ideal. It was the Renaissance period and the Italian architect, Alberti, who started this divergent thinking. In "The Architect," Ettlinger writes about Italian architects, "In any case, none of these men, who were responsible for so many of the most celebrated Renaissance buildings, were technicians, and they all needed help when it came to problems of structure or building methods. Such help could only come from the practical men, the masons, builders and joiners."[21] He goes on to discuss the

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[18] Kostof, Spiro. "The Architect- Chapters in the History of the Profession."

[19] IBID

[20] IBID

[21] IBID

limitations that model-making present when a project undergoes construction by writing, "Models did no more than give a general idea of the appearance and scale of a building, and they seem to have lacked details. These, and much else, were left to discussions between the designer and those responsible for the execution of the designs."[22]

Catherine Wilkinson writes about the architect's role of the sixteenth- century Renaissance period, and their effort to search out and establish their own identity and social standing of the time. She writes,

> *A new working relationship with the building trades was as necessary to the sixteenth-century architect as the new style of patronage. Alberti had quite consciously opened a gap between the architect and the craftsman, a gap so eagerly accepted by architects and, by the sixteenth century, already so firmly established in Italy that it was difficult to bridge from either side. It was responsible for the often-bitter exchanges between men working as architects but placed on opposite sides of the division between the liberal and the mechanical arts. These debates usually concerned technical competence- the 'craftsman-architect' accusing the 'dilettante-architect' of incompetence and the architect asserting his intellectual superiority over the craftsman. The craftsmen who were to execute the architect's designs were, in Alberti's words, just 'an instrument to the architect.' Philibert Delorme took much the same view when he spoke of the 'the third class of persons...the master masons, stone cutters, and workmen whom the architect must always control.*[23]

In France and Spain, the training was quite different from that of their Italian counterparts. Their education was more closely associated with that of architects of the medieval system, in that the training of the Spaniard architect "took place on the job."[24] As the sixteenth century went on, the master craftsman (architect) began to disappear from the projects and set himself apart from the building trades as well. This continued to be the trend throughout France and Spain and eventually led to architects with training like that of Juan de Herrera. Herrera fashioned himself after Alberti's definition of architect, which was well schooled in geometry, mathematics, and philosophy but "had no practical training in building."[25] This is important because the building profession was being held powerless while architects like Herrera ruled under the reign of Philip II. Now, master-builders were becoming displaced at an alarming rate.

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[22] Kostof, Spiro. "The Architect- Chapters in the History of the Profession."

[23] IBID

[24] IBID

[25] IBID

The architects' status quo was quickly going the route of the "technical inexperience of the artist-architect of the Renaissance"[26] period.

This period also marked a shift in the way architects communicated with craftsmen and workmen. The new artist-architects, as mentioned before, were spending less and less time on the project site requiring greater means to express their design wishes; so the "medieval tradition of model-building in Italy continued in the Renaissance,"[27] as well as the use of drawings as an effective design tool. As early as the previous century, drawings were beginning to replace the earlier models of the practice. The idea "that architecture could not be learned on the job,"[28] but rather required intense study and no role in the construction process was the dominating ideal.

It became the character of "the profession until very recent times, when architects have begun to feel constrained by the image of the omnipotent designer."[29] It was the Renaissance, where the professionalism of the architect began as well as the distancing between him and the constructor. In the words of William Carpenter in, "Learning By Building, "It put the architect above the builder, and our profession went off course."[30]

There have been times and architects throughout time who have positioned theory and practice as equals. From the Renaissance on, theory has often been placed above the practice, and therefore placed the architect above the builder. Carpenter argues, "The architect should not remain distant from the act of making. This is not to say that the architect must build; everything, but the architect should not simply *observe*; the architect should be immersed in the potential of construction and its conception."[31] Carpenter speaks about the Ecole des Beaux Arts as the beginning of "formal architectural education."[32] In the school, "construction was removed from the design process."[33] Where, not only was the building itself replaced, but even

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[26] Kostof, Spiro. "The Architect- Chapters in the History of the Profession."

[27] IBID

[28] IBID

[29] IBID

[30] Carpenter, William J. "Learning By Building- Design and Construction in Architectural Education."

[31] IBID

[32] IBID

[33] IBID

the idea of model making. In the early 1900s the craft of architecture and construction was beginning to be found again in the German Bauhaus. It was here under such architects as Walter Gropius and Mies Van der Rohe, that students again studied the technical aspects of architecture. Many schools began to follow the model the Bauhaus set, but chose to replace the full scale work "with a *representation*-based pedagogy."[34] According to Carpenter, "This analogue-based approach changed architecture as these students graduated with a view of architecture removed from the actual act of making."[35]

Carpenter also points out those architects,

> *like Thomas Jefferson, Frank Lloyd Wright, and Tadao Ando learned architecture with little formal instruction and mostly from personal reading, travel, and building experience. Jefferson made many trips to visit architecture and undertook a lifelong design/build project which went through many conceptual and tectonic changes: his house, Monticello, in Virginia.*[36]

Pedagogical Precedents

Today, the idea of design/build is becoming increasingly more active in producing work in the field of architecture. Carpenter questions, "Why is most of the current design/build work lacking in substance and innovation? Perhaps one reason is that construction is not yet a part of the education of the architect."[37] There have been some educational and practicing models that have received notoriety, respect and awards. The University of California at Berkeley is one school that has been able to adapt construction into the learning process and is well known as a top architectural university. Under the direction of Professor Christopher Alexander, the students were able to study their ideas by constructing full-scale mock-ups of their designs using scaffolding and plastic sheathing.

> *Both the practicing architects and students entering the profession lament the lack of understanding that architecture students have for construction and the built reality of their designs. Their lack of building know-how comes, not from any deficiency on their part, but from two characteristics inherent in the institution of architectural education. The first is the growing fracture between design and construction, which finds the architect drifting further and further from the contact with the craft of building. The second is the growing imbalance between conceptual thinking and 'the idea.*[38]

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[34] Carpenter, William J. "Learning By Building- Design and Construction in Architectural Education."

[35] IBID

[36] IBID

[37] IBID

[38] IBID

Another successful academic endeavor was the work of the Parkstadt Workshop of the Fachhochschule in Frankfurt, Germany. This workshop, led by Professors Hajo Neis and George Elvin, was set in making full-scale models of an arcade on site.

> *This method weaves design and construction into a continuous, unified building process-one with several advantages over the traditional way of designing at the drafting board and handing the drawings over to a contractor for execution. Design takes place on-site, where we feel the wind, see the way the light falls, and experience the view through the columns to the open field. This takes us away from the once-removed world of the office to the site, and engages our body as well as our mind in the design process. It also gives us a more sharable language of design. In the course of working in this way, I have seen time after time how many arguments about specific design issues that can go unresolved in the office or classroom can be resolved quickly once we get together on-site and test things directly. This happens naturally because, when we talk about an object abstractly, we each have a slightly different view of the thing. But when we stand in front of it, and experience it as built reality, we are dealing with the thing itself, and this eliminates some of the confusion that inevitably results from discussions based on drawings and explanations once-removed from the real thing.*[39]

Other schools such as Cranbrook Academy of Art in Michigan have long been associated with the arts and crafts and have naturally fed that aspect into full-scale architecture. With the rest of the academy shifting to a more conceptually based approach than in past years, the architecture department has "re-dedicated"[40] itself to building experiences. In doing so, the studios use full-scale construction as the foundation for their architecture pedagogy. The following images are case studies of that re-dedication process that was shared with the community in some outreach construction, where the department was able to operate "as an architect, contractor, and builder for a number of smaller infrastructure projects."[41]

Entrance Canopy and Guard Booth
Production of custom-made brick at factory

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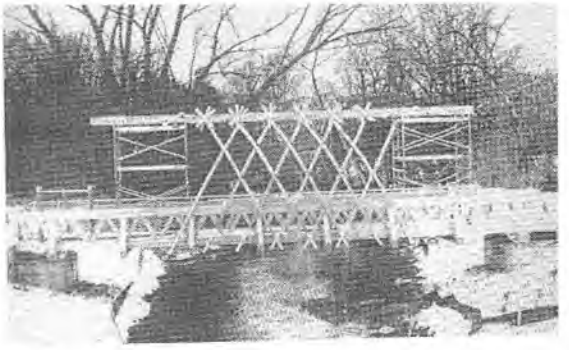
[39] Carpenter, William J. "Learning By Building- Design and Construction in Architectural Education."

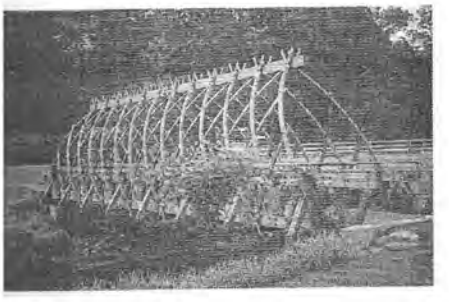
[40] IBID

[41] IBID

[42] IBID



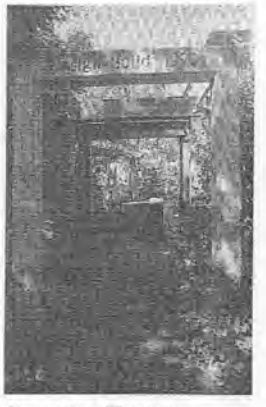
Trellis Bridge
Bridge in progress with scaffolding 43



Trellis Bridge
Final installation 44

A fourth design/build program at the University of Washington is also a major producer of designed and built works by students. It is offered as an elective and only then if certain requirements are previously met in the department. The course is structured quite simply and is well set in its goals and strategies. Here, the studio is viewed as a collaborative effort and consensus design experience. This is because, "traditional studio reinforces some unfortunate assumptions about creativity, most notably that practice is a solitary endeavor."[45] The following images will highlight some of these projects.

University of Washington
Design/Build Studio
Stair to nowhere
Final installation: view from park
Photo: Jared Polesky



University of Washington
Design/Build Studio
Gould Park Project
Entrance
Photo: Jared Polesky

University of Washington
Design/Build Studio
Gould Park Project
View of class on stair to nowhere
Photo: Jared Polesky 46

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[43] Carpenter, William J. "Learning By Building- Design and Construction in Architectural Education."

[44] IBID

[45] IBID

[46] IBID

University of Washington
Design/Build Studio
Instructor Steve Badanes
Gould Park Project
Stairway to nowhere: construction view
Photos: Jared Polesky

University of Washington
Design/Build Studio
Gould Park Project
Final installation: view from street
Photos: Jared Polesky

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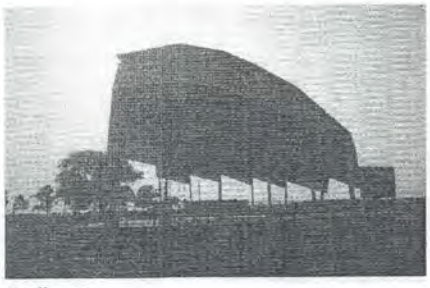
The next studio is a highly touted program, Yale University in Connecticut. It has been operating for over 25 years under the leadership of Charles Moore. The projects range from "single to multi-family housing units constructed in partnership with non-profit organizations and several open-air pavilions at local parks."[48] It was originally founded as a way to ease the break formed between theory and practice by, "presenting a complete professional experience of design, offering hands-on construction experience, and allowing a view of architecture within a social context."[49] As a focus, the Building Project has attempted to grasp a "means of understanding the process, practice, and scope of the architectural profession."[50]



Yale University
Building Project
Final installation of Concert Stage Pavilion, 1987

Yale University
Building Project
Copper roof application at Concert Stage Pavilion, 1987

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[47] Carpenter, William J. "Learning By Building- Design and Construction in Architectural Education."

[48] IBID

[49] IBID

[50] IBID

[51] IBID

Yale University
Building Project
Students lifting a wall into place at 348 Newhall Street

Yale University
Building Project
Final installation of 348 Newhall Street [52]

One of the more recently heralded design/build programs, have not only set themselves apart through their built work, but also their greater social mission. The Rural Studio, set up through Auburn University, was headed up by architect and humanitarian, Samuel Mockbee. His Rural Studio engages in the poverty stricken area of Alabama's Hale County. It is here, they design and construct for those who would normally be unable to help themselves.

Even though, I believe the work of the Rural Studio to be very aesthetically pleasing it is the greater compassion the students and professors show to those individuals they are working with that sets them apart. This mission is so inspiring, that I hope to be able to touch even one individual in such a way. Mockbee says, if architecture is to, "nudge, cajole, and inspire a community or challenge the status quo into making responsible environmental and social structural changes, it will take the subversive leadership of academics and practitioners who keep reminding students of the profession's responsibilities."[53] It is here, in these rural towns where architecture is lifted from theory and made real, which allows students the opportunity to observe architecture changing lives.

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[52] Carpenter, William J. "Learning By Building- Design and Construction in Architectural Education."

[53] Dean, Andrea Oppenheimer and Hursley, Timothy. "Rural Studio-Samuel Mockbee and an Architecture of Decency."

[54] IBID

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[55] Dean, Andrea Oppenheimer and Hursley, Timothy. "Rural Studio-Samuel Mockbee and an Architecture of Decency."

[56] IBID

[57] IBID

[58] IBID

Theoretical Precedents

We now shift our focus towards individuals whose use of the idea of making is at the heart of the work. This is true from writers, to philosophers, to artists to architects. We will begin by examining the written work of three writers; Michael Pollan, Jody Proctor and Henry David Thoreau; artist Richard Serra; and philosopher Jean-Jacques Rousseau. After which, we turn our attention back to architecture and more specifically the architects who hold making central to their architecture.

The work Henry David Thoreau did on Walden Pond is not only a legendary piece of prose but a very inspirational and theoretical model to follow. It was this combination of living, building and writing about life through his eyes in nature that lent his book to helping shape American architecture. Several architects extended his beliefs of allowing nature in and through, such as Frank Lloyd Wright. It is in Thoreau's work, where he writes that a building's architecture can be so clearly expressed by examining the building, and here one begins to understand something of its builder. Upon visiting Daniel Ricketson's shanty in Brooklawn, Massachusetts, Thoreau writes, "I found all his peculiararities faithfully expressed, his humanity, his fear of death, love of retirement, simplicity, etc."[59] He suggests the idea of a building's expression stemming not only from the designer, but from the builder as well.

In Michael Pollan's "A Place of My Own," Pollan describes how the idea of building his own place in the woods was begun and how instrumental it was to his writing and self. The idea of building it himself was the most intriguing part for Pollan and of the greatest value. It was his questioning of his own personal work, writing, that led to his desire to approach something more "real" and concrete. About this he writes,

> *At home, perhaps, yet not entirely content, and in this dim restlessness may lie a clue to the unexpected emergence of my do-it-yourself self. For if the wish for a room of my own answered to a need I felt for a literal and psychic space, the wish to build it with my own hands, though slower to the surface, may have reflected some doubts I was having about the sort of work I do. Work is how we situate ourselves in the world, and like the work of many people nowadays, mine put me in a relationship to the world that often seemed abstract, glancing, secondhand. Or thirdhand, in my case, for I spent much of the day working on other peoples' words, rewriting, revising, rewording. Oh, it was real work (I guess), but it didn't always feel that way, possibly because there were whole parts of me it failed to address. (Like my body, with the exception of the carpal tunnel in my wrist.) Nor did what I do seem to add much, if anything, to the stock of reality, and though this might be a dated or romantic*

[59] Pollan, Michael. "A Place Of My Own- The Education of an Amateur Builder."

> *notion in an age of information, it seemed to me this was something real work should do. Whenever I heard myself described as an 'information-services worker' or a 'symbolic analyst,' I wanted to reach for a hammer, or a hoe, and with it make something less virtual than a sentence.*[60]

Pollan writes about how the decision was reached that he would become the builder of the writing hut. It was through research of other buildings of a similar scale as well as through the teachings of Thoreau in his "author/architect/builder's description,"[61] of his cabin on Walden Pond. One of the main books that led to his decision to build it himself was "Tiny Houses," by architect, Lester Walker. In its introduction Walker writes, "One of the great thrills in life is to inhabit a building that one has built oneself. My goal was to inspire people of all ages and degrees of carpentry skill...to take hammer in hand and build themselves a little dream."[62] Pollan then begins to question his father's "great indoorsmen" quality as a constant "delegator of all conceivable outdoor tasks-lawn mowing, car washing, gutter cleaning, and tree-house building."[63] About this idea of building himself he writes,

> *To hire the local Goeltz, to knock the thing off from a picture in a catalog, was to miss the point, or at least, the possibility. For besides getting his son off his back for a while, what had my father really gotten out of his hut-building project? What had he learned from it? Not nearly as much as he might have or as I stood to were I to build my house myself. I began to see a mental life I hoped such a place might house and the kind of work I'd have to learn in order to build it, a connection hinted at in words such as independence, individual, pragmatic, self-made. To build a house in the first person, a place as much one's own as a second skin, would require an exploration of self and place-and work itself-that simply could not be delegated to somebody else. The meaning of such a place was in its making.*[64]

Pollan sheds more light on the theoretical idea of making as opposed to simply designing by writing,

> *For someone as attached to word and books and chairs as I am, gratuitous physical labor wouldn't ordinarily hold much appeal. Yet I had lately developed-in the garden, as it happened-an appreciation for those forms of knowledge that seem to yield most readily to the hands. Different kinds of work, performed with different sets of tools, can disclose different faces of the world, and my work in the garden had revealed a face of nature I'd never seen before, not as a reader or a spectator. What I'd gleaned there was a taste of what the 'green thumb' has in abundance, this almost bodily sense of pants and the earth*

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[60] Pollan, Michael. "A Place Of My Own- The Education of an Amateur Builder."

[61] IBID

[62] IBID

[63] IBID

[64] IBID

> *that comes from hardwork, sweat and a particular quality of attention that involves very little intellect, but all the senses. It reminded me just how much of reality slips through the net of our words, and that the time spent working directly with the flesh of our world is the best antidote for abstraction.*[65]

Later Pollan reminds us again that even though writers often like to think of themselves as architects of the written word; it is the process of "building" that is actually neglected by both.

> *Did the writer inhabit a world where 'true' and 'right' were things you could ascertain, where abstractions stood or fell of their own weight, where the existence of something didn't depend on a consensus? At the end of the day the builder alone could say-and yet didn't need to say, because there it was-he had added something to the stock of incontestable reality, created a new fact. It sounded too good to be true. This might not be a universe where I'd feel even remotely at home, but it was one that I resolved to visit, in the hope of finding something I needed to know.*[66]

It is ideas such as these which motivate my idea of discovery and learning in a concrete reality. To examine this other face of learning while trying to maintain our focus as scholars and ultimately as designers is perhaps the key to understanding good design and being knowledgeable about the whole process.

Harvard Graduate, Jody Proctor had lived in Los Angeles, San Francisco and Eugene, Oregon, working and writing through a series of jobs. He worked as a performance artist, with the design/build firm Jersey Devils and as a TV producer for PBS. The book, "Toil: Building Yourself," are tales recounted of Proctor working with a construction crew in the Pacific Northwest in the building of a house. Sussannah Lessard, author of "The Architect of Desire", writes about this as,

> *Classic in its simplicity and lucidity, Toil takes us into the heart of a life and the essence of work. Proctor's rolling prose is mesmerizing: he is recounting the daily grind on a construction site, and that experience in all its texture, depth, and concrete actuality lives on in these pages. The medium is carpentry and the form is the construction of a house, but the subject is the human spirit. This book fed me: I walked away from it felling strong.*[67]

Proctor writes about his coming to the field of carpentry through a series of events that include a Modern European History degree from Harvard magna cum laude, a stint as a performance artist in San Francisco, and the beginning of his carpentry career that took him

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[65] Pollan, Michael. "A Place Of My Own- The Education of an Amateur Builder."

[66] IBID

[67] Proctor, Jody. "Toil- Building Yourself."

from San Francisco to Los Angeles to Malibu and eventually to the beginning of his tale in Eugene, Oregon. In Oregon, Proctor returned to graduate school. He writes,

> *I managed to completely remove myself from my former reality, my reality as a carpenter, husband and father. Reality for me became the library, the world of books and words and ideas. With my latent alcoholic capacity for total obsession, I became immersed and finally all but lost in this new realm. I wasn't drinking and wasn't taking drugs, but I was, as Kathleen noted on more than one occasion, 'somewhere else.' Kathleen and Shannon, looking in on me from the outside, continued with their lives. Shannon was in school, Kathleen was a full-time clinical social worker, while I, if I was home at all, was back in my study, staring bleary-eyed into my computer screen, the floor and every other flat surface in the room thick with papers, open books, journals, and empty coffee cups.*[68]

After graduating, he spent time doing odd jobs as a carpenter on several small projects, but eventually returned to work "as a real, full-time carpenter."[69] In the account of tales Proctor writes,

> *I am an alien in this world, playing at being this construction cowboy, outside myself, looking back in, trying to wear the right clothes, to blend into the corps of workers who again today number eight with two roofers back and the two plumbers. Funny, I realize, that when I graduated from Harvard I had never even heard of a Phillips head screwdriver. The first thing I ever built, the bed in the back of my hippie VW bus, came out all wrong because I never knew that a two-by-four was not two true inches by four true inches, but a half-inch shy on both sides. Who would have told me these things? My father, the Republican businessman? My mother, the artist? The work at our house was done by rough-looking men, plumbers and carpenters and electricians who came to the house in their old trucks, and seemed to me as alien as if they had just arrived from Outer Mongolia. Now I had become one of them.*[70]

The text offers more entries like these which allow a glimpse into the daily life of the crew as seen through the poetic eyes of Proctor. It is here we are taught more about the relationship between builders and the building and the spirit they give and take from being involved to such a degree. It is this idea, again, of learning through building that I hope to carry into my project.

The political philosopher Jean Jacques Rousseau believed nothing could be learned without directly experiencing it.[71] To me, his philosophy seems very true and it is with this in mind that I sought to find my own experience.

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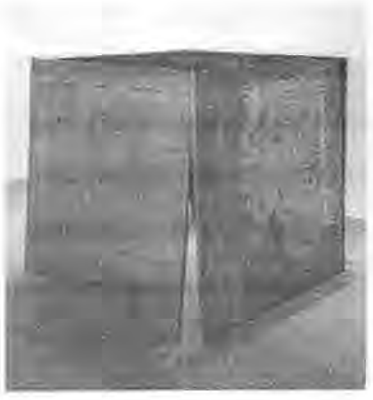
[68] Proctor, Jody. "Toil- Building Yourself."

[69] IBID

[70] IBID

[71] Bennett, Paul. "Approaching it Hands-On."

There are also several artists, such as Richard Serra, whose work lies directly in the process of making. In Carpenter's "Learning by Building," he writes, "Many artists have understood the importance of making, because the education of the artist includes broad vision of process. It allows for mistakes, and discourages preconceptions. In painting and sculpture, the process of making is the generation of the work itself."[72] The following piece of work is by Serra. It is sculpture formed by placing four steel plates in a corner of a square room and stand by the weight of each plate.



[73]

Serra describes the work in saying,

> *The part of the work which surprises me the most invariably leads to new works. In all my work the construction process is revealed. Material, formal and contextual decisions are self-evident. The fact that the technological process is revealed depersonalizes and demythologizes the idealization of the sculptor's craft. The work does not enter the fictitious realm of the master. My works do not signify any esoteric self-referentiality. Their construction leads you into their structure and does not enter or refer to the artist's persona. If you reduce sculpture to the flat plane of the photograph, you're passing on only a residue of your concerns.*[74]

Works by Carlos Scarpa echo some of these same theoretical ideas about the power of making as a learning tool in architecture. About Scarpa it was written,

> *The first step in the development of his architecture thus created a union between workshop and Academy, ending a separation between craftsmanship and the academic approach which had begun with the first working drawings…Scarpa did not restrict himself to using the available skills, but cultivated*

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[72] Carpenter, William J. "Learning By Building- Design and Construction in Architectural Education."

[73] IBID

[74] IBID

> *communication with the people who were to implement his drawings, developing both their skills and their creativity. With this conviction that one can learn by doing, he also developed the intellectual side of manual work which had typified mechanical drawings since the early Renaissance. He emphasized that one reaches the truth through manual construction work, a thought akin to the logic of dialectical reasoning.*[75]

Another architect whose work and teachings deliver a similar message is those by, Christopher Alexander, who writes,

> *Quite apart from my desire to work as a builder, quite apart from my desire to see buildings with this quality built, and quite apart from my belief that architects should be builders, there is just the simple, plain, ordinary fact of the necessity for having first-hand acquaintance with building and making things. And it seems ridiculous to have to mention it except for the fact that most architects today do not understand this. In a woodworking shop, one of the distinctions between somebody who understands working with tools and someone who does not is to realize that the process of sharpening or sweeping up are absolutely fundamental to the activity of making something. Most people who do not really understand tools properly, you realize that sharpening the tool is an integral part of its use. For example, I used to spend day after day out on my site in Martinez, trying our gunnite experiments. It is the love of making, and the instinct for making, which has led me in the right direction.*[76]

Alexander went on to create a Hippocratic Oath for the architect in describing some of the rules an architect should follow in designing. To Alexander, it is essential for the architect to understand the process of making as central to the idea of designing.

Other famous architects such as Walter Gropius, Frank Lloyd Wright and Le Corbusier, were also advocates of this idea of learning through building. The study of architecture, as taught by Gropius consisted of two parts, Fromlehre and Werklehre. Fromlehre was "the study of form including the study of nature and materials, and Werklehre, the instruction of craft-working in stone, metals, clay, wood and glass. These studies in form and craft were linked to working, so that each type of learning could reinforce the other."[77] Carpenter writes, "Gropius insisted that teamwork and craft are connected, that without the experience of making the theoretical learning of a student remains static and not tested."[78]

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[75] Pollan, Michael. "A Place Of My Own- The Education of an Amateur Builder."

[76] Carpenter, William J. "Learning By Building- Design and Construction in Architectural Education."

[77] IBID

[78] IBID

CHAPTER II: PROFILES

The project selected for construction will be a shelter on a recreation trail linking the Woodward Resource Center campus to the town of Woodward, Iowa.

Woodward Community Profile

The town of Woodward, Iowa is located on State Highway 210, about 30 miles northwest of the state capitol of Des Moines. It borders the county lines of Boone and Dallas County, but located solely in Dallas County. The city is approximately 0.9 square miles and primarily sets on a grid which surrounds the highway going south through town where it joins State Highway 141. The town of Woodward was first born in 1883 and was incorporated that same year.

> *If it hadn't been for some uneven ground, some hills and knolls, the present town of Woodward would simply never have been. But there was a steep incline a mile and a half east of Woodward where the thriving small community of Xenia was located in 1880. So when the Chicago, Milwaukee and St. Paul Railway Company constructed its lines through this community, the depot was constructed on level ground where Woodward now stands. Through this one simple fact, the village of Xenia has sunk away into the past until now it is merely a name, and the town of Woodward was born when the railroad was built. The original name for the town was decided upon as Colton, but trouble developed as the result of some other town in another part of the state already adopted the name. After various troubles with mail and the like, the name was changed to Woodward. Woodward grew rapidly from the first. Folks who had been mainstays in Xenia began to move over to the Woodward location. In several cases, the houses were moved from Xenia to Woodward, and even some store buildings were brought over to the town. Located advantageously as far as trading territory was concerned, business started, homes were built and in the relatively short time of a score of years, Woodward had quite a number of business enterprises and a population of approximately 600.*[79]

[79] Woodward Centennial Committee. "Through the Years."

The above is a mural located in Woodward, designed and painted by Dennis Adams for the 1983 Centennial Celebration. The mural is a collage of images which tells the history of Woodward. The buffalo represents the last buffalo killed in Dallas County, where Woodward stands today. The Indian, named Two Hatchets and a member of the Kiowa tribe, signifies those which were present in the area. The team of horses signifies agriculture and the relocation of the community of Xenia to Woodward. The two locomotives represent the changing of times and definite periods in Woodward's history. The coal burning engine was commonly used in the 1800s and represents the railroad's part in shaping the town's earliest roots and demonstrates the coal mining history. The streamlined steam engine was used from the 1930's to the 1950's. In the collages' sunset, a grain elevator is shown to reflect the town's more recent state.[80]

[80] Woodward Centennial Committee. "Through the Years."

Today, the town is bisected into east and west halves by State Highway 210. Most businesses today are located along this main thoroughfare. Between 1980 and 2000, Woodward has remained steady in population while Dallas County has grown by 38 percent. The Dallas County population is younger (67.2 percent) than the states average (62.9 percent) of people under 44 years of age and is aging at a slower rate as the median age change indicates.[81]

> *In 2000, Dallas County had 15,592 households and an average of 2.61 persons per household. There were 1.15 million households statewide with an average of 2.54 persons per household. Compared to the state, Dallas County had a higher proportion of young people (19 or younger) and a lower proportion of older people (age 65+).*[82]

In terms of ethnicity and race, Dallas County is like most of the other 98 counties, predominantly white, with not much change from 1980 to 2000. Educational levels of Dallas County also compare favorably to the state. In 2000, 56.9 percent of Dallas County residents had more than a high school education compared to 50 percent of Iowa residents.[83]

The median household income in fiscal year (FY) 1999 was $48,528, up $6,855 (adjusted dollars) from 1979. This median income is also $9,059 higher than the state average in 1999.

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[81] Iowa State University. "Data for Decision Makers."

[82] IBID

[83] IBID

Poverty levels in Dallas County decreased from 1979 to 1999 by 1.6 percent and less than the state average of 3.5 percent.[84]

In fiscal year 2003, the 52 retail firms in Woodward had total retail sales of 4 million dollars. With this, Woodward had sales per firm of $77,253 or $3,282 per capita sales. The pull factor, an indicator of loss of commercial sales and loss of needed tax revenues, for Woodward is 0.34. Dallas County's Index of Income was 114.5 for fiscal year 2000. This number measures the county's per capita income to that of the state. This indicates that compared to the state, Dallas County's per capita income is 14.5 percent higher than Iowa's average.[85]

Since 1980, the amount of retail sales leakage has increased from -29 percent to -53 percent in Dallas County. These numbers are calculated by subtracting potential sales with actual sales, and suggest a net outflow of retail sales, meaning residents are shopping elsewhere. In 2000, the total labor force for Dallas County was 20,700 and an employment rate of 98.6 percent. This labor force consists of all persons aged 16 or older who is employed or currently looking for employment. The largest portion of employed (35.9 percent) was in management, professional or related occupations.[86]

Over the last twenty years, residents of Dallas County have been more apt to travel or commute outside of their neighboring communities for employment. With Des Moines suburbs stretching to the west, many employment opportunities have arisen and Dallas County has taken advantage of this. Residents of Woodward are typical of this trend and are willing to commute well beyond the town's boundaries for jobs.

The community was profiled because of their association with the campus and their possible effect on the Woodward Resource Center Trail. With the continued downsizing of the Woodward Resource Center, it is obvious the community of Woodward has also felt the changes. The town of Woodward is part of a conceptual plan of bringing the "Rails for Trails" bike path through the community and connecting it to trails in Slater and Perry. These linked trails could have a positive impact on Woodward's pull factor and increase spending levels as well, which could raise the income level of some Woodward businesses. The possible "Rails for

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[84] Iowa State University. "Data for Decision Makers."

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Trails" could also mean an increase in traffic for the recreation trail. If the bike trails do come through Woodward, I believe it will have a great impact on some of the town's businesses and more recognition for the Woodward Resource Center.

Woodward Resource Center Profile

When the Woodward Resource Center (WRC) began, it grew quickly as one of the largest state hospitals in Iowa. With a change in public attitude and new medical advancements in drugs and research, a downsizing of the WRC clientele and a more intense focus on placing higher functioning residents back into the community was established.

> *Since 1917, when Woodward State Hospital-School first opened its doors, a strong bond of mutual benefit and dependence has existed between the institution and the community. A good example of this mutual benefit is the annual Christmas tree lighting ceremony which is shared by the Woodward State Hospital-School and the surrounding communities. In this centennial year, the hospital-school is still the largest single employer for the Woodward area. The institution budget of several million dollars annually is circulated throughout the local economy in the form of employee wages, institution purchases, and client spending. The town of Woodward, likewise, has continued to provide the hospital-school with many resources of which the most important is its employees. There are families in Woodward for which this employment has spanned several generations.*
>
> *Five hundred thousand dollars was appropriated by the legislature in 1915 for the cost of buildings. The initial construction phase was for ten buildings in a "hospital-group," one power house, one service building, and one laundry. The "hospital-group" would include a medical administration building, two observation cottages (one for each sex), two general hospitals (one for each sex), two contagion hospitals (one for each sex), an operating building, kitchen with dining room, and an electro/hydro therapy building. All the buildings were located around the medical administration building and were connected by sheltered corridors. This group of buildings could accommodate from 150 to 200 patients. The complex was called "The Meadows" and is used today as the Administration Building.*
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> *Early news clippings describe hard-working, dedicated staff members who endeavored to cope with an ever increasing population. An employee who began working at the hospital in 1932 wrote that there were no street lights or cement walks at that time. The patients were taken to shows and entertainments over cinder paths with the aid of flashlights.*
>
> *Although training for a return to the community was a goal for higher functioning residents even from the beginning, census figures show that admissions far exceeded outplacements. This was due primarily to a lack of available training opportunities and living facilities outside the institution.*
>
> *By 1960 the philosophy of caring for the mentally retarded had changed considerably. The "custodial care" concept was replaced by one of specialized treatment, training, and research. An editorial in the Des Moines Tribune advocated spending more money for staff and staff training so the mentally disabled could move back into the community, and less money on additional buildings to house residents in lifetime custodial care situations.*
>
> *In moving towards these objectives W.S.H.-S. began an in-service training program in the early 1960's. The "team" concept of treatment originated whereby residents were grouped according to needs and abilities and served by professionals representing various disciplines. This approach recognized that the needs of the retarded consisted not only of food, clothing, and shelter, but also training, education,*

recreation, and vocational habilitation. Individual goals were to either allow the resident to move back into the community or to adjust to a more meaningful life at the institution.

There are few similarities when compared with the epileptic colony of 1918. Instead of a closed, isolated, self-sufficient colony for custodial care, W.S.H.-S. is an open, progressive facility dedicated to helping the mentally retarded become an acceptable part of the community. The town of Woodward has been a partner in working toward this goal.[87]

Residents of Woodward have had a long standing relationship with the WRC and the betterment of society through working closely as a community. In recent years, as the WRC goals have changed to community integration for their clients, the town of Woodward has embraced an opportunity to share not only its resources but to engage the campus. Many residents of Woodward and the surrounding rural community work with WRC residents in community enclaves or supported work situations to receive training. The community also uses the WRC ball field for many extracurricular games. Resident school-age children of the WRC attend classes at Woodward-Granger School District.

Each person living on the Woodward campus participates in all day training programs designed to meet their needs, from campus recycling operations to arts and crafts and active leisure programs and social activities. These programs take place on campus and in a variety of community sites. All of these ideas are part of the WRC belief that:

All persons are capable of learning;
Independence should be fostered,
People are individuals with their own wishes, dreams, and strengths;
Individual choice, balanced with safety, should be supported;
Individuals have a right to experience community life to the fullest extent possible.[88]

The WRC has changed philosophy along with the rest of the social and medical fields. Their philosophy is now focused on understanding and providing the best quality of life for its clients. Their mission is to place clients back into communities and assist them there, and provide those unable to return to a community a similar experience on the WRC Campus.

Woodward Resource Center is a network of programs that support the diversity of all individuals and their communities. WRC focuses on the enhanced delivery of supports and services to people with disabilities, their families, and all those who work toward inclusion of all people in community life.

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[87] Woodward Centennial Committee. "Through the Years."

[88] Woodward Resource Center. "Residential Services."

Building on a tradition of excellence, WRC provides these cost-effective, innovative, highly-specialized supportive resources and services to Iowans. These include respite care, time-limited intensive services, regional assessment and diagnostic services, outreach consultation and technical assistance, and residential services to support individual needs.

The Woodward Campus of WRC, once serving only as a state hospital-school, now capitalizes on its setting in the heart of Iowa to attract and encourage partnerships and sharing of space with public and private organizations. It serves as a hub that enhances the accessibility of training and services to support people living in their chosen communities.[89]

Project Profile

The trail was originally proposed as an opportunity to provide a greater and safer route for pedestrian traffic between the two communities. It was begun in the fall of 2003 as a multi-phase project dependant upon funding from the Olson Foundation, which supplies funds each year to complete a new stage of the project. In the first year, roughly $8000 was earmarked as available for trail construction. What was deemed Phase I, was semi-complete when this project began.

The WRC Leadership Team was unsure on how to complete the other phases of the trail. It was at this point my proposal was made to their leadership team and accepted as a project for future master-planning of the trail and a constructed shelter for Phase I.

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[89] Woodward Resource Center. "Residential Services."

Process Profile

The trail was to provide a unique recreational experience that becomes a two-way passage between the WRC and Woodward, and be intertwined by people, resources and work. The first step was to design the trail as part of the design/build process used to complete the construction of the shelter along the path. This planning process, common to architectural projects, was new to me.

This design/build process began with project selection. I first took a tour of the WRC and was made aware of all different levels of projects that would provide a design/build opportunity. After selecting this project, the proposal for design and construction was approved by the WRC Leadership Team. The following is my initial project schedule and outlines the process.

Task: Thesis Project Process

A. Program Development Phase
   a. Round Table 1 (Team Leadership Committee) 10.28.03
      i. Introduce Team Members
      ii. Review Planning Process, Dates & Budgets
      iii. Review Space Program & Research Precedents
      iv. Discuss "Design Issues" & Design Philosophy
      v. Examine WRC Campus
      vi. Discuss Precedents
      vii. Key Staff/User Interviews
   b. Round Table 2 (Support Council Meeting at WRC) 11.07.03
      i. Key Client/User Interviews
      ii. Review Budget Constraints
   c. Round Table 3 (WRC Committee) 11.21.03
      i. Review Team Leadership and Support Council Feedback
      ii. Review Ancillary Space Needs
      iii. Review Utility Reports
      iv. Discuss Emerging Technology and Trends, including Sustainability
      v. Schedule Individual Meetings

B. Schematic Design Phase
   a. Round Table 4 (WRC Committee - Design Charette) 12.19.03
      i. Review Selected Schematic Design Option(s) in Detail
      ii. Review 3D Ideas, Color Renderings, Sketches, & Massing Models
      iii. Review Budget Spreadsheet
      iv. Review Inventoried Materials List
      v. Select Schematic Design
   b. Round Table 4 (WRC Committee - Design Charette) 01.22.04
      i. Review Selected Schematic Design Option(s) in Detail
      ii. Review 3D Ideas, Color Renderings, Sketches
      iii. Review Inventoried Materials List
      iv. Select Schematic Designs

C. Design Development Phase
      i. Round Table 5 (WRC Committee Books) 02.06.04
      ii. Review Surface Choices

iii. Review Design Concept of Lighting, Colors, Spaces, etc.	
iv. Finalize Design Choices and Materials	
v. Discuss Budget and Phasing Options	
D. Construction Drawing Phase	
a. Round Table 6 (WRC Design Guide)	02.29.04
i. Review Landscape Concepts, Furniture Options, etc.	
ii. Finalize Building Schedule	03.01.04
iii. Cost Estimate vs. Budget Verification	03.02.04
iv. Complete Review of Drawings and Specifications	03.04.04
v. Finalize Design Guide and turn over to Barry Wills	03.09.04
E. Construction Phase	
a. Begin Phase	03.12.04
i. Site preparation, layout, excavation and set forms	03.13.04
ii. Forming, re-rod, pour cement, set columns, clean-up	03.17.04
iii. Framing	03.27.04
iv. Framing	04.03.04
v. Roofing	04.10.04
b. Complete Phase	04.11.04
c. Clean-up Complete	04.12.04
F. Oral Exam	04.16.04
G. Written Evaluation/Reflection/Analysis	04.23.04

This process will be discussed in further detail through the roles as designer and contractor. The schedule was determined using a balance between required and desired dates for completion. As a fast-track project, the need to greatly understand project due dates, scheduling opportunities and conflicts was a must.

To understand this process I outlined a calendar with dates needed for thesis requirements. I looked at each phase as requiring a certain amount of days or weeks for completion. My first approach looked forward from the current day and set dates accordingly. This placed my schedule past the due dates for the Oral Exam and Written Thesis.

Therefore, I worked backward from these dates with the schedule. Obviously, this led to a start date two weeks prior to the current day, so I overlaid the two schedules and attempted to find opportunities for shortening schedules or adjusting phase due dates.

After finding a schedule that fulfilled my time capabilities and thesis requirements, I compared the schedule to local weather statistics. This led to serious issues of concern because increased levels of precipitation were present during the determined construction phase. (Appendix A) However, the project had been proposed, accepted and was of the appropriate scale, so the decision to move forward with the proposed schedule was made.

CHAPTER III: PROJECT

The WRC Recreation Trail was begun August 19, 2003 with my proposal for future planning and building, accepted on October 28, 2003. The "Pathway to the Community" was started.

Contextual Dilemma

I worked with a WRC staff member, who had knowledge of several design opportunities available on the WRC campus. Those opportunities had varying degrees of scale, complication and need. The recreation trail was selected because of its current need and funding potential. The trail also presented great learning opportunities for community and regional planning, landscaping and dealing with many architectural lessons including:

1. How do you profile a community, a user, a client, etc.?
2. What is a master-plan?
3. What does landscaping include? (Trees, plants, groundwork, etc.)
4. How do you deal with an existing landscape or site?
5. What are the steps for completing a built project? Where does one begin?
6. How do you deal with many different users of differing physical and mental abilities?
7. How do you provide a similar or equal experience for those with accessibility issues?
8. How do you deal with the bureaucracy of a federally funded institution?
9. How do you take a project from conceptualization to realization? What are the steps?

At the beginning of my involvement, the trail had been started with little design intent; more from a purely functional aspect of providing the most direct route from the campus to the town of Woodward. In terms of context or problematic issues, the WRC was unsure how to continue the trail once it met the boulevard entering campus. They were also unsure of its connection to the town and how this could be made.

Upon visiting the WRC for the first time, I felt it was a community with its own identity. At first, it seemed to be very institutional given its social history, planning and architecture. However, upon visiting with the WRC Leadership Team, the Support Council and more intense historical study, it was obvious their goal was to be an extension and part of the community not a separate institution.


The way they discussed the trail was more like a journey linking the two communities together. Viewing its current condition, it seemed to be nothing more than a sidewalk across a field in a straight-forward manner.

To me, the path had an opportunity to provide an image or identity much different from an institution and encourage users both from within the campus and the town of Woodward. This was an opportunity to provide a more inviting space by serving all the necessary functions it was meant to accomplish. This sense of creating an inviting space out of the trail was taken as the conceptual goal of this project and determined to be its contextual dilemma.

CHAPTER IV: THE ARCHITECT'S ROLE

This section examines the project from inception to completion through the eyes of the designer. The process includes six phases:

1. Project Selection
2. Program Development
3. Schematic Design
4. Design Development
5. Construction Documents
6. Construction

In some phases, a hypothesis about what might have been expected before the stage was begun is given. The hypothesis is later discussed in terms of its success or failure of thought.

Project Selection

The first role an architect has is project selection. Typically an architect does not have much say which projects they are selected for, but do have control over which projects they pursue. An original hypothesis is that finding a project would not be difficult but selecting a project of the right scale and magnitude would be hard to determine having never fully designed and constructed a project.

In this process, I researched as many projects as possible and even visited and worked with several individuals and groups on helping to coordinate smaller projects including a residential accessible ramp for a physically disabled son and an accessible ramp for a small rural church.




However, the scope of those projects was too small in budget and time, and would not have lent them well to a sustainable construction process. As was previously stated, I met with a representative of the WRC who toured me through several possible projects on the WRC campus.

I then met with the recreation supervisor and business manager at the WRC, and began talks about the recreation trail. The trail was under-construction, but the WRC staff was unsure of how to continue the development process. After receiving permission from their business manager to pursue this project, I met with the WRC Leadership Team on October 28, 2003.

The WRC Leadership Team is a council of WRC staff members who meet to discuss campus planning activities, coordinate the scheduling of events and make general decisions that guide the WRC. On this day, I presented my proposal to redesign the trail entitled "Pathway to the Community." I discussed the implications the trail development would have for both the campus and the town, and how this connection should be made as strong as possible to increase the amount of users and increase their enjoyment of using it. I encouraged as much participation and input as possible and outlined the project and timeline required for my educational goals which were:

1. Provide a more integrated approach to architecture to prepare for practice.
2. To better understand the multiple roles architects can play in practice.
3. Reinforce the idea of community service (social awareness).
4. Increase knowledge of other design phases.
5. Increase communication and collaboration skills through interaction with clients, public, users and consultants.
6. Reinforce the connection between planning, design, landscape, construction process, materials, built and living environments.
7. Reinforce the idea that architecture is not a solitary action or created in a vacuum.
8. Bring legitimacy to education by experiencing the pleasure and frustration of completing a task.

I continued by showing precedent images for this type of small scale project and why it was this pedagogical opportunity I sought. I left them with images of successful reduced-scale projects as well as my desire to try and be as socially aware as possible.

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My social awareness included choosing a client who was in need of project guidance, designing for everyone and even re-using materials. The leadership team gave me approval and offered a few suggestions while asking many questions. With their approval, I was assigned a smaller committee to work directly with and under their supervision and guidance. These members consisted of their business manager, resource supervisor, recreation supervisor and facilities manager. This was my first experience presenting to a "real" client group.

I met with my Program of Study Committee at Iowa State University and discussed the proposal as well. In discussing the project scope, size, expectations and goals, it was determined to be of a sustainable length and quantity of study and permission to pursue it was granted.

Program Development

The second stage of design is program development. Architects are usually given a program and asked to review it for consistency, inclusiveness or exclusiveness as required. The goal in

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[90] Richardson, Phyllis. "XS: Big Ideas, Small Buildings

[91] IBID

[92] IBID

[93] IBID

[94] Dean, Andrea Oppenheimer and Hursley, Timothy. "Rural Studio-Samuel Mockbee and an Architecture of Decency."

[95] IBID

[96] IBID

program development is to determine the proper space functions and begin to analyze and diagram circulation and adjacency requirements. Programming is an opportunity to realize form and building operations, as well as to understand the site and how design can be affected by it.

I began this phase with a series of roundtable discussions. The first meeting was about introducing myself to the committee members and reviewing the planning process. We also discussed the dates and budget required to complete the project. Next, a review of required space programs, design issues and philosophies was discussed. I arranged another WRC Campus tour and exploration and set-up key staff and user interviews.

The next roundtable held was with the WRC Support Council on November 11, 2003. The Support Council is a group of the higher functioning residents of the WRC. At this time I put together a list of questions distributed to all staff at the WRC. Those along with the script used to introduce myself to the support council and questions I asked to stimulate discussion can be found in Appendix B.

The responses were diverse, in terms of length and substance. The idea behind these questions was to allow everyone a forum for expressing their opinions about the project and its design. In this case, responses were reported only by members of my WRC Committee. The support council was given strong consideration, since they are ultimately the persons designed to more effectively use the path. Their responses were varied and much was learned in this meeting about better understanding the user and their desires and needs. These include:

1. A wide spectrum of intellectual and physical abilities was to be designed for.
2. They enjoy outdoor activities and prefer being outdoors.
3. They like animals and enjoy being able to watch them.
4. They were interested in using the trail and excited to go into town.
5. They want and need destinations or things to see along the trail.

Although this group does not reflect the greatest cross-section of the WRC client population, since they are the higher functioning individuals, they do represent a group more likely to use the trail on their own or at least more frequently.

During the final roundtable discussion for program development on November 11, 2003, the program was modified to include:

1. Two shelters
2. Three rest stops
3. Signage
4. Increased crosswalk presence
5. Increased landscape elements
6. Biodiversity of plants

The ancillary spaces were left open to suggestion and design guide recommendations were encouraged. This meeting also included discussions on utility reports completed earlier that day.

No major utility set backs or infringements were found on preliminary investigation and a recommendation this be followed up at time of future construction was made. Preliminary investigation looked at the green space between the highway/boulevard and the tree line as well as along Highway 210.

The Iowa Department of Transportation (IDOT) was not contacted but a follow-up communication was required to understand the full implications. Alliant Telephone also needed to be contacted in regards to the guide wires that fell into the green space. This meeting also included discussions on sustainability and possibly re-using materials found on the WRC Campus. These ideas were approved and a schedule for individual and group meetings for schematic design was begun.

Schematic Design

Schematic Design is where conceptually the project is put together and developed as a whole. Schematic Design can take many different forms and conceptual responses to the site,

program, circulation, etc. There are infinite numbers of possibilities the design might take and this stage helps to narrow the choices through proper analysis, researched precedents and good decision-making. This stage holds the prospect for being the most demanding in terms of decision-making, overall conceptual development, and aesthetic discrepancies. As a designer, one should match the context of the site with their personal aesthetic while maintaining the client's goals and expectations. My original hypothesis had this stage providing a lot of aesthetic discussion and reflecting a compromise of both sides to be completed.

In maintaining the same roundtable format, I met with the WRC Committee on December 18, 2003, for a design charette. At this time we reviewed the schematic design options that included the proposed pathway along the roadsides and through the green space. Fortunately, prior to this meeting the discussions with the IDOT, led to a great spectrum of cost considerations. If we were to take the trail alongside the highway, we would need to build the trail to DOT specifications, thus incurring a cost of $438,450 as compared to $22,710 for the pathway in the green space.[97] (Appendix C)

All ideas for the trail along the roadsides and in the green space were discussed and cost factors were given. It was an interesting moment because most members of my WRC committee thought the roadside was the natural choice, and were leaning more towards it as a solution. However, upon hearing the costs the green space was quickly adopted as the trail course.

Next, we discussed the proposed program options. The green space affords more opportunity to interact with the user, and create a more safe and inviting experience. The conceptual idea resolved was one of an experiential journey or sensory experience. The conceptual goal of the trail would be to create more interaction with the user and the environment by simply using the path. The proposal included the original idea of phasing the trail, but added at the culmination of each trail phase a built ancillary space to fulfill a programmatic need.

Phase I included a shelter sited near the boulevard, in order to increase the trails presence and as a safety precaution to gather individuals and groups before crossing the boulevard. Along the large stretch of linear path from the residences would be areas for sitting, surrounded by trees, so residents could treat the area more like a park.

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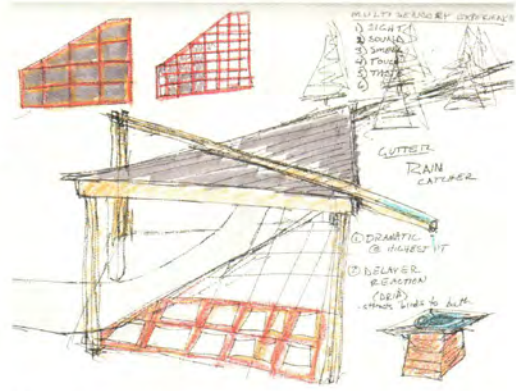
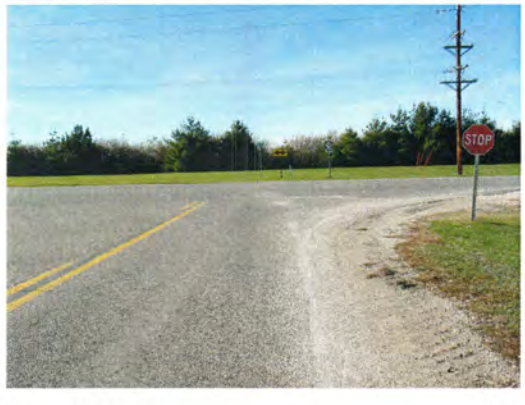
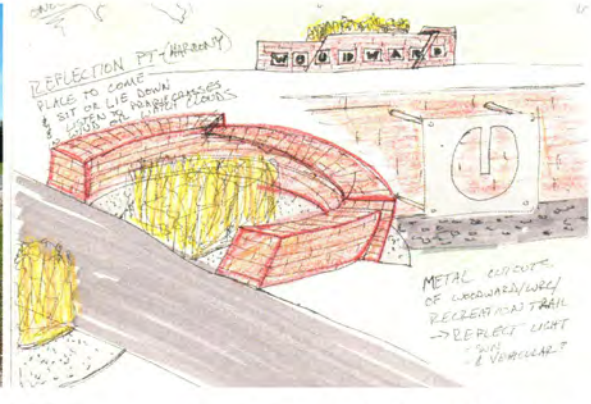
[97] Martens, George. "Personal Interview."



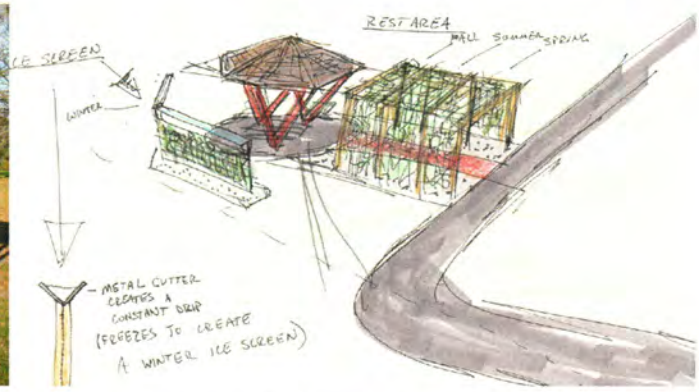
In Phase II, the boulevard crosswalk was treated with a different materiality, landscaping and signage to help identify it. The proposed material was brick, as an introduction to the material found on campus. The path then curves toward the south and begins to follow the natural terrain, and bends again to make the necessary clearance between the guidelines and the telephone pole. Just after this point and straight in front of Highway 210 headed west, a second proposed built area for rest would culminate this phase.





The sitting area would be a circular wall which serves as a turn around point and opportunity to house plants so trail users come in direct contact with them. The wall would also provide an opportunity for a more unique WRC sign.

Phase III would terminate the trail, by completing the path to meet the county road from the west at the intersection. Just as the trail begins to curve toward the road, the second shelter would be located on the bend. This shelter would be a re-use of a current structure already used on campus. It would be used to enhance the connection between the trail and the WRC and would provide an area for rest for any individual traveling between the two communities.



The path also includes signage at both terminus points to indicate the trail's use and describe its programmatic elements. Also, ornamental trees would begin to surround the shelter areas to help provide shade and increase the bio-diversity of the current woody plants found in the area. The trees would be used to increase the sensory experience of the user through sound, touch, smell and sight.

As the designer, this stage was meant to provide a lot of discussion between the committee and myself. However, many of the ideas were accepted as proposed and asked to be developed further. I thought to move into Design Development but realized I was not giving them enough detail for feedback and scheduled a second design charette for January 22, 2004. In the original schedule, only one review and just over one month was scheduled for schematic design. However, this did not provide enough time for this phase, so the schedule was revised and extended a month.

In this time, I met with my POS Committee and began to detail the ancillary spaces further. I developed the structure along Phase I, as two sloping planes that met in a central gutter and emptied into a constructed bird bath. The sloping triangular roofs were essentially two wings over a concrete foundation and the gutter spread across the trail to provide a covered entryway for users.

Along Phase II, the circular rest area moved north of the guidelines because, as the WRC committee pointed out, a reckless driver always crashes through that intersection. It also grew in detail and provided more opportunity for various levels of seating. It also shifted its attention away from typical plantings and towards natural prairie plants.

Phase III began to introduce manipulating the topography to create more visual presence through the idea of burming alongside the trail and wrapping the final structure. This allowed for a more inviting space since it was shielded more from view and given a greater sense of privacy even in the open. Most of these details were explored in these sketches.

With the greater detail and more focused attention given to each piece, the WRC committee was able to make more clear and concise recommendations as to what they liked and disliked. Greater detail allowed for a more in depth opportunity for discussion and allowed a more positive pass into Design Development.

Design Development

In this stage, details are developed to an extent where construction drawings are begun. These details allow a personal aesthetic to come through. The details seem to ultimately determine the success of a project and how well it was thought out both on a large and more intimate scale.

Because this was a fast-track project, design development needed to be extremely concise and efficient of both time and effort. The original schedule called for a roundtable on January 30, 2004, but was pushed back to February 6, 2004. During this meeting, we reviewed the project in greater detail and discussed surface and material choices. We reviewed the original concept and goals, and discussed budgeting. Many ideas and decisions were altered at this point, because of collaborative decision-making and other project factors.

Originally, a budget of $6,000 was proposed for my project. However, at this time the budget was cut to over $2,000. As designer and builder, the desire to provide the greatest value for the project dollar was always a main focus, and no intention of fully using the original budget was conceived. Having said that, to have a budget reduced by nearly two-thirds, extremely affects the planning and detailing of a project.

The structure as it was currently designed had already been altered by not being able to re-use materials. Unfortunately, just after I presented my proposal to the leadership team and suggested re-using some of the materials from their waste pile, it was sold to a salvation company.

Although this allowed more material choices, it also provided more cost and produced a seemingly infinite amount of material choices.

After this, I tried to make material and detail connections related to WRC buildings and structures. I began to explore steel connections as a way to tie all the structures together. The Phase III structure currently in use has steel plate connections, and this detail was to be adopted and redeveloped for the other structures.

However, the cost of fabricating steel plates is costly and so another detail would need to be chosen to accomplish as much or more.

After learning about the reduction in budget, decisions needed to be made quickly in order to fully develop the design so Construction Documents (CDs) could be made and construction begun. I returned to a few ideas well received by the WRC committee early in schematic design, walls and regional influences. These led to solutions that solved many problems I was facing.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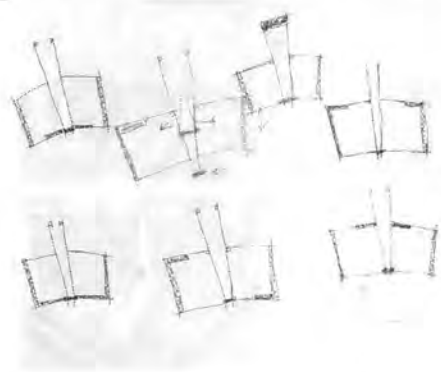
One of those issues was structural stability in terms of lateral bracing. I did not want to fully enclose the structure, but at the same time was having trouble trying to provide enough shade for the shelter because of the way the roofed pitched outwards. Walls allowed me to create the lateral stability I needed, provide shade without enclosing the space and play with the light. They also tied into many of the surrounding agricultural buildings one views on their way to Woodward, by using a corn-crib slat effect. The slats help to reinforce the structural stability and allow a more unique wall that appears to belong in the landscape adjacent to the field. Slanted walls were created around the rest of the structure to provide its lateral rigidity, more aesthetic interest and frame certain areas or views.

Other design elements changed were the roof and gutter. In order to maximize the structures floor plan, minimize the time for completing the details, construction drawings and

[98] www.valleyviewcampus.org/ Corn%20Crib.jpg
[99] www.kountrylife.com/ content/vin14.htm

construction; the structure was changed to a rectangular shape and the roof was pitched in only one direction. The gutter was then created down the center as if each building split and angled out equally. This created a narrow and wide end for the gutter. The narrow end is pointed toward the open field and the larger end crosses over the trail and creates a covered walkway into the structure. This allowed for a seating area across from the structure, for more private or intimate sitting. The below vignettes are explorations of lateral bracing walls.



Around the structure, areas for ornamental plants were planned to help reinforce the sensory experience. The Shaking Aspen was chosen for its ability to create sound in even the lightest breeze, and the Sycamore for its unique tactile, aesthetic trunk and branches.

In developing the design, the rest of the phases were brought up to a more detailed level. Phase I delve deeper into the idea of the "Memorial Walk." The walk became an exploration of the WRCs current landscape and tried to develop a more park-like setting by bringing the path into a more human scale. The memorial walk was to help create a more walk able path by increasing diversity of native and regional plantings, introducing new mowing practices, and adding additional seating areas adjacent to the path.

Phase II included reworking the crosswalk to include a more integrated materiality with the brick and trail. It also provided an opportunity to introduce plantings within the median to help add to the presence.

The trail itself is given more guidance by its surrounding landscape. The trail curves closely to the western tree line and hugs the edge. It is guided there by similar mowing practices to those incorporated around the trees in the memorial walk. The path seems to follow the higher grasses and cut through at certain points. These rough areas are kept to a minimum and only occur whenever the trail is needed to move out of a linear orientation. One of these areas occurs

as the trail reaches the steepest slope and cuts across the slope to help minimize it. This also allows the trail to re-direct itself under the guide wires of the telephone poles and into the "Prairie Circle."

This area was redesigned as an enclosed circle by a sitting wall and exterior path. The wall surrounds the eastern side of the path and a portion of the west. The interior circle and wall is completely surrounded by a path that allows for those exercising to turn around. It provides a midpoint between the campus residences and the downtown as well.

Phase III also introduces a greater level of detail and solution. In order to bring the path back to the tree line, burming is introduced. Burming creates a more dramatic topography and allows the path curvature to seem more natural of a solution. On top of the burm woody plants are introduced to keep with our sensory goal, add to the biodiversity of the site and increase a more aesthetically changing topography. They would also increase more opportunities for wildlife and create another level of interest.

The same burming technique is used closer to the final structure but wraps around it to help provide a sense of privacy in an open area. The tree line is filled in to help complete this same sense of enclosure. Some of the same ornamental trees are re-used in this location to provide a more park-like atmosphere as well. All of this is done to turn a low lying open area with no use into a small park area on the edge of town. This would create interest in the trail and provide the community a feeling of being invited.

These sketches helped to complete the master plan, which can be found in Appendix D. After reaching a certain degree of design development that could be used to guide further detail drawings, it was time for construction documents of the proposed structure.

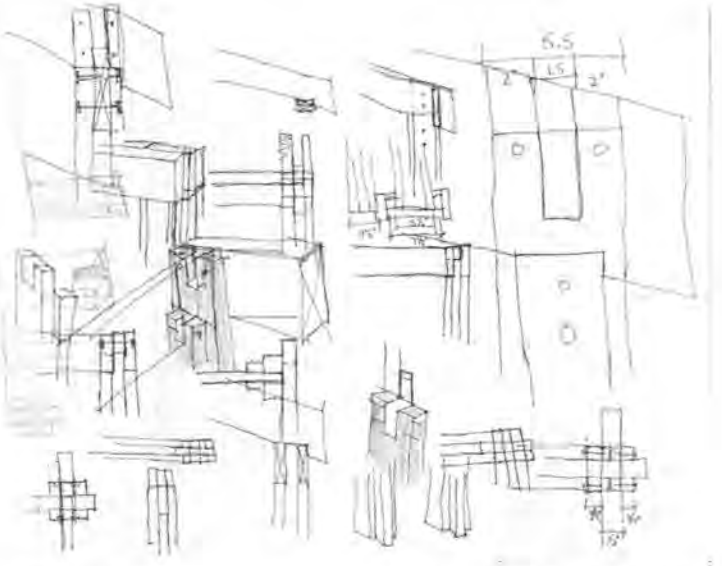
Construction Documents

Construction Documents (CDs) are the drawings a contractor or builder uses to determine which materials, sizes, measurements and specifications are being used for construction. One of the greatest opportunities for learning will begin here and carry on into construction. The opportunity to understand a conceptual detail and what it takes to communicate that idea is the truest blend of pedagogy and practice.

In beginning the CDs, it was important to have a full understanding of the details. Some of the details were developed to a certain degree, only to find some measurement or area not fully

understood before beginning. This led to working out details from a new perspective and creating new documents that met original intent. Ultimately, this stage has been the most difficult and time consuming. Many times one aspect was not thought of thoroughly and did not allow the detail originally conceived. This stage was difficult to understand because it is such a specific area we do not cover well in our education but is necessary and expected in beginning to practice.

After several misconceptions and trying to do everything in AutoCAD, I decided to change my process. I took the original detail and produced as many sketches in different perspectives to allow a full study. After fully thinking and sketching out the details, I used AutoCAD for exact measurements and specifications of materials. This worked more effectively and allowed a greater and quicker study. However, it seemed more time-intensive because I generated more ideas for exploration.



One of the biggest detail dilemmas was the rafter, column and beam connection above. Conceptually, I wanted everything to be flush and so many studies were done. However, I always encountered another problem with the wall to rafter detail as I processed new ideas on the column connections. It ended up a continuous circle where both details were worked at the same time. In doing this I was able to find problems more quickly and deal with them simultaneously. Previously, I would work an entire detail and then re-work the other details. The idea of working details simultaneously became an obvious decision as the process progressed.

The CDs were at different stages when construction began. All the necessary drawings for preparing and laying out the site were complete and the rest were finished along the way. These documents can be found in Appendix E. At the final meetings with the WRC committee, we reviewed the building solution, documents and finalized the schedule for building.

Construction

After CDs have been created, construction on a project begins. It is here where details take on a large role in teaching. Construction is taking the design documents created and turning them into a realized piece of work with actual dimensions in space. Hypothetically, the opportunity to realize a better method or detail than specified in design would likely show up in construction and provide a better solution than originally conceived. This provides an opportunity to learn more about material properties and characteristics not imagined or over imagined in the studio atmosphere. This stage provides for greater pedagogical understanding of the built world, a new dimension not available for study in a typical studio, and reinforces the link between pedagogy and practice.

As designer, ones role during the construction phase is to make sure the design integrity is maintained. Usually work has already been passed on to a contractor who uses the CDs and specifications to create the work. However, sometimes short-cuts are made in order to save time and money. It is here the architect should be available to help identify whether the change would affect the building's conceptual or detailed design.

As designer, I constantly questioned the importance of the detail in maintaining the shelters integrity, because there were occasions when time and cost savings outweighed the original intent. An example of this was in making sure all bolted and nailed connections remained flush. Because of a construction design change, one less stud was used and so the bolts ordered were too long for the application. Instead of just using those and moving on, we maintained the design and continued to countersink the bolts and then rid the excess portion. An example of maintaining the building's integrity but changing the design is found in the wall slats. Because many of the lumber sent was warped or twisted, we increased the spacing to use less bad lumber. This also cut cost and time, because we ended up using less lumber by maintaining a similar solution.

CHAPTER V: THE CONTRACTOR'S ROLE

This section will look through the eyes of the contractor from project inception to completion and will focus on the roles the contractor played at different stages of the process. Each stage provides different opportunities and levels of involvement necessary to complete a project. The process will be looked at through these six phases:

1. Project Selection
2. Program Development
3. Schematic Design
4. Design Development
5. Construction Documents
6. Construction

Project Selection

In project selection, many times the client can bring on a specific builder as they do an architect or hire a contractor later in the process. It is important the architect and builder have a good relationship because communication throughout the process is one of the most important elements to completing a project well.

By allowing me to design and build this project, the WRC is maximizing the communication between designer and builder. As builder, my role was to constantly question the design and the construction process. An easier or more cost-effective solution is given great consideration. As contractor, it is about maximizing the cost through less time and material.

Program Development

As previously mentioned communication is instrumental to providing a well-designed project and the same is true for a well-built project. In maintaining constant communication with the contractor, the architect is ensuring the design functions and program are well-documented so the building's integrity is maintained. Likewise, the contractor needs to stay in communication with the architect so their ideas and suggestions continue to be evaluated and they understand the client and architect's intent.

As contractor, my role in program development was to aid in understanding the program and to maintain a sense of budget and time requirements.

Schematic Design

In schematic design it is important to realize ideas or solutions can come from anywhere, anytime and a more reasonable solution might be found by the contractor. The contractor can begin to give feedback in terms of cost, time requirements and construction processes. A contractor is usually brought on through bidding a certain project. In this case, the contractor has not had much input in terms of the building's solution, but can help to create better details as the project moves forward.

In schematic design, I continued to play the devil's advocate on issues I thought were too hard to build or would cost too much. I was always the little voice asking for a better and cheaper solution.

Design Development

During this stage the contractor needs to be working closely with the architect so scheduling the building process and what will need to be ordered for materials is effectively done. The architect and contractor should begin working more closely to establish the final design solution.

This phase began to open the door for the contractor to begin to question how this would be put together. The most important questions I asked myself were how the details worked and what it was made out of. This allowed me to focus on the true intentions or conceptual goals as the designer. If a detail was not aiding this process, maybe it was not the proper detail and needed reworked.

Construction Documents

CDs are instrumental to the building process and as mentioned before, need to be fully understood in order to maintain the buildings integrity. The contractor needs to make sure that all documentation be legible and understood so those building are able to execute the design. They need to make sure the CDs are complete and offer full specifications so mistakes in ordering and putting materials together are eliminated.

It is this stage where communication between the Project Architect and Project Manager (contractor) begins to escalate to multiple visits a day. The project manager is responsible for setting up the staging of the construction process and needs to be fully aware at this point of the buildings materials, measurements, details and specifications.

Construction

This stage is where the contractor takes over the design process and executes the CDs into three-dimensional reality. The contractor at this point is fully aware of how the building will be built and the different stages it will take to complete the work. Prior to and during construction, the contractor is also staging the entire process. Staging requires ordering materials and delivery dates, making sure all subcontractors are hired, scheduling the building process and subcontractors, and overseeing the site and building process.

During this process the contractor is constantly on call and in communication with all parties to make sure the process goes as scheduled, with minimal delays and remains on budget. Effectively, their role is to get the design built as efficiently in time and cost.

Construction officially started on March 13, 2003. The first day of construction was mostly site preparation and layout. On March 14th excavation and forms for pouring the floating slab were set up. On Monday the 15th, a late spring snowstorm left over a foot of snow on the ground. This stopped construction and a valuable lesson in scheduling delays was learned. Luckily, most of the snow was gone by Thursday and construction continued.



On this day, forms were finished being set and a 2-inch layer of gravel subase was laid to prepare for a Friday pour. On Friday, March 19, 2004, rebar was delivered in the morning, cut and put into place for an afternoon pour.



Concrete was to be delivered in the early afternoon and poured into place. Unfortunately, another lesson in scheduling was learned. The concrete was not delivered until 3:00 p.m., and in discussing the amount of concrete to order with the plant, I rounded up the dimensions of all sides and ordered a half a yard more to account for a light load.

However, when we poured we were two-thirds short of our second slab of concrete. The driver fortunately went back to the plant and added another one and three-quarter yards, and returned around 4:30 p.m. We finished pouring the slab around 5:00 p.m. and allowed it to set up to spray on the retarder. Unfortunately, the precedent for many long days of work was being set. We finished spraying the slabs before 8:00 p.m. and covered it for the night.




On Saturday March 20th, the retarder and top layer of concrete was sprayed off to reveal an exposed aggregate surface. One of the main lessons learned from pouring the slabs, other than the how-to of it all, was scheduling equipment and managing it. During this part of construction I had already dealt with scheduling and operating a skid loader, water-tank and pump. The

remoteness of the site also required me to provide power, transportation, and equipment through scheduling.

Because this was an actualized project being constructed, it was necessary to prepare for the scheduled activities and have the proper materials, equipment and necessities available for construction. This required maintaining a work schedule and contact with the WRC staff in terms of which equipment would be needed for construction on a daily-basis. As contractor, I had to be very organized for each activity and understand all the factors from material to equipment that was necessary.

On Sunday, we finished excavating the site, setting the rest of the forms, and laying the gravel subase. On Monday, March 22nd, the second and "final" pour was delivered in the late morning, after rebar was laid. For the second time, the pour came up short and we had to wait on another load over an hour later. As contractor, I had calculated the wedge shapes as rectangles, rounded up all the measurements and added another half a yard. Because this was the second time such an incident had occurred, I requested the next load be free. It took longer to finish, but allowed us to remain on schedule and helped to keep costs down as much as possible. This slab was completed with a simple brush finish to match and tie in with the path, and provide a contrast to the exposed surfaces.



The following weekend, March 27-28, 2004, was marked with laying out the structure's walls before beginning to build. Unfortunately, the weather struck with a day of rain and eliminated Saturday. On Sunday, the building layout was completed and sill plates for the walls were attached before rain started in again.


Another lesson was learned this week about specifying materials. When materials were delivered a different post base and concrete anchor had been replaced for those ordered, therefore, details needed to be changed. Normally, this would be unacceptable, however, given the timetable and schedule changes were made.

On Saturday, April 3, 2004, the first load-bearing wall was built and the second was started. There was a lack of good lumber for wall slats so I decided it would be equally effective to increase spacing between slats in order to use the best lumber. On Sunday, the second wall was completed and the four interior columns were set in their bases. The walls were then lifted in place and braced off. As contractor, I measured and cut the first rafter using the construction documents. When it was put in place, we discovered it needed more trimming on the bird's mouth. After making the right fit, we used this piece as the model for the rest of the rafters. With both walls up, braced off and exterior rafters in place the rest of the structure was braced off to complete the day.




The following weekend was April 10th and 11th. On Saturday, the interior rafters were put in place and the structure was racked for plumb. After leveling all the walls, they were braced again. Next, the purlins were laid out on 18-inch centers and set across the rafters. After installing the high-wind resistant ties, the gutter was laid out and the post bases were attached. On Sunday, the columns were measured, cut and put up. The gutter beams were then bolted to the structure and connected to the columns across the path. Next, the plywood decking was put down in the gutter. The decking was then covered with Weather-lock and then flashing to prevent leaking. After a medical incident, we stopped construction for the day.




The construction was finished on Saturday, April 17, 2004. On this day, we finished the gutter flashing, and laid the metal decking for the roof. After which we finished the slat walls and cleaned up the site. The rest of the landscaping (settling the site, laying matting and rock, etc.) will be completed as time and money are found.








CHAPTER VI: FINDINGS AND TRANSLATION

This section becomes the pedagogical analysis of the project. The findings of the process and different roles are discussed and analyzed to give an understanding to the value of this type of study. The roles will be compared and contrasted and a translation between what was researched and learned about the process will be given as the thesis value.

Description of Findings

Ultimately the process was extremely difficult. Some phases and roles were more difficult than others, some were more enjoyable and exciting, others more intense and detail oriented and others were more free and creative. The process created many learning opportunities and united pedagogy and practice. This was the main goal identified and sought out from the beginning. I feel as though the project was a success in regards to furthering my education by helping to mend the break and can be used as a model to better understand the process. If one were to follow this model, they would probably find their own process or theories that make their project unique to their study, but pursue a similar path. The following description will discuss the process and roles through comparison and contrast.

I found this type of project requires a definite understanding of project scale. In looking at different models from other academia and individuals, I knew scale was probably the most important factor. A project too small would lack attention and focus throughout an entire year, would not be a significant enough model for construction and not allow a deep enough commitment for study. A project too big in scope would require too much attention and focus, could present time and schedule conflicts, and be too large a model for a concise study. There is a middle ground and the search was for this balance of scales.

One of the other main ingredients to selecting a project was a social need for a designed response. I was influenced by the work of Auburn's Rural Studio and had aspirations this project could serve a social dilemma. I began to search out people who were dependant on others and could be for a built response as well. This led me to a lot of accessible ramps, which were too small in scale to sustain a full year of academic study and construction process. Fortunately, I was led to the WRC where many of the projects were directly related to the clients, improving some aspect of their life and of the appropriate scale and scope for academic study.

Because of funding, I chose the master planning of the recreation trail and the built shelter. Looking back, I think this was too large a project. The actual structure built was of the perfect size for academic study and construction, but the designing of the trail, was too comprehensive and took a lot of time and research. For a normal studio, the master planning of the trail would be a good introductory project where one could learn about many disciplines such as community and regional planning, landscape architecture and architecture.

For a thesis focused on learning by building, it was hampered by a lot of other design and planning of things I would never build. The best scenario would have been to focus on the design and construction of the final structure. However, as part of a trade-off for funding the construction I was asked to plan the rest of the pathway. As an architecture student, I found the design hard to put down and felt the need to design as much as possible, because in the academy we are so well versed in schematic design and is essentially all we learn. In terms of over-extending myself as both designer and builder, this became the greatest problem.

As the phases passed on to program development, I found myself doing a lot of necessary research in order to determine the necessary program, functions and space requirements for the trail. Again, this is usually a given in most projects and looking back was very time intensive in research as well.

Schematic Design was one of the most enjoyable aspects of this process. It was an opportunity to develop a lot of ideas and do a lot of research on parks and trails. To me, architecture is interesting and intriguing because of the potential for learning about new project types and sites. This phase allowed me to do a lot of research of the site, WRC and community as a whole. It also allows the most conceptual thinking and provides for the most creativity. The unfortunate side to this project was essentially based in the pragmatics of building. The end result would be a built piece so more time spent on schematic design of the trail, the more it hurt detailing the constructed space. The trail began to take on a life of its own and required an intense study.

This phase of the process was lengthier because of a lack of detail with the shelter. As contractor, I fell behind in focusing my attention on the built piece rather than the whole. I needed to be more specific about the actual design of the shelter, which meant becoming more involved in details. This was difficult because I needed to receive feedback about the design

direction, but did not feel comfortable moving forward into Design Development, since I had never gone that far in my design education. It was also hard to move forward with not much criticism. One thing we are prepared well for in academia is criticism and feedback. Without these, I felt lost at times and unsure of which direction to go. The WRC was so glad to have someone helping they seemed too agreeable and positive. Communication became very important, to me trying to represent the project and for the WRC Committee in providing feedback.

Design Development did bring back pragmatic aspects to this project needed in order to be a success. Unfortunately, this phase had fallen behind in schedule so confirmation of overall design had only a certain level of detail. This led to design development essentially merging into Construction Documentation and being completed together.

Construction Documentation was the hardest part of the whole process. It was time consuming and not terribly interesting. The creativity toward the shelter and trail was starting to wane and ideas of other possible, or worse, better solutions began to emerge. Because the schedule to better schematic design was pushed back, design development suffered and ended up affecting CDs. Often details were being developed and simultaneously turned into CDs. Because of the time crunch, some details were sacrificed to a certain degree in order to begin construction on time.

In construction, the details were constantly questioned, given the fast-track nature. This too became the point where weather began to affect schedule and less time led to less creative solutions to problems in the field. Ultimately, the easiest and quickest solutions were found and adopted, with the hope that details could be added back in the end. One such example was column detailing. Columns were originally detailed to have mitered edges and lines at one foot on center. However, the time to put the structure up required these details be sacrificed for the greater good of completing the building.

The role of designer played the heaviest part throughout the process, although I tried to ground myself in pragmatics. When I first came to the WRC, I had the overwhelming feeling of being at an institutional facility. With the governmental blue sign, linear boulevard entry, and early 1900 brick architecture it felt to some degree sterile and lifeless, but remarkably well kept. After meeting the staff and residents, researching the WRC care philosophy and history, it was

clearly evident that this was an institution, but one in positive change. Their current goal in helping people return to the community, both figuratively and physically was clear and well documented. As designer, I felt the need to express this vision as much as possible conceptually at first and then physically in design decisions.

These ideas were well received and asked to be explored in greater detail. Feedback was specific as to aesthetic issues and general towards conceptual ideas. I was asked to provide something that did not resemble a typical park structure, to be as maintenance-free as possible, and try to incorporate many native or regional plantings while increasing the bio-diversity. Those were my three biggest feedback comments. As long as I addressed these issues from the client, they were always positive in accepting ideas.

To me, this felt like an evolutionary process of ideas, until it became more specifically about details. Then it seemed more revolutionary, because of decreased funding, no re-using of materials and pragmatic issues, I started changing whole detail ideas and went from a completely open-air structure to walls and a more symmetrically shaped structure. Ideas thought to be developed did not work in details and began to disappear, while ideas from early schematic design began to reemerge such as walls and regional influences.

As contractor I felt responsible for getting the shelter done as quickly and efficiently as possible. This role hampered the design details even though this was directly related to such a short construction schedule and weather delays.

The contractor stifled design creativity more than increased it, because I tried to ground it too much in my construction know-how, which is to say very limited. However, as contractor I also became more creative in solving problems that were not evident in design, but were staring directly at me on the job site. For instance, cutting the angled walls and adding new walls on the gutter to increase the building stability were problems solved on site. Also, when materials ordered were not those delivered, it created another set of problem solving opportunities. In consistently questioning the design and its ability to be constructed, I did realize a greater sense of why details were so important and needed to be worked out, but realized that nothing works as perfect as in AutoCAD.

Translation

The following is a translation between the research, process and project. The goal of this section is to discuss the influence research had on understanding the process and project.

I was first inspired to this type of project as I read Spiro Kostof's, "The Architect-Chapters in the History of the Profession." The text outlines the different roles and degree to which the "architect" has played through out history in the field of building. As I began to research this topic more intensely, I realized the historical break where architect became separated from builder was still highly recognized today. Although this might have seemed like evolution to some and revolution to others, it seemed as a false resolution to me.

This is because it seems as if our main goal is the same, to create a built work. To separate our knowledge and to not share similar experiences is to not understand the others role in the process. To create a better solution, it seems as though one would require a full understanding of the work from design intent to construction process. I believe it is this lack of understanding of the processes required to complete a task that weakens our ability to create better solutions.

This is not an argument for design-build as a way of producing architecture. It is a way of exploring architectural education using history as a model for understanding the constructed world more accurately. Throughout my entire design education, all work has been completed in studio with a few trips for site documentation. To most architecture students, it must seem as though the design profession works in a vacuum. However, this is not the case. In ancient Greece and Egypt the architect was essentially a "master-builder", who worked right on site along with others. To this individual design and construction were one and the same. This historical perspective became the precedent for beginning to research this type of thesis.

Although I used the same process as in studio, the opportunity to visit the site continually, meet with the client and actually build the project led to a greater understanding of the whole process needed to produce architecture. It was connecting the design and construction which helped bridge the schism between pedagogy and practice, and related it to the historical precedents.

There are several current educational models that could be followed. The most significant in my research and the biggest influence was Auburn and Samuel Mockbees' Rural Studio. To me, this is the most accurate model to follow in trying to blend a historical perspective to bridging

theory and practice. With students living amongst its clients and separated from the classroom, the site truly becomes the classroom.

It is this basic premise that I wanted to borrow, adapt to a certain degree and re-use. The Rural Studio is a blend of social and aesthetic architecture. To do the inspirational work they do, with materials and design, and do it to help others, is such a refreshing take on architecture and the power of practice. With my limited time and ability, it is these principles I hoped to achieve, though on a much smaller scale.

Lastly, many architects, writers, artists and philosophers were certainly advocates of learning through direct experience. Henry David Thoreau most certainly would have been an advocate of this approach to architecture because of his view that a building's expression comes from both the designer and the builder. To ground the theoretical process of design into physical materials, elements and settings, might have been one of his biggest arguments.

It is definitely this process of doing that generates a greater understanding of architecture as a whole. In discovering these individuals who would have or did believe in learning by building, it was apparent these experiential realities led to an important and greater understanding than the academy currently lends to them. I felt these ideas come alive at times throughout the project, particularly during client meetings, dealing with suppliers, workers and actual construction. Up until Design Development, it still felt mostly like research and a typical studio, except for

meeting and engaging client groups. However, once CDs were worked on, it was an extreme change from the conceptual process to production processes.

All of these different precedent models help to reinforce learning. Before beginning such a project, I could probably have told you how I thought a project would get done, but I would have been wrong. I am sure the process is never the same and so one needs to take caution in following this model or process through. The ideas and possibilities this creates are well worth the extra time and work a project of this magnitude represents.

CHAPTER VII: CONCLUSION

The conclusion will place emphasis on the value of this thesis as a model to be followed by students who desire to understand more about the built world and the value of a "hands-on" project. This thesis can be used to assist someone in better understanding the problem, resolving the appropriate solution and carrying it through in the construction administration of a "hands-on" approach.

This approach has led to several lessons learned about the process and roles of producing architectural works including:

1. It is truly an evolutionary process through construction
2. Issues not faced in traditional studio are in your face on the site (3D Reality)- structures, details, design issues, dimensions, construction strategy
3. The process is a psychological rollercoaster
4. The design concept can not be separated from reality of construction, limited time or budget, and a need to function
5. Lack of a client voice (criticism) results in indecision and lack of action
6. Measure twice, cut once
7. Order more material than you need, because you will need it
8. Collaboration and communication equal success

The above are probably the most significant lessons of this thesis. Each student will take a different approach to a project and will learn different lessons they find significant. This creates the beauty and uniqueness of architecture and this process. To be able to look at what I found and generate conclusions about the success of the process as well as walk away with a greater understanding of architectural history, theory and practice validates the success of this thesis.

Those conclusions are as follows:

1. Effects might not be immediate, but have the potential for long-term, sustained growth as a designer and human being.
2. It does validate and cultivate curiosity, humility and empathy of creating and constructing work.

3. Creates a broad and more solid foundation of knowledge and preparedness for employment through working with materials, schedules, clients, public, users, etc.
4. To approach CDs as if design work is completed is a misconception. It is a time to sort through and solve mistakes.
5. One better understands the difficulty and time-consumption of bringing a building into reality.
6. Social-relevance makes it more than just a building. It creates an experience, a story to be developed and shared with others.

It is the model for how works gets done in such a well thought out manner that is the essence of this type of project. The gaining of these "real" experiences has helped carry me through such a long project and has sustained not only my focus but drive towards practice. One of the first conceptual ideas to spark the idea of participating in such a project was the historical past of the profession.

To realize the historical break in theory and practice was in retrospect the defining point of the architect's role today was instrumental in understanding the limits our current role has in the academy. This break is responsible for our lack of material, project management, and construction process and construction methods knowledge as architecture students.

For the most part, I am fine with that, but somewhere in our process of education, the break between the two should be bridged if only for a studio. Early on in ones design education might help, because it would allow one to feel more connected to the built world and help improve their ability to recognize the value of detail in design. Or the opposite perspective might be taken, in that to ground a student early on would be detrimental to creativity, and so the break should be mended at the end of their education to make that final connection. I could imagine both arguments, but agree with the former. To have an understanding early on of the built world and the historical, theoretical and precedent implications of it, could lead to more creative solutions. It is easier to imagine things, when you understand the requirements, elements and materiality used to create them.

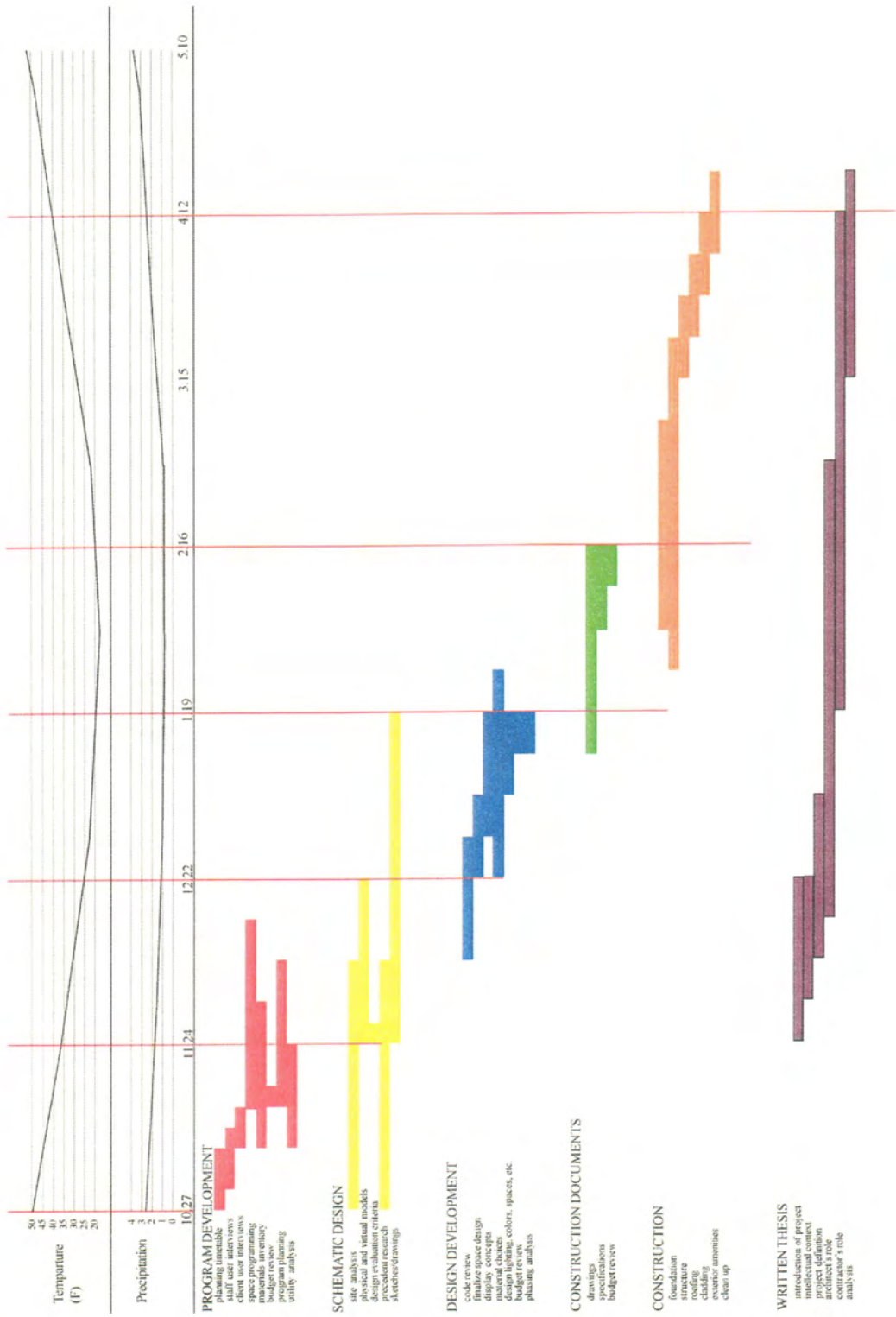
It is these gaps in understanding the built world, the properties of materials and their general construction and use that allow me to only imagine them as I have already seen them applied. To

work with these materials, elements and settings not only reinforce the conceptual process but prepare for the next.

It is this preparation for the future, which I hoped this project would begin to create, and I feel this was the exact answer to the problem I originally longed to solve. I feel as though this has helped to springboard my design and personal education forward to where I now feel more prepared to enter practice and be able to more quickly and readily tackle problems outside of the design realm. I feel this type of project not only reinforced the design principles I have been taught over the years, but help add a level of substance and confidence to them.

Many of my pedagogical goals were answered throughout this design/build process. I feel more ready for practice and able to more quickly and better understand what it takes to complete a project. I also have a better understanding of the different roles architects can play and how personal strengths can lead towards filling those roles. I feel as if I have made a contribution to society, not just in a built work, but creating a better experience for someone. Even though I was the only one working on this project, as designer and builder, this reinforced the idea that architecture is not a solitary action. The numerous meetings, individuals and groups I visited all had a significant part in creating the work. My knowledge of the other design phases and what it takes to get through them is by far the greatest lesson learned. The reiteration of communication and collaboration as key to providing a successful and completed task was learned many times throughout the process. The reinforcement of all disciplines sharing a part in creating a built work is highly established in the design/build process. In the end, I believe this brought legitimacy to my education by experiencing the many frustrations and pleasures of accomplishing such a task.

APPENDIX A: SCHEDULING



APPENDIX B: QUESTIONAIRE

INTERVIEW QUESTIONS
Woodward Resource Center Recreation Trail
Prepared by Zane N. Muntz

FUNCTION
What do you think the mission of the WRC Recreational Trail is?

Who do you perceive using the trail and how much?

Who do you think should use the trail? For any specific purpose(s)?

What type of security measures should take place along the trail?

What type of information (WRC mission, campus map, etc.) do you think the trail should exhibit?

What relationships do you think the trail can have with the city? The WRC campus?

What outdoor space requirements are needed?

What are some functional alternatives?

FORM
What site elements (trees, lawn, plantings, etc.) do you think the trail should focus on?

What type of structures do you envision along the trail?

What type of safety measures do you think should be included?

What type of social spaces do you think should be included?

What do you think the projected image of this trail should be?

What type of building quality would you like to see?

What type of spatial quality in structures do you imagine?

What functions do you think the trail should include?

What accessibility issues do you think are necessary?

ECONOMY
Do you have any suggestions to increase cost effectiveness?

What type of maximum return on investment do you expect?

What are some suggestions for minimizing maintenance and operating costs?

What multi-functioning spaces could be created to decrease the costs?

What energy conservation methods could be implemented?

TIME
Do you think the trail should have the flexibility to change?

Do you envision the opportunity for growth of the trail?

What adaptability, convertibility and expansibility opportunities are there?

WRC Support Council Script

My name is Zane Muntz and I am a graduate student in architecture at Iowa State University. I am here today to discuss the recreation trail that has begun on the south side of campus. I was hoping to ask you a few questions and then discuss the trail.
Do you know what the trail is for?

What do you think the trail could be used for?

What would you like to do or see on this trail?

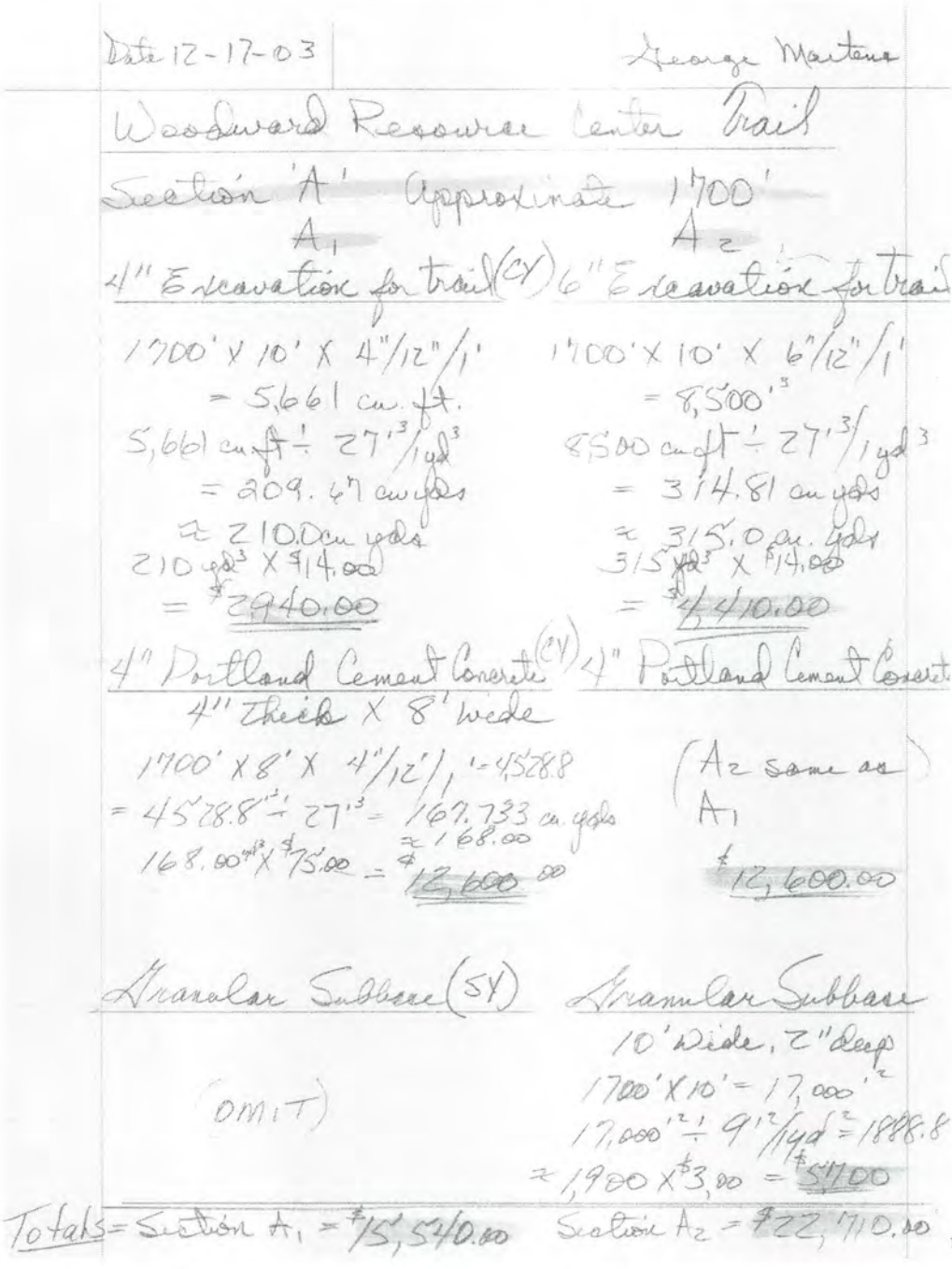
RECRUITMENT MATERIAL-SCRIPT
My name is Zane Muntz and I am obtaining my Master of Architecture degree from Iowa State University. I am contacting you to see if you are interested in becoming involved with the planning of a recreational trail which will connect the Woodward Resource Campus to the city of Woodward. The trail would help to connect the campus and the city and provide a safer route for pedestrians and bike riders. If you are interested in becoming involved you can reply through e-mail or by telephone at the numbers and address listed below. If you aren't able to assist personally, please let me know of anyone else you might think necessary to contact. Thank you for your time and assistance as well as any help you may provide.

Sincerely,

Zane N. Muntz
515.233.5680 Home
515.294.8797 Studio

APPENDIX C: TRAIL COST COMPARISONS

The following is information prepared by George Martens of the Iowa Department of Transportation. The first page is the cost of the trail in the greenway and the second page is the cost along the highway built to Department of Transportation specifications.



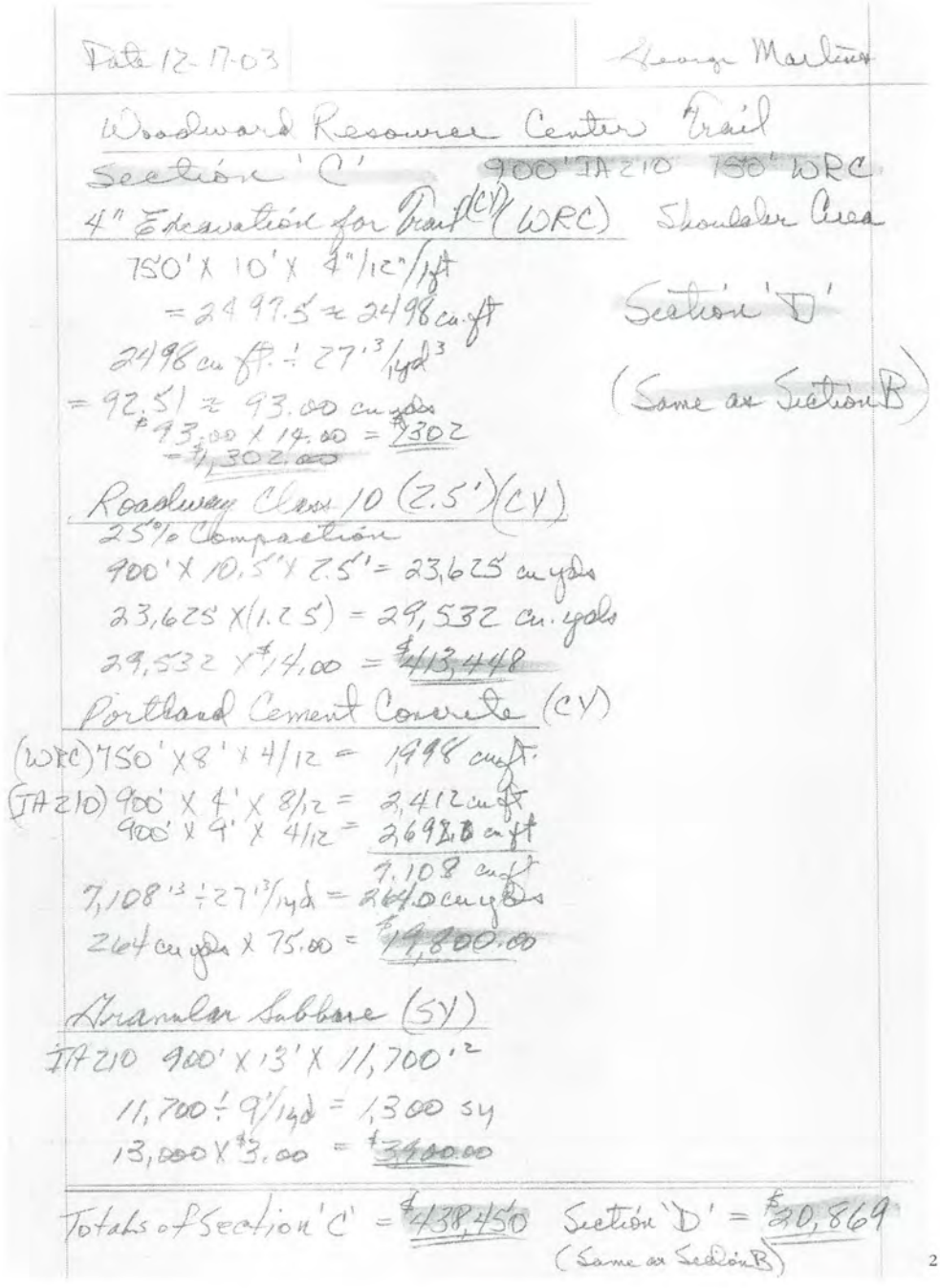
Date 12-17-03 — George Martens

Woodward Resource Center Trail

Section 'A' Approximate 1700'

A_1	A_2
4" Excavation for trail (CY)	6" Excavation for trail
1700' x 10' x 4"/12"/1' = 5,661 cu. ft.	1700' x 10' x 6"/12"/1' = 8,500 cu ft
5,661 cu ft ÷ 27 cu ft/1 yd³ = 209.67 cu yds ≈ 210.0 cu yds	8,500 cu ft ÷ 27 cu ft/1 yd³ = 314.81 cu yds ≈ 315.0 cu. yds
210 yd³ x $14.00 = $2940.00	315 yd³ x $14.00 = $4,410.00
4" Portland Cement Concrete (CY)	4" Portland Cement Concrete
4" Thick x 8' wide	
1700' x 8' x 4"/12'/1' = 4528.8	(A_2 same as A_1)
4528.8 ÷ 27 = 167.733 cu. yds ≈ 168.00	
168.00 yd³ x $75.00 = $12,600.00	$12,600.00
Granular Subbase (SY)	Granular Subbase
	10' wide, 2" deep
(OMIT)	1700' x 10' = 17,000 ft²
	17,000 ft² ÷ 9 ft²/1 yd² = 1888.8
	≈ 1,900 x $3.00 = $5700
Totals = Section A_1 = $15,540.00	Section A_2 = $22,710.00 [1]

[1] Martens, George. "Personal Interview."



Date 12-17-03 George Martens

Woodward Resource Center Trail

Section 'C' 900' JA210 150' WRC

4" Excavation for Trail (CY) (WRC) Shoulder Area

150' X 10' X 4"/12"/1ft

= 2497.5 ≈ 2498 cu ft

2498 cu ft. ÷ 27.3/yd3

= 92.51 ≈ 93.00 cu yds

$93.00 X 14.00 = $302

= $1,302.00

Section 'D'

(Same as Section B)

Roadway Class 10 (2.5') (CY)

25% Compaction

900' X 10.5' X 2.5' = 23,625 cu yds

23,625 X (1.25) = 29,532 cu. yds

29,532 X $14.00 = $413,448

Portland Cement Concrete (CY)

(WRC) 750' X 8' X 4/12 = 1,998 cu ft.

(JA210) 900' X 4' X 8/12 = 2,412 cu ft

900' X 9' X 4/12 = 2,698.8 cu ft

7,108 cu ft

7,108'3 ÷ 27'3/yd = 264.0 cu yds

264 cu yds X 75.00 = $19,800.00

Granular Subbase (SY)

JA210 900' X 13' X 11,700'2

11,700 ÷ 9'/yd = 1,300 sy

13,000 X $3.00 = $3900.00

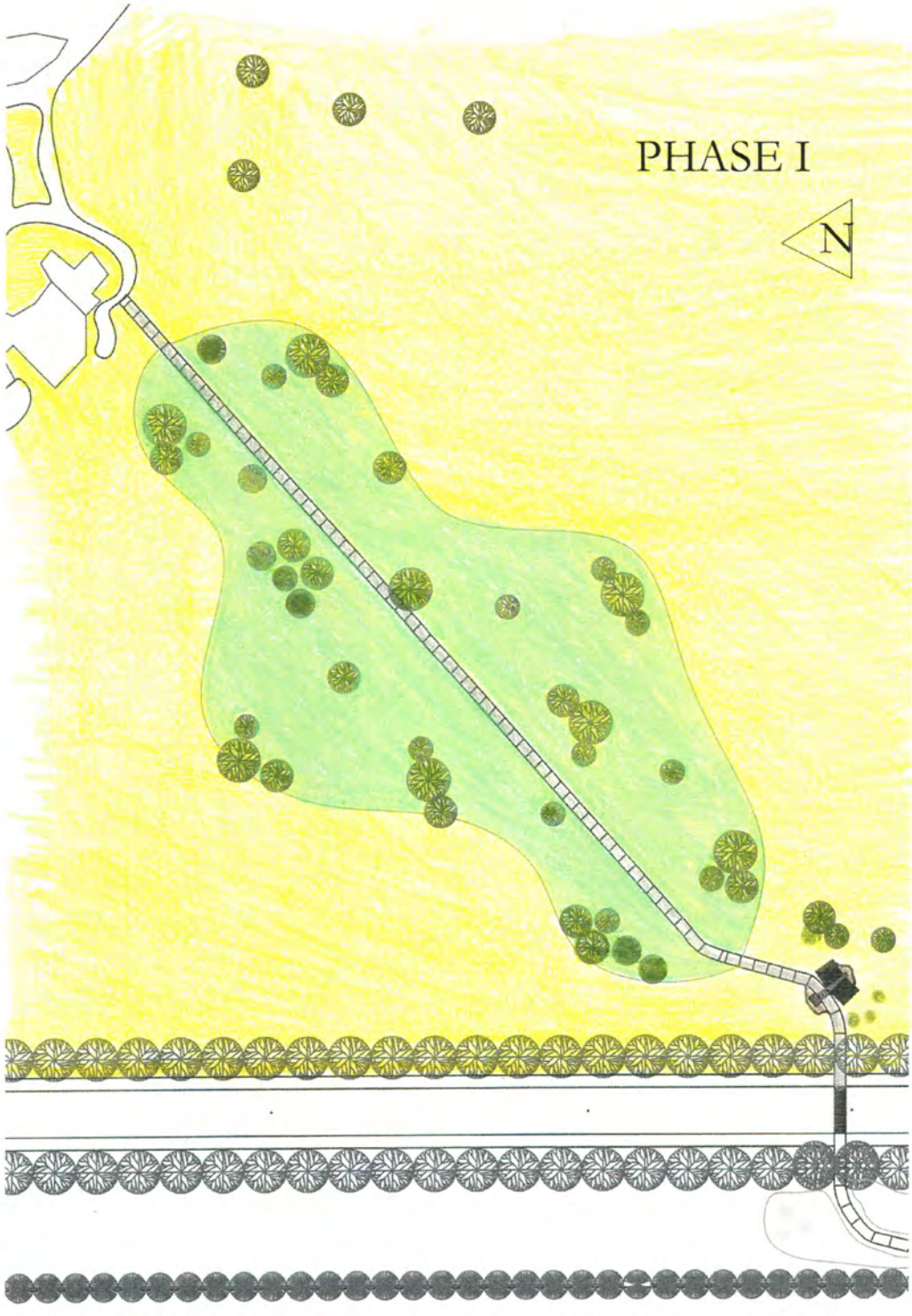
Totals of Section 'C' = $438,450 Section 'D' = $20,869

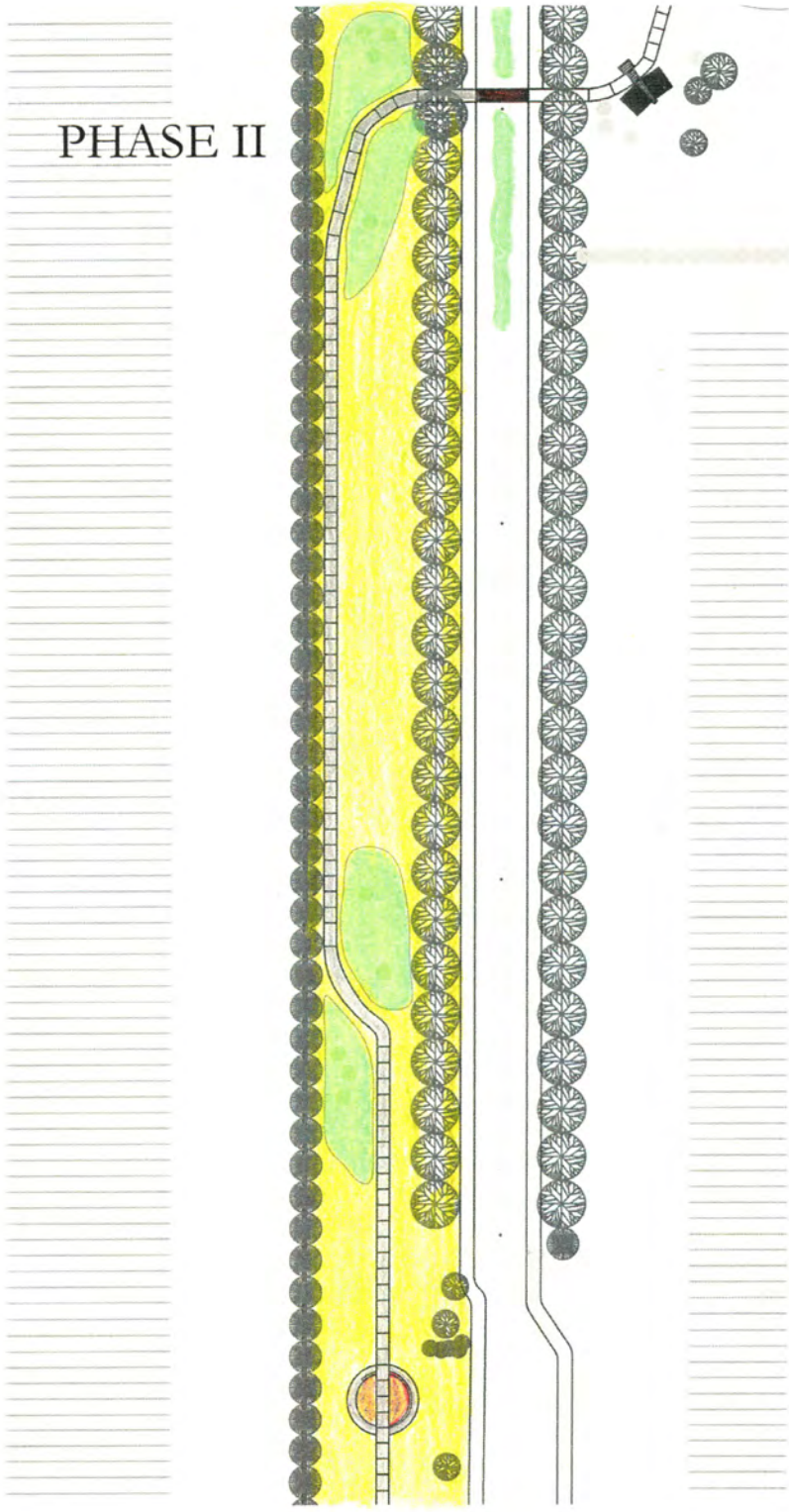
(Same as Section B)

[2]

[2] Martens, George. "Personal Interview."

APPENDIX D: MASTER PLAN

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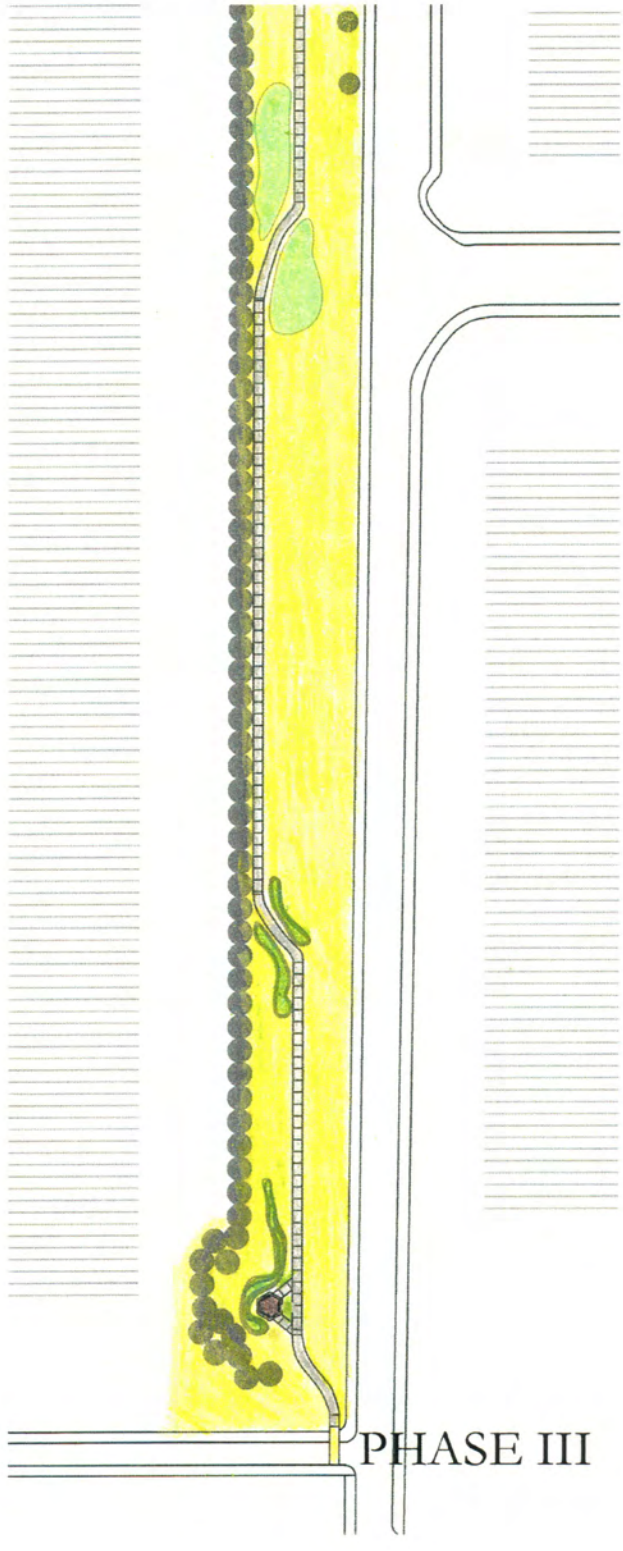
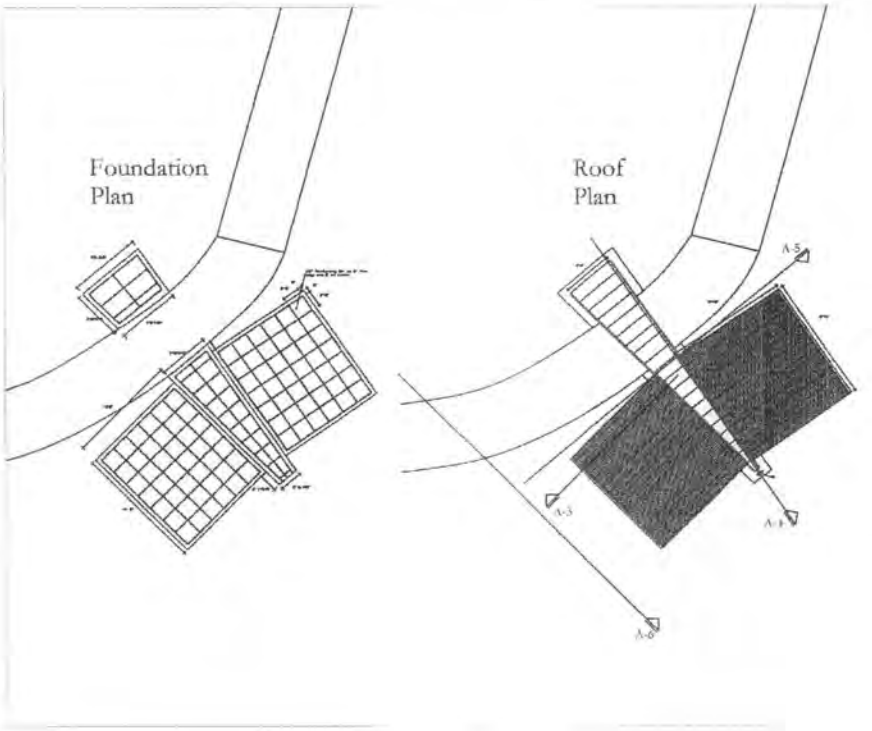

PHASE III

APPENDIX E: CONSTRUCTION DOCUMENTS



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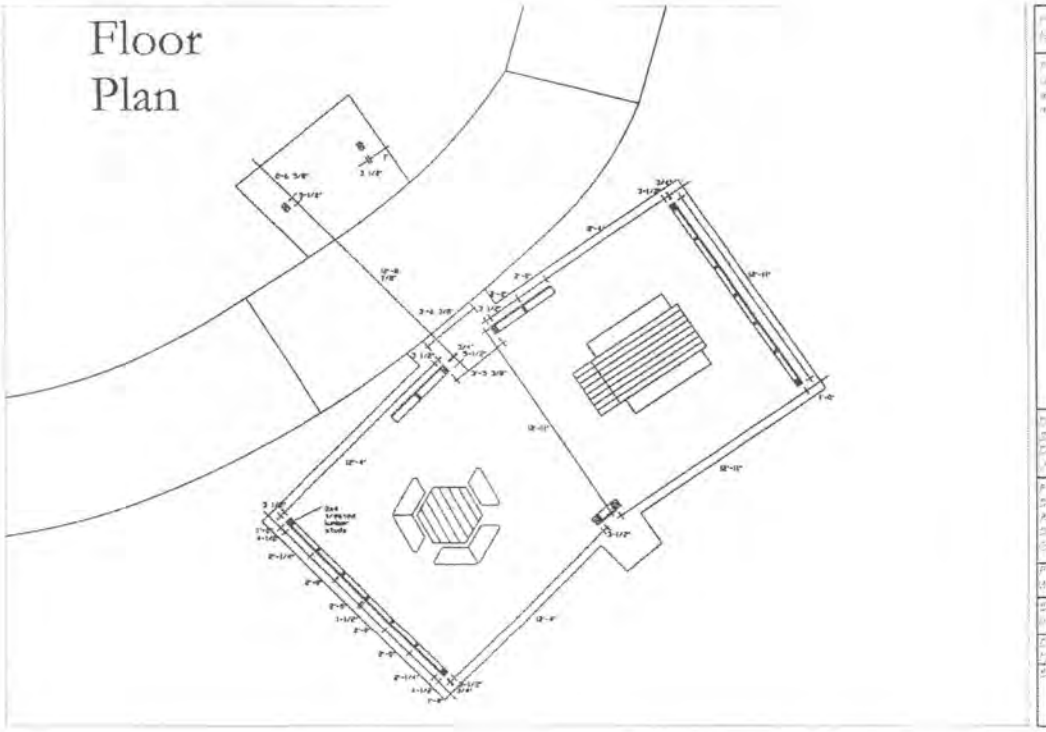

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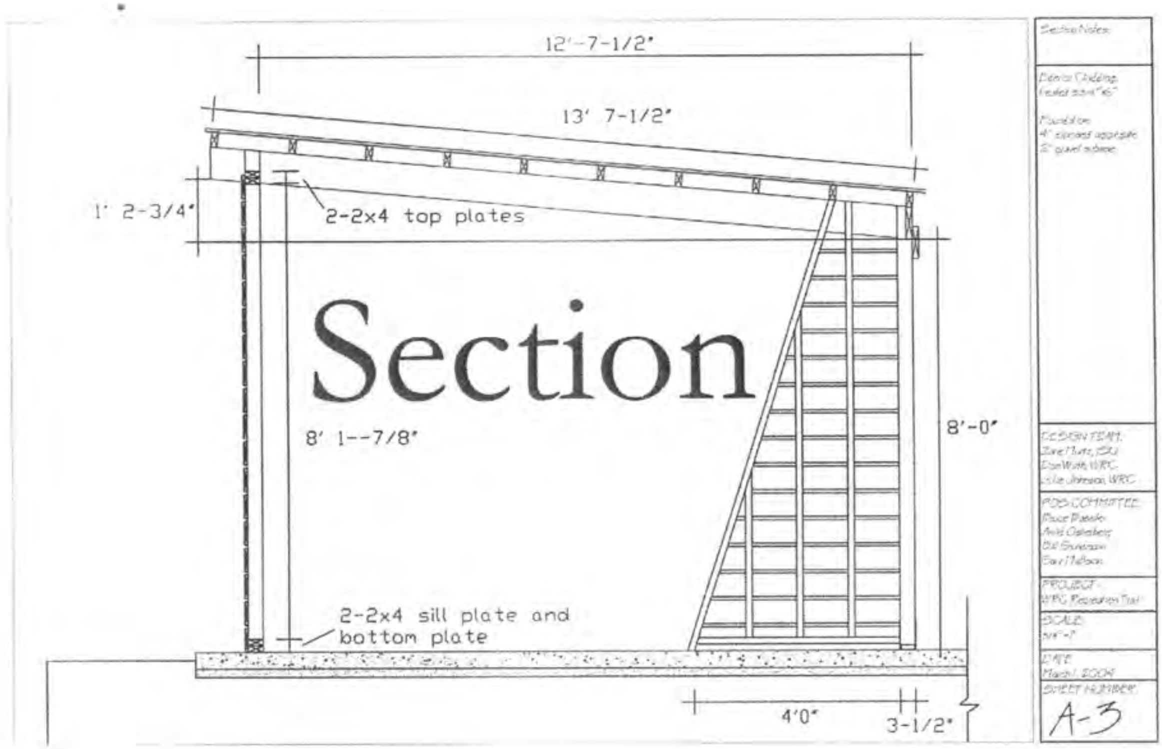
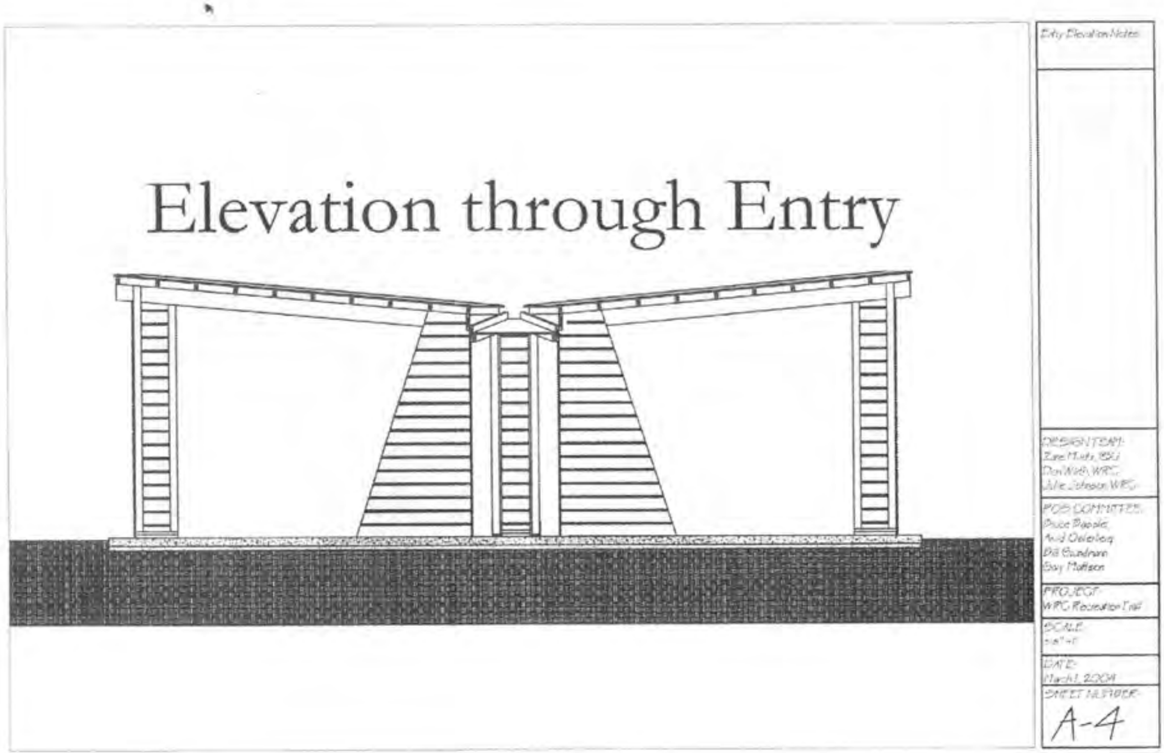
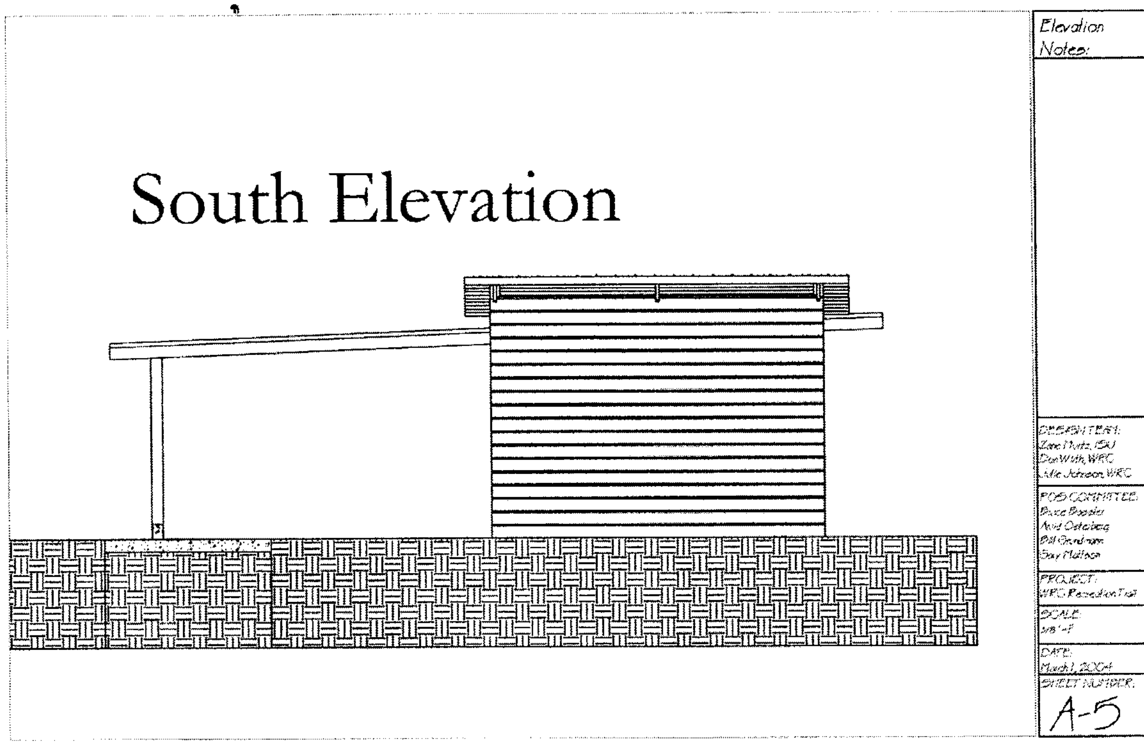
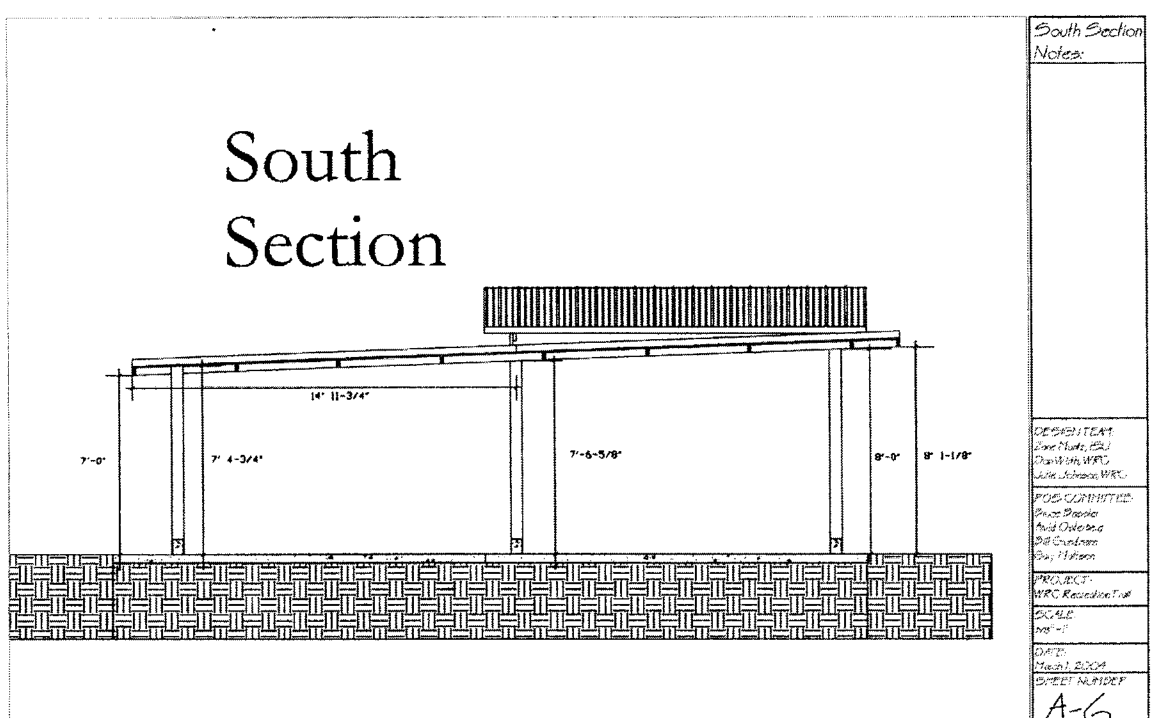
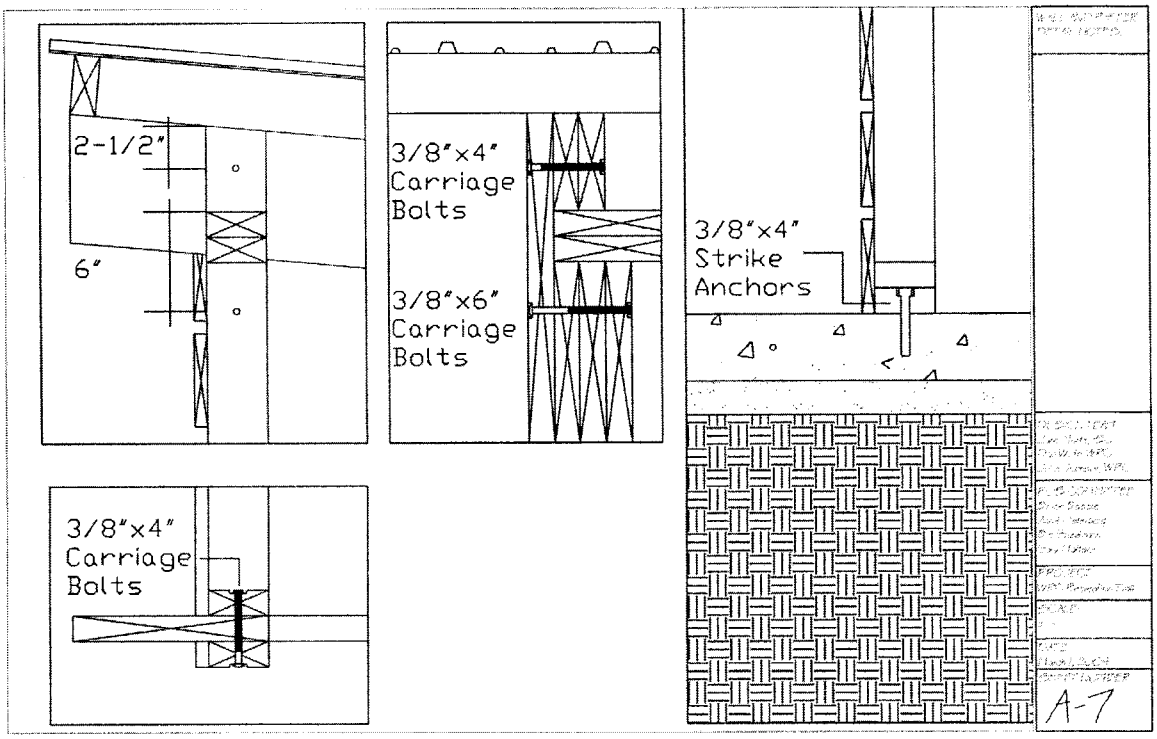
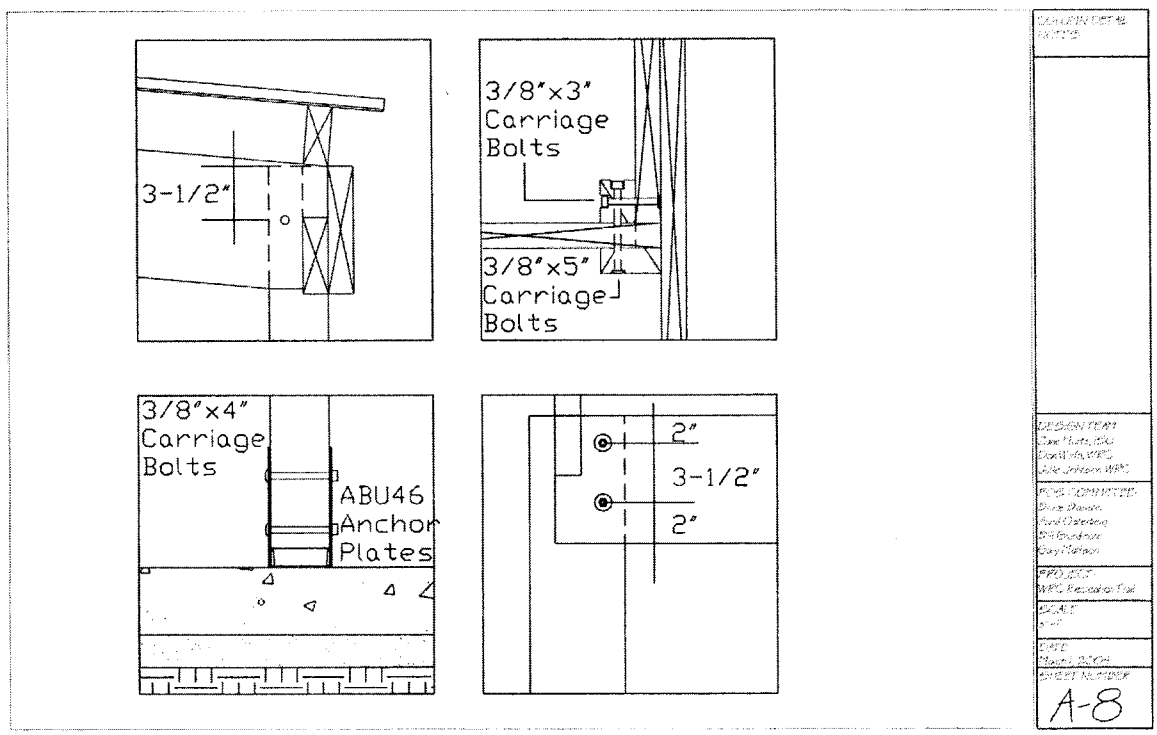

12'-7-1/2"
13' 7-1/2"
1' 2-3/4"
2-2x4 top plates
Section
8' 1--7/8"
8'-0"
2-2x4 sill plate and
bottom plate
4'0"
3-1/2"
Section Notes
DESIGN TEAM:
POS COMMITTEE:
PROJECT:
SCALE:
DATE:
March 1, 2004
SHEET NUMBER:
A-3

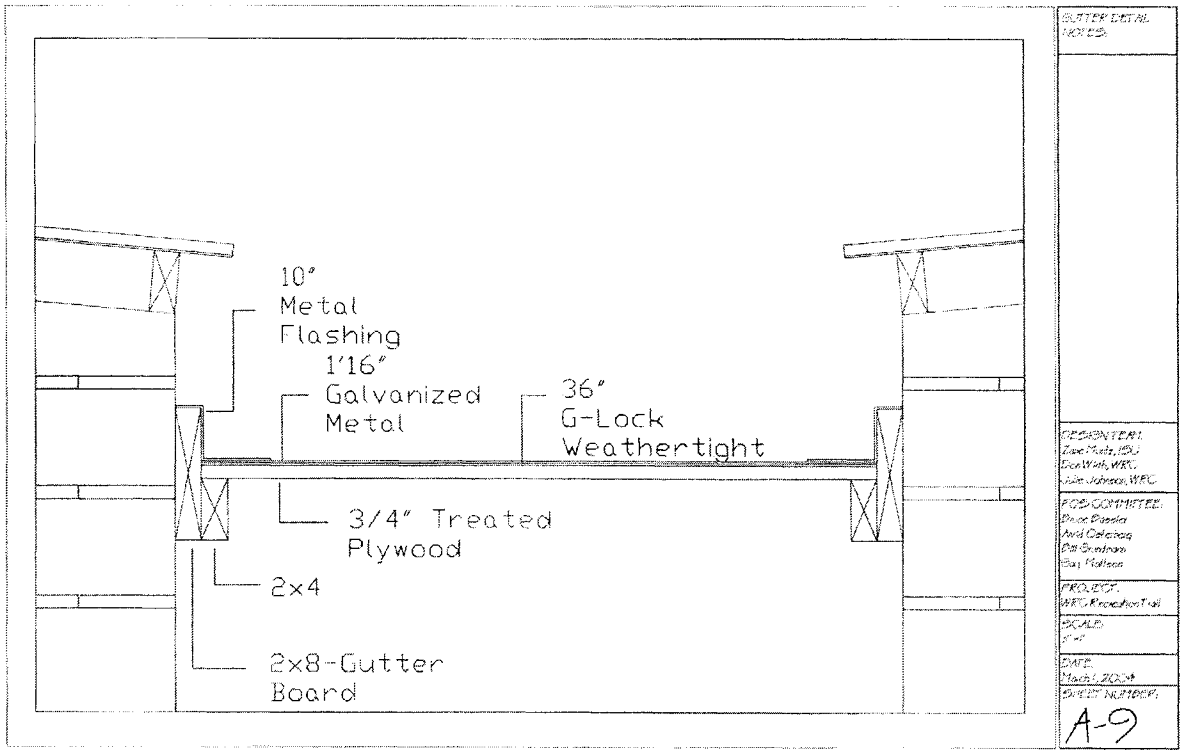

Elevation through Entry
Entry Elevation Notes
DESIGN TEAM:
POS COMMITTEE:
PROJECT:
WPC Recreation Trail
SCALE:
DATE:
March 1, 2004
SHEET NUMBER:
A-4


South Elevation
Elevation Notes:
DESIGN TEAM:
PROJECT:
SCALE:
DATE:
March 1, 2004
SHEET NUMBER:
A-5


South Section
South Section Notes:
14' 11-3/4"
7'-0"
7' 4-3/4"
7'-6-5/8"
8'-0"
8' 1-1/8"
DESIGN TEAM:
PROJECT:
SCALE:
DATE:
March 1, 2004
SHEET NUMBER:
A-6


2-1/2"
6"
3/8"x4"
Carriage
Bolts
3/8"x6"
Carriage
Bolts
3/8"x4"
Strike
Anchors
3/8"x4"
Carriage
Bolts
A-7


3-1/2"
3/8"x3"
Carriage
Bolts
3/8"x5"
Carriage
Bolts
3/8"x4"
Carriage
Bolts
ABU46
Anchor
Plates
2"
3-1/2"
2"
A-8


10"
Metal
Flashing
1'16"
Galvanized
Metal
36"
G-Lock
Weathertight
3/4" Treated
Plywood
2x4
2x8-Gutter
Board
GUTTER DETAIL
NOTES:
DESIGN TEAM:
PROJECT:
SCALE:
DATE:
SHEET NUMBER:
A-9

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