DETAILS: The Expression of Meaning and Materiality in Architecture

Randall S. Robison
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Ball State University College of Architecture and Planning
Department of Architecture

Professor Andrea Swartz
thesis studio instructor

Professor Wes Janz
thesis advisor

Bob Githens
woodshop advisor

Family and Friends
Invaluable encouragement and support
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INTRODUCTION
Definition of Detail

According to Webster's Dictionary, the definition of a detail is

In architecture, the detail is the tangible scale in which an architect is able to assign meaning to their built idea. It is the art of the architect. It is

The detail is the joining of the mental process of design with the physical construction of the building.

Of course architectural meaning can be represented in many forms. Symbolism, historical reference, formal elements, etc, but detail design is fundamental to all these methods.

Without the well considered detail, the human observer is potentially left unconnected to the concepts and meanings of the architecture. Hence without the 'well connected' detail, architecture cannot be considered successful.
Humans experience life through a range of senses. Sight, sound, touch, taste, and smell. These senses not only guide us through our life, but also link us to specific places and moments within it. Similarly, our experience of architecture is formed by what we see and touch and how we feel about it. We become connected to a place through physical contact. That same physical contact encourages mindfulness, focus, and memory.

Architecture, no matter how well received by critics, cannot be considered successful if it does not spark that moment of conscious awareness when a person feels intimately connected to a place. Once the tactility of a material has opened a person to the experience of architecture, it is up to the craft of the construction to make it memorable.

'Craft' is a handmade coffee table passed down from generation to generation. Craft is the careful attention paid by a group of volunteers to each brick used to lay the foundation of a Habitat House. Craft is a grandmother's handmade quilt wrapped around a newborn child. Craft is the point in life where the meaning and the construction are united for the first time.

This focus on the tactility of material and the craft of construction will manifest itself in an architectural education facility in the historical Cranbrook Educational Community located in Bloomfield Hills, Michigan. This thesis proposes an expansion of the existing masters of architecture program. The hypothetical pedagogical underpinning of this school will be to foster the students' awareness/understanding of materials and craft as fundamental aspects of architectural design.
Criteria for Judging Details

Once the architect understands the importance of the detail, he/she must then understand how to detail. A quality detail may only be accomplished by thinking cyclically about the issues constantly and simultaneously during the design and if possible, during the construction. Issues such as the details’

are all essential aspects to bare in mind while designing any detail. Each presents a unique difficulty in every specific project.

In order to gauge my thoughts and my work, I felt it necessary to compose a list of criteria I personally feel are important to the success of a detail.

- A detail must serve a specific function. It may not be merely ornamental.

- Consideration of time, weather, use, audience, etc is fundamental to the success of detailing.

- A detail should serve to create a human scale, approachable atmosphere. It should foster an intimate/memorable connection between the architecture and the user.

- A detail that strives to enhance the meaning of a place should have a tactile quality. It should not only engage the sense of sight, but also of touch. Memories and connections are made through physical contact.

- Whenever possible, it is desirable that a detail not hide its construction, material, or function. Often the purest and sometimes simplest details are the most successful.
This thesis begins to formulate answers to these questions.

We know this is true, because we experience these things daily. It may be something as simple as a wedding ring. A wedding ring is a tangible expression of a multitude of meanings. To some, it represents happiness, security, and good fortune. To others, it may symbolize anxiety, fear, rejection, or loneliness. The feelings vary from individual to individual, because a person's background and experiences dictate how they perceive a wedding ring. The point however, is that the ring transcends its physical limitations as a metallic circle. It is
Architectural Importance of the Detail

I believe

the hand remembers how a material feels while
the mind remembers the object and the
emotion of the moment.

The detail is the means of producing
this connection when it comes to
architecture. The

The

It is also the physical/human
link to architecture. It is the tactility of the
material and the sincerity of the joint. It is
the perceived historical connection, or the
connection to each individual's memory and
experiences that makes a place special.
Therefore,

This thesis will attempt to
explore both issues of materiality and the
significance of meaning in detailing as
thoroughly as possible.
As the practice of architecture has evolved, the art of the detail has progressively diminished. It is derived from the Greek word "architekton", which literally means "builder". In truth, that is what Greek architects were. They were carpenters, blacksmiths, glass smiths, and master masons. The early architects truly understood how to construct. They understood the joining, the weatherization, and indeed the essence of their material palette. Consequently,

Today the profession of architecture is struggling to retain its rooted definition. This is partly due to the loss of the true architect as one who understands not only the process of design, but also the construction. There are many contributing factors to the decline of the architectural profession. Such influences include the industrial revolution, frequent (and often frivolous) litigation, the advancement of computer technologies, economics, and even licensure.

Architects' roles have evolved, expanded, and contracted simultaneously, to the point that another title may be more appropriate. In fact, many modern day architecture firms operate without an "architect" as defined in Vitruvius time. Firms are composed of designers, engineers (electrical, mechanical, structural), construction managers, accountants, marketing personnel, and more. However, there is no true architect. That is not to say that the firms are operating without properly licensed architects, only that they are not architects in the traditional sense of the word. This is why it is not surprising that the detail, the art of the architect, has also been diminished.

In an ironic twist, many of today's architecture firms, assign the details to the most inexperienced of its staff. They are seen as the "dirty work" or simply "taking care of business." Therefore,
Role of the Master Builder

As technology evolves and we complicate the world around us,

As I mentioned earlier, the industrial revolution was one catalyst to the diminishing art of the detail. To understand this phenomenon, one must understand how detailing was originally accomplished. A set of construction drawings from around 1910 or earlier, lack detail drawings. The

The lack of drawn details was a direct result of the architects' close relationship to the craftsmen and their understanding of the material. The overall design had an understanding of detailing and materiality embedded in it from the architects’ awareness of materials and fabrication methods. The architect understood that many details must be explored in the field, where all conditions are evident, in order to fully comprehend its resolution. Therefore, by allowing room for interpretation of design ideas, the architect set up a situation whereby the manifestation of those ideas could take place in the most expressive and often most functional form.

However, within the fast-track delivery of today's construction industry, the low skilled labor environment, and the litigious context of our society, it is not often desirable to allow the contractor or construction worker to adjust or manipulate the design of an important detail. Therefore,

Today, successful architect/craftsmen who consciously consider detailing (i.e. Peter Zumthor, James Cutler, Peter Bohlin, Patricia Patkou, etc.), do so concurrently with the development of the overall architectural design.

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It may be that the role of the master builder is no longer feasible in today’s technologically complicated building profession. However, it is very possible and indeed imperative, that the role of the detail not be forgotten in the wake of the changing times. In order to revive the art of the detail, today’s architects must understand the importance of the detail to the work of architecture as a whole. The architectural detail serves many functions. It can help in the ordering of the structural system by suggesting problems and solutions early in the design. A thoughtfully designed detail can serve to reinforce the encompassing concept of a place. The detail also acts as a definitive human connection to the physical architecture. It is the joining of both the architectural meaning and the human perception of a place. Architecture is deemed successful when its human counterparts feel intimately connected. The detail addresses the issue of human scale through proportion and tactility.
Numerous architects share the concerns of this thesis. The study of their works became important to the manifestation of the final project. Some of the projects supplied direct inspiration for the articulation of specific Others have had a less tangible contribution by being memorable models of examples of architectural
Still others, less solid in my own mind, have simply left traces of ideas and thoughts that mysteriously work their way into the design ideology.

is one such architect whose work exemplifies an understanding of his material palette and its potential to create meaning. His residential architecture is masterfully detailed with of wood to metal and building to earth.

His details They seek to be honest and pure, not only to the nature of the function they serve, but also of the material palette itself.

The joints and connections he makes within his building, are also applied to the connection between building and context. His context, the northwest United States, is rich with natural qualities and textures. His architecture strives to blend into the environment and become a welcome addition to it, rather than an obstacle within it.
is another architect that makes a specific and concentrated effort to and materials to amplify the meaning of the architecture as a whole.

At the Salk Institute in La Jolla, California, Kahn pays unique attention to the articulation of the concrete surfaces which create its hard courtyard, study spaces, and entries. The materials construction is evidenced by the form tie holes and the lines created by the form work itself. They all

work on the natatorium located near the old Saarinen gymnasium, is a great example of architect choosing to respect the context while not imitating it. The building, though contemporary in its glazed brick skin and wooden louvers, seems to belong to the master plan of Cranbrook.

The architects themselves also feel that details are a fundamental aspect of built work. They champion the idea of ‘slowness.’

Slowing down and appreciating your surroundings, the view framed by a low aperture, the breeze flowing through an open vent in the wall, the polish of a handrail, or the acknowledgment of structure in a natural setting.
work reflects the close connection we have as inhabitants and users to the materials and spaces around us. His thought and design process is closely tied to the experience of an individual and the intimate connection one has with their own space.

His work gets at the heart of material and

His work not only displays a knowledge of the material, but also of the meaning of the material.

work, though somewhat difficult for me to follow, is an inspirational example of the purpose of drawing, especially of detail drawing. He did not draw for the sake of presentation. For him,

Scarpa understood the importance of the depth of a window sill, or the texture of a wall panel, or the implications of a misaligned piece of structural steel. His drawings, and therefore his built works, display a personal attachment/involvement and a kind of sincere compassion for craftsmanship.
The act of making is not only a way to a final product, but it is also a direct link to a deeper understanding of the medium being explored. The physical action of cutting wood, or pouring and drilling concrete, or punching and welding steel, or even glueing acetate and cutting museum board, whether a success or failure, is an invaluable lesson.

For example, I learned that steel is an extremely hard material. Proper tools are a must and a skill saw with a metal blade, is not a proper tool. (It caught on fire as I was cutting.) I learned that concrete does not dry, it cures. Concrete will harden underwater. I learned that for most concrete applications, one inch is the minimum thickness. Anything less won’t last long. I learned that PVC pipe can be cut, heated, and flattened to create a sheet of plastic. I learned that PVC epoxy is terribly nauseating. Silica sand is a carcinogenic. So is treated lumber. I learned that dust particles will adhere nicely to polyurethane.

Although these may seem like elementary observations, to me they represent the endless wealth of knowledge that can be gained through making. For me, making is an exciting realization of design.

- I built a form using wood and foam
- the concrete was a mixture of Portland cement and sand
- the proportions are nearly 1 to 1 to achieve an ultra smooth finish
- just enough water to give the mix a milkshake consistency
- I let the concrete cure for 3 days before I removed it
- I picked up a steel plate at the local scrap yard
- my attempts to cut the sheet failed miserably and I resorted to bribing a local steel manufacturer with a case of beer
- the steel was cut, punched, bent, and welded in less than 2 hours
- the ‘truss’ was made from two laminated 2x6’s
an all wood form was built using scrap 1x and Masonite
special care was taken to build the form level as it set upside down to cure
holes were drilled into the concrete using a hammer drill
expanding lead sleeves were inserted into the holes to receive the bolts
time constraints did not permit steel, so PVC pipe was shaped to take on the form of the steel tube and connection it was cut, heated, and flattened to represent steel plates
the finished forms were then joined together using PVC epoxy finally painted

the form was built using 2x4's and Masonite for the surface finish
I purchased concrete form ties from a local building supplier to create the tie holes left after they are removed the ties were cut in half so I only needed half as many steel mesh was cast in the center of the wall panel as reinforcement (3) 5" inch long by ¼ "bolts were cast into the concrete in order to a fix a base to the bottom. The base is not part of the design, but meant to make the piece stable since I poured the wall panel only 3 inches thick the concrete was kept moist even after it was removed in order to assure proper curing strength the ridges on the surface failed to cure properly and blew off like dust when it was removed
Upon my arrival at Cranbrook, I quickly noticed that there are very few signs to point you in the right direction. Cranbrook, planned by Eliel Saarinen, is a collection of hidden treasures. At every turn, something unique waits to be discovered, touched, and used. The campus has an old world feel unlike any I have ever witnessed. It is Europe in Michigan.

It wasn’t until the second site visit that I stumbled onto the existing architecture facility. It is quietly tucked away near the southern edge of the campus. If you did not know where it was, you probably would not find it. As you approach the building, it looks more like a maintenance shed than an architecture department.

The interior is much like you might imagine. It feels like a small maintenance shed. The rooms are partitioned off using make-shift walls and the roof structure is exposed on the inside. It feels as though it is a work in progress. The students have large spaces in which to make full scale models using metal, concrete, wood, etc.

There is a large storage loft built above the central hall and at the end of the hall, I found a metal shop and a wood shop. A single student was cleaning up after herself. The space was quiet, solemn, intimate, yet functional.
The site is situated near the center of campus on a narrow strip of mostly unused green space. Immediately surrounding it are student dorms. Nearby is the new Williams and Tsien Natatorium, the Cranbrook Museum and Library by Eliel Saarinen, and the new museum addition by Rafael Moneo. At the site, and in fact all over the campus, you will find courtyards of various sizes and functions. Each one presents a unique spatial quality that my architecture will strive to take advantage of.

The topography of the site is flat except for a small unpaved parking lot that wraps around the site and then slopes down on the east to approximately 4' below grade. Beside the lot is an undeveloped green space which I intend to take advantage of.

The vehicular entry is from the west off of a side road which leads to Lone Pine Road, the main thoroughfare on campus. The site itself is wooded on the east, obstructing the view between buildings. In an informal way, the road itself is reminiscent of an alley, without actually being an alley.

The site is a perfect place to house an intimate structure for the newly expanded college. It provides the existing seclusion, but with the potential of being a main destination for those who know it is there.
SPACE PROGRAM
Spatial Relationships

design/build yard

wood shop

studio

social shop

studio

masonry shop

SUNY BROOK COLLEGE OF ARCHITECTURE
## Basic Space Requirements

<table>
<thead>
<tr>
<th>Space Type</th>
<th>Area</th>
<th>Subtotal</th>
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</thead>
<tbody>
<tr>
<td>exhibition space</td>
<td>400 sq.ft.</td>
<td>1390 sq.ft.</td>
</tr>
<tr>
<td>administrative waiting/reception</td>
<td>350 sq.ft.</td>
<td></td>
</tr>
<tr>
<td>faculty secretary</td>
<td>100 sq.ft.</td>
<td></td>
</tr>
<tr>
<td>workroom/storage</td>
<td>200 sq.ft.</td>
<td></td>
</tr>
<tr>
<td>directors office</td>
<td>220 sq.ft.</td>
<td></td>
</tr>
<tr>
<td>directors secretary</td>
<td>120 sq.ft.</td>
<td></td>
</tr>
<tr>
<td>faculty offices</td>
<td>4 @ 275 sq.ft.</td>
<td>1100 sq.ft.</td>
</tr>
<tr>
<td>general lecture/classrooms</td>
<td>2 @ 300 sq.ft.</td>
<td>600 sq.ft.</td>
</tr>
<tr>
<td>large formal exhibition space</td>
<td>1 @ 600 sq.ft.</td>
<td>1200 sq.ft.</td>
</tr>
<tr>
<td>small critique space</td>
<td>2 @ 200 sq.ft.</td>
<td></td>
</tr>
<tr>
<td>project photography room</td>
<td>1 @ 200 sq.ft.</td>
<td></td>
</tr>
<tr>
<td>design studio</td>
<td>2 @ 1800 sq.ft.</td>
<td>4900 sq.ft.</td>
</tr>
<tr>
<td>computer lab</td>
<td>2 @ 250 sq.ft.</td>
<td></td>
</tr>
<tr>
<td>printing room</td>
<td>2 @ 100 sq.ft.</td>
<td></td>
</tr>
<tr>
<td>student/faculty lounge</td>
<td>2 @ 300 sq.ft.</td>
<td></td>
</tr>
<tr>
<td>wood/model shop</td>
<td>1 @ 1250 sq.ft.</td>
<td>5750 sq.ft.</td>
</tr>
<tr>
<td>metal shop/masonry shop</td>
<td>1 @ 2800 sq.ft.</td>
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<tr>
<td>shop instructor office</td>
<td>2 @ 150 sq.ft.</td>
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<tr>
<td>material storage</td>
<td>2 @ 700 sq.ft.</td>
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<tr>
<td>book stacks</td>
<td></td>
<td>1500 sq.ft.</td>
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<tr>
<td>librarian office</td>
<td>200 sq.ft.</td>
<td></td>
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<tr>
<td>reserve desk</td>
<td>100 sq.ft.</td>
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<tr>
<td>design/build yard</td>
<td>2 @ 3250 sq.ft.</td>
<td>6900 sq.ft.</td>
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<tr>
<td>outdoor storage</td>
<td>4 @ 100 sq.ft.</td>
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### Summary

<table>
<thead>
<tr>
<th>Category</th>
<th>Total Net Sq.Ft.</th>
<th>Total Gross Sq.Ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative Offices and Support</td>
<td>1390 sq.ft</td>
<td>2138 sq.ft</td>
</tr>
<tr>
<td>Faculty Offices</td>
<td>1100 sq.ft</td>
<td>1692 sq.ft</td>
</tr>
<tr>
<td>Classrooms</td>
<td>600 sq.ft</td>
<td>923 sq.ft</td>
</tr>
<tr>
<td>Exhibition/Critique</td>
<td>1200 sq.ft</td>
<td>1846 sq.ft</td>
</tr>
<tr>
<td>Studio and Support</td>
<td>4900 sq.ft</td>
<td>7538 sq.ft</td>
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<tr>
<td>Fabricating Shops</td>
<td>5750 sq.ft</td>
<td>8846 sq.ft</td>
</tr>
<tr>
<td>Library and Support</td>
<td>1500 sq.ft</td>
<td>2307 sq.ft</td>
</tr>
</tbody>
</table>

**Totals**

<table>
<thead>
<tr>
<th>Category</th>
<th>Total Net Sq.Ft.</th>
<th>Total Gross Sq.Ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>16,440 sq.ft.</strong></td>
<td><strong>25,290 sq.ft.</strong></td>
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</tbody>
</table>

*Total Gross Sq.Ft. = Total Net Assignable Sq.Ft. / 0.65 (building efficiency ratio 65/35%)  Exterior spaces not included.*
From the beginning, the site played an integral role in the design of the new school of architecture. The idea of the, of which there are dozens on the Cranbrook campus, and, became the two main ordering concepts.

As with the detail, it was necessary to define what makes a true courtyard. The criteria below was influenced by my experiences at Cranbrook.

; horizontal and vertical enclosure, preferably on three sides

; must serve a specific function in addition to being a transition space

; must have a unique identity to separate from a simple green space

; vertical height serves to further define the 'walls' of the space

; step-backs at second floor and meticulous details are effective scaling techniques

; a successful courtyard has an identifiable entry into outdoor and indoor spaces; axis

The context dictated three possible sites. The first was most conducive to an axial concept, the second, to the courtyard, and the third to the connection between new construction and old.

After the second site visit, I decided the middle sized site would be the best context in which to study the idea of the meaning and materiality of the detail. The existing context provided appropriately intimate spacial proportions. The site was also enough to allow the study of minute details without getting absorbed in the overall design.
Initial Explorations

The schematic design began with mass building forms drawn over the site plan. The forms transformed from one main building, to two, to three, to one, and on and on, but the courtyards always remained the central focus of the ordering of the buildings.

I experienced great difficulty and frustration as I tried to rough out the interior spaces. Without understanding more of the structure, the materials, and in fact the details, I could not progress on the floor plans. After three days of getting no where, I abandoned the plans and moved on to elevation and section studies.

Initially, I found myself dogmatically referring to the architecture of Saarinen. Pictures of his architecture, from the Cranbrook campus, were scattered around my desk and I was somewhat unconsciously referring to it for inspiration. I had difficulty moving from the beautifully crafted and detailed mason structures into a more contemporary architecture, which is what I felt the project called for.

Although much of the initial work was too complacent, it did afford me the opportunity to discover the project's potential. I found that I could pull away from the architectural style of the context and still respect it. (I believe in order to create successful architecture at Cranbrook, it must be respectful of the context.)

Now I felt I was free to explore an architecture that was more representative of the present.
of specific design elements. The canopies above the entries of the two studio buildings and the large canopy extending from the street through the entire site, were both excellent vehicles for the study of details.

I started by sketching out an overall form and then this approach forced me to think about each and every joint. If it were truly to be built then, nothing could be left to chance. So, I worked my way around the canopy to each connection, sketching and thinking about material, function, and its' potential contribution to the idea of the place.

This design methodology of the process of detailing not only advanced the level of completion of the project, but it also propelled me to further define it.

I couldn't design the detail without first fully understanding its' purpose both as an individual functional element and as a 'part' of the overall meaning.

The introduction of the canopy through the entire site served many purposes. It not only presented an ideal element from which to create details, but it also became, by definition, a detail itself. Like the smaller details, it also affects the whole. The canopy connects the two workshops and their design-build courtyards. It also
Initial Explorations
A new axis was created through the site using a long canopy stretching from the street on the east, to a new social courtyard on the west side of the site. The canopy peeks through the dense buildings to draw pedestrians into the Quad. The linear composition of the canopy creates an effective visual focus which 'ends on itself' as it sinks into the final courtyard.

I removed the existing north/south road and shortened the parking in order to open up the existing green space for a new courtyard. As the design-build yards are a focus of the curricula at the new school, they received specific attention. The spaces are defined as courtyards by the vertical building heights on two sides and the retaining walls on the other two.

Once the formal arrangement of the buildings was roughed out, I began to concentrate on the articulation of the facades of the studio and workshop. The workshop is skinned by a space frame hung from the steel structure, while the studio building utilizes the structure more directly to create a curtain wall flanked by solid horizontal and vertical elements.
Current Design

1. Entry
2. Exhibition
3. Student/Faculty Lounge
4. Computer Lab
5. Print Room
6. Conference/Lecture
7. Women's Restroom
8. Men's Restroom
9. Mechanical Room
10. Wood Shop
11. Metal/Masonry Shop
12. Design/Build Courtyard
13. Design/Build Storage
14. Sitting Area
15. Library
16. Reserve Desk
17. Librarians Office
The entry canopy above the door to the studios not only serves to protect the students and visitors from the elements, but it is also an identifying element for the design/build courtyard.

The canopy itself is composed of two layers. The upper metal panel matches the raised seam roofs and protects from blowing snow and rain. The lower layer is a suspended metal grid supporting glass panels which allow for an unobstructed view from the studio windows above.

Below is sketch of the southern elevation of one of the studio buildings. The vertical elements are composed of a concrete skin over structural steel columns. The horizontal elements are a modular steel panel positioned over the concrete floor slabs. The curtain wall system is reminiscent of the small lead window mullions of the existing architecture facility.
Current Design

Transition into the new Architecture Quad

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In order to further the idea of understanding through making, I wanted to build several of the details at full scale. My original intention was to use only real materials, but as I am beginning to understand, it is very , and therefore not very plausible to do so.

So, for the initial site canopy detail, I forced myself to settle on plywood as the construction material. It somewhat fails to get at the issue of tactility and material, but it was useful to further consider the design of the connections themselves.

Through the physical act of constructing the model, I realized the connection between the C-channel and the I-beam was less than ideal. I'm sure it could be accomplished with steel, but I didn't feel it was honest to the nature of the material. Therefore, it did not meet my set of criteria.

Building the model at full scale was also invaluable in that it gave me a better sense of the scale of the detail. I came to the conclusion that it did not accurately tell the story of my architecture. The detail itself was too foreboding and did not encourage a hands-on approach.

It is exactly this type of discovery that is crucial to successful architecture. I believe it is imperative that an architect test their design in the real world with real materials before it is committed to societies built fabric. Without actually making, and often remaking, progress and improvement is slow and often at the price of the integrity of the architectural profession.
After realizing that the detail was out of scale and too harsh, I tried to push it's design in the direction of the tactile nature of the overall architecture.

The canopies on the site serve not only as protection from the elements, but also as points of entry. As an element of the whole, the function of the site canopy

Therefore, in order to be successful, the details need to be approachable and inviting to the passer-by.

After analyzing the first built piece, I further defined the 'story' I wished to tell with the new architecture. It must be one of

Next, I took on the challenge of building a column for the entry canopies of each studio.

Appropriately, the detail's design was influenced by it's buildability. I wanted to pursue my original intent of using real materials and so my limited resources were a factor in the design. I feel this real world 'limitation' worked in favor of supporting my thesis. An architect must constantly be aware of the limitations of technology and the construction industry.

My first attempt at pouring the concrete base failed when the wood form used to create the recesses refused to release from the concrete. The result of the first attempt was a piece of rough concrete with no finish or detail whatsoever. I was frustrated, but not discouraged, and tried again. The second form utilized foam insulation board instead of wood, and the pour went without a hitch. The form itself was flawless in that it did not spill a drop of concrete. (that had never happened before.)

The steel was purchased from the drop shop of a local manufacturer. For the column, I chose a 4"x4" steel tube because of its natural ability to resist twisting motion and it's more tactile finish. The steel was cut, punched, and drilled in less than an hour thanks to Thompson Welding. With the steel in hand before the second pour, it was simple to align the anchor bolts for the concrete, with the pre-drilled holes in the 3/8" steel plate.
In order to further my study of materials and details, I decided to charge myself with the design and construction of a finely crafted and detailed piece of furniture. There was little question in my mind about what piece to do and with Woodshop Bob’s help, cherry was chosen as the medium.

I had an initial image in mind of a coffee table from my childhood. (Actually, it turns out I had an image of two different tables and had somehow combined them) I modified the design in keeping with the architectural meaning of the new Cranbrook School of Architecture.

The goal was and is to create a functional and meaningful piece of furniture to cherish for years to come. I began with little craft and an abundance of enthusiasm to both create and learn.

- The cherry boards were joined and planed in the wood shop from mill scraps called 'outs.'
- Once planed, they were cut to the most economically viable sizes.
- The base acts as a frame in which the bottom surface rests. The joint is a simple rabbit.
- The bottom surface is framed on all four sides to reduce the effects of expansion and contraction.
- The corner connection is a traditional hand cut dovetail joint (lot of practice)
- The joint was then sanded on a belt sander to round off the edge. A rounded edge is safer and more durable than a ridged corner.
The next step was to cut the legs. I finally decided on a design that would expose a second layer of wood. This was approximately the same time my elevations were coming together using layers of concrete and steel to create human scale.

- Boards were cut an inch larger to allow for error, and a miter was cut on the outer edges of the four pieces of each leg.
- The boards for each of the four cuts were taped together before cutting out the arc.
- All four identical pieces were cut simultaneously in order to insure symmetry.
- Once cut, the pieces, still taped together, were sanded on an orbital sander.
- Finally, the pieces were simply glued as there was ample surface area.

At this point I was nearly out of milled wood, and the shops' planer was broken. I had enough small boards to build three sides of the cabinet while I waited for the planer to be fixed.

- The inner panels are connected by a tongue and groove joint.
- Unfortunately, I was unable to plane the wood to a smaller size and was forced to glue the panels into the frame. I was assured they would not crack out. I'm sure time will tell.
- The corners were mitered together and biscuits were used to insure adequate strength.
- The cabinet door is yet to be cut, but will consist of a floating panel inside a solid frame.
- Hardware has not yet been chosen, but it will be an elegant two piece handle.
Seven weeks later, I was able to plane more wood and begin the table top. As this was the third time cutting more wood, I cut one and a half times as much as I expected to use.

- The boards were carefully chosen for their unique grain and color.
- The center piece resting over the cabinet utilizes the tongue and groove joint with the same routed texture as the cabinet walls and door.
- Like the bottom surface, the top is set inside a frame. A dozen biscuit joints connect the outer frame to the inner panel.

- I mistakenly assembled the frame and inner panels before tapering the edge of the table. With a little ingenuity and a lot of help from Woodshop Bob, we managed to trim the sides on a radial arm saw using a special planing blade.
- A half inch piece of walnut was inlaid between and over the joint of the frame and inner panels. It was then hand planed to approximately the same height as the cherry.
- Sanding on every piece followed. Beginning with a 60 grit paper and moving up to a 120.
- The table will be sealed with a single coat of polyurethane to protect from spills. Then sanded with steel wool, and finished with several generous coats of wax.

Even though the table is not yet complete, I feel it is a success. The physical act of making the table has taught me more than I could have hoped to learn. Not only about woodworking and craftsmanship, but also about the meaning of a piece of built work. Immeasurable time, presence of mind, and 'personal self' has gone into this piece of furniture.
I feel like I am being asked whether or not I feel my thesis was successful and I am reluctant to answer. As I understand it, a thesis is an opportunity to explore an issue you personally find worthy of study. It does not represent a final solution and certainly does not come to a true or false conclusion. More accurately, a thesis is a point of departure. It is the spark of intellectual investigation that will, if nurtured, continue for a lifetime or two.

Like every other project I have done, this one too, has had its highs and lows. I had moments, actually they were weeks, where I got lost and struggled to find my way again. I did not produce as many ‘final’ drawings as I would have liked, but in general, yes I feel it was a success. I set out to explore and build full scale, real material details. I also wanted to produce a well rounded, thorough solution to an architectural problem. Although I didn’t build as many details as I had planned, I discovered more through the act of making than I had expected. What I mean by ‘more’, is that the scope of learning was greater. I learned as much about my own passions for architecture as I did about the process of designing architecture. I not only discovered that it is not plausible to build every detail, but also that it is the making that gives me the greatest satisfaction. It is building with my own two hands and having the final product even closely resemble the image I had in my head.

As it generally goes, now that my thesis ‘project’ is over, I can better appreciate my own intentions. Hindsight is 20-20 right? As far as the project itself, I would do things a little differently. I got wrapped up in creating working floor plans with ADA accessibility and fire stairs, and forgot that my thesis was an exploration of the meaning of materials and details. Of course, in the real world everything must be explored, but in our warm, fuzzy little studio nest, we are unbound by the constraints of codes, and clients, and money. So, if I were able to start this thesis over, I would take advantage of our segregation from real world issues and spend more of my time and energy on that which excited me in the first place. The material and the meaning.

Soon enough, we will all begin our careers and be forced to become concerned with code issues and budgets. As for me, I will miss the comradery of our studio and the freedom we are afforded to find our own way.
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Photographs

001. Eliel Saarinen: Cranbrook Library
002. Williams & Tsien: Natatorium
003-004. Cranbrook Educational Community Details
005-006. Peter Rose: Kingswood Elementary
007. Steven Holl: Cranbrook Institute of Science
008-013. Cranbrook Educational Community Details
014. James Cutler: Guest House
015. Williams & Tsien: Natatorium
016-017. Cranbrook Educational Community Details
018. Peter Rose: Kingswood Elementary
019-021. Cranbrook Educational Community Details
022. Peter Rose: Kingswood Elementary (The Pickle)
023-024. Cranbrook Educational Community Details
025. Williams & Tsien: Natatorium
026-028. Cranbrook Educational Community Details
029-030. James Cutler: Guest House
031-032. Louis Kahn: Salk Institute of Biological Studies
033. James Cutler: The Bridge House
034. James Cutler: The Wright Guest House
035-036. Louis Kahn: Salk Institute of Biological Studies
037-039. Williams & Tsien: Natatorium
040. Peter Zumthor: Thermal Bath
041. Peter Zumthor: Guggenheim House
042. Peter Zumthor
043-045. Carlo Scarpa
046-050. Randall Robison: James Cutler Detail
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055. Louis Kahn: Salk Institute of Biological Studies
056-058. Randall Robison: Louis Kahn Detail
059. Eliel Saarinen: Cranbrook Museum and Library
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072. Randall Robison: Coffee Table
073. Randall Robison: Indianapolis Judicial Center
074. Randall Robison: James Cutler Detail