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Architectural Tectonics
A Shift Between The Cultural Tradition Of Making To Contemporary Building Processes
Sean Christopher MacManus

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A Shift Between The Cultural Tradition Of Making To Contemporary Building Processes

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ABSTRACT

Modern architecture has lost its sense of place by the adoption of practices like standardization and universal modularity, over the focus and influence of unique local building practices. However, looking outside of the cultural main stream works of architecture, there exists some built structures with such purity around how they were constructed and a form of honesty deeply embedded within their material usage. Having been idealized in such a locally specific manner, these attributes become the essence of belonging that ties the building to its particular place. In this thesis, I have considered architecture both within regional or vernacular architectural traditions and the unconstrained means and methods of modern architecture. I looked at how modern technologies related to fabrication can be influenced by the subtle adaptations that traditional architectural crafts have developed, unique to specific regions.

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With special dedication to my family, which through their continued support has made this work possible. The continued dedication of my committee members and supporting faculty that has allowed for the growth and personal expression in my education.

To a friend and mentor, Jonathan Foote, with whom I had the great pleasure to share the spirit of the workshop, and shared many valuable conversations about the role of making.

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“must we throw out the past culture and traditions so that we have the chance to move forward... “

“it is necessary, to distinguish between critical regionalism and simple-minded attempts to revive the hypothetical forms of a lost vernacular”

*-Kenneth Frampton:
“Towards a Critical Regionalism”*



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*Image 1: The Lowcountry, near charleston, sc
Photograph by author*

intro: an approach to vernacular architecture

On an early account of my architectural education I found myself driving through a serene place, that I would later learn to be termed the Lowcountry. A distinct and marvelous landscape where upon the coastal planes of South Carolina I stared endlessly, gazing into the marsh as my eyes followed the winding creeks into the distance. Charleston was my destination, I was upon my journey to discover for myself the mysteries and cultural traditions of this city. Within the Charleston peninsula there exists an urban fabric so dense with culture and history that a passerby's gaze will never hold the true identity to the city. Charleston developed around plantations and rice fields, survived the Civil War that broke apart the nation, and became a tightly knit weave of social attributes and cultural revolutions that can be found no place else. The richness of the city's inhabitants are equally marveled by the richness of the city's architecture. Styles having been interpreted and adapted from European standards to befit this new city, responsive directly to the regional aspects of the Lowcountry. The cool sea breeze meandering between the houses, through piazzas and into every open space, carrying the faint odor of the marsh. I found myself here, now, living amongst this architectural wonder, unknowing of the impact it would likely have on my own architectural approach.

There are fewer cities that one can identify as having a unique architectural language unadulterated by the use of the 'universal' that dominates modern architecture. I am conflicted, for on one hand I have observed and studied a city like Charleston, SC created with a richness and consistency in its architecture, not blurred by thoughtless endeavors of construction. The other hand, a new world of architectural technologies has developed from which the entire language of how we construct, to the time it takes to produce, and by whom it is designed by and/or made by is becoming revolutionized. All things seem to run simultaneously within the constraints of time, with less importance or priority being placed on the building's response to cultural ideas within a local scale. Contemporary architectural practice has managed to allow for objective criteria for how buildings should perform environmentally, while little emphasis is placed on the subjective design in response to the cultural landscape. I find this intriguing for the reason that it was truly the first vernacular type buildings that should produce the greatest efficiency within the environment. Vernacular architecture was derived from necessities over time, adaptation after adaptation led to architecture that was most pure and honest in response to its climate.

The culturally significant aspect of architecture that has been lost to the idea of a 'standard' or 'universal' has not been the aesthetic created by modern architecture, produced by the machine, but rather within the process of making that has lost the spirit it once held. The spirit of the material and of the craftsman.

"The American architecture that I admire is almost invariably that architecture which has sprung naturally from local condition and customs"

W.G Clark - Lost Colony

The terms regional or vernacular are most often associated with rural settings, places that are far outside of mainstream culture, and far from the forefront of architectural technologies. That is not to say that a regional or vernacular form of architecture can not be found in urban settings. I have found that Carlo Scarpa's work in Venice is most appropriate as one of the few examples of vernacular works that are truly related to the urban context. Scarpa's works were primarily within or working around existing structures, which I believe led to his success in the work he did. The very problem that most urban contexts have in regards to building is that they don't allow for work like Scarpa, or others, to come very easily. Historic preservation organizations often see new work needing to imitate historical work as a single solution, when in reality it is only an exterior aesthetic that is *imitated*, while the means and methods of construction become the tell-tale sign that construction was of modern day. I have firmly found other such works that use historic context and culture as a means of *inspiration* from which to build and through adapting methods of construction, as able to create a significantly more profound expression of what a regional building type can be regardless of setting. This thesis, confronting these ideas, in which a work of new construction on an urban site, will have to respond to its context and historical building techniques, while not being an imitation to the tradition methods.

the contemporary craftsman

essay by author



Image 2:
The Hand and the Eye
<http://images.unrthed.com/Moffitt-hand-with-an-eye-33.jpg>

The role of the craftsman has often been associated with describing a person who in the traditional sense had dedicated their life to a specific trade. Commonly thought of as the carpenters, the masons, the blacksmiths, etc. the term craftsman has described these types of skilled trades for centuries. The verb, to craft, however can be used to describe a far wider grouping of skills and studies. Architects have routinely been influenced by the ideals of craft, having been instigated initially while carrying out the role as the master builder. The ideas of craftsman or the action of making, i.e. to craft, has transgressed through many types of work or study to include actions performed by architects, surgeons, and parents. Each presented fundamental aspects in which Richard Sennett defines, in his book titled *The Craftsman*, the practice of craft as “the desire to do a job well for its own sake.” (Sennett 9) The particular job was not critical for defining craft, but the physical actions and care upon how we perform in terms of making provide us with the quality associated with craft as can be expressed by a poets search for the perfect word that expresses his feeling. In the tradition of craft, the role of the craftsman was fulfilled by those whom had studied and apprenticed under the guidance of a master, for long enough time, Sennett gives “10,000 hours”, to learn and experience enough of the master’s technique in order to begin to perform and express their own ideas, although often trained to mimic the style and actions of the master having been apprenticed under. Performing the job well was typically given greater importance while “originality was a value not celebrated by the rituals of medieval guilds.” (Sennett 66) As also associated with contemporary architecture practices, in a time where technology allows for new expressions every day, the architects whom have refined the skill to truly understand their buildings are most successful. The ideas of a craft, particularly in terms of the making of an object, building, or jewelry piece each have changed radically in past centuries. Mario Carpo points to mass production of printed books as having “changed the course of architecture first and foremost because of the printed images they contained”. (Carpo 12-13) Perhaps the idea first encountered Victor Hugo’s *The Hunchback of Notre-Dame*. Whether it was the hand written book, original drawn image, or hand built staircase we realize a specific quality inherit to the object not found in mass produced pieces. In contemporary culture, we must rethink the definition of what craft represents or by what is understood through the use of the term. Many changes began with the industrial revolution; mass production and consumption were reflected in the items produced with the sole intent of making everything available to everyone.

The ideas of the “identical” object were perfected for a machine process but distanced the role of the traditional methods of craftsman. (Carpo) The verb, to craft, became a term that could describe the one who controlled or directed the machine. Referring to classical Greek plays as the origins of the use of the architect, in a academic lecture by Lisa Landrum, she introduces the verb “to architect” or the “act of architecting” primarily translated to meaning “to direct”. (Landrum) The contemporary craftsman has become the director of machines and technology removing them almost completely from the building and making process thus allowing machines to produce and construct the product. Having expressed these ideals I look to explore the idea behind the role of the craftsman, comparing the traditional to contemporary practices and techniques of design and fabrication in architecture by examining the roles carried by different titles of craftsman, the process of discovery associated with making, and the contemporary techniques of applying technology to the building process.

The term craftsman has been used to define the role of such a person whose work encompasses the ideas of craft. The architect is both a craftsman by themselves, but additionally dependent upon the craft of those who perform the making of the building. As we have discovered through Alberti’s treatise on architecture, the “carpenter is but an instrument in the hands of the architect”. (Alberti 3) This point in time represented the birth of the modern architect whose drawings carried out and fulfilled in construction of the building by the masons, whom construct the arches, and the carpenters, who detail the wood joinery. While the role of various crafts have been given to different professions, the architect having left the building site for the library, leaving the builders and craftsman in charge to erect the structure as drawn or modeled by the architect. As we recognize specific differences amongst the roles of various crafts, each integral to the process, we apply a vocabulary similar to the expressions emphasized by the terms mason and brick layer, which refer very different statures of craftsman. The bricklayer not formally trained in craft and without the expertise gained through experience, whose primary responsibility carries less technical ability and applies to the laying of repetitive rows of bricks. The mason is the artist and master of their trade, with the skill and experience to influence the learning of apprentices. The contemporary equivalent we find in the difference between the one who assembles and the computer programmer, whose action may be similar to that of the architect as one who directs, in this case the machine and the assembly of the pieces. In the instance of digitally fabricated works the act of assembly is often similar to the repetitive process of laying bricks and performed generally by someone not requiring knowledge and skills of the programming aspect. The advances in technology have led this role additionally to become fully performed by robotic and mechanical devices. “The machine has become our main source of magic, and it has given us a false sense of possessing god-like powers”. (Mumford 137-138)

6 We discover a loss of the traditional crafts of making in most contemporary products and find nearly all items are

made for their standardization and universal applications, “our technics have become compulsive and tyrannical, since it is not treated as a subordinated instrument of life”. (Mumford 137-138) As the programmers (whom also encompasses the designer and architect) have greater influence on the making of digitally fabricated objects. There is steady exclusion of the traditional craftsman whose intimate knowledge of particular practices and material characteristics would often be helpful to the design meanwhile the “development of the machine arts... and dangers of the reproductive process” destroy the craft. (Mumford 138) The role of the craftsman has been limited in the realm of architecture and fabrication of pieces that are beyond standardization needing specialized skills to construct, but lack the development in the design process to let the actions of those whom have to construct the piece influence the construction process aspects during the design process.

We lose sight of the practice of craft when there becomes the separation between the scholar and theoretician who thinks about making, and the person who performs the making. This is when Alberti’s definition of the role of the architect gives us the modern practice of the architect. The roles of the architect or computer programmer involve acquiring vast amounts of knowledge, as stated by Alberti, but lack the experience of years working under each unique trade. There are specific qualities of the contemporary architect/ programmer that show reliance upon the computation methods of computer technology to take place of the suggested knowledge of practice. Vitruvius lays out for us in the book *Ten Books on Architecture* the first chapter titled “The Education of the Architect” stating that architects must encompass the knowledge of many disciplines. While “the architect will have the knowledge of many disciplines, the architect would generally be skillful at few.” (Vitruvius 5) A blacksmith’s knowledge of fabricating metals, or the carpenter’s knowledge of selecting a tree out surpasses the knowledge of the architect/ programmer about the same subject. In traditional practices of craft the knowledge of material uses was crucial to the quality and aesthetic value of what was made. The performance of different species of wood, the aesthetic quality of grain directions, and joinery are critical to the carpenter’s work. The mason has an intimate knowledge of mixtures to make brick or concrete of the perfect consistency. Contemporary practices of digital fabrication have left the architects and programmers mostly with a blind eye toward the intimacy of materials. Primarily due to the uses of materials appropriated for digital fabrication applications. As much as the product being output is digitally fabricated, so is its input material. The materials of choice for machine production, consists of a manufactured pallet of materials consisting of plywood, MDF, plastics, and even manufactured bricks. These products are specifically chosen for their lack of variation and uniqueness, which reinforces Mario Carpo’s comments about the identical object that has become accustomed to most production services. (Carpo 13) (fig. 1)

dimensional size, a mode of thought that is vastly different than the approach of the carpenter who hand selects each board of wood for its unique characteristics present in the grain, knots, and color. This application of materials influenced by the technique of making has brought many questions. When we experience a product of a traditional craft we find the inherent beauty of the natural variation of materials and more importantly the techniques and skill of the craftsman often having a signature to their work of the craft being represented in the way they perform the action of making. The carpenters' scribe mark, the sculptors chisel mark, and the painter brush stroke. As digital fabrication technique have inherently made all of these types of technique signatures the same amongst many digitally fabricated projects. There is a hidden language in the scripts written by the programmers, to direct the machine that becomes the programmer's signature to the work, just as the brush stroke is to the painter, or the style of drawing is to the architect. It is the creation of something to be made by others. As the drawing marks



Image 3: On the Bri(n)ck
Harvard University. Source unknown.

the particular style of the architect, the scripting code found in computer application marks the style of the individual programmer the knowledge of material uses and application techniques that make the architect and computer programmers successful. Carpo also discusses in his book, referencing Alberti's architecture treatise, the idea of authorship of architectural works. In Alberti's treatise he states that the building belongs to the architects because he designed it. However this is only possible when "notational identity" as claimed by Carpo, is achieved and the drawings of the architect are perfectly identical to the building. (Carpo 23) The architect can "claim some of the ownership of the building which in most cases he does not in fact own, and which he certainly did not build". (Carpo 23) This complication referring to authorship of design will reappear in computer applications. Often a single script or code can produce multitudes of different designs, and while the original script belongs to a specific author, all subsequent creations are manipulations of that form whose creation having been discovered by other designers. This is exemplified to us by the idea of the contemporary artist, whose artistic work is the manipulations of work of others, and while the creation is their own, the structure to the piece may belong to several other authors.

As was previously mentioned there is an inherited beauty of natural materials, each with unique characteristics and markings. Slight imperfections provided the essence of the piece labored over meticulously by the craftsman. Karsten Harries speaks deeply in his book *The Ethical Function of Architecture* of the sense of beauty given by an original piece that is not perceived by copies. Harries discusses ideas of art and architecture in reference to the phrase, “art for art’s sake”. (Harries 72) In which he implies that some examples of art or architecture are simply products of design or ideas that represent nothing more than what they are. The ideas behind some of the digital fabrication techniques exemplify similar thought processes that are not associated with traditional craft methods. When we look deeper into the functional aspects of digital fabrication we realize at first glance an impending sense of a procedure to produce visually similar pieces from a lifeless material that holds no uniqueness or variation. The aesthetic beauty in digital fabrication techniques is found in the forms and variation of the identical scripts that allow for some creations that are not physically possible with traditional methods. We see in an example of modern architecture of Le Corbusier’s design for Ronchamp (fig. 2) in which “engineers had to alter the original model ... to make it geometrically measurable”. (Carpo 37) The computational patterns and forms have become exponentially more complicated than hand driven forms.

Frank Gehry’s contemporary architecture creations show us the possibilities of computer applications and control of complex forms. While digital fabrication methods lack the inherited materials qualities of natural materials, they conjure a great respect for the formal complexity of the forms, although the initial models were physically made. For example in Gehry’s work in Bilbao “thanks to digital technologies, the geometrical representation of irregular (or free-form) three-dimensional objects have become a relatively easy task”. (Carpo 37) (fig. 3) While industrialization revealed the making of identical objects, digital fabrication techniques have the ability to create variation amongst identical scripts. The making a compound curves and other free-form shapes is developing a standardized approach to the building techniques that are known to support such building. As contemporary designers and architecture push farther in the digital craft of programming and custom of fabrication associated with it, we must also be mindful making things for sake of making them. There belongs an underlying process of discovery that must take place upon the creation of a form, a process that allows for the making a physical objects to determine its functionality in the physical world. The traditional methods of craft had very rigorous methods of testing and creating new ideas for building that is often forgotten in digital fabrication. Architects have grown accustomed to understanding the computer, and the letting the computer understanding the information.



Image 4: Ronchamp
Le Corbusier, The Chapel of Notre Dame du Haut, Ronchamp. Source unknown.



Image 5: Bilbao
Frank Gehry, Guggenheim Museum, Bilbao. Source Unknown

Whether we are architects, designers, or artists there should always be an aspect of one's work that is the influence of the time spent working out a detail or the meticulous working of a drawing that should be realized. We must instill within the work the sense of the craft that we do. The performance of technology and by association the uses of digital fabrication methods over tradition crafts will need to remain a constant discussion amongst both professionals and students of architecture. It is not uncommon even today that the role of traditional craft is not always present in architecture schools, and the immediate dependency upon digital fabrication techniques such as laser CAM systems and CNC (computer numerical control) routers has taken over the making of objects. Not that either of these systems are wrong to use, but one must study and understand the techniques where they are appropriate to use over a traditional method of making.

lessons: carlo scarpa

I have found that within greater context of the idea of regional architecture, or a regional architect, that this topic holds attachment to the term rural or vernacular. Most urban infrastructures are beyond classification of the term regional, primarily for their response to global influence and diversity of culture that many larger urban contexts exhibit. The vernacular architecture of rural America is thought to express beauty in the pure function and necessity of the building, and where materiality serves as a mechanism for the expression of economy. Comparatively vernacular architecture of Venice, Italy doesn't respond in the same manner as American vernacular, but rather finds a deeper cultural tie to the tradition of Venetian craft.

The work of Carlo Scarpa is fundamentally most appropriate when the subject is vernacular architecture. As Scarpa was so deeply rooted in the Venetian culture and particularly their forms of craft, he undoubtedly brought a modern presence of both materiality and culture to the works. Scarpa achieved this in such a way that the modern counterpart lived in the background to the city's historic architecture. Scarpa's sensibility to these conditions and his ability to create the most intimate details between old and new was most dependent on the role the craftsman. The Venetian crafts were the counterpart to Scarpa's ingenuity and without his knowledge and tradition of these crafts the architecture would not achieve the quality and sense of belonging that it has been able to exhibit.



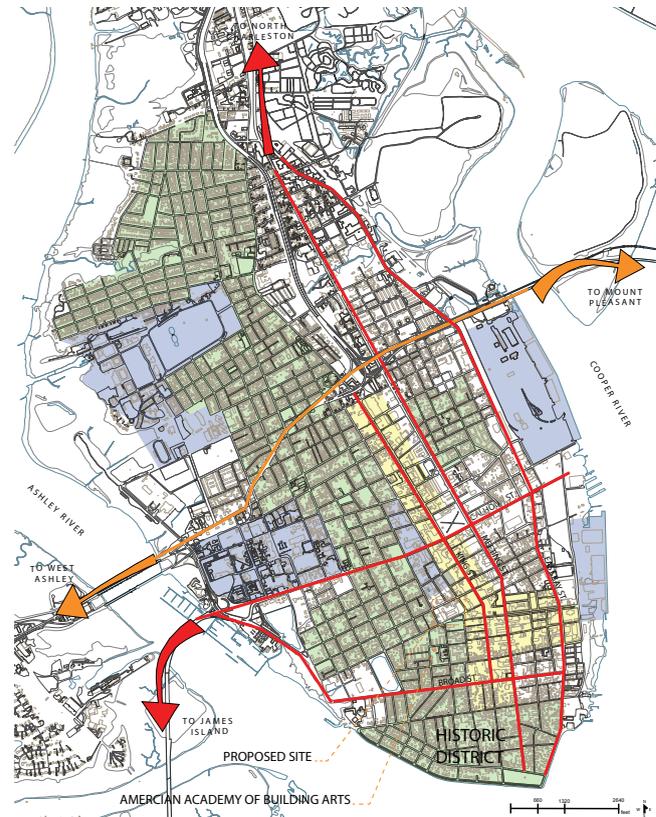
image 6: Museo Di Castelvecchio
Museo Di Castelvecchio. Carlo Scarpa. http://www.junglekey.fr/search.php?query=Carlo_Scarpa&type=image&lang=fr®ion=fr&adv=1



image 7: Querini Stampalia
Querini Stampalia. Carlo Scarpa. <http://traceblog.com/2010/08/03/designer-feature-vol-3/> (12)

lowcountry charleston, south carolina

The Charleston peninsula is bordered by the Cooper and Ashley Rivers, which control most of the direct access into the downtown historic area of Charleston. The city is divided amongst areas of high density residential, business, and civic structures with university programs scattered throughout many areas of the peninsula. As can be studied, the city first developed in the southern most portion of the peninsula which initiated the development of the city grid and shifted off axis when expansion took place. Beaufain Street, once the city's outer boundary, is where this axis shift takes place. The two main spines that runs the length of the peninsula are both the main business routes and also the elevation high point of the city. While leaving most of the remaining peninsula at or below sea level.





The site chosen for this thesis was based both on its urban location adjacent the vertex of the city's shifting grids and the site's long history of serving institutions, with the most recent having been torn down. The city's unique circumstances to the proximity and severeness of rising sea levels, and additionally the proximity to an earthquake fault line have caused many architectural techniques to be adapted over time as direct response to these conditions.

Adjacent to the site is Memminger Auditorium, a historic, civic building that hosts local events, and in the past helps serve the needs of a school that had previously occupied the project site. Within a few blocks is located another institution run by the American College of Building Arts, located in the historic City Jail building. This facility aims to teach the trades and craft most associated to historic preservation. The goal for this thesis is to provide an *Institution of Craft* on this re-adapted site. This will allow the city of Charleston the unique opportunity of having direct influence over its own architectural future. This project establishes a means to develop architectural techniques and processes that can be traced directly into the regional culture and context from which they are derived.

Charleston's urban grid developed over two centuries becoming what it is today. This included the expansion of the peninsula coast line through the means of infill, and the creation of tidal ponds to help alleviate water damage to lands prone to high sea level flooding. As shown in these series of maps below, the development of the city's network of infrastructure creates a unique attribute in which the city's grid shifts off axis from that developed in the original settlement. This shift occurs primarily for the expansion of the city, but can be seen as in direct response to the constraints of the landscape.



image 9: Early Charleston Maps
Simons, Albert. *The Early Architecture of Charleston*. University of South Carolina Press: Columbia. 1927

lessons: Clark and Menefee

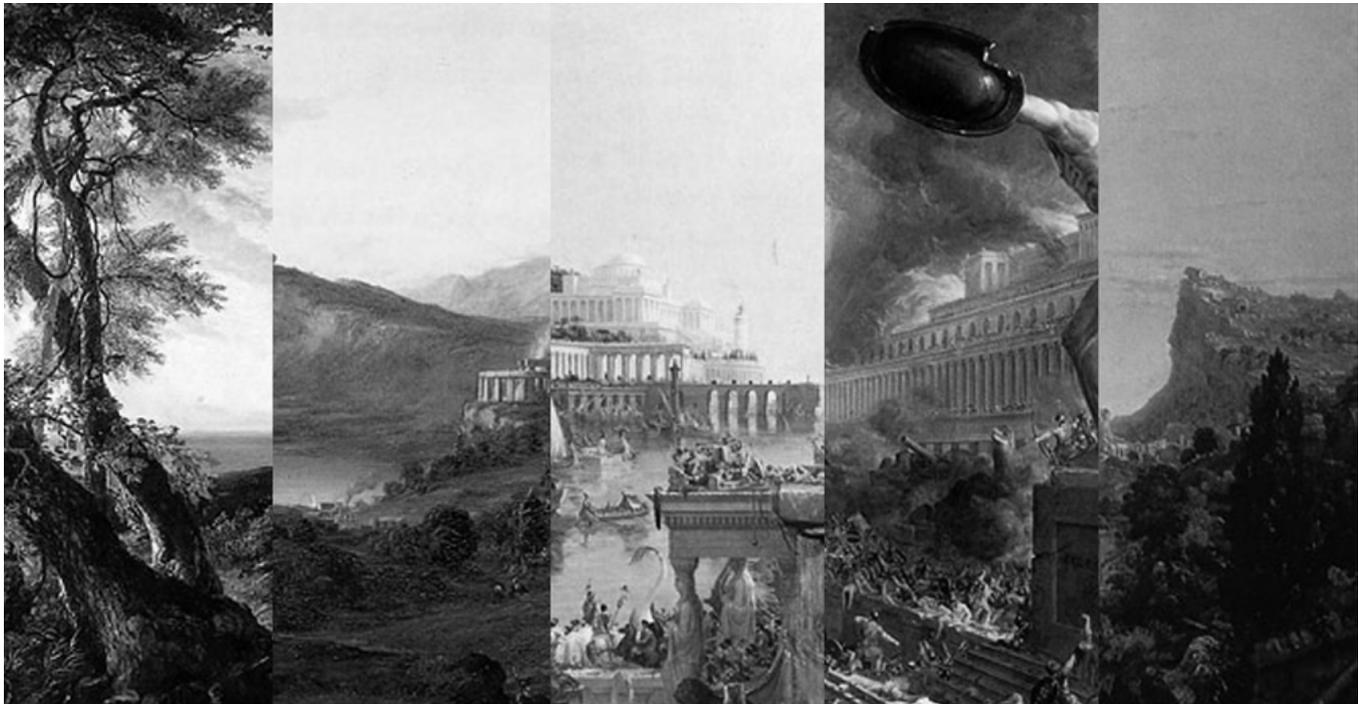
Clark and Menefee's architectural work has had profound influence on both the city of Charleston and throughout the Lowcountry by introducing modernity with Charleston's urban culture. Clark and Menefee designed distinct urban features like the Charleston Bus Stop, civic venues such as the Charleston Aquarium (whose final design was not carried out), and Middleton Inn, which sits quietly, as if it were a forgotten ruin, along a creek adjoined by the historic rice ponds of the Middleton Plantation. Their work also includes numerous private residences scattered throughout the Lowcountry, each distinctly modern while humbly disciplined in their approach to materiality and building tectonics of the region. Clark and Menefee's work is best understood as examples that maintain a sense of place within the regional culture. The writings of W. G. Clark share this idea within Clark and Menefee's collective work: the importance of landscape and cultural significance that architecture must have. I carried many of these fundamental ideas through my own work with the intent to design a building humble to the city it will inhabit, and methods of construction that respond to historic ideas of making.



Images 9,10,11 Experiences in Architecture
Inn at Middleton Place by Clark and Menefee
near Charleston, SC
photographs by author

architecture and the age of modern man

essay by author



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Image 11: Collage:
by author
original paintings by Thomas Cole titled "The Course of Empire"

“In architecture another and a less subtle more contemptible, violation of truth is possible; a direct falsity of assertion respecting the nature of material...”. (Ruskin 34) In the architectural theory of John Ruskin and other like-minded purists, materials should be revealed and expressed in their purist, most natural state. In the above-mentioned quote, Ruskin continues with “and the quantity of labor”. This factor in contemporary architectural practice is most directly in response to the advancement and utilization of “mirror tools” and their processes in constructing. (Sennett 84) Mirror tools, as Richard Sennett states, are described as being either Replicants or Robots. While the definition of a tool has broadened from hand tools to including CAD-CAM technology processes in the search of creating innovative work, these tools have changed the architect’s realm of authorship and ones ability to control and comprehend the entirety of the design. In Le Corbusier’s treatise *Toward An Architecture*, the ability of an engineered mind to understand the fabrication processes and the resultant aesthetic is appreciated and set as an example architects should follow. The aesthetic of the Engineer, as described by Le Corbusier, “in full flower, the other [Architecture] in painful regression.” (Le Corbusier 93-98)

The architect’s use of these tools should not be in the same manner as the engineer, for then there would not be architecture. The architect must fundamentally understand these principles of technological and digital forms of production and construction. It is only when an adept knowledge of the machine processes that the architect will create a work appropriate to the machine and material use. I realize in contemporary architecture issues the overuse and reliance on some production methods under a premature knowledge of what falsely appears appropriate to the architecture. While these fabrication processes such as Computer Numerical Controlled [CNC] and CAD-CAM allow for “mass-customization” in the products, there still remain a disconnect between the architect/designer’s computer screen and the realization of a product. (Carpo 12-13) One of the most blatant of these issues I speak of is the misuse of material properties associated with manufacturing processes. Material, whether natural or man-made, go hand in hand with the tools used to manipulate them. Historically, the tool was developed after the material discovered in attempts to yield its properties in a new form. Technological discoveries have often led us to creating new materials for which we already have had the tools developed to manipulate them, such as composite materials or smart materials. I wish to further address these issues surrounding the use of the digital tools of architectural practices and productions along a series of relevant threads that relate both the material and tool, simultaneously. Beginning with material representation, then looking at wall enclosures, cladding, and skins, the direct correspondence between tool and craftsman, and the relationship of the architect as master builder.

It has long since been tradition that the material of architecture be thought of secondary to, or in expression of, the primary architecture expression, the form. As discussed in *Architecture and Material Practice* the author expresses example that formal aspects of a project are usually thought of first with material consideration at a later stage of technical studies. (Thomas 2-3) In contemporary practice, materials are included only within a package of written verbiage, both on the drawing and in the material specifications that accompany the drawing set. Pablo Miranda notes “that the ‘craft’ of the architect is not building but drawing” and that through these drawings architecture material needs to be represented. (Thomas 151-162) While Adolf Loos expressed that he need not to draw his design. “A good Architectural concept can be written down. The Parthenon can be written down.” (Loos 178) Loos, whose attitude toward material is of a clarity and honesty in the material representation, like that of Ruskin’s attitude, of a primary influence on the work because the craftsman creating the work should be intertwined and enveloped in every aspect of a particular material. Although very specifically, only in one material, the craftsman cannot excel in multiple materials, “we can only think in one material.” (Loos 134-135) The material should be expressed for what it is. Plaster should not be made to look like stone and ironwork not painted to look like bronze. “And you, plasterer, what is the stone mason to you?” (Loos 135) The craft of each is highly tuned to its art but the growing influence of society wanting more lavish of materials has led to the increasing use of imitation of material. One craft need not be concerned with imitating any others. Placing joints in plaster work to read like stone or painting a cast iron ceiling plate to read like carved plaster would only be in attempts to deceive a lesser man. Loos argued that material importance or expression in terms of quality or lavishness has more to do with the labor involved obtaining the material rather than the material property. (Loos 37-41) Carpo states that it is with this machine revolution that we have reached a standardization of work, the ‘identical’ in objects amongst our societies. (Carpo) While Carpo is not defending or in favor of the ‘identical’, the author uses this as a means of explaining the resulting revolution in Architecture of ‘mass customization’, from which the work is no longer identical, but similar and endlessly variable. We must bring to mind how both these revolutions in Architecture that Carpo speaks of relate to the previously quoted “quantity of labor” statement from Ruskin. (Ruskin 34) While machine tools and CAD-CAM technologies allowing us to replicate, duplicate, animate, and manipulate through a variety of methods and materials and at a speed much faster than cutting granite straight from the quarry. Does this inherently make the work of lesser quality as seen by in Loos’ eyes? Machines have put everything into fast-forward, but it is rather the architect’s responsibility to control this speed, principally thru mock-ups and prototypes. Endless availability physical models and explorations are therefore only an instant away. For example, the models used by Brunelleschi in completing the dome of the Cathedral of Florence, each exploration carries a more tangible understanding of solving the design

problem. In contemporary practice, it is questioned why these methods have not been further implemented other than by a select few, majority of architectural firms still practice living in realm of mass production and not mass customization.

The appropriate expression of architectural material is in using what is available to the architect in the most intuitive and expressive means as possible. Semper experimented much with the use of wall enclosures, as one of his “Four Elements” in means to define architectural spaces. (Semper 101-104) The hanging of wall enclosures, whether carpets or weaving, clearly were not structural, nor did they try to resemble the structural wall of which was covered. It would be entirely inappropriate and immoral in architecture according to Loos to have a carpet with the pattern of bricks. While Semper speaks of Enclosures in this example, Loos brings the same arguable point using “Cladding” as the point of departure. (Loos 42-47) Enclosures and Cladding overlap in a technical sense of their description, each providing a covering to something or encasing a space. Each author, I believe understood the material element from which they made their walls. Digital tools in practice today, and the highly expressed architectural forms in practice today, seem to have lost their supposedly inherent material appropriateness. Architectural skins, no matter the material, hide the structure beneath often with no corresponding design and are composed of endless variety of materials. Loos, Semper, Ruskin, and others argue that it is misrepresentation that leads to bad architecture. The development into CNC works and material experimentation has led to an over reliance of manufacture or engineered materials, while each has different properties associated with them the tool has no regard for the individual property nor does the design of the work. The material solution should be appropriate for the design.

Although through these material experimentation through the uses of CNC and CAD-CAM fabrications and production, there has begun a bridging of the gap between the form/matter boundaries. (Thomas 4-6) This brings to life the issue of the role of the designer in these digital fabrication tools. The idea of a craftsman can be related to anyone who has a particular knowledge and passion to do the particular craft well. So while the idea of the programmer of digital fabrication processes is a craft, the designer of the digital component and the programmer of the machine tool are often highly differentiated. Although it would be clearer to one that the individual programming the machine would be better equipped to design using the machine than the individual who creates the work on the computer screen and only sees a finished ‘print’ of the pieces. Here lies the disconnect, the involvement of the human hand. For any craftsman, much of the ability to highly express a design with a specific tool and

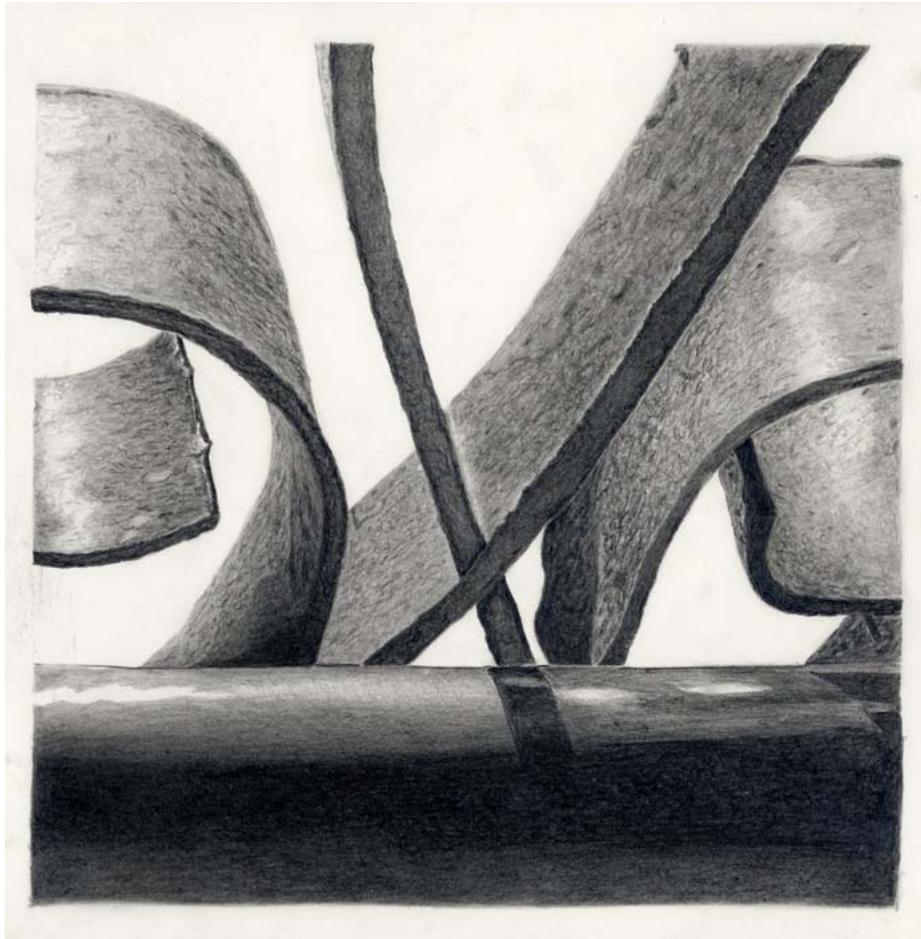
material comes from the ritual of making, fixing, and re-making, but without the connection to the physical hand that cannot happen. With digital technology and the tools to produce it, the architect can again become closer to the role of master builder. I disagree with this, because most often there is a separation of roles, the architect, the machine programmer, and the builder. While some gaps are closing between these relationships, most often one is expressed in some manner as a middleman, somebody whom manufactures the piece for the architect or the builder. As Loos argues, it is naïve to think that the architect can be intimately knowledgeable about all the crafts to the degree that a more specified person would be knowledgeable. In early treatises, such as Vitruvius', the role of the architect was to be knowledgeable about many fields, but only an expert in a few of them, which applies to both the material craft and the material property. (Vitruvius 5-12)

The idea of the master builder in architectural theory has allowed the development of BIM software and CAD-CAM techniques to become integrated entirely in profession practice throughout the design process. In Mario Carpo's book *Algorithm and Alphabet* the author discusses the uses of contemporary tools to allow for what he calls 'mass customization' in architecture. The ability to parametrically control various aspects of architecture systems so that our limits of design are no longer limited to the reaches of universal parts pre-determined by secondary manufacturing. Carpo compares the practice of Brunelleschi and Alberti, stating that we "made the transition from Brunelleschi's artisanal authorship (this building is mine because I built it) to Alberti's intellectual authorship (this building is mine because I design it)." (Carpo 23) Much of the comparison looks at Brunelleschi's completion of the dome for the cathedral of Florence throughout which Brunelleschi performed the role of master builder probably as intimately as any other in history. In Alberti theory the material process of making, albeit carried out by human hands, is devoid of all human intention. John Ruskin, in the essay title "The Nature of Gothic" stated that "Renaissance architecture turned workman in to slaves." (Ruskin) CAD-CAM technologies have closed the notation gap in architecture but have continued to leave the author and builder more separated than ever. With this the abilities to have control over the designs and the possibility to have a near instant realization of the piece, within the realm of digital tools. This has brought us nearer to the position of Brunelleschi, in which making of a piece or a model was authorship to the work. With the ability to create most any object using digital printing the role of authorship has certain vagueness to it by having the means to physically make another author's design with a certain degree of ease.

tectonic studies in architecture

The idea of the detail in modern architecture is a subject with numerous theories about the importance and use of the architectural detail. Is the detail considered ornament, an exaggerated piece that functionally is not essential to the architecture? Should the detail be minimized or hidden, the better the detail is, the less it is noticed? Perhaps, one should perceive the detail as scaled representations of the entire work of architecture, one architectural idea carried throughout all related parts? In Edward Ford's book The Architectural Detail he discusses similar concepts for what conceptual principles detailing has been defined under throughout modern architecture.

I particularly find that the context of a project like this, focusing on architectural regionalism and locality, the details of the craft can function as a fundamental link between tradition and contemporary techniques. Through studying the traditional means and methods of a specific region and developing a full understanding of them, we create the ability to transform those techniques into modern constraints of time and process. Finding unique connections that link the craft of contemporary building processes, the machines, the programming, the aesthetic, etc to become rooted within cultural techniques. Contemporary architecture should be inspired by and not imitating the aesthetic of past crafts. Rather, becoming a re-presented way in which the ideas from past times can be transplanted into modern day. In a similar manner that certain trades or crafts have been lost to modern construction and re-birthered into new crafts revolved around new processes. As example, the traditional role of the mason has been subjected to the economy of brick cladding, a building technique to which the skill of mason is not required but the technique of cladding or building skin has created opportunities for new architectural processes.



charleston ornament - pencil rendering 10 in. x 10 in.



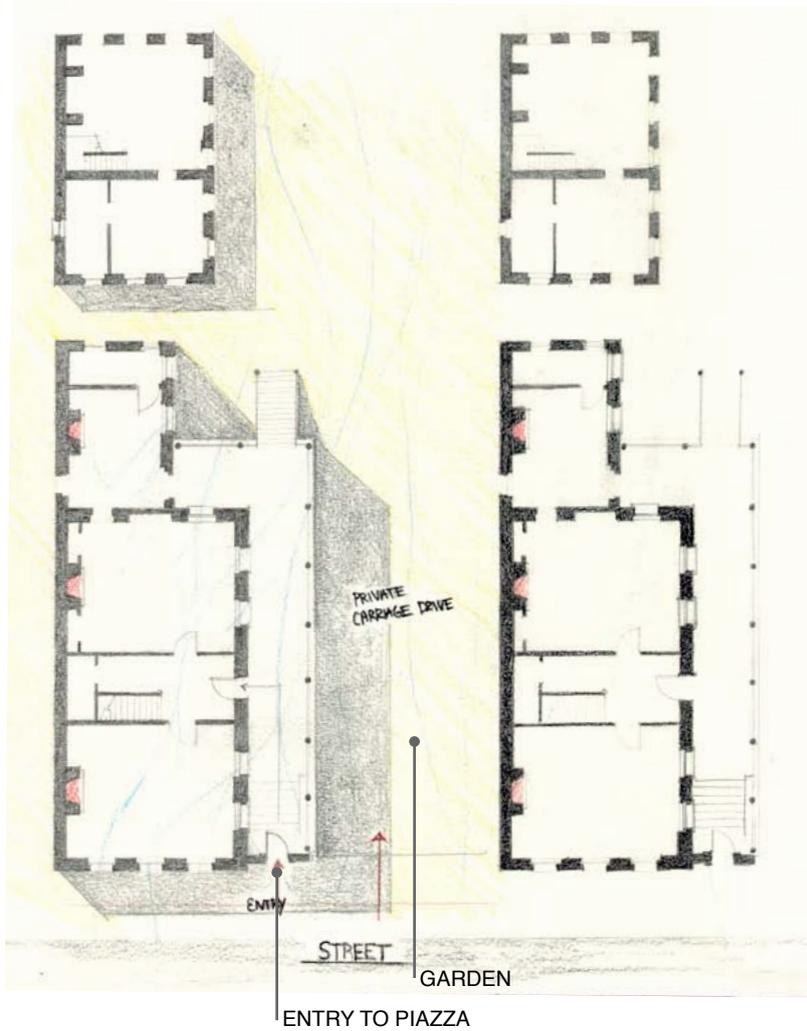
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market hall_ charleston, sc - pencil rendering 10 in. x 10 in.



charleston ironwork -pencil rendering 10 in. x 10 in.

The ***Charleston Single House*** became the dominant residential type dwelling throughout Charleston and the larger extent of the Lowcountry. Adopted from a European model by earlier settlers to befit the distinct climate and demands of the coastal South. The Single House is defined by its short street front and long depth, the width comprised of only one room so that the sea breeze could ventilate all spaces. The unique public to private zones created between neighboring houses: the solidity of the main house, the semi exposure of the piazza (defined here as the porch that runs with the length of the house), and in the most public of spaces resided the gardens protected and given privacy by its neighboring wall. The numerous chimneys and above-grade floor allowed hot air to exist around the building but never trapped within. Distinct to the Single House was the main entry, which most often was a means to enter the piazza, before entering into the main house. The arrangement of these houses throughout the city allowed for the great density needed for such a city to thrive.



28



charleston single house

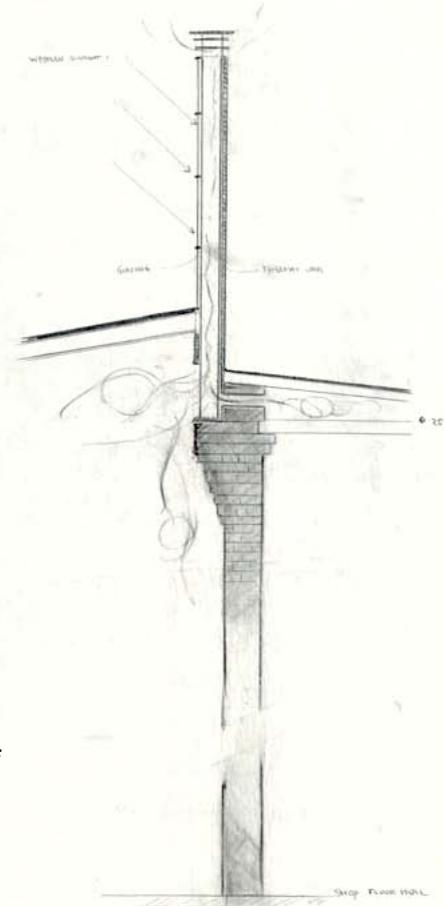
“Architecture must be a provocative force, both at the scale of the environment and the scale of the human interaction”

-Louis Kahn

“the practice of architecture... polarized between... a so-called hi-tech approach predicated exclusively upon production and... the provision of a compensatory facade to cover up the harsh realities of this universal system”

-Kenneth Frampton:

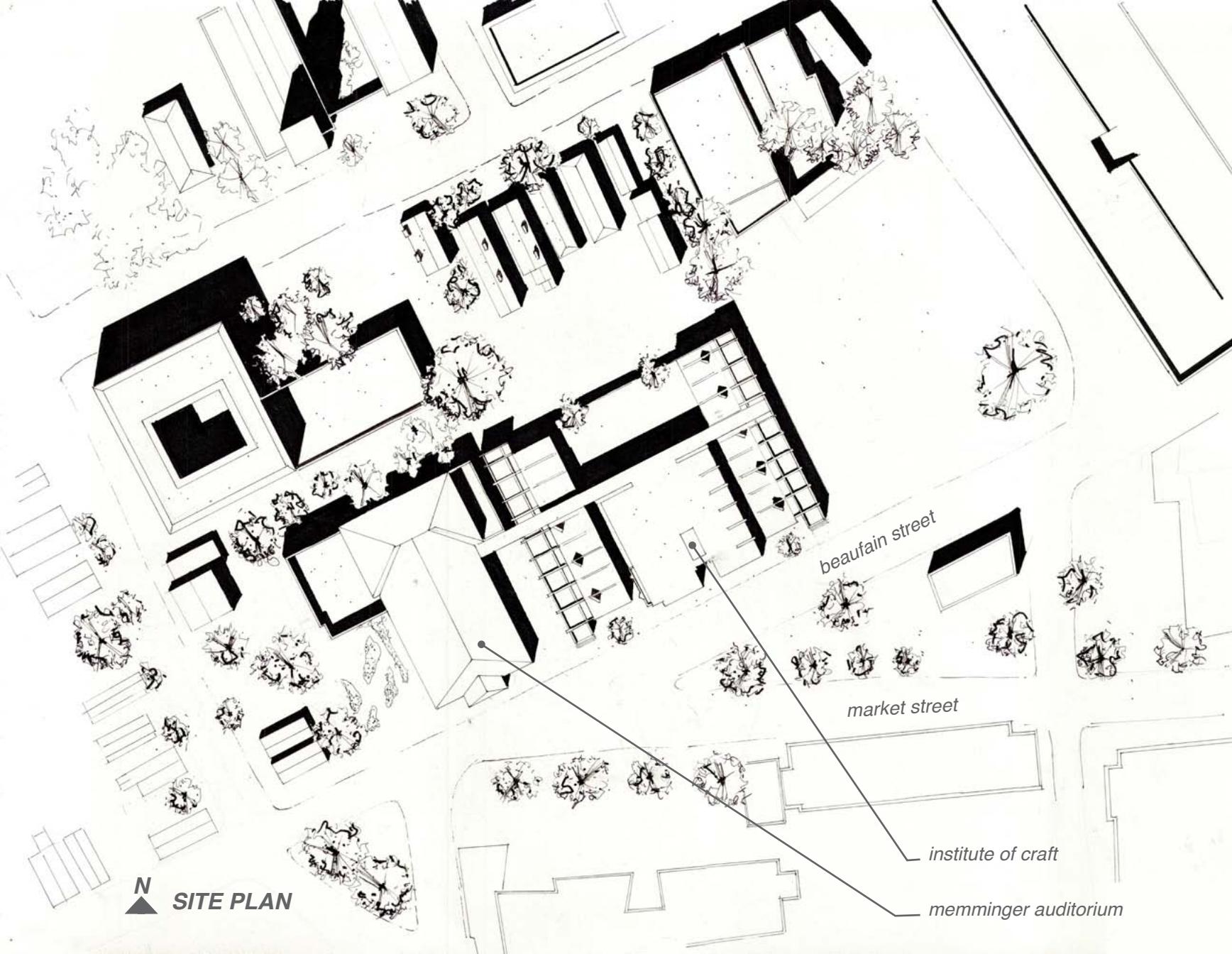
“Towards a Critical Regionalism



sketch 1_chimney

an institute of craft

This architectural project was the conceptual idea for a building dedicated to the field of architectural tectonics. It was designed as a contemporary counterpart to the American College of Building Arts, an existing institution focused on teaching traditional methods of craft. Students at the American College of Building Arts become experts in historic building methods and preservation from a hands-on and craft oriented pedagogy. My thesis project acts as both physical example of contemporary building means and methods while programmatically providing workshops and space intended for the trials of physical constructs that are fundamental for the exploration of craft. Emphasis, as imagined, to be concentrated on future building systems with primarily the integration of digital and robotic fabrications into the designing/ making process in attempt to better understand the relationship of production to the construction process.



N
SITE PLAN

beaufain street

market street

institute of craft

memminger auditorium

Working within a dense urban fabric, reminiscent of plantation mills and crop warehouses, the design for this institution achieves contextual success by taking on many urban characteristics that define Charleston. The Institution is set apart into three stand-alone buildings that create intimate alleys between each structure leading to hidden courtyards like the so many found throughout Charleston. The central structure serves as the main facility and common meeting spaces, while the two flanking structures perform architecturally most closely to that of the historic crop warehouses, in providing a large volume of unobstructed space, perfect for the workshop functions. Constructed of load-bearing masonry, these high arched rooms are joined, to the interior side, by a modern steel structure that is proposed to house the fabrication equipment. In response to the analysis of the Charleston Single House type, I developed a similar relationship within the rhythm of the building elements along the facade to define private and public spaces. Through the adaptation of regional ideas on passive cooling, I reinterpreted this into the use of solar chimneys over each of the workshop rooms to provide sufficient quantities of hot air to escape, while direct natural ventilation is achieved to each room through operable units located toward the interior alleys.

“[Critical Regionalism] has to deconstruct the overall spectrum of world culture which it inevitably inherits... it has to achieve, through synthetic contradiction, a manifest critique of universal civilization”



COURTYARD

WORKSHOP

FABRICATION SHOPS

COURTYARD

GALLERY

CONSTRUCTION COURTYARD

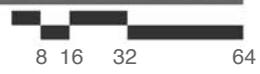
EXTERIOR CIRCULATION

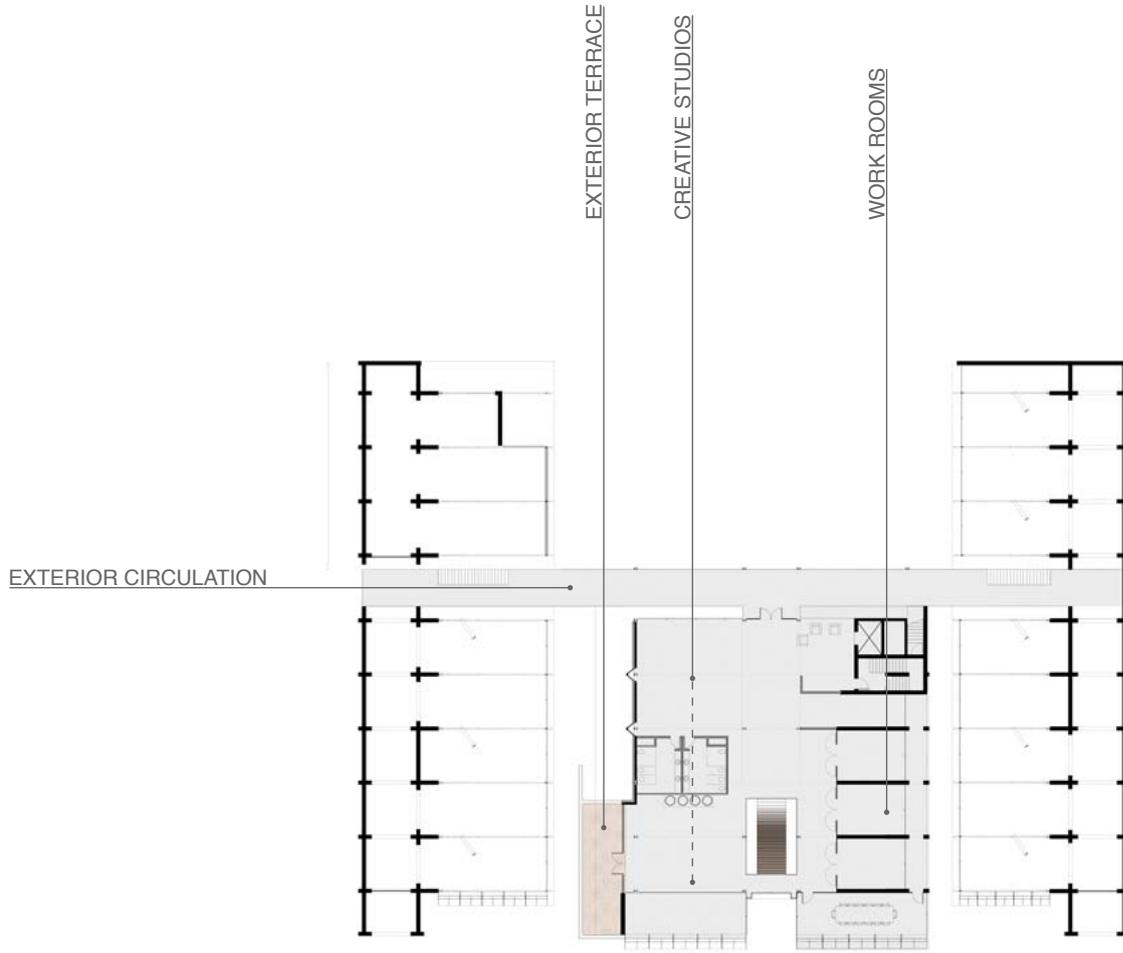
LIBRARY

READING ROOM

33

FIRST FLOOR PLAN





EXTERIOR CIRCULATION

EXTERIOR TERRACE

CREATIVE STUDIOS

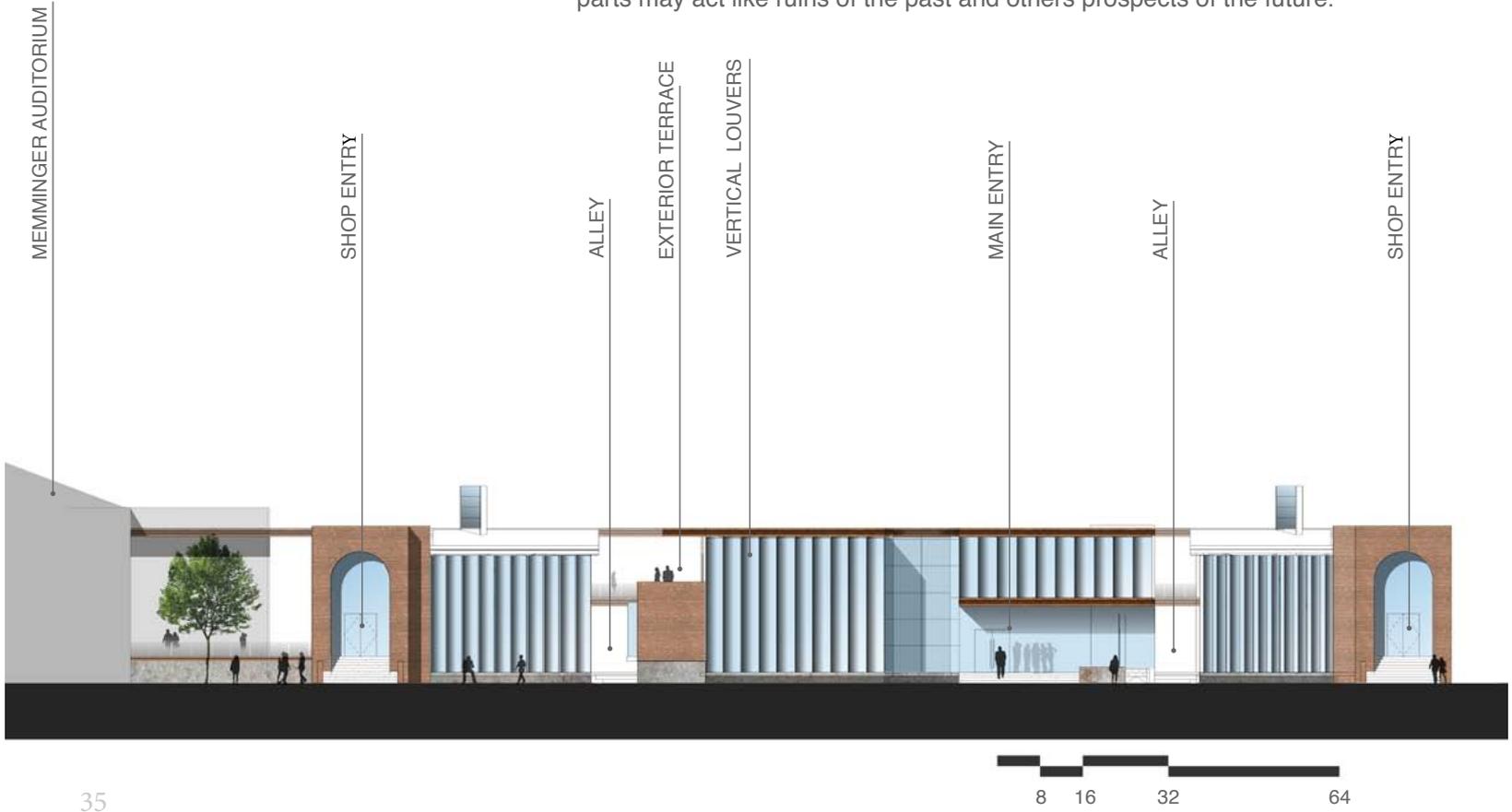
WORK ROOMS

SECOND FLOOR PLAN



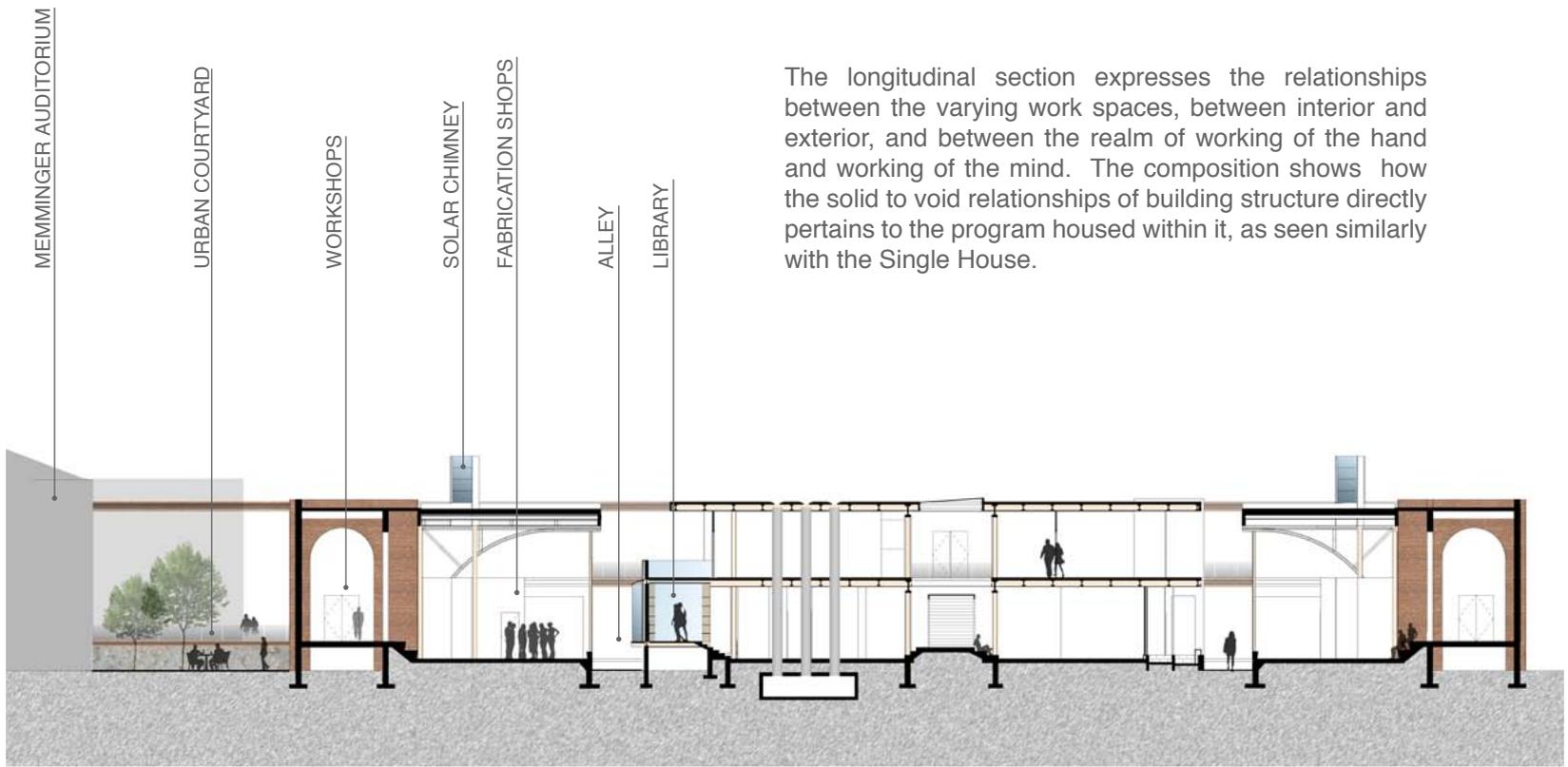
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The Beaufain Street facade shows how importantly and carefully the break down of one holistic structure can be achieved to create a series of individualized but complimentary pieces. The conceptual detail of how materials connect or relationship of construction types give this main facade repetition and order while also acting a distinct portions of buildings. Some parts may act like ruins of the past and others prospects of the future.





BEAUFAIN STREET PERSPECTIVE



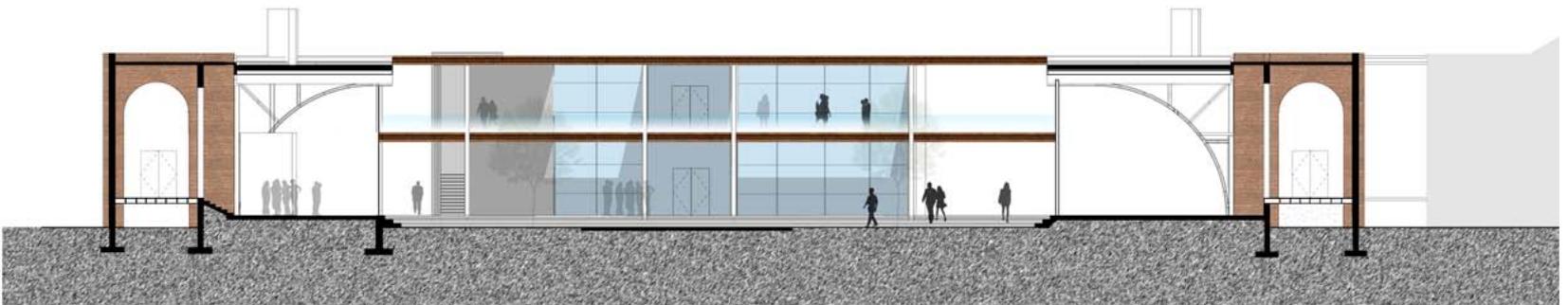
The longitudinal section expresses the relationships between the varying work spaces, between interior and exterior, and between the realm of working of the hand and working of the mind. The composition shows how the solid to void relationships of building structure directly pertains to the program housed within it, as seen similarly with the Single House.



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LONGITUDINAL SECTION - MAIN BUILDINGS

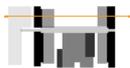




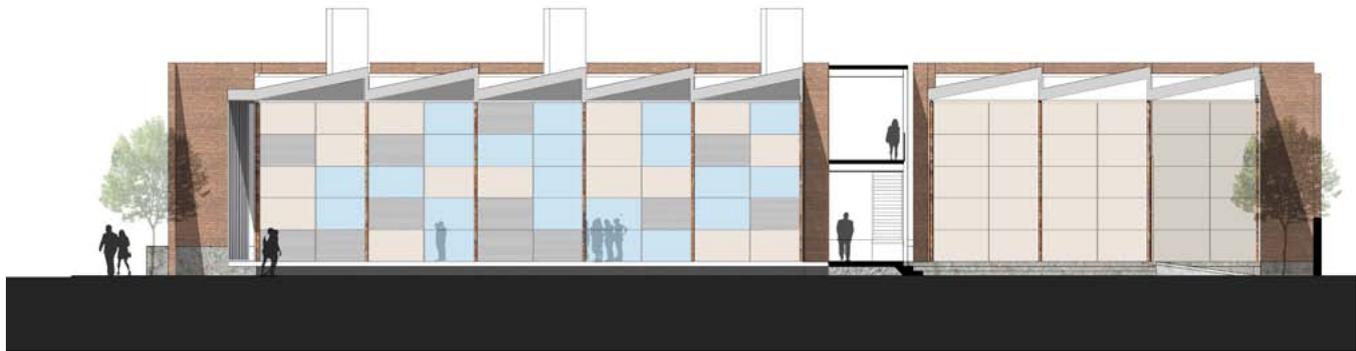
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LONGITUDINAL SECTION - CONSTRUCTION COURTYARD



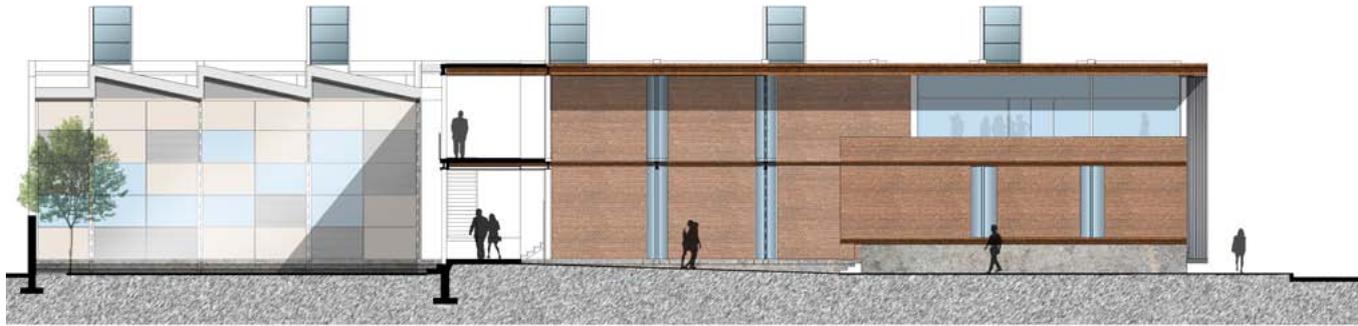
Each of the structural systems allows for the most effective building system adapted to fit the regional climate. Taking advantage of natural lighting, cross ventilation throughout all the program spaces, and solar chimneys in the workshop spaces to draw warm air up and out of the building. Southern exposure on the south facing facade is controlled through extensive use of vertical solar fins.



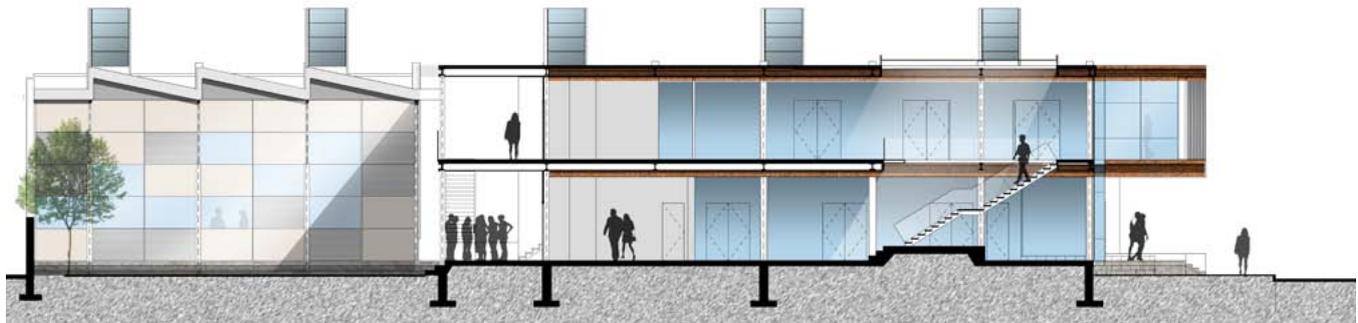
39

ELEVATION OF FABRICATION SHOPS



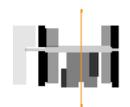


ALLEY ELEVATION



40

TRANSVERSE SECTION - MAIN BUILDING





41 PERSPECTIVE OF CONSTRUCTION COURTYARD



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image references

1. The Low Country.

Photograph by author. (1)

2. Hand and the Eye.

<http://images.unurthed.com/Moffitt-hand-with-an-eye-33.jpg>. (5)

3. On the Bri(n)ck.

Harvard University. Source unknown. (8)

4. Rochomp.

Le Corbusier, The Chapel of Notre Dame du Haut, Ronchamp. Source unknown. (10)

5. Bilboa.

Frank Gehry, Guggenhiem Museum, Bilbao. Source Unknown. (10)

6. Museo Di Castelvecchio. Carlo Scarpa.

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