Designers, Builders, Users:

Messing with Mainstream Architecture

AJ Noto

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table of contents

abstract.

The built environment is representative of a society's health. It grows and diminishes with economic changes and largely affects social behavior. Therefore it is easy to ascertain that healthy and vibrant built environments equal social success and human well being. Architectural practice has been responsible for much of this ongoing struggle, and within the last 40 years collaboration between the design and building trades has began to re-establish itself. Coupled with this re-adapted design process, North America's ongoing evolution into a modernized, fast paced economy has put pressure on the development of today's built environment. In this respect, education has not caught up with the demands of society and a gap has grown between designers, builders, and users, resulting in high numbers of low quality economic designs, fit to please bank accounts and not living or working conditions. These social circumstances are represented through the design and development of built environments, but much of this information remains unknown to individuals without training. This leaves the responsibility of creating well designed and functioning environments secluded within a select field of individuals, none of which are the users of the built environment. This seclusion will remain in place until incorporating the user into the design process becomes economically feasible. As this is not likely in the near future of commercial development, architecture should respond to this with explorations into alternative design processes, ultimately with the knowledge that if or when the user becomes fully incorporated into a standardized design process, the learning curve will be shorter. This theory is only applicable if user's have a pre-existing and appropriate understanding of spatial design and architecture, potentially allowing their perspectives to become incorporated into the design and building trades on a more experiential level. This thesis aims to uncover the means by which this theory is possible.

research.

A delicate system.

A discourse of ideas has always existed within a built environment through the relationships established by those responsible for its creation: designers, builders, and users. These relationships generate situations in which the outcome of the built environment is reflected within their prosperity or negligence.

Prosperous relationships and economic stability stimulate urban growth, and in these times of economic success, architecture quickly becomes a demanded profession. Development increases resulting in sustainability within design and building trades. Previous abandonment becomes replaced with new developments, and healthier social environments emerge. Through this, living and working conditions are improved, and real estate values increase stimulating building,

When these conditions reverse, architecture is one of the first professions affected negatively, although all building trades begin to diminish. This in turn produces a lack of development in the urban fabric and tends to remain in effect until societal circumstances change and the urban economy can return to a balanced state. Because of this, neglect towards the built environment will increase and evolve into abandonment; inevitably providing the means by which unhealthy social environments develop. This downward track will eventually resonate itself into the city's living and working conditions.

The connection between the built environment and social success suggests a need for emphasis on designer, builder, and user relationships to come together in the development of the built environment. This thesis is focused through the architectural profession and its corresponding reactions to social success at different periods of time.

The context of design-build.

Historically, professional architectural relationships were more closely integrated into the building trades through an individual known as a master builder. This individual was fully immersed within, and in charge of, the building and design of a project. Arguably, this produced designs that enabled the building components and design elements to seamlessly coexist in a built structure. Master builders, however, do not make up the entire essence of the design-build industry that existed pre-industrial revolution. The artisan, an individual usually reflected as a sculptor or painter, has a design-build nature inherent in their work. These individuals were in charge of designing and constructing smaller scale projects, typically within a larger context such as the decorative cornice of an exterior pediment. The need for the artisan was crucial in most projects because the work being produced was mostly custom designed. It was their ability to adapt to changes and still produce a high quality product which enabled their success. Nevertheless, as the social and physical needs of a society change, inevitably so does the profession.

The artisans and skilled trades began to separate, creating pockets of more specialized builders focused towards technology growth. Projects became more complicated and the master builder transitioned into a role that can closely be associated with a modern day project manager. The foundation of the American Institute of Architects (AIA) in the mid 1800s completely separated the architect from the skilled trades, and architects became exclusively in charge of the project's design. The architect no longer felt the need to maintain design and builder relationships resulting in the architect having a sense of exclusive ownership over the project, neglecting the builder's influence on project delivery. This thought produced an ego which was carried into the education

of the architect limiting their ability to gain knowledge of building methods. By the early twentieth century societal elements had changed once again, generating advancement in educational theory.

The Bauhaus's influence on the education of the architect started around the early 1900s. The school's methods for blending design and builder relationships became incorporated into the curriculum, addressing master builder ideologies in a more modern era. The school challenged the architect's to reclaim lost relationships in the building field and explore materiality while simultaneously learning design methods. The thought behind these goals was to introduce an individual which was able to adapt to changes in the profession. The Bauhaus aimed to create a criteria by which a thought process, or philosophy on architecture would establish itself and asked the questions, what if the architect knew more about the building delivery methods? What if the builder had more knowledge of the design impacts on a space? These begged the question that complete or even partial knowledge of these elements, would result in substantial improvements within the built environment, simply from the reestablishment of professional relationships and knowledge.

The principles of the Bauhaus' education transferred into the professional realm almost immediately. However, it was not until the 1970s that project delivery methods adopted a design-build relationship.

American consumers began expecting higher quality designs through economical and fast paced delivery systems. Design-build emerged to offer the conveniences of collaboration between building trades and designers combined together within a packaged system. Projects were completed on average one-third quicker than expected, lowering the overall cost of the development. Attributes towards the physical space became inherent with this process.[1]

1 Branca, A. Cost Effective Design/ Build Construction. Kingston, MA: R.S. Means Company, 1987. Print.

Design-build enabled the project to adapt to the uncertainties of project delivery by utilizing a close collaboration of the parties involved. This permitted a quicker building revision that was more coherent with the overall design concept of the building because there was little compromising in a specific area of the project. These buildings also addressed a conversation that traditional, architecturally exclusive designs could not – the way in which design-build scope contained the building's life cycle through its entire design and delivery. It provided an obtainable degree of evolution within the building associated with the constantly changing society in which they were built. This process sparked healthy competition and heightened expectations within new development to maintain a high level of project quality. However, many times theory does not match with reality.

Reality.

Design-build delivery, in its traditional tract, typically requires a larger scaled project such as a commercial or industrial program, where the trades involved cannot work in a singular manner due to the complexity of the project. In addition, design-build is used as a tool to sustain quicker project builds in a competitive nature. These requirements rule out most built environments except urban areas, which can support this project delivery type. However, in the nontraditional sense of design-build, similar to the artisan who creates and builds their work separately, but within a larger context, an architect has the ability to mimic this process. With little sub-dividing of the work load, an architect is able to design and construct a project individually, resulting in the connotative sense of design-build. In this case, a project might exist on singular basis, but reacts to and influences the existing urban fabric in which it was built. Today's urban fabrics are constantly evolving, and society's demands for becoming a

modernized, fast-paced economy puts extraneous pressures and limitations on the quality of projects currently being developed. In many ways, this pressure has allowed for budget cuts and simplified designs where time becomes a major factor in project design and delivery, creating a separation between good design and “economical” design. The end result, however, does not affect the architect or the builder, but the users of that built space.

In urban environments, living and working conditions become dense from the lack of space available. Meanwhile, the project is designed on a low economical basis resulting in lower quality, tightly spaced conditions. These conditions are common, and because of this, they have a tendency to become the expectations and normative experiences of urban users. If the user has accepted these conditions, it is because they lack design knowledge to realize that more effective and higher quality designs could be available. Either way, this gap in the relationships between designer, builder, and user can cause problems for a healthy built environment to exist within a pre-existing urban context. Is this cause enough for the next societal change which architects to adapt to?

Incorporating the User.

As the relationship between designer and builder continues to grow, the discourse it creates should extend past these two fields, and enter into a user specific area. In several respects this should generate designers, specifically architects, which are capable of adapting to these focus-based user designs in order to help maintain healthy built environments and balance out the existing negative developer-oriented spaces. This discourse is intended to act as a placeholder in modern design delivery processes until incorporating the user into the design process

becomes economically feasible or common practice.

Now that there is an established need for the user to become more integrated into the design process, a question arises. If a user is content on living in low quality urban environments, either by choice, or lack of acknowledgement of poor design, then how can the user ever become more than just an end result of a process? How can they be thought of as attributes to the design and building relationships if they have little to no knowledge of those trades?

User based theory.

There have always been influences on the built environment arising solely from the user. Traditionally, user-based design incorporated communities that existed prior to the industrial revolution. These areas were still urban fabrics but without a general hierarchically designed nature, precluding the era of the master builder. As these communities transitioned through time, they created a co-authorship with new built environments. Master builders in many ways used these designs as a basis to learn from, advancing themselves within their own industry. However, this co-authorship of the existing undefined urban fabric with the new methodologies of building trades has lost itself through the professional fields it created.

User designed spaces still exist today, but in a diminished form. Users no longer have the means necessary to create fully functioning structures within the built environment. This incompetency is caused from the advances in the lifestyle of a modern society's living conditions, which have exceeded the boundaries of a specific user's capacity to design and build at such large scales and scopes. This leaves their ability to influence design limited to their individual personal spaces. It is the user's way in which they achieve a sense of ownership in their

urban fabric, and typically this is achieved through little manipulations such as decorating or remodeling. These simpler methods afford the user the opportunity to enhance their built environment where the design and building processes have been lacking.

The user might implement adaptable-based designs predicated within an evolving society. These design elements might be focused on the spatial needs of the user, which are in a constant flux throughout their lifetime. For example, it is not uncommon for a family structure to separate over time, whether it is due to children maturing to adolescence and making their own family structures, or the occurrence of divorce. Either way, the spatial needs of these family structures are inherently different. In these situations, financial limitations, mass production, obsolete technologies, and a user's preference in spatial arrangements all lead into design elements capable of being influenced through individual users.[2]

Designers have reacted to this understanding, but there have been little improvements to establish an architectural language focused solely on user design. The existing architectural languages which react to this theory usually lack the means to provide users with enough knowledge of design limiting their abilities to create functioning, and healthy environments for themselves. The role of designer in these theories is similar to Christopher Alexander's A Pattern Language, where the role of designer is transferred completely to the user. Often times this creates a situation where a user will simply regurgitate architectural elements in unorganized and haphazard way. This in turn produces designs that do not mesh with the preexisting order of modern urban fabrics.

Modern urban fabrics, whether or not they were pre-planned, represent inevitable unforeseen societal changes and create the necessity for the professional roles currently existing in society. Logically, to remove these

2 Friedman, Avi. The adaptable house: designing homes for change. McGraw-Hill Professional, 2002. Print.

roles, or relationships, would result in urban fabrics no longer capable of evolving and adapting with changes in time. However, the redefining of these design processes, and therefore their relationships with one another, would enable the current discourse between designer, builder, and user to continue, while still maintaining and taking advantage of each established relationship.

Thesis.

This thesis is aimed at exploring the re-connection of designer, builder, and user relationships in an urban living scale. The project is based on producing a system of design intended to blur the boundaries of designer, builder, and user through their controlled influences on one another. Parallel to this, the system is also intended to provide a degree of design knowledge to the users inhabiting a living space. The end result of the system is seeking to create shared-authorship of design, where the designer and user come close to merging.

The design of the system is created by the architect. His influence on the system remains hierarchical, where his previous design knowledge and experience give him the responsibility of teaching the user to design for themselves. It is important for the architect to maintain this role in his design process and also for the system itself to represent this hierarchical relationship.

The user's influence on the system is shown in his ability to learn design skills and reproduce them for himself in the future. The retention of this design knowledge allows him the opportunity to adapt his living conditions and create a space centered on his needs. This information transference can eventually recycle its way back through to the architect, completing the design cycle which existed during the emergence of the master builder.
The builder is represented within the architect and the user separately. Initially his

knowledge of building is taught to the architect through previous experience and academia. The architect takes that knowledge and implements it into the design of the system and into what that system designs. The user learns the builder's skills through the means provided by the system.

The scale of this thesis is determined by several conditions. The first is the way in which corporate architecture is practiced and implemented. If this model was used, it would limit the ability of the project to succeed through the complexities inherent in business politics and economics. There needs to be an intimate level of communication between the architect and user if any attempts at shared-authorship in design are to exist. The second condition is modern urban living conditions, which many times are underdeveloped. Opportunities exist at this level of scale which allows the architecture of the thesis to play prominent role than it would be able to in a suburban context. Urban living conditions also allow the user to fully integrate their design into a space which is personalized for their needs and not affected by a wide range of external factors.

Detroit, Michigan is currently in an economic recession, and has been for several years. Blight has taken its toll on the urban fabric and many abandoned buildings are left to ruin in this post-industrial city. Detroit is not the only city weakened by a post-industrial economy, and theoretically this system can exist anywhere these conditions present themselves. With the abundance of post-industrial space in Detroit, these buildings can once again become an asset to the city through redevelopment and urban renewal. Trends in Detroit have led to these building's renovation for loft housing or live-work spaces. The increase in popularity of these spaces reveals an opportunity to design for these users which typically have an undefined and transient lifestyle.

This thesis is attempting to prove that a system can bridge the relationship boundaries between designer, builder, and user. The system is the way in which the architect teaches design, and the user implements it, but in a constantly changing and adapting way.

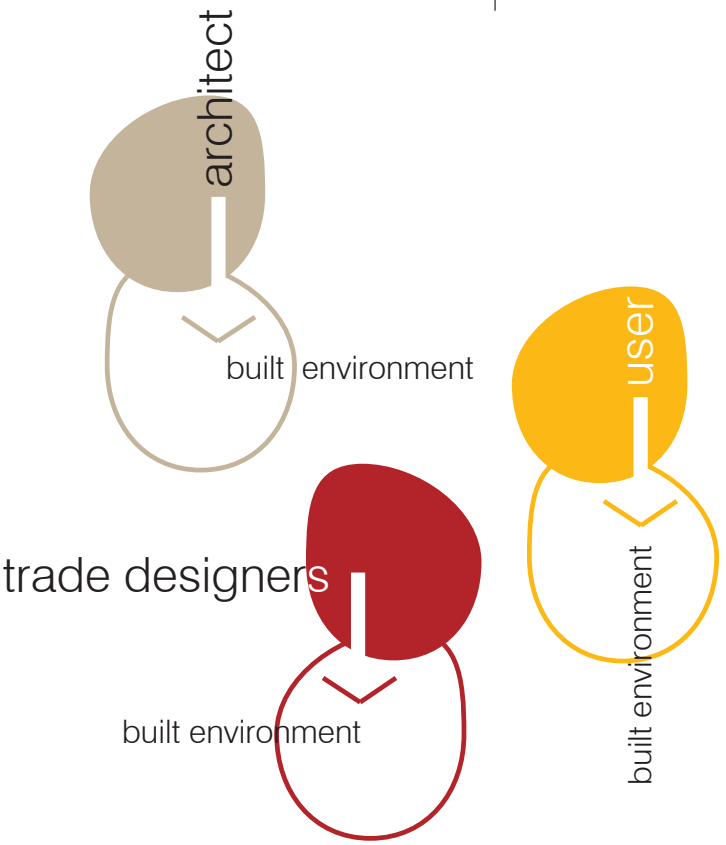
statement.

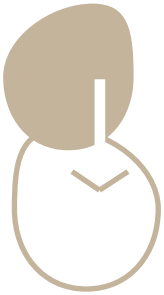
This thesis is attempting to prove that a system can bridge the relationship boundaries between designer, builder, and user. This system is the way in which the architect blurs his role as lead designer and transfers design knowledge to the user through controlled methods, therefore providing the user the means necessary to create and design their personal environment.

precedent research.

Each of the following precedents were chosen to be examined in two categories. First were their underlying theories. This was a method to establish a basis of understanding for which this thesis can build off of.

The second part to these precedents were their real-world applications. Each of these particular theories were placed into an architectural context throughout the 20th century. These precedents' methods and applications grounded this thesis within all categories of the built environment, designer, builder, and user.


architect
built environment
user
built environment
trade designers
built environment



architect bauhaus

The Bauhaus' ideology was to advance architectural theory and practice; to become a movement or thought process rather than a style. Its theory was based on combining the designer and builder. This concept brought into education was thought to produce a designer or builder with the knowledge and capability to adapt to and evolve with a changing society. This rationale became a reaction to the advancement in industry, the machine, and architecture's need to constantly advance itself. More simply, the Bauhaus aimed at resituating the role of the architect in the design and building trades. However, the Bauhaus ideology excluded the importance of the user within its methodology.

user a pattern language

The Pattern Language is a system of alternative design where the user controls the outcome of the built environment in which he or she dwells. The system is outlined by a series of ordered relationships which Alexander calls patterns. These relationships are responses to social habits within a specific culture and aim to recycle existing architectural elements, the patterns of the built environment, in a new order to create design. However, the flaws of this ideology are inherent within the user-only designed spaces. It is unreasonable to agree with Alexander's philosophy that any person can design. Further, this process only looks to create new design from past architectural designs, and does not suggest the need for new inventive designs, eliminating the role of the architect.

trade designers design build

Design build: (excluding legal aspects) a process dictated by unpredictability, integrating trade qualities of open-design and construction with emphasis on adaptability.

Design build: (legal aspects) a union between the designing and building trades where the concept of the project can remain focused through their efforts to remain synchronized during the project delivery.

Legal aspects are professional relationships described contractually to help understand the role of the designer.
Emphasis of adaptability refers to the flexibility the project design has to evolve.

architect bauhaus

tel aviv, israel

1500+ international style buildings.
17+ former bauhaus students lived and worked locally.

Tel Aviv, Israel currently has the largest collection of buildings designed in the international style, a dominant Bauhaus archetype. With so little user or builder influenced buildings, the urban fabric becomes associated with architecturally defined space.

http://www.flickr.com/photos/hanneorla/239878511

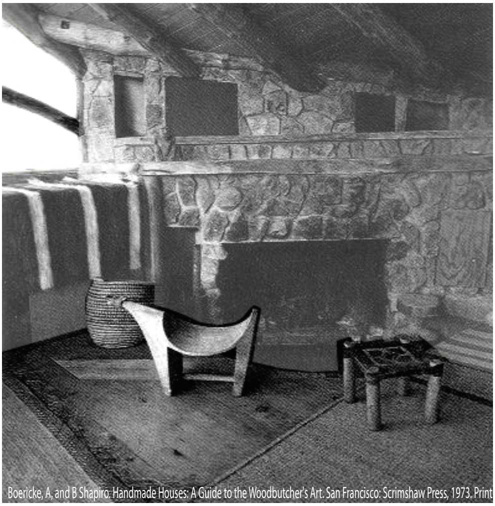
user a pattern language

handmade home 1

this space represents the relationship between materials, scale, and craft capable of being built within a user's ability to design for themselves.

Boericke, A, and B Shapiro. Handmade Houses: A Guide to the Woodbutcher's Art. San Francisco: Scrimshaw Press, 1973. Print

Boericke, A, and B Shapiro. Handmade Houses: A Guide to the Woodbutcher's Art. San Francisco: Scrimshaw Press, 1973. Print



Boericke, A, and B Shapiro. Handmade Houses: A Guide to the Woodbutcher's Art. San Francisco: Scrimshaw Press, 1973. Print

a pattern language user

handmade home 2

this space was built by a retired engineer.
it is representing user built space by an individual
with prior construction and material knowledge.

user a pattern language

handmade home 3

a user defined community designed around
environmental necesities resulting in adaptation.

trade designers design build

connotative case study

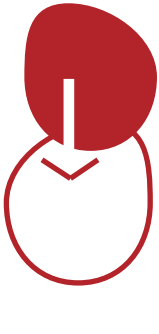
st. joseph rebuild center, new orleans

Because the architect was able to participate in the building of the space, when the need for change presented itself, the architect was able to address the situation with a more in-depth approach. The evolution of the design is more unique.

The following collage shows the phasing of the built structure and grounds it in scale, material, construction type, and its users.

design build trade designers

general case study



la sagrada familia, barcelona, spain

With over a century of construction, this cathederal was able to maintain its overall design while keeping the original design concepts intact by the flexibility of the design-build business model it followed.

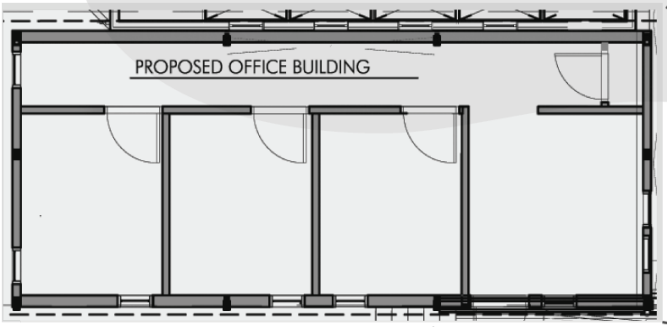
The following collage represents the periods of postponed construction during the constant changing of time.

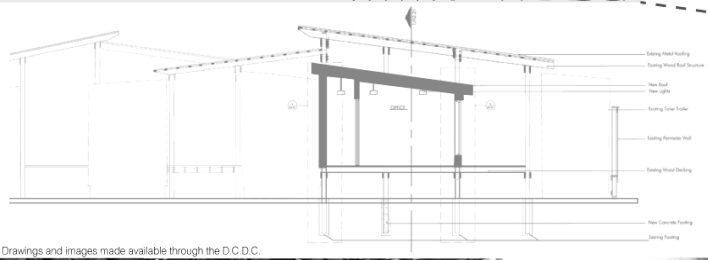
St. Joseph Rebuild Center, 2007 New Orle

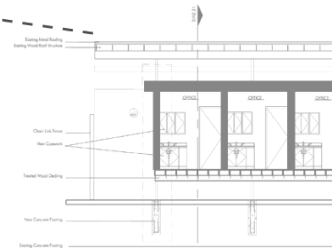
Detroit Collaborative Design Center

Relief for those displaced during Hurricane Katrina

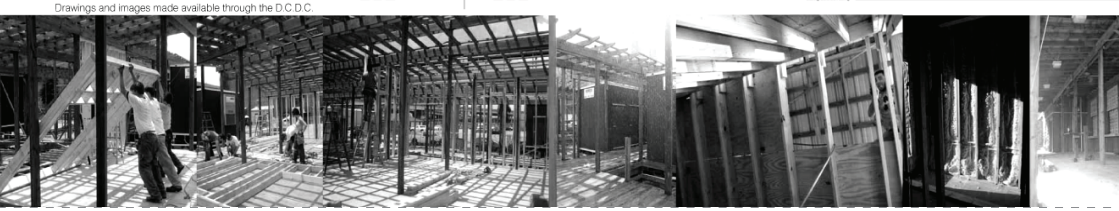
Harry Tompson Center, 2008 Medical Addition





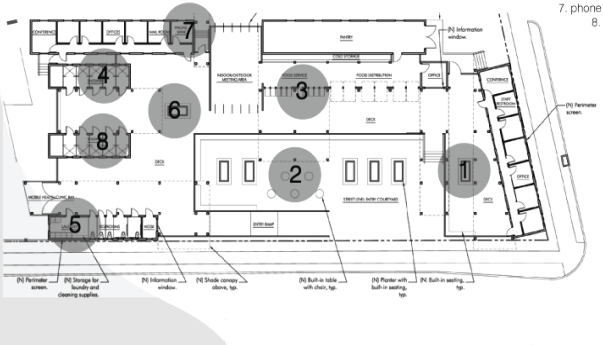


Drawings and images made available through the D.C.D.C.

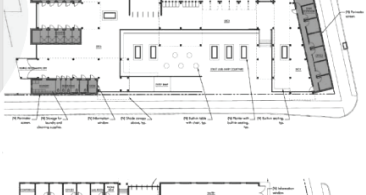


eans, LA

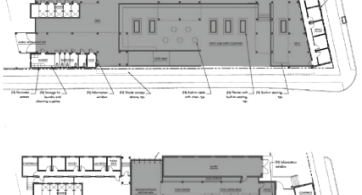
1. entry kiosk
2. central court yard
3. food distribution
4. showers
5. laundry
6. wash sinks
7. phone services
8. showers



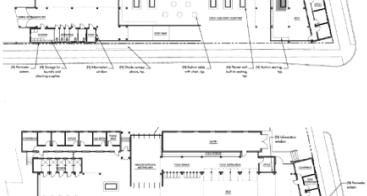
stage one: FEMA trailors



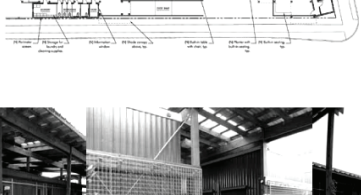
stage two: decking/outdoor circulation



stage three: meeting/kitchen space



stage four: HTC/medical addition



2.

3.

5.

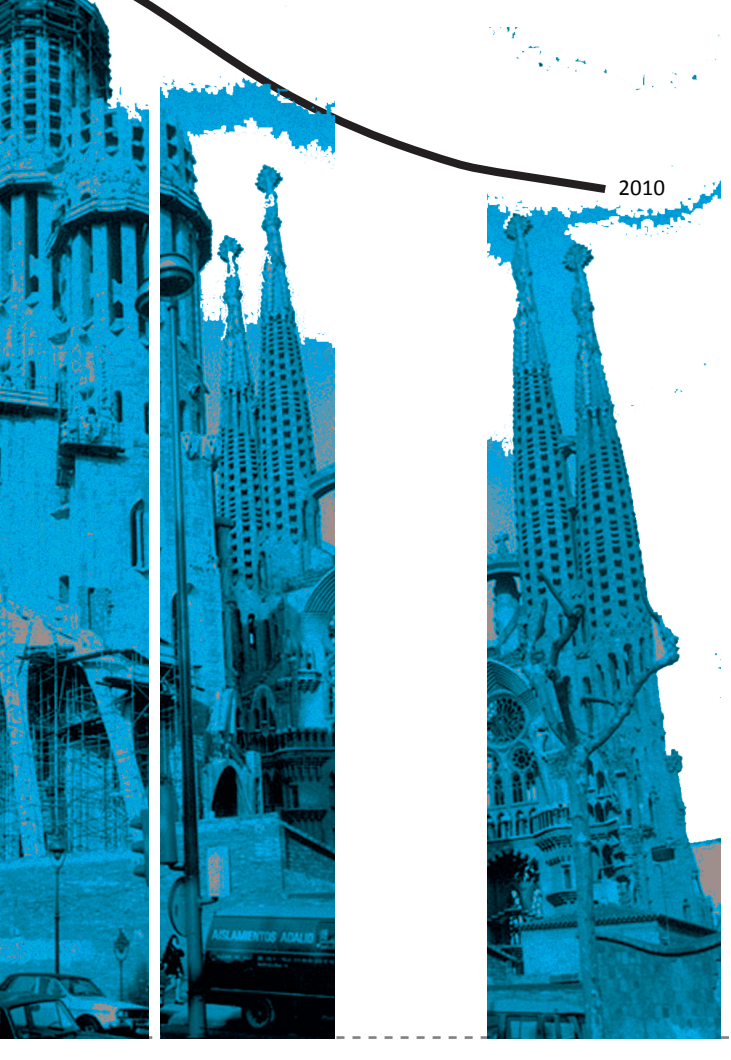
6.

7.

precedents


1934
1926
1882

la sagrada familia, barcelona, spain



an introduction.

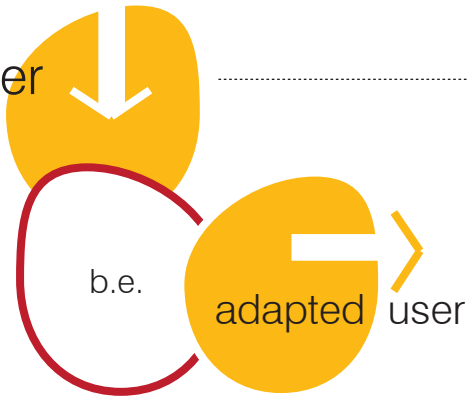
The established gap between the designers, builders, and users have remained intact throughout all forms of development. These groups of individuals all play a part in the advancement of the built environment, and a theory suggests that a cohesive blending, or co-authorship, of that built environment would produce developments of higher quality.

The question presents itself. Can this process of co-authorship exist in a development of physical space?

The process must first be tested, and in this section a detailed experiment was developed and tested, introducing an alternative design process.

system development & sketch problem


architect
s y s t e m
user


b.e.
adapted user

the overall process.

an architectural system will be created to explore the possibilities of designer relationships. In this case, the role of lead designer rests with the architect, only to be blurred and then transfered to the users of a space.

with an architectural system in place, the user can design his built environment within the capabilities of the system available. The user is expected, but not limited to, using qualities of design-build delivery methods, which will be integrated within the architectural system itself.

the adapted user focuses on creating his built environment based on the knowledge gained from the architectural system, which in itself is pedagogical. The built environment then evolves through the given system to adapt to unforseen circumstances.

research and development.

With the overall process generally defined, the specifics were developed as research into other alternative designs and their processes were discovered. These precedents all met the standard requirement of a system which was developed by a designer in order to achieve user interaction and manipulation of that corresponding development.

gary chang - urban transformer 1

+/- no evolution of the designed product

+/- learning process is limited by assembly

+/- advanced engineering

Gary Chang's personal apartment was developed to manipulate the limited space available by creating a sophisticated track system which allowed the resource furniture to change location and shape as he needed. This space is an example of the boundary between a user defined but designer controled space.


http://www.daylife.com/photo/0gb1bk3fzEezg


http://www.daylife.com/photo/0gb1bk3fzEezg


http://www.ezarchitecture.com/blog/episode-5-of-ezarchitecture-podcast/

resource furniture 2

+/- fully integrated systems (can be limiting)

+/- high level of trade collaboration

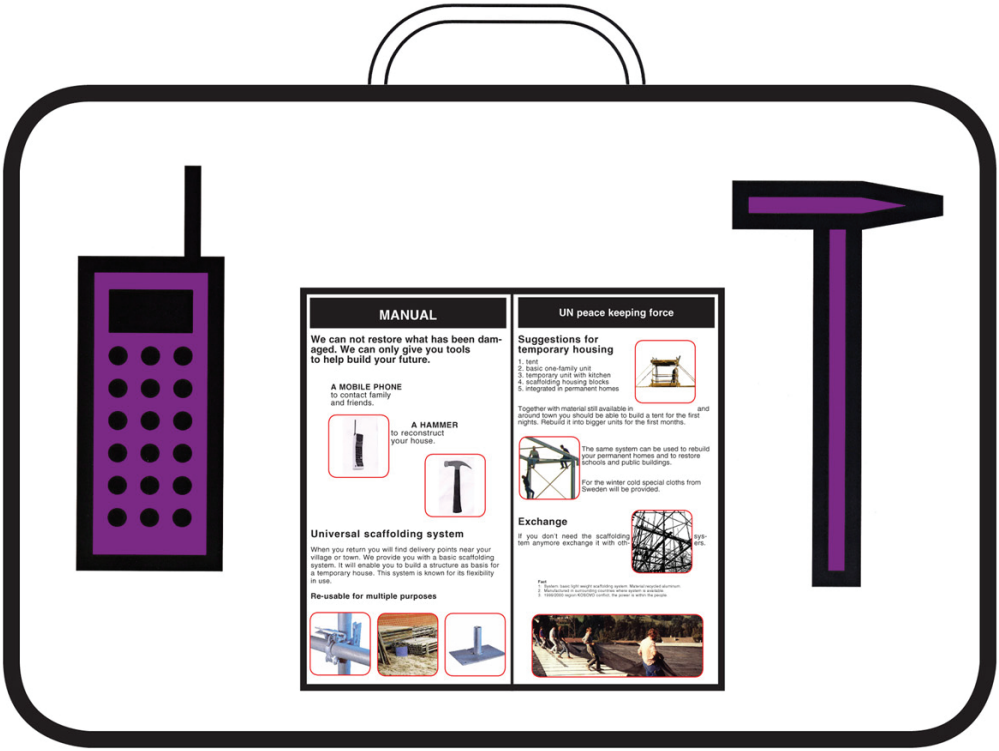
+/- always results in final forms

Resource furniture is designed to take advantage of space limitations by combining two or more functions into a single piece of furniture.

http://marketplace.apartmenttherapy.com/stores/resource-furniture

http://kendallsmoot.blogspot.com/2010_05_01_archive.html

http://kendallsmoot.blogspot.com/2010_05_01_archive.html



http://www.openarchitecturenetwork.org/sites/default/files/active/0/Ruimetalab.jpg

triage relief competition 3

addresses social and structural environments +/–

learning process is inherent within the package +/–

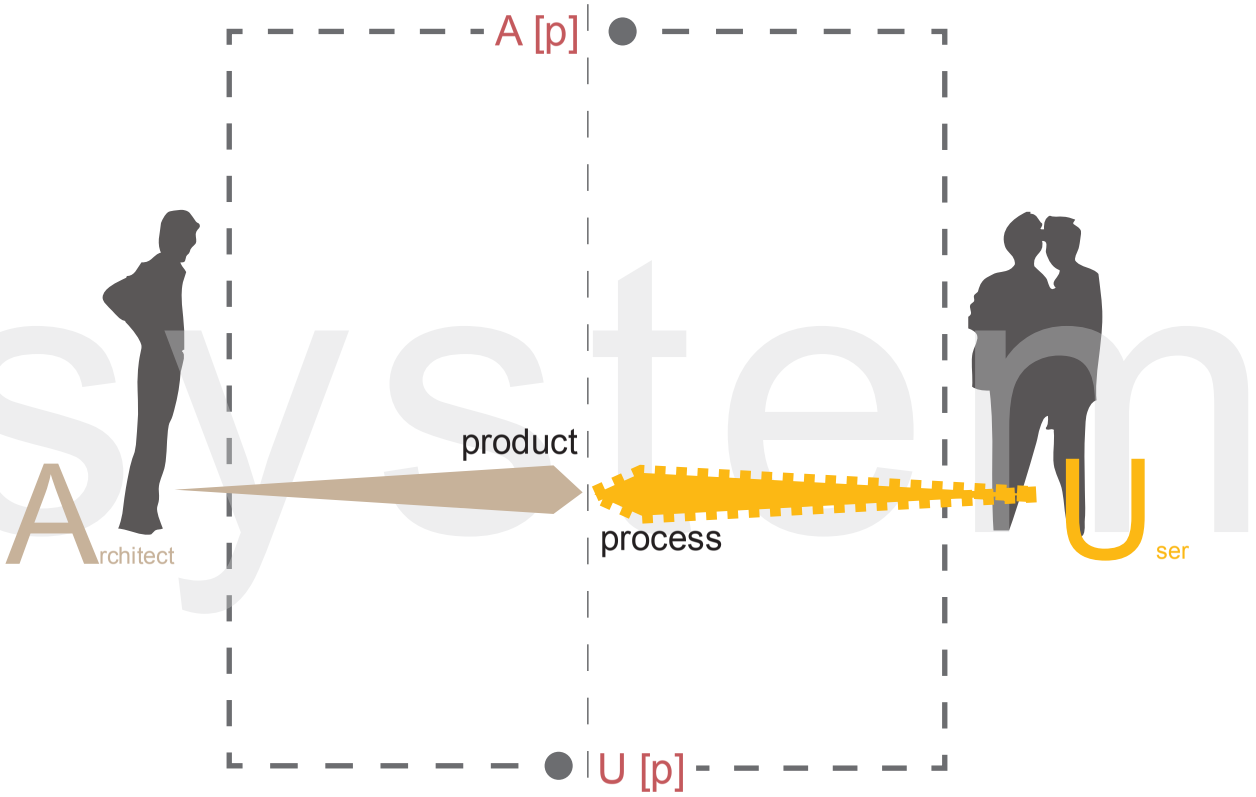
user friendly +/–

This design competition was a conversation on triage relief, specifically in Bosnia. This finalist's submission incorporated a complete designer defined system for users within their urban environment.

A designed system:

After analysis of the precedents, a system was concluded to be developed in which architectural products meet user based processes. It manifests itself at this juncture, at which point a cyclical design process exists, simultaneously containing, and contained within the didactic elements which arise from the architectural product and user process.

This cyclical process is limited in scope by two factors, one is the user's ability to interact with and design spaces for themselves, and the second is the limit by which the architectural product is designed. These are constantly pushing each other's boundaries, and finding their balance can result in a system designed to teach and a system limited by its methods of teaching.


A [p]
product
process
U [p]
Architect
User

Transferring of design knowledge:

Each didactic element of the system has its own process and its own product represented within a piece of furniture. The furniture was a method to contain issues such as scale and complexity in a managed way, both within the exploration of this thesis, and also as a spatial object itself. To maintain a feasible experiment, the role of the builder was transferred into both the architect and the user.

The process and products are represented in the way the furniture was designed and built, the way the instructions were designed, and the way in which the users implement the design through the instructions and furniture. These products and processes all contain a level of evaluation, assessment, and assembly.

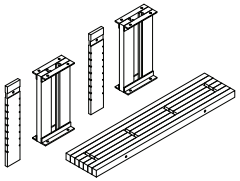
For this sketch problem to continue as a pedagogical experiment, the E.A.A. system of design, undertaken by the architect, must be transferred to the user and the user must implement his or her own system of E.A.A. design.

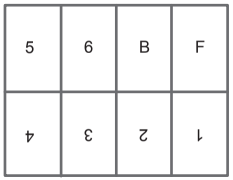
The instructions on the following page were designed on a component basis because the outcome of the furniture's function and form are undefined. The components are the furniture's only source of rigidity and had to be documented in way which showed the versatility of their design. The instruction's final graphic layout was produced on an 11x17 piece of paper, and through a series of folds, became a condensed pamphlet the user could keep in their pocket for reference during the building of their furniture.

A

process
design. build. learn.
design. build. learn.
product
build. design. learn.

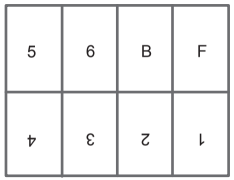
=





U

process
build. design. learn.
build. design. learn.
product
design. build. learn.



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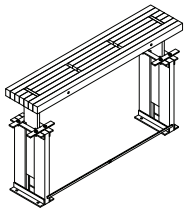
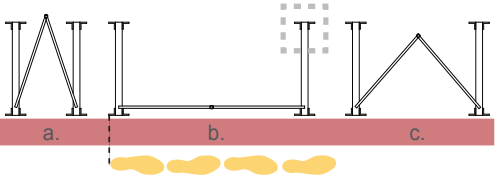


program/details



use your body to evaluate your space.

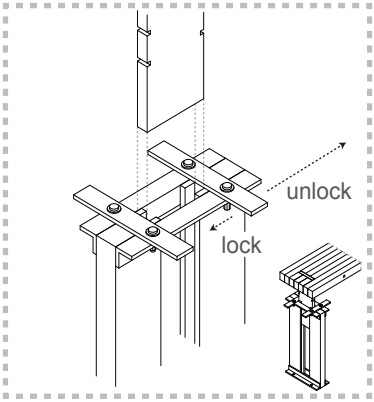
Typically arm span is the same width as your height. For example, if you are 6 ft. tall your arm span reaches within an inch or two of 6 ft. Also, walking a space can give you clear reference to the length and width of a space.

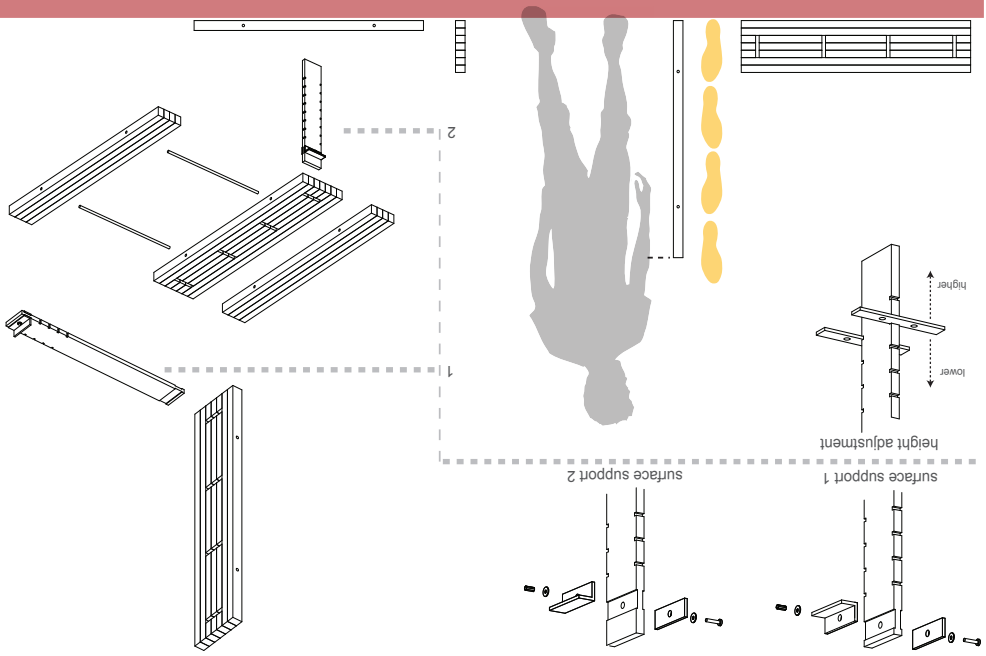
assess your needs with regards to your evaluation of the space.

After your space has been evaluated, start thinking of what you might want to design. Are there specific needs within your space?

assemble your parts.

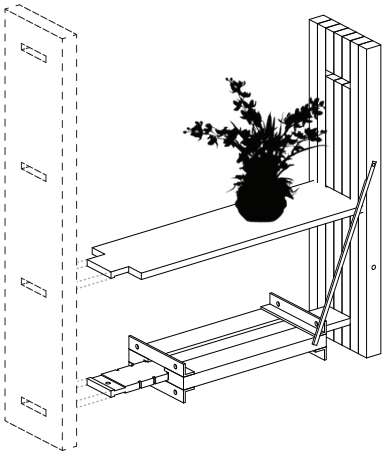
Determine the orientation of your designed product, while keeping in mind your spatial allowances and needs. The connections are adaptable and there is more than one way to assemble your designed furniture.



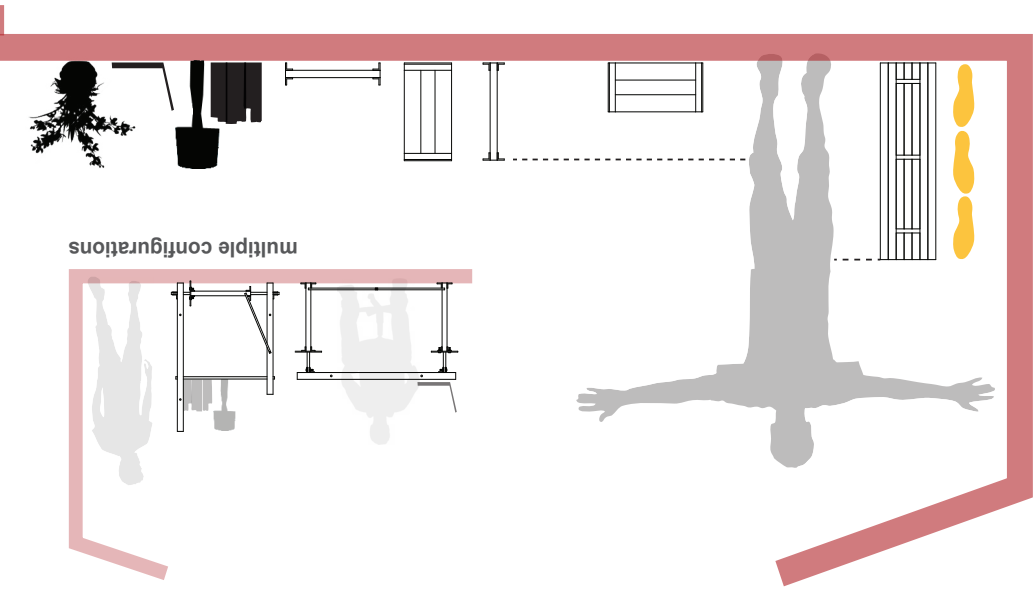


Personally Programmed Furniture Directions:

partial assembly

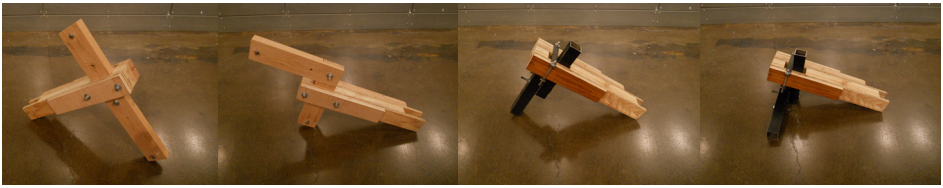


do it yourself.
personally programmed furniture



multiple configurations

the big picture.



Trails and errors:

Early attempts at the design of the furniture's components were changed and influenced as the architect's product and process develop. Above are two examples of working components which were evaluated and redesigned as their function was either too clumsy or too complicated to produce a level of user based E.A.A.

Final Design:

The final design of the furniture's component was simplified to function as a slip-joint, where a standard sized module would provide the means of attaching to further components, such as horizontal or vertical surfaces, in order to allow for adaptability of user-based programming. The furniture is shown here, below and to the right, in a variety of suggested forms, but can expand and change to forms not currently shown.

Its aesthetics and material applications were determined by the architect's abilities of design and building knowledge to clearly be understood by the user. More simply, the product had to read as clear as possible, "square peg goes in square hole".

Much of the furniture's design was compatible with modern construction techniques. For example, the mortise holes in the horizontal/vertical surfaces were detailed so that the slip-joint component's metal brackets would be spaced apart at 16 inches on center to allow for possible wall mounting.

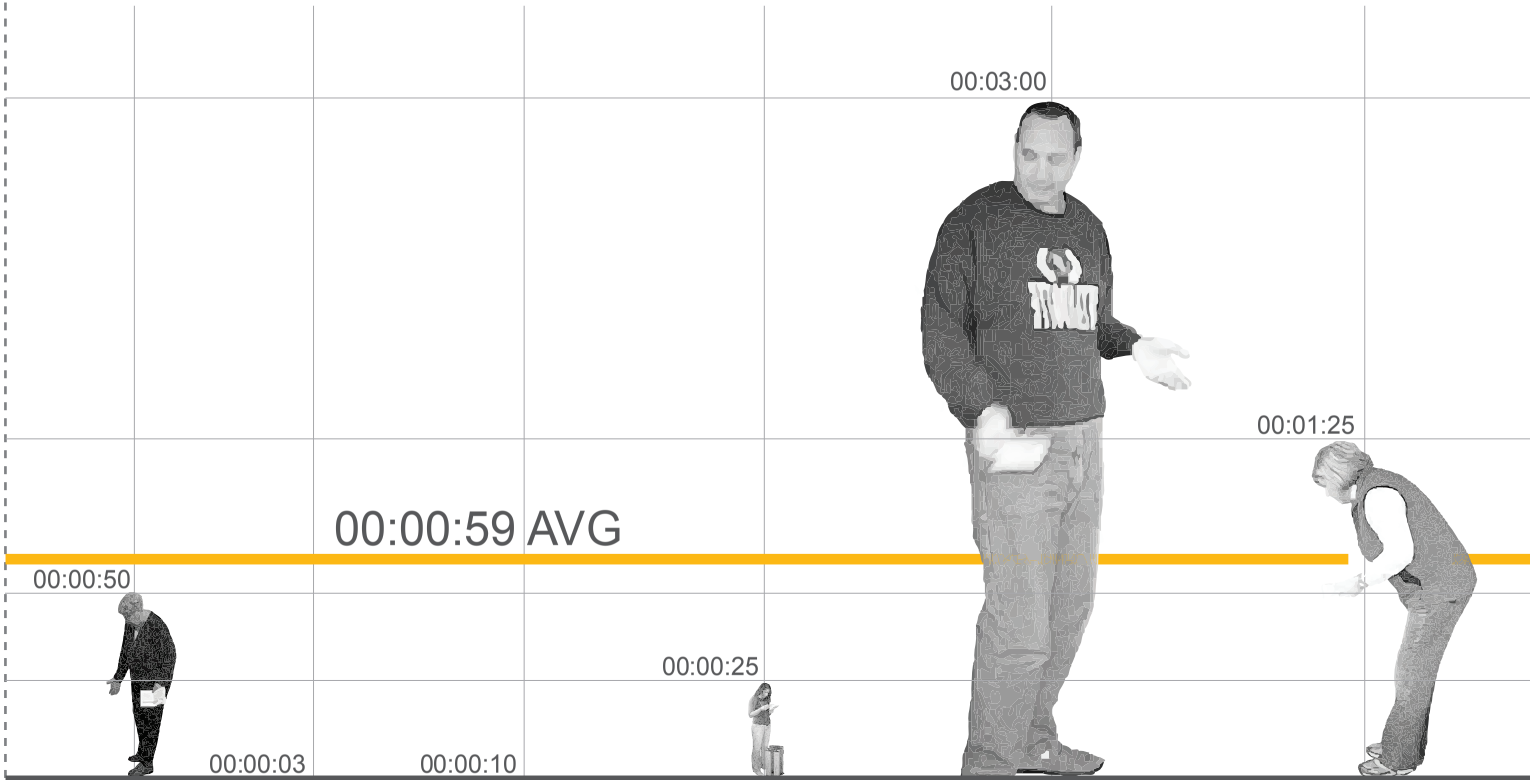
analysis and conclusion.

The experiment was tested on 6 individuals. In each experiment, the furniture was disassembled into its basic components represented in the directions. The directions were then handed to the individuals and a basic verbal explanation of the experiment was given, instructing each participant that the final outcome was to be a piece of furniture, with multiple ways of building it, and that the furniture's program was appropriate for the space in which they were assembling it.

Analysis of the experiment was broken into several categories. The first was the amount of time each individual user spent on reviewing the directions before assembling began. The second was the amount of time each individual took to reach completion of the piece of furniture. The final analysis was documenting the amount of design knowledge transferred through the experiment itself, in form of evaluation, assessment, and assembly (EAA).

Instruction use:
In terms of the overall use of directions prior to project construction, there was a minimal amount of time spent, with the average at 59 seconds.

Instruction review prior to project construction



Time of total project completion

00:11:27 AVG

00:06:27

00:10:00 +/-

incomplete

00:09:56

00:06:30

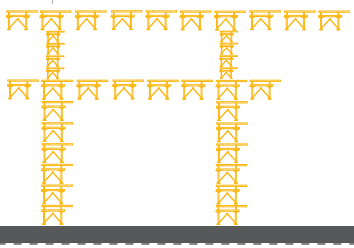
The amount of time spent on project completion includes the amount of time spent on direction review, as these two categories affected the individual's understanding of E.A.A. The average time was 11:27 minutes, with each individual spending close to 1/6 of that time on direction review prior to assembly.

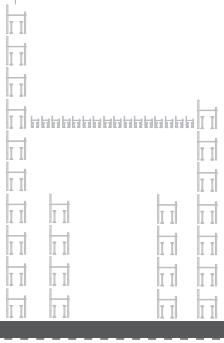
Project Scope: Evaluation, Assessment, and Assembly

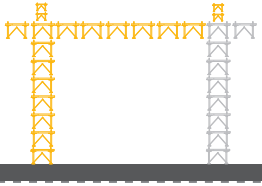
% complete

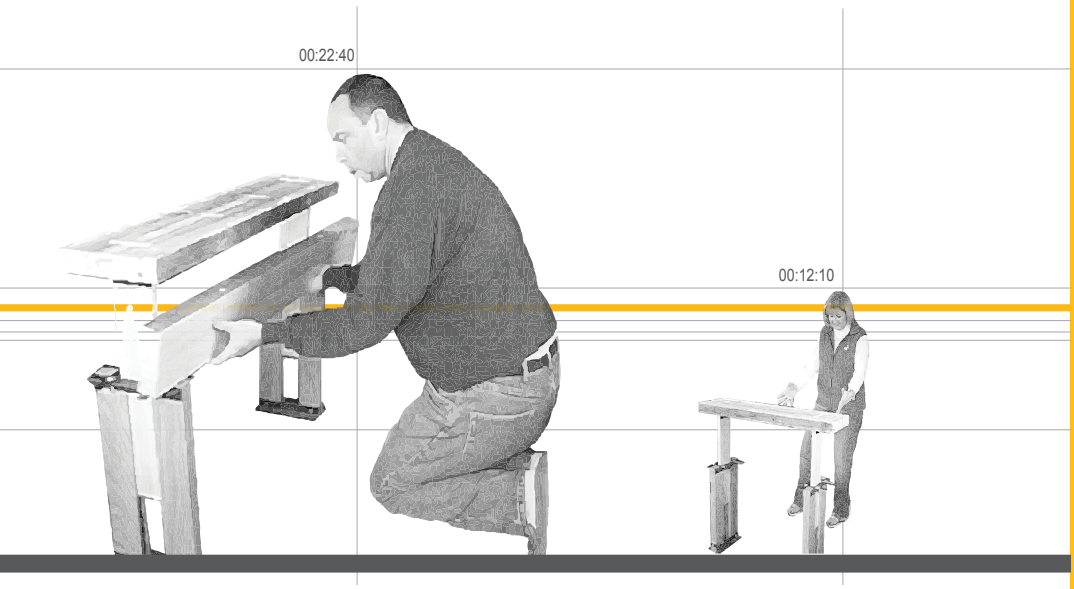
% incompl

E	used body height to adjust table's height	none	none
A	location: behind user's couch	none	location: end of a bed
A	00:04:30 "Oh! I get it."	"Thank God we have Art Van!" parts were too large to handle easily little comprehension of furniture connections	additional bracing technique





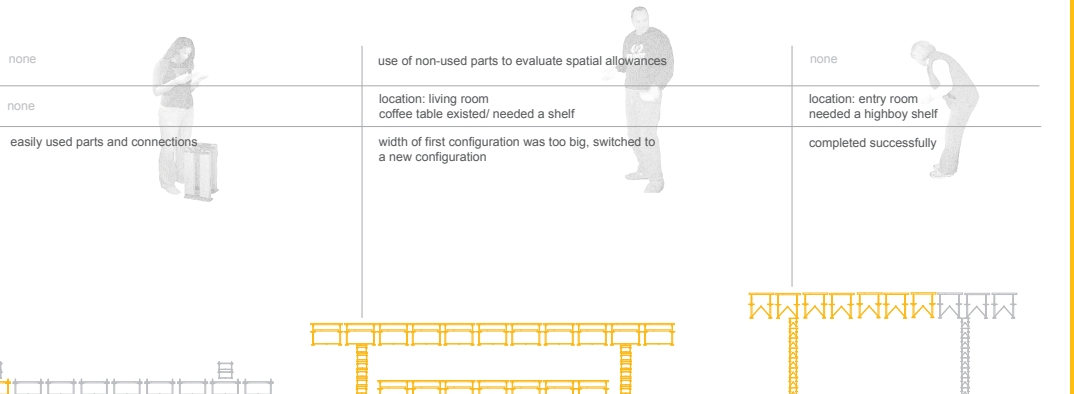




There was about a 33% success rate for the experiment. This was determined by the individual's ability to obtain a level of design knowledge through E.A.A. These two individuals, representing the success rate, finished the project by different methods appropriate to their personalities.

ete

none	use of non-used parts to evaluate spatial allowances	none
none	location: living room coffee table existed/ needed a shelf	location: entry room needed a highboy shelf
easily used parts and connections	width of first configuration was too big, switched to a new configuration	completed successfully



Conclusion:

This experiment resulted in three general outcomes. The first showed that there were those that cannot design for themselves. The second was represented by those which were able to influence a design, but not completely design it for themselves. Finally, there were those who were able to design completely for themselves.

The process and system were clear enough for the didactic elements to bleed through to the user, and with a 33% success rate.

The success rate was affected by a couple of factors. One was the disloyalty to follow the directions once the individual was told that the furniture's end result was not defined. The second was each individual's ability to assemble something for themselves. This may be due to past experiences and personal interests.

This sketch problem proves that the system does transfer design knowledge to its users, but to a limited degree. This process does not have a high enough success rate to truly scale this experiment from a piece of furniture to the complexity of a complete home, however, it does suggest that users are capable of designing spatial elements within that home. This opens the door to possibilities of design within pre-built spaces, such as renovated urban environments where the structure and facilities of that environment are intact.

site selection.

Site selection in this thesis is based on several factors determined by the outcome of the sketch problem. This outcome concluded that the system's inherent qualities of scale, typology, and user must have a need for adaptability in their current living conditions.

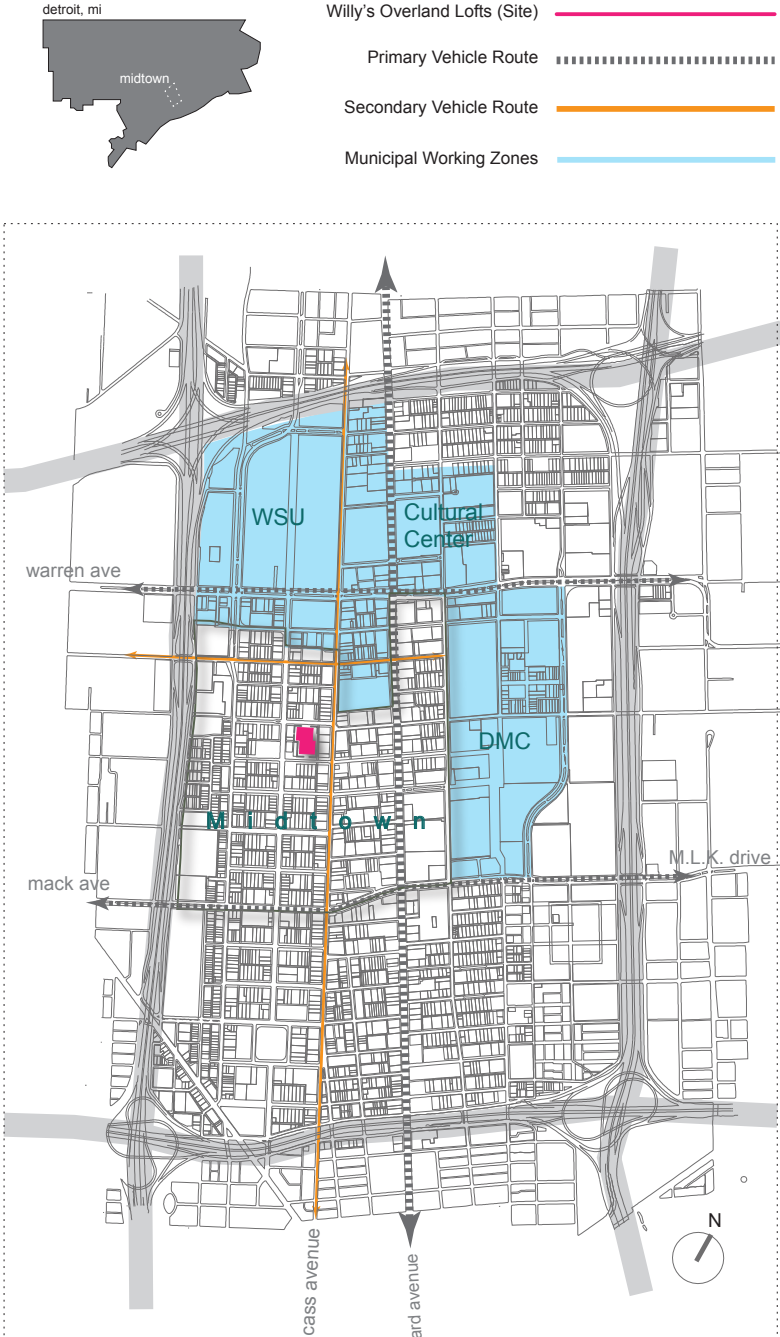
Scale, as the sketch problem suggested, is limited by usability of the system and the intimate nature that it requires. Smaller spaces, such as interior rooms, support the system by simplifying the user's ability to adapt to that space and implement the didactic functions of the design.

Post-industrial spaces represent a new trend in building redevelopment. These spaces are typically transformed into loft or apartment housing. The quality of these spaces lend themselves to younger adults looking for semi-permanent space to live and work. Live-work individuals require a high level of adaptability and program within their living space. These individuals are capable of designing their living conditions as their needs change and in this case, represent the appropriate users this system can work for.

Macro Context Analysis:

Detroit, Michigan was once the epicenter of the automotive industry and grew exponentially during the turn of the 20th century as the United State's culture began to require the use of automotive transit in order to support its economy. Detroit's industrial nature has since been reduced, and what is left behind are multitudes of abandoned spaces, many times structurally intact, but in need of renovation and reuse. These spaces are fluent throughout the city.

Spaces were analyzed which have adapted slowly over the years to obtain their own identity within the city, while incorporating the use of former industrial spaces. Midtown, Detroit has created an economic stability for themselves through several municipal working zones: Wayne State University, the Detroit Medical Center, and the Cultural Center. These employment sources support many young adults and therefore many living conditions. Also throughout Midtown, artists and young entrepreneurs are establishing themselves in this growing neighborhood. These conditions stimulate the area and bring in individuals on a temporary basis.



Macro Context Analysis

Focus Area Context Analysis:

Near the heart of Midtown, a growing neighborhood, West Willis Village, is establishing itself as a local artist and local business natured space. Many buildings are being renovated to accommodate this change.

Willy's Overland Lofts is a former Jeep dealership, left behind with the automotive industry, and is currently under renovation and redevelopment into loft housing. Its location is surrounded within a mixed use environment, supporting many different types of users, including live-work individuals.

The building's program is separated by floor. The first floor supports live-work housing. The second through fourth floors are traditional loft-type housing, and the fifth and sixth floors are newly constructed penthouses. Until this design-build development acquires an individual ready to buy a space, these units remain undeveloped. Once a committed client enters the equation, the floor plan is then designed by the architect and user together.

Although spaces within Willy's Overland Lofts remain undeveloped until a client is committed to buy the space, there are typical roughed-out spaces on the first, live-work, floor. These spaces are estimated at 1000 square feet, making up a 20 foot wide by 50 foot deep floor plan. Because this building is a former Jeep dealership which has acquired two additions over its lifetime, its structure is a mixed combination of concrete columns and brick walls. Each floor is 15 feet tall from floor to ceiling, and all utilities run along the ceiling, allowing for a flexible floor plan.


woodward avenue
second avenue
cass avenue
canfield avenue
willis street
N

schematic design.

While the sketch problem related to spatial conditions in which the user could easily adapt to, the system's architectural product transitioned into a wall assembly. The architectural implications of the wall in this design have two conditions to react to.

The first condition is the typical live-work space in which this system is designed to temporarily exist in. The second are the ways in which this system adapts to the undefined requirements of a live-work environment and the transient individuals which occupy these spaces. It does this by addressing four categories: the manipulation of volumes, spatial arrangements, growth and divisions, and housing a typified live-work program.

In these early stages of design, a broad based attempt to address these issues is explored.

The wall assembly's typified program influences the adaptive nature of its ability to transform as the user see's fit. Because the live-work individual has unique requirements dependent on their work, the typified program is thought of as basic functions.

Similar to the undefined nature of the program, the manner in which the user defines their personal space is equally as undefined. A hypothetical spatial transition analysis begins to identify the needs of the wall assembly as it and the user progress through time.

program

storage/shelving

horizontal surfacing

partition panels

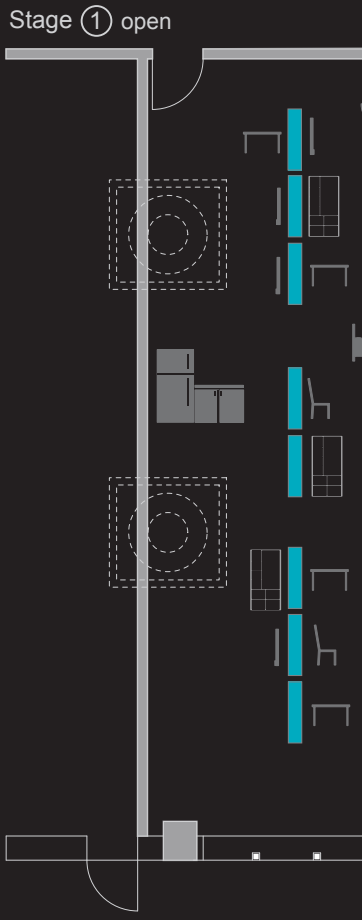
seating

bathroom

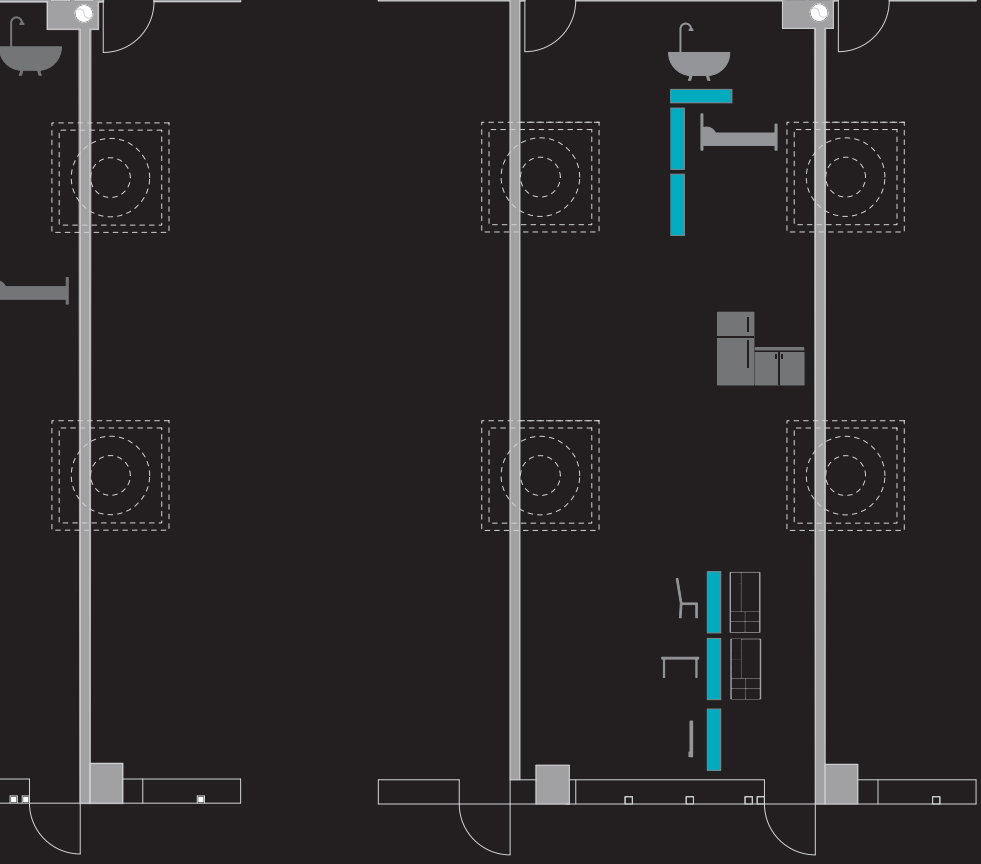
rest

food service

system



transitions



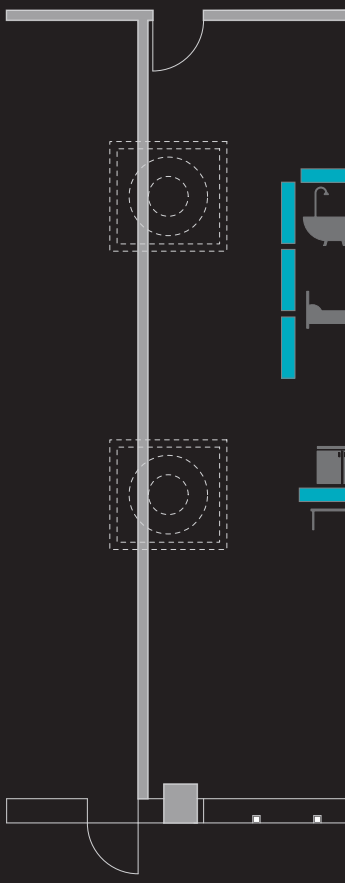
system

These diagrams show the development of the wall assembly and user changing in a phased manner. The user might start as an individual requiring the need of a completely open live-work space. Potentially, if that business starts to establish itself further, the need for more space might require the user to look elsewhere for available working conditions. As this happens, the need to transition the current space into a more traditional living condition occurs.

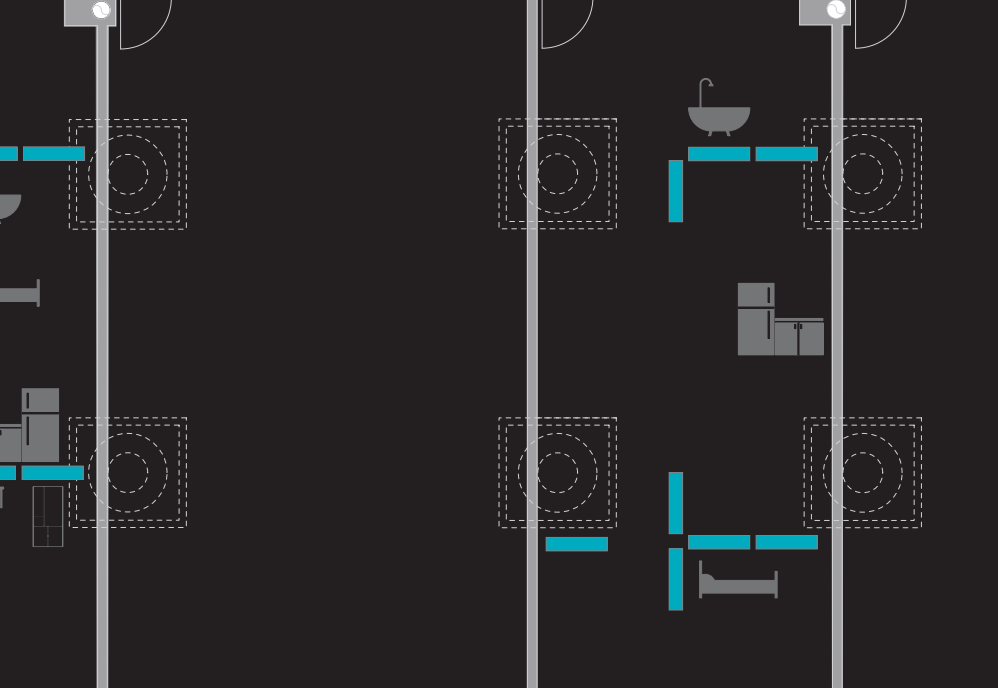
If the user outgrows the current living condition, the wall assembly needs to be able to adapt to new circumstances. This might be the transition from a 1000 square foot loft space with 15 foot ceilings to a 1500 square foot house or apartment with 8 foot ceilings.

These changes in functions and space are explored in three themed wall assemblies seen in the following pages.

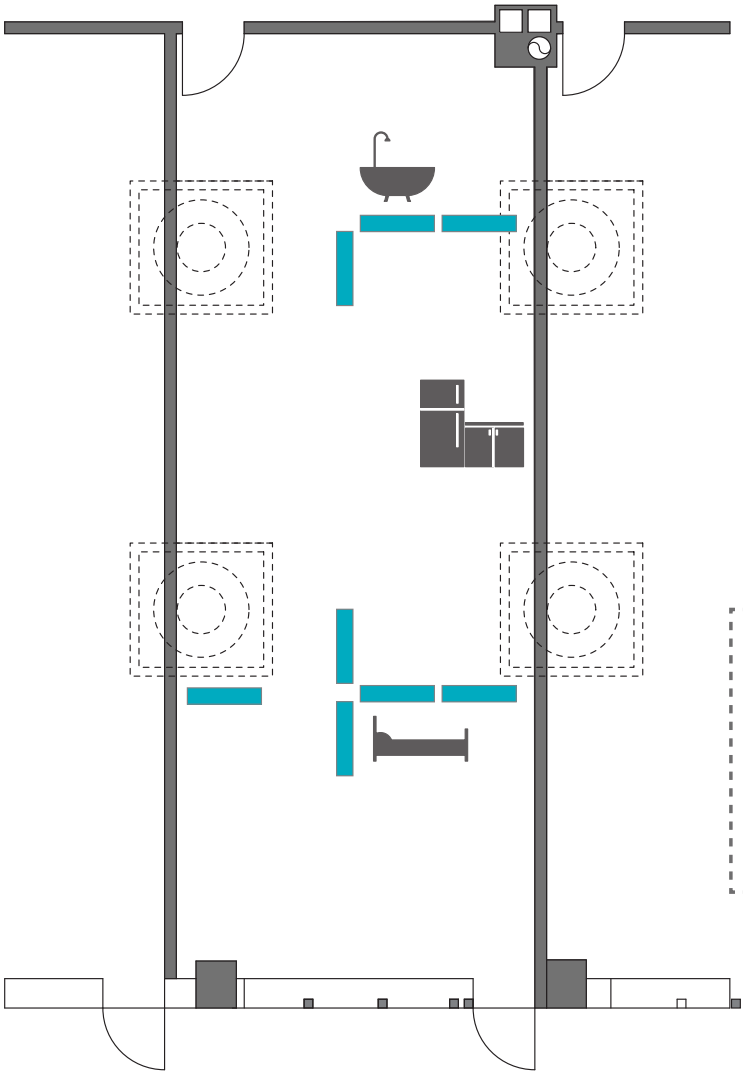
Stage ③ privatized



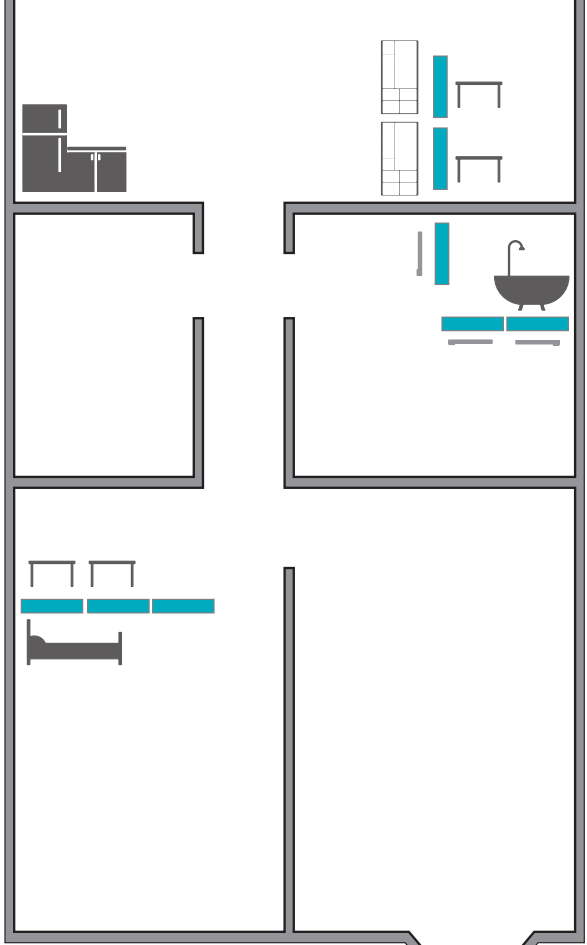
transitions

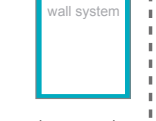


growth & division

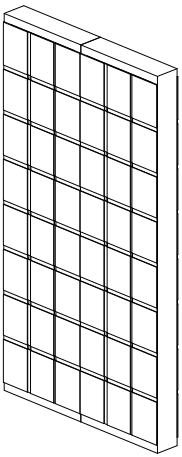


Stage ⑤ space change

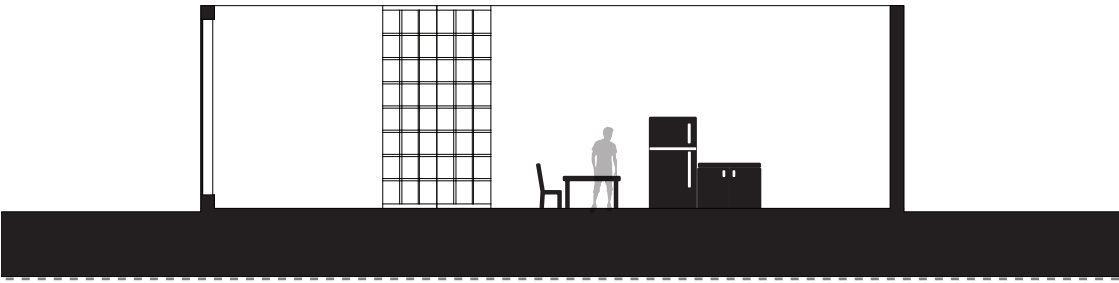


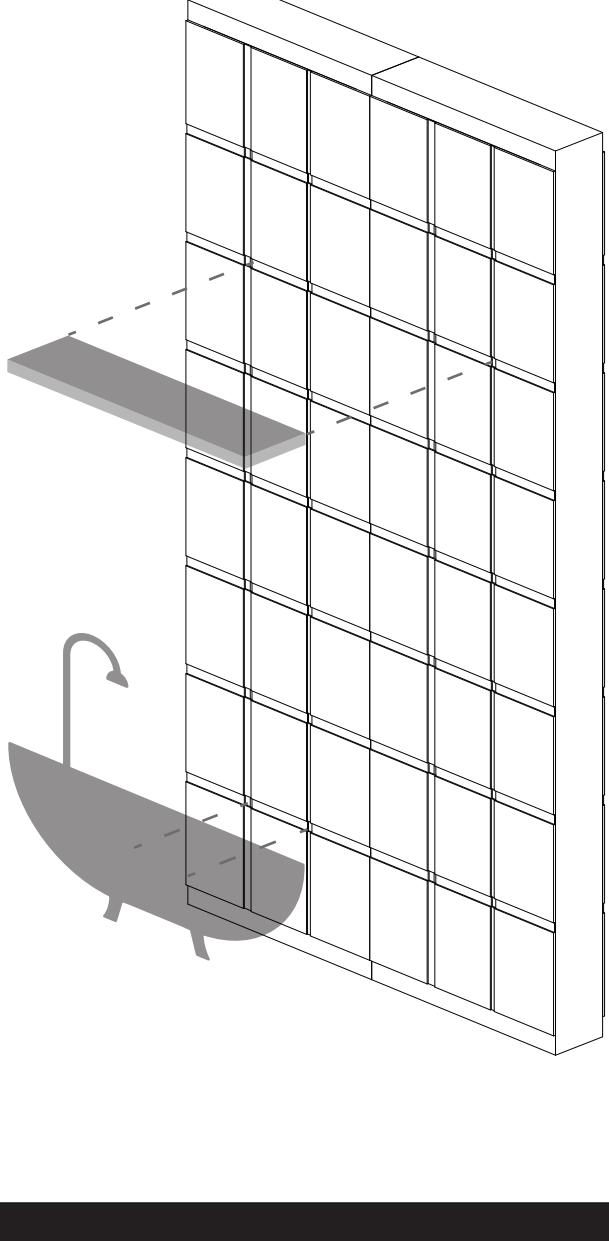


port system

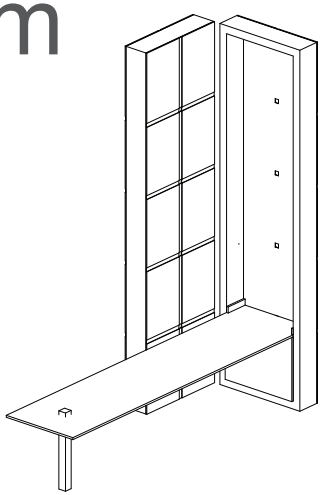


The port system became the first step to addressing adaptability in the wall assembly. Its focus was on creating a standard series of ports in the gaps designed between connecting wall panels. A corresponding detail would then be clipped to the program components needed and hung off of the structure. This allowed the user to define what functioning program went where. The structure of the wall assembly was designed to exist as a pressurized system. This meant that the frame would not be attached to any existing walls or ceilings, but that the pressure of the frame would secure it in place. This gives the user an easier time relocating the wall assembly. The pressurized system conforms to most leasing agreements in apartment buildings as well, where tenants are not allowed to build permanent walls. This system is used in the following themes as well.



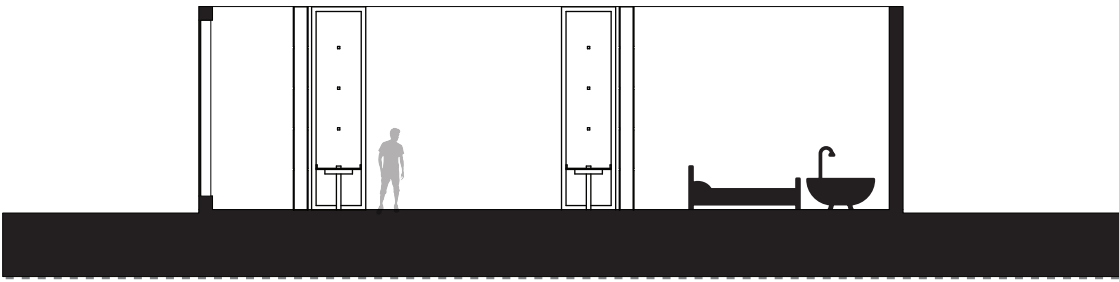


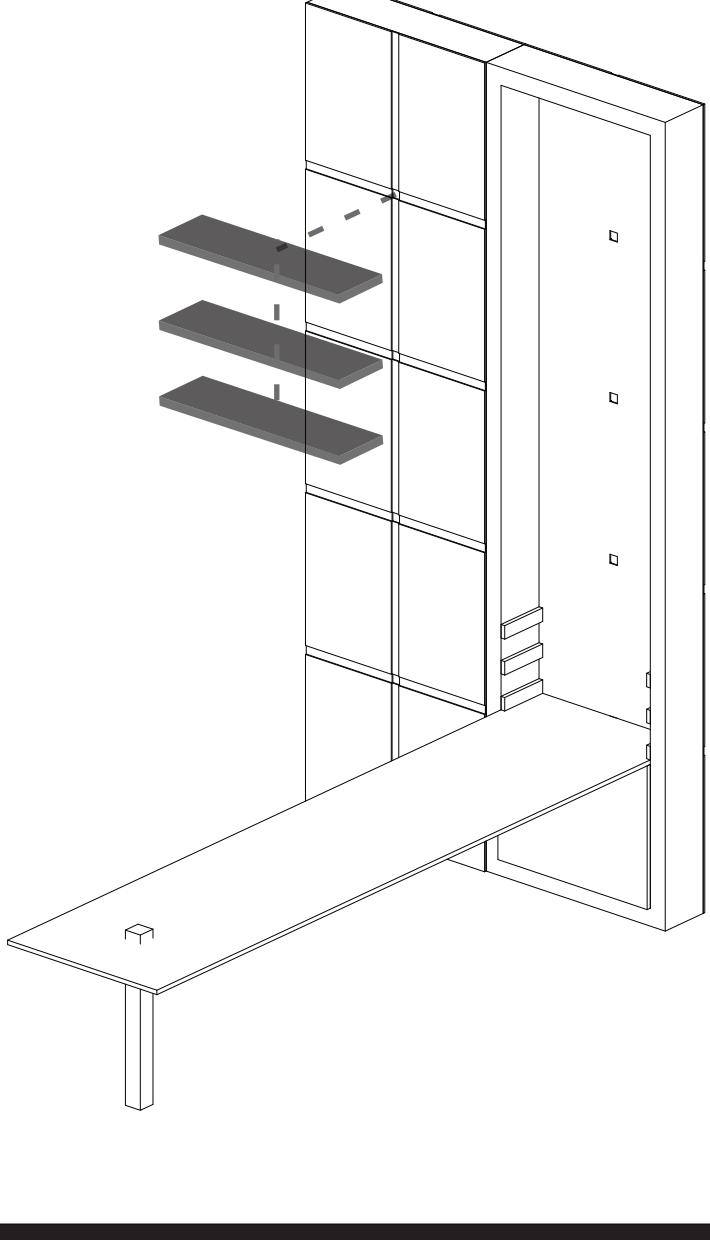
rotating system



The rotating system, actually more of a flipping system, suggests that the wall assembly becomes more than just a partition. The wall assembly itself detaches and becomes a horizontal surface for multiple types of program. Again, this assembly incorporates the pressurized framing system.

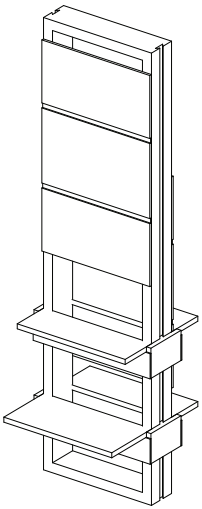
This system is also suggesting that the rotating system and port system work together to define spaces and programs within the user's environment.

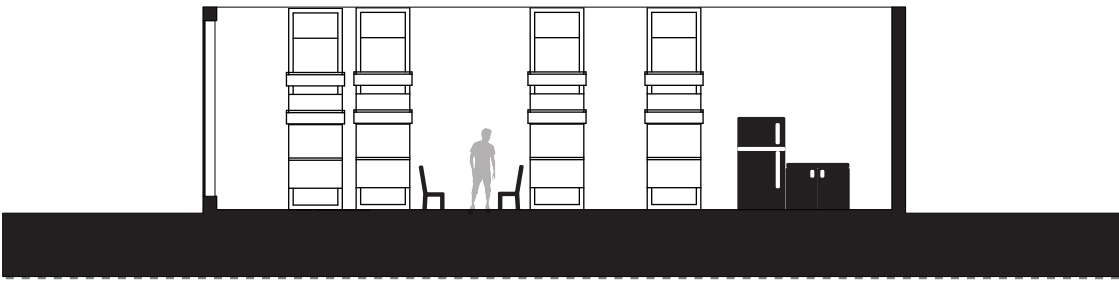


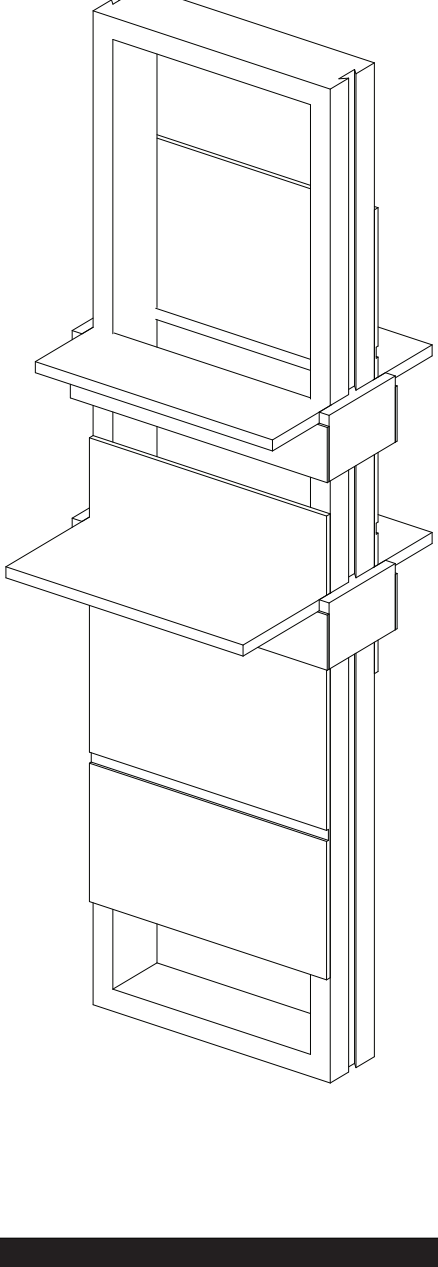


sliding system

The sliding system is a track based system. It houses two main tracks. The first is an interior track within the pressurized framing allowing for the wall assembly to telescope or retract depending on space limitations. The second track is exterior. This track is the wall assembly's means by which a universal sliding joint transverses the space. The universal joint houses many detailed connections where appropriate program plugs in and hangs off the supporting frame. The sliding system also utilizes detachable wall panels which give the user the ability to create transparent or opaque living spaces.







final delivery.

As schematic design was nearing completion, a decision to take qualities of each individual system and combine them into one was reached. The synthesis of frame and component details resulted in a final prototype, who's function was theoretically sound. The final protoype, entitled *A*/**Wall**, was illustrated to represent the ways in which users can adapt the system to their needs as circumstances arise. Its catalog layout was a way to bridge the gap between advertising the system as marketable and providing preliminary instructions to its use.

The catalog is broken into a series of five instructional steps, simplifying the didactic nature of the system. The following promotional descriptions outline the benefits to incorporating this system into a living space.

Step 1: Spatial Evaluation
Step 2: Need Based Typology
Step 3: Frame Assembly
Step 4: Hardware Assembly
Step 5: Component Assembly

The idea of *A*/**Wall** is to provide the skills necessary for any individual to design their own personal living and working spaces.

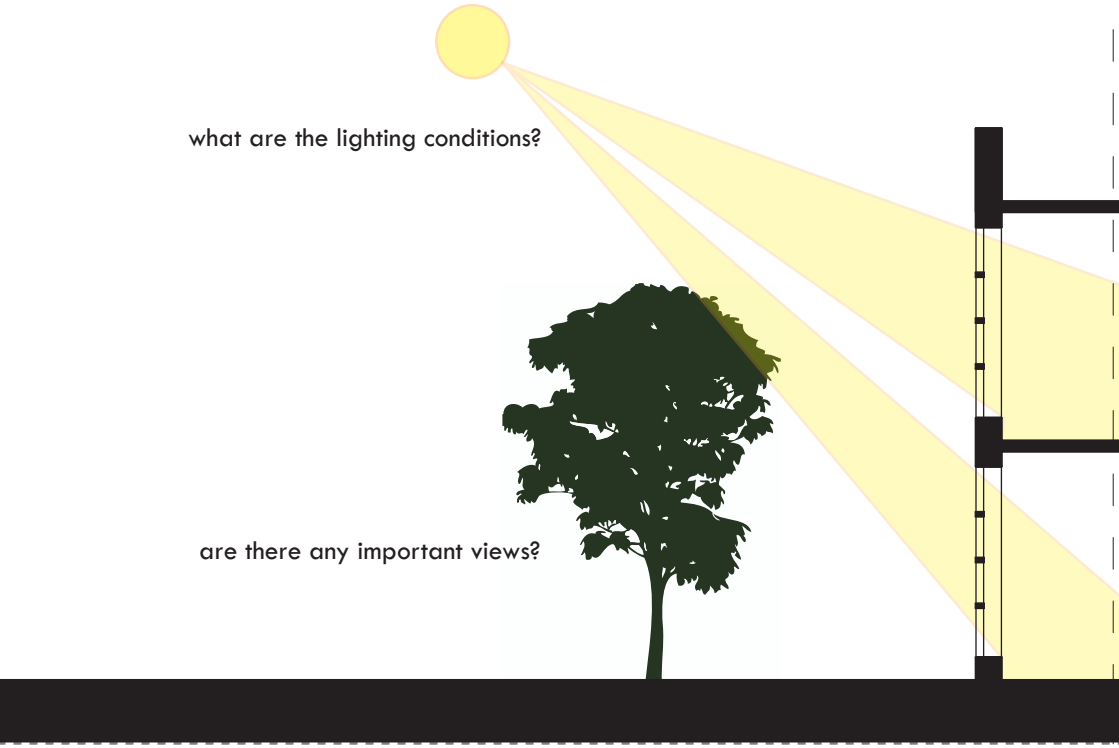
A/**Wall** is designed to act as a tool in which elements of spatial design are taught to, and learned in the assembly of this system within a physical environment.

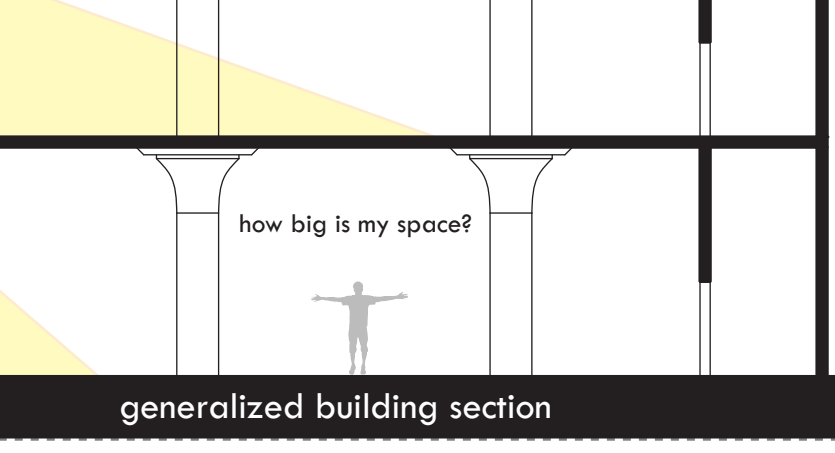
A/**Wall** is a system of spatial components adaptable enough to grow or shrink with whatever new circumstances may arise to change your physical environment.

Finally, *A*/**Wall** is unique and will cater to your personal living conditions, whether its an apartment or house. If you are changing living spaces, simply pack the frame and its components into a pick-up truck and take it with you.

ONE

spatial evaluation: begin to envision your personal space.





generalized building section

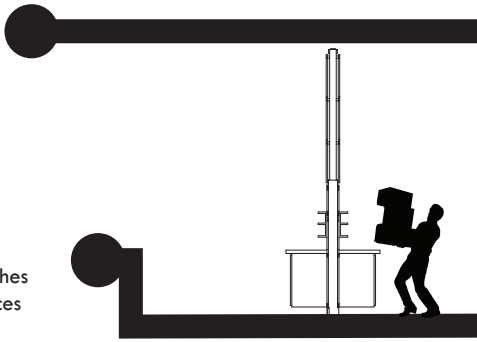
TWO

need based typology: who are you and what are your needs?

You pick the components which best suit your lifestyle and needs.

Live?

bedroom
closet space
kitchen
living room
dining room

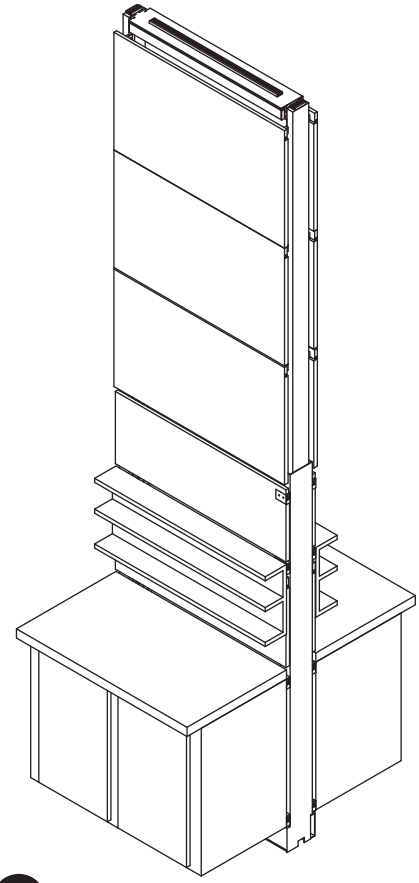


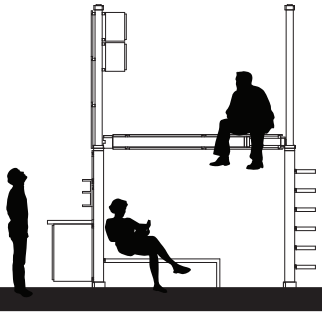
Work?

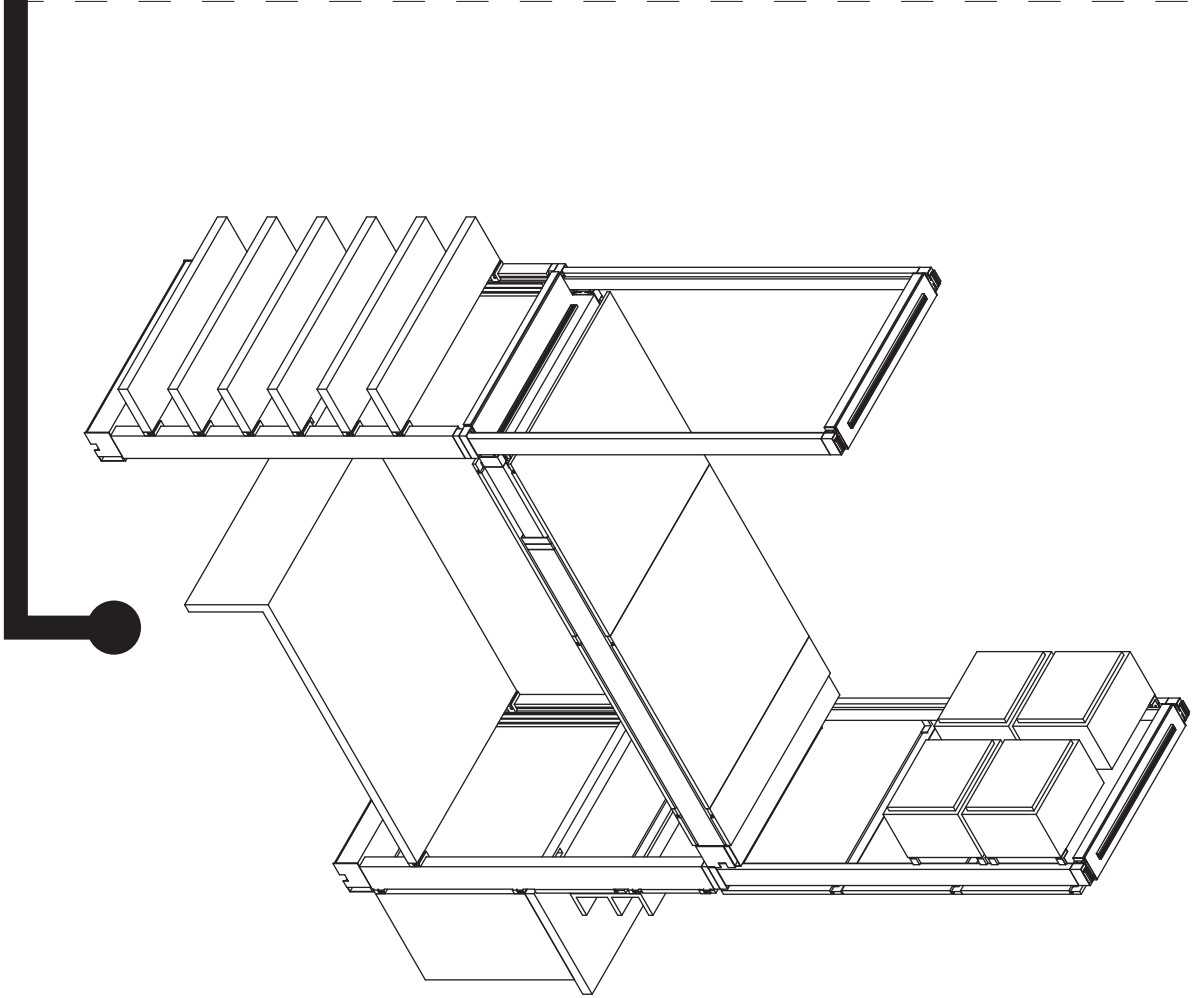
shop space
heavy storage
tables and benches
cleanable surfaces
extra lighting

Live/Work?

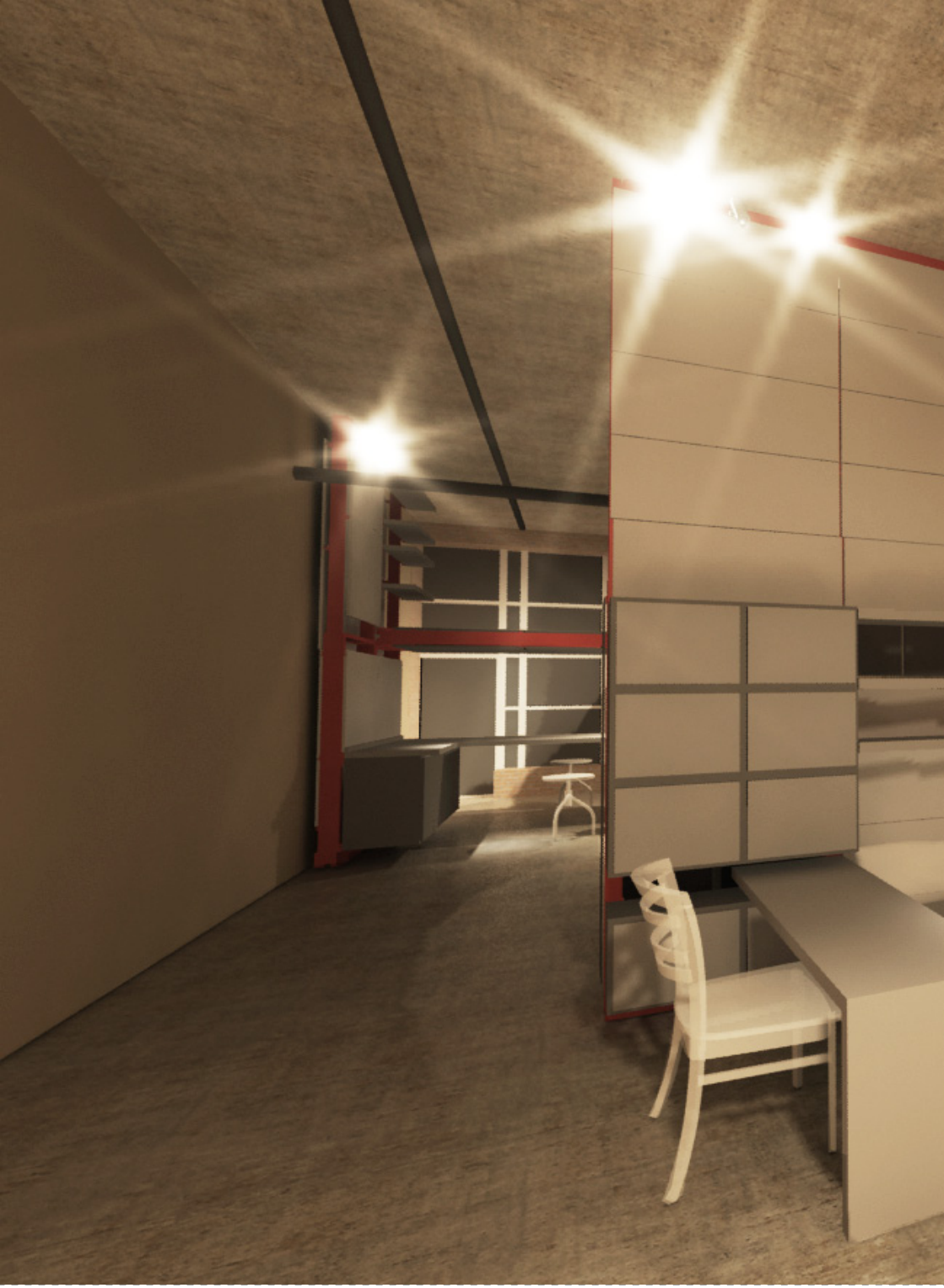
condensed furniture layouts
lofted spaces
adaptable for pre-built spaces







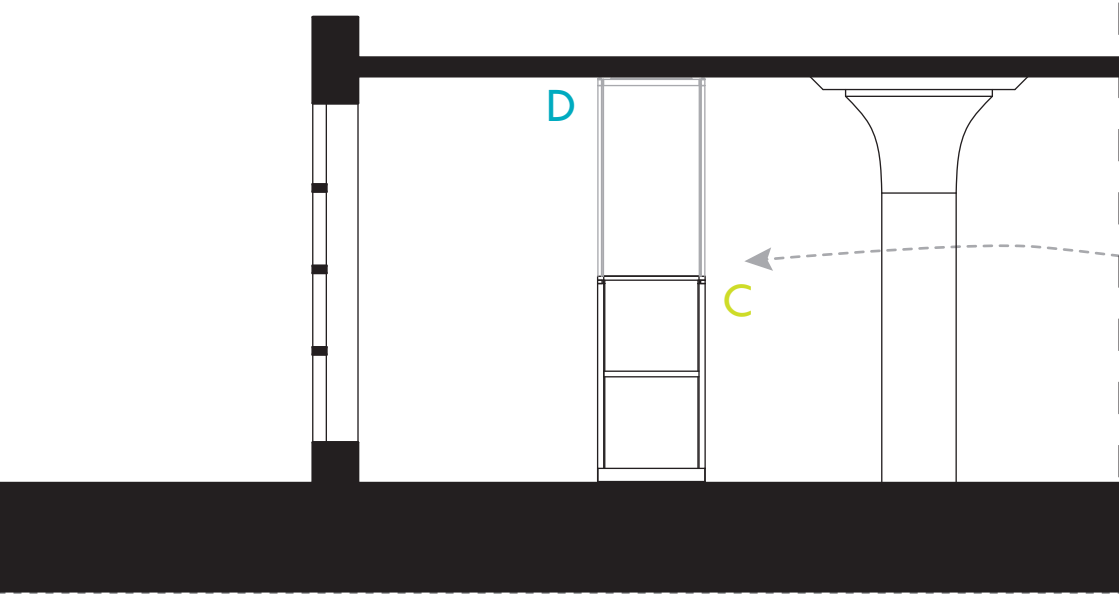
final delivery



final delivery

THREE

frame assembly: overall process

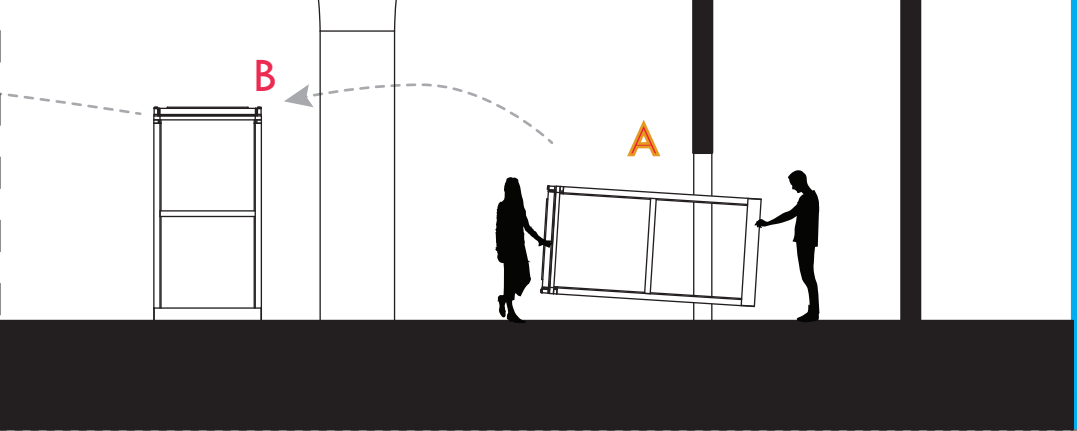


A framing can be delivered or easily transported from one space to another in a full size pick-up truck's bed.

B framing is easily carried into your personal living/working space

C once in place, use handles to lift and lock frame vertically within an inch of the ceiling.

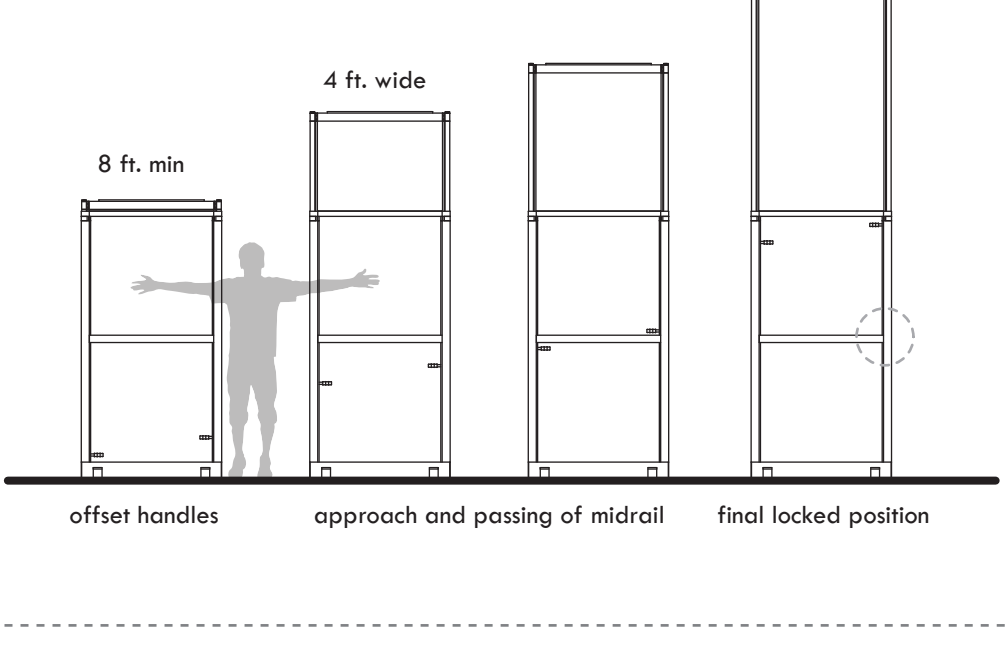
D secure the frame completely by stepping on both hydraulic locks in the base plate of the frame to provide a pressurized fit.



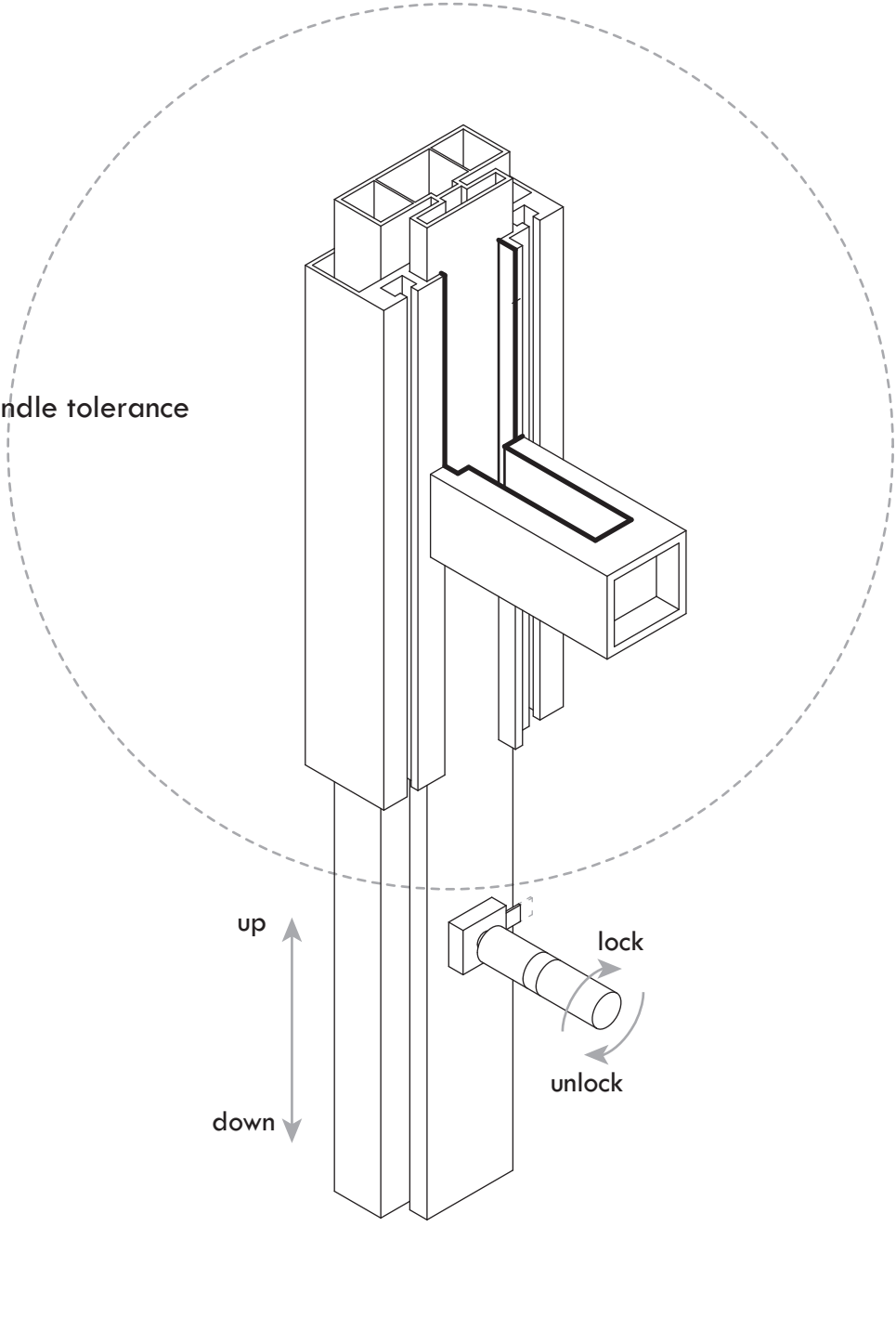
THREE C

frame assembly: erecting the frame to the ceiling

slot at midrail for

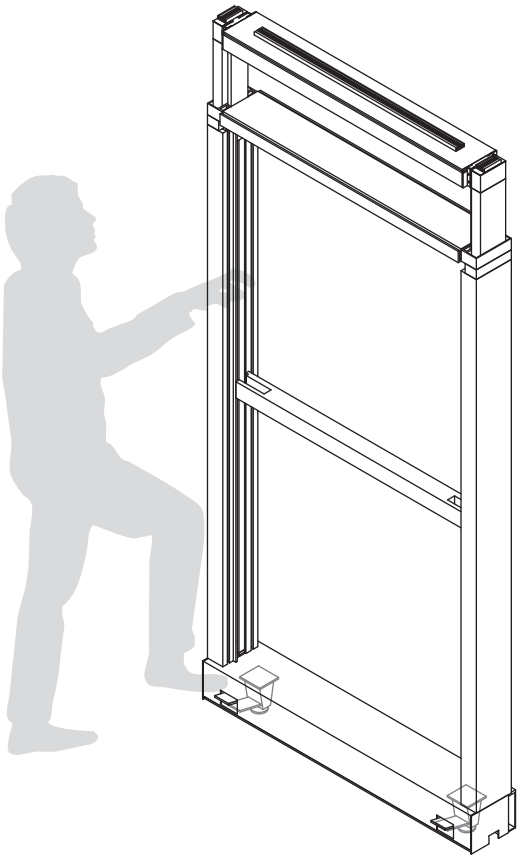


handle tolerance

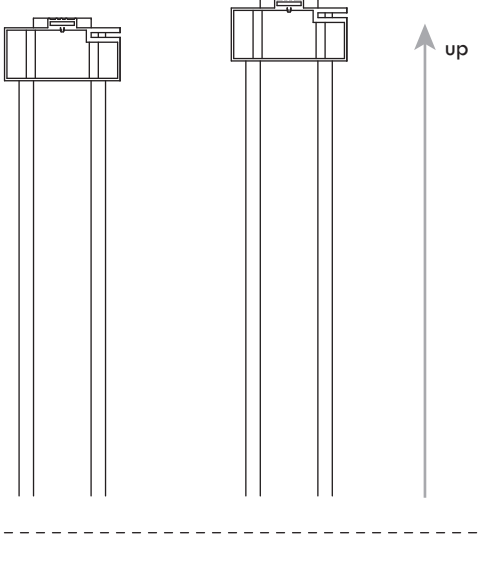


THREE D

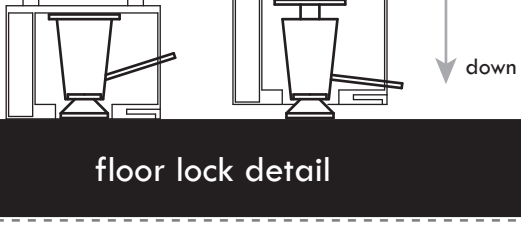
frame assembly: pressurizing the frame



To pressurize the system simply step down on the floor locks to lift the frame slightly off the ground securing it against the ceiling.



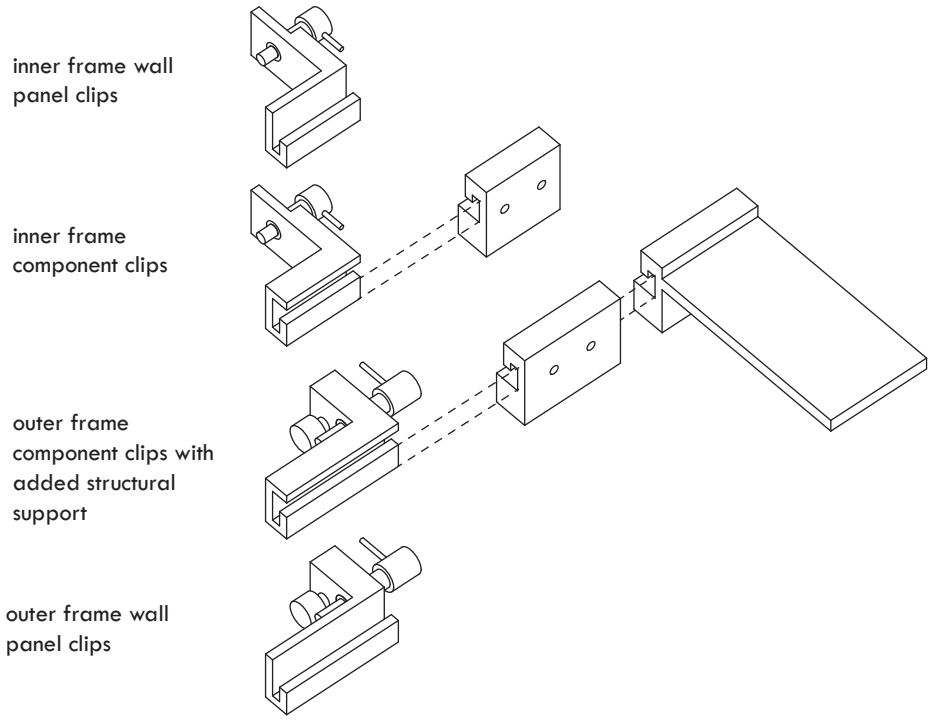
Lift the interior frame as close to the ceiling as possible before pressurizing the system.



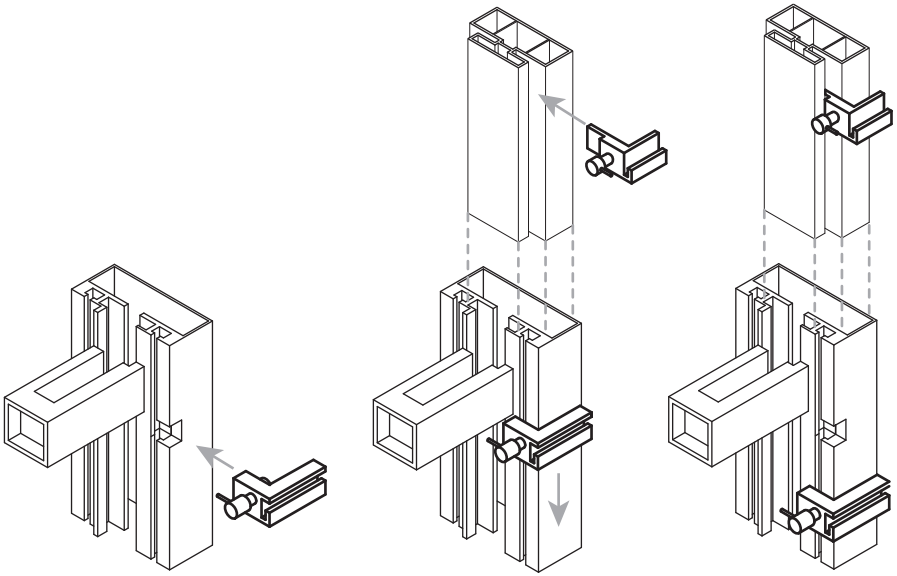
floor lock detail

FOUR

hardware assembly: locating program



inner frame dual track system



attach via access slot

set height

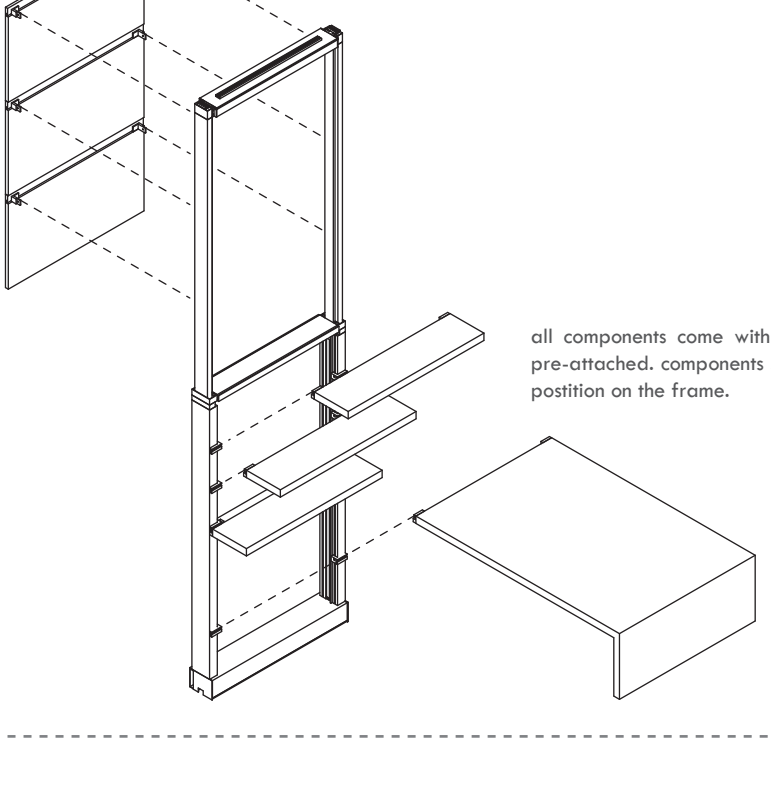
secure in place

outer frame dual track system

final delivery

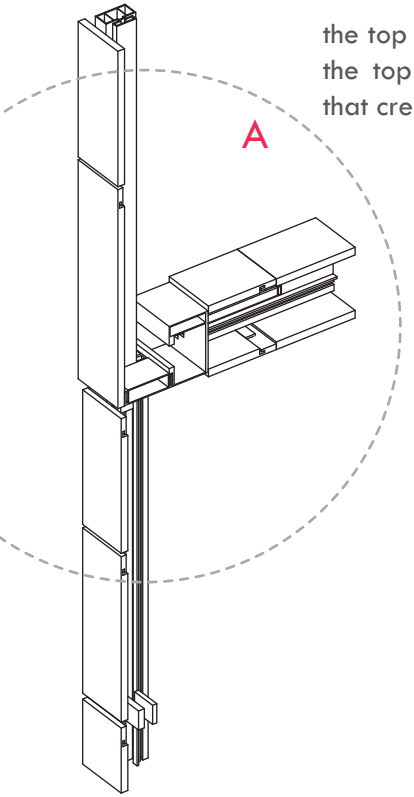
FIVE

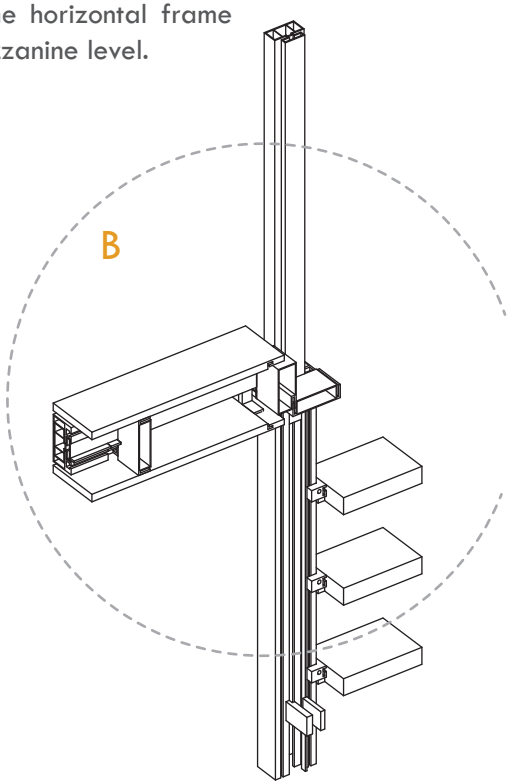
component assembly: attaching program

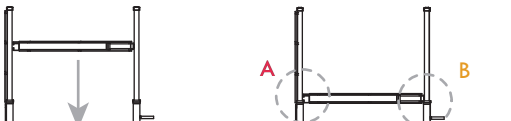


all components come with support clips pre-attached. components slide into final postition on the frame.

the top rail supports the baseplate and the top plate of the horizontal frame that creates the mezzanine level.







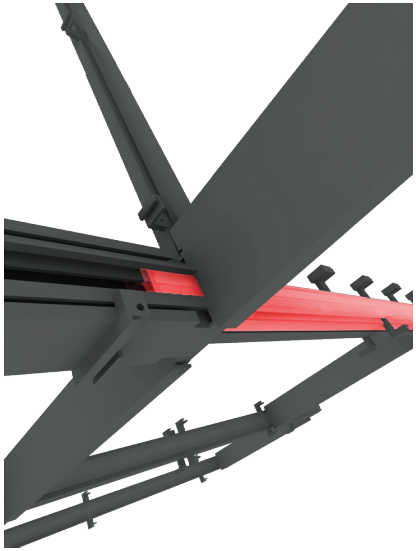
mezzanine connections

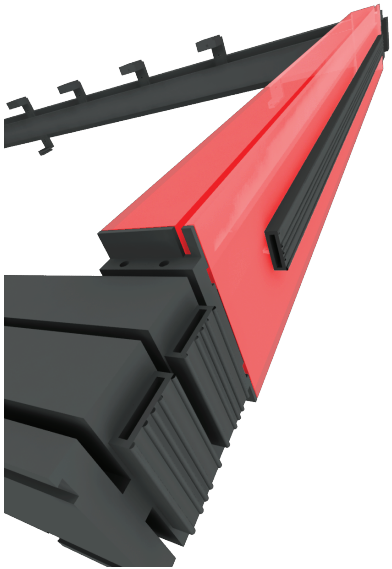
Details of Wall Assembly System:

The following pages are specific call-outs of the extruded aluminum framing. The cross-sections are designed in a custom manner but intended to be further developed for the marketability of mass production.

The engineering of the frame was based on the architect's knowledge of construction from experience an through research of materials. Because the frame is a prototype, all connection and joint details were designed to be functional, however, not always in the simplest manner, and further development from a builder is required.

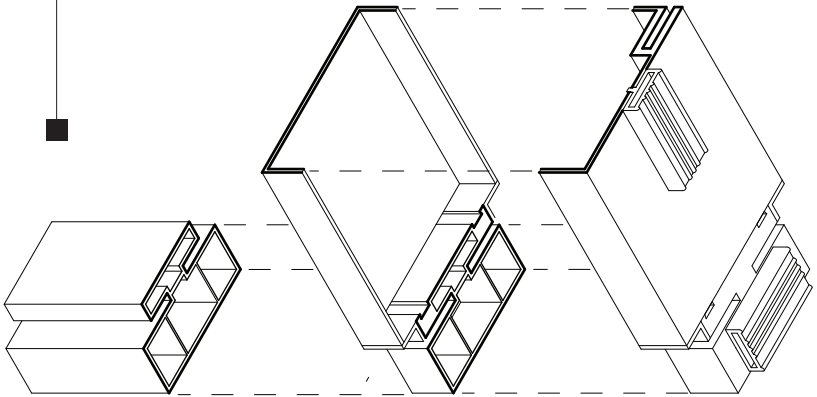
The images accompanying the construction details are identification renders, showing the specific part of the frame associated with the detailed call-out. These images begin show the linear development of the connection details from the upper most section to the lowest section of the frame.





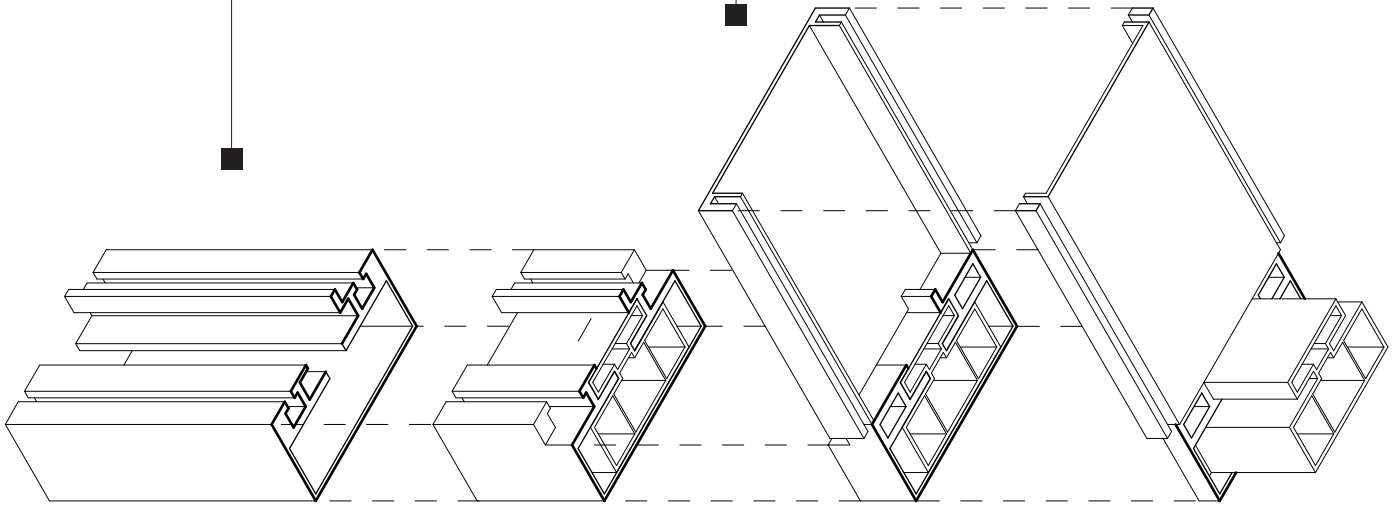
INNER FRAME

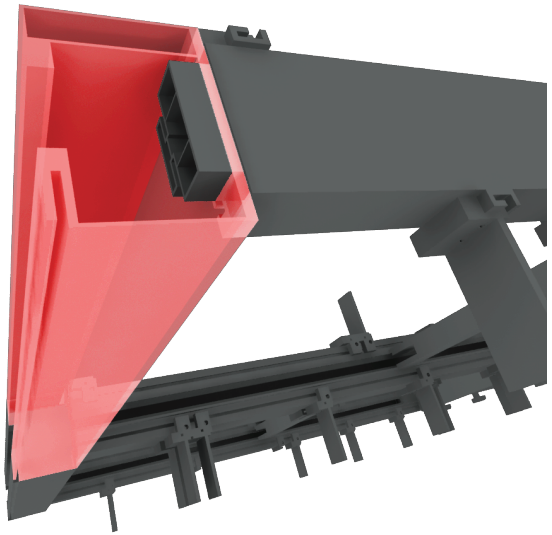
TOP PLATE & GASKETS

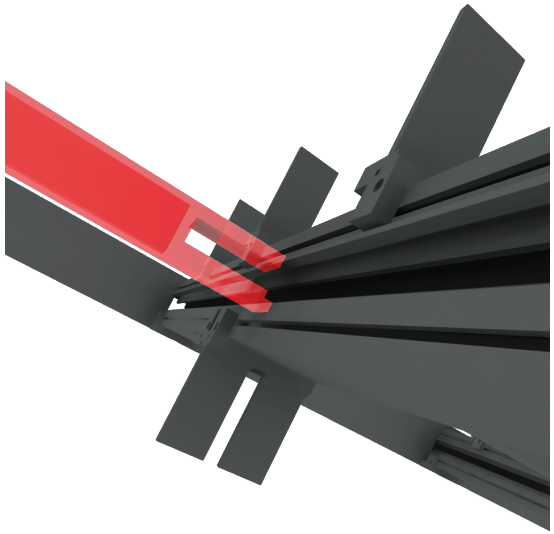


UPPER SUPPORT RAIL

OUTER FRAME

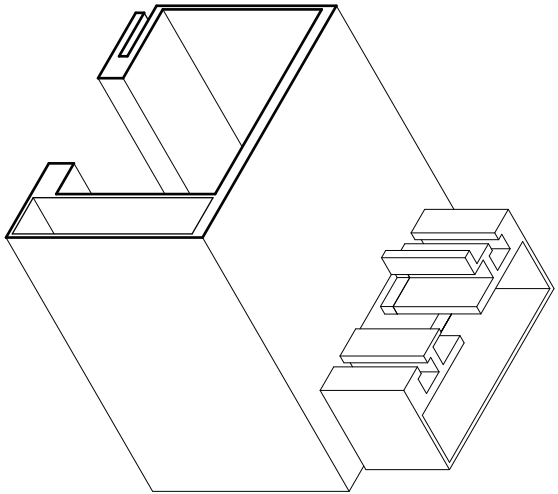


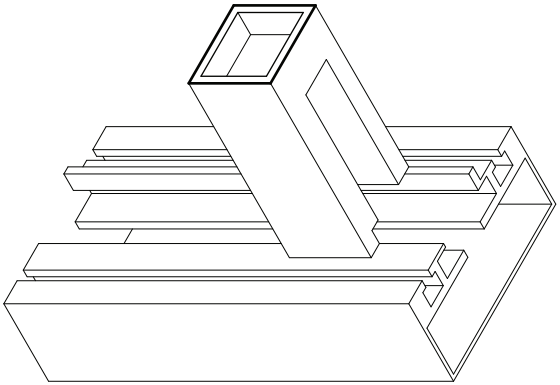




BOTTOM PLATE

MID SUPPORT RAIL





final conclusion.

For the purpose of this thesis, the role of the builder was split between the architect and the user separately. I found that this was important to obtain knowledge to put towards the development of the system, but in reality, the need for a builder is imperative. The final prototype, AllWall, was developed as thoroughly as possible without the use of an engineer, but to continue exploring its possibilities would require a professional builder's input. As such, the overall alternative architectural system would need to be redeveloped.

In that redevelopment, the system's approach to the architect gaining of knowledge from the system, and therefore the user, would be redefined. In the original theory, the architect would gain knowledge in the traditional nature of learning from the built environment. When the final architectural solution became an interior design it limited the amount of knowledge the architect could gain.

As I approached this thesis project, I believed in the necessary skills and knowledge obtained from working on small scale design-build projects and their ability to enhance the architect's design, not only for his own benefit, but for those he designs for. At the end of this thesis project, what occurred was an architectural design that simplified design-build methods and made it possible for users to design and build their own environments.

This became an important issue in my exploration and I believe that this was a success. However, qualities from the original sketch problem, the adaptable piece of furniture, such as co-authorship in design, were diminished in areas specific to the component scale, but appropriate for the overall spatial scale. As the designer I could predict the overall limitations in program component layouts, but not as much in the orientation of the wall assemblies throughout

the space. Reasons for the limitations in program occurred partly because the program development itself was subject to market research that unfortunately was never completed.

Print

Blundell-Jones, P, D Petrescu, and J Till. Architecture and Participation. London: Spon Press, 2005. Print.

Boericke, A, and B Shapiro. Handmade Houses. San Francisco: Scrimshaw Press, 1973. Print.

Branca, A. Cost Effective Design/Build Construction. Kingston, MA: R.S. Means Company, 1987. Print.

Friedman, Avi. The adaptable house: designing homes for change. McGraw-Hill Professional, 2002. Print.

Gropius, W. Scope of Total Architecture. New York: Collier Books, 1962. Print.

McClure, W. The Built Environment : a Collaborative Inquiry into Design and Planning. 2nd ed. Hoboken: John Wiley & Sons, 2007. Print.

Rudofsky, B. Architecture Without Architects. Hartford, CN: Connecticut Printers, Inc., 1964. Print.

Non-Print

"Face Mounted Tiles." DIRTT Environmental Solutions. N.p., n.d. Web. <http://www.dirtt.net/public/products/wallsFaceTiled.php>.

"Center Mounted Tiles." DIRTT Environmental Solutions. N.p., n.d. Web. <http://www.dirtt.net/public/products/wallsGlassCenterMount.php>.

"Extruded Aluminum Tubing." Argyle Industries Inc.. N.p., n.d. Web. <http://www.argylein.com/srch_tubing.html>.

McMaster-Carr. N.p., n.d. Web. <http://www.mcmaster.com/#>.

"How to FlatPak." FlatPak. N.p., n.d. Web. <http://www.flatpakhouse.com/>.

"Ball Bearings Online Catalog." QBC Bearings Data Base. N.p., n.d. Web. <http://www.qbcbearings.com/RFQ/Default.asp?Page=B610Main.htm&gclid=COOE7tShpKcCFQ915QodyXoUEA>.

"Building "pressurized" walls." HomeKB. N.p., n.d. Web. <http://www.homekb.com/Uwe/Forum.aspx/construction/8306/Building-pressurized-walls>.