

Arch 684: Competitions Essay Component
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Precedence and the Single Family Home:



(Image from the Big Ideas for Small Lots Competition Submission)

A Call for Change:

“Essentially, it might be said there is but one archetypal mythic hero whose life has been replicated in many lands by many, many people. A legendary hero is usually the founder of something—the founder of a new age, the founder of a new religion, the founder of a new city, the founder of a new way of life. In order to found something new one has to leave the old and go in quest of the seed idea, a germinal idea that will have the potentiality of bringing forth that new thing.”¹ —Joseph Campbell

I believe the typology of the dwelling unit is in essence a representation in the purest form of what a culture values most. In the case of the city of Portland Oregon, the typical dwelling unit represents a culture that places great value on the automobile and less value on the environment the home inhabits. The most common residential streetscape in Portland is composed of large 5000 square foot lots littered with blank facades composed of driveways and garages. The construction and materials used to build these houses are based on outdated, uncreative, conventional methods, and the planning of these homes, as the city grows, imposes on outlying open green spaces and agricultural land. With the emergence of environmental awareness and a realization of the benefit of the ‘design’ of pleasant living environments, a call for change has been made. This call for change emerges from the heroic actions of a small group of individuals who have taken it upon themselves to show the people of Portland that there is a better way to live and to treat the environment we live in. The ‘seed idea’ is planted at many scales; beginning with the introduction of new planning laws, an emphasis on alternative modes of transportation, and a call for; innovative design, environmentally sensitive design, and pedestrian friendly design. The ‘Archetypal hero’ in this story, is a new generation of the single family house, and its introduction to the people of Portland will show them that there are alternatives to their conventional lifestyle.

Based on the programme of the Living Smart competition, there is a vision for an alternative way of living. One that focuses on walk able and pedestrian friendly neighbourhoods, affordable in-fill entry level homes, and a focus on neighbourhoods served by an array of transit options. In their program they state, “While the delineation of a regional Urban Growth Boundary protects outlying open spaces and agricultural lands, this visionary approach to regional planning requires advocacy for in-fill housing development in the urban core and existing neighbourhoods.” Furthermore they state that, “After Careful consideration of public opposition, the Portland City council reaffirmed its commitment to the regions urban growth boundary by supporting narrow-lot, in-fill development”². While there is general public resistance to this proposition, this action has allowed for the introduction of a new building type which will serve as a precedent for future homes within the city of Portland.

One of the most notable historical examples of the use of design to introduce a new precedent is the early work of Frank Lloyd Wright in association with his mentor Louis Sullivan. Their inspiration was based on what they called, “the transformation of industrial technique through art...Sullivan and Wright resorted in their search for an appropriate style in which to embody a New World.”³ During the evolution of his work, Wright wrestled with many influences such as the work of his master Louis Sullivan, Japanese and European Architecture. From these influences the Prairie style home came into being; “Its elements were now established: an open ground-plan contained within a horizontal format comprising low-pitched roofs and low bounding walls – the low profile being integrated deliberately into the site, in a strong contrast to the vertical chimneys and internal double height volumes.”⁴ Wright felt that his work and portfolio could make a difference. “His goal, like that of many of his contemporaries, was the achievement of a total environment, embracing and affecting the whole of society.”⁵ After many of his works were published, including the works issued by Wasmuth in Berlin in 1910 and 1911, his work was very influential and available to places as far as Europe.

Although Wright's design values embodied in his buildings did become precedents for a new lifestyle, the role of the architect in the residential industry over the following decades to the present has unfortunately slowly declined. The function of good design has become secondary and a new set of values have taken precedent; namely the economics of construction. As a consequence, this has allowed for the introduction of the developer as the main player in the residential industry, and has given the architect of today a minimal role in this very important industry.

The Value of Design:

The role of design is crucial to effectively integrating new forms of the house typology into an existing fabric. Unfortunately, history has shown us that in North America, there is a weak mentality towards design in the residential industry. According to John Brown, "The single-family residential construction industry is a major force in the North American economy, but architects have historically played only a very small role in this very significant sector of the built environment."⁶ He believes that in order for the architect to become an important player in this industry we must re-evaluate, "its traditional role and methods of practice and develop innovative strategies for working within the overpowering normative conditions of production within the industries."⁷ It is argued that since the early 20th century, architects have largely abandoned the single family housing industry handing over the responsibility to planners, builders and developers. Edward Ford believes that the "many attempts to reverse this trend did not succeed because they [architects] focussed too narrowly on issues primarily of interest to architects, such as new materials and technological innovations, without accounting for the entrenched production processes that actually define the industry."⁸ I feel that this statement is well-founded. Generally speaking, unless the client is well off and desires custom design, architects have the tendency to ignore economic factors. In order for the architect to heed the

call for change, and successfully contribute to the design value of the residential industry, they must learn to integrate cost effectiveness into their design values.

The city of Portland has decided to take a different approach in involving the architect. The introduction of a design competition is a very potent way of accumulating ideas, towards the cause of alternative lifestyles. The design values within the program for this competition include many layers of issues that must be considered by the architect including; placing non-automobile and transit modes above the automobile, helping to create an excellent pedestrian environment, creating highly live able and walk able neighbourhoods, creative designs for interior spaces and areas that transition from public to private, and encouragement for the use of sustainable development practices and building techniques such as mass customization. Based on these parameters, the goal of this competition is to compile a portfolio of alternative designs. These designs are the departure point, showing the people of Portland what the architect has to offer to the residential building industry and how these new ideas can successfully be introduced into their daily lives.

My Contribution to the Portfolio:

See Cover page for reference image

My contribution to this design competition is in the form of a narrow-lot house, which is on a 100 foot by 25 foot lot, with a maximum building width of 15 feet. The design challenges for this house are two-fold; the first is to maximize the use of the space given in the program, and the second to fulfill the design values of the Better Living Program. With the help of several precedents of existing buildings, I have been able to follow the design values prescribed, and in addition to this I have also paid close attention to the economical factors involved in the construction of the home.

In order to better explain my design, I have broken down the design principles into three considerations; Architectonic, Environmental and Human. This method is based on the “triad of environmental, architectonic and human considerations,”⁹ found in Mary Guzowski’s, *Daylighting for Sustainable Design*. She believes that all three concepts must be woven together in order to include poetic and experiential implications when working with sustainable design. I will begin with the first consideration, Architectonics.

Architectonics:

The part of this house is a long and narrow rectangular box held up by columns and covered by a pitched roof. On a conceptual level the house is separated into four components; beginning with the threshold on the ground level, followed by the structure, the container and finally the roof. The area below the rectangular box serves as the threshold, where pedestrians and automobiles enter from the public street. The structure visually defines this threshold and also supports the container above which in turn serves as the inhabited space and sanctuary for the family. The roof completes the enclosure of the container protecting the interior from the elements above. The inspirations behind the form of this house include; the Soivio Bridge by Jukka Siren (fig.1), the Summer Residence by Henning Larsen Tegestue (fig. 2), the Moosmann-Hammerle House by Herman Kaufmann (fig. 3), and the Bridge House by James Cutler (fig. 4), and the Clare Residence (fig.5). These five precedents are examples of maximizing the use of limited and narrow spaces, and minimizing the impact of the buildings footprint on the site.



Fig 1: Soivio Bridge



Fig 2: Summer Residence and Gallery



Fig 3: The Moosman House

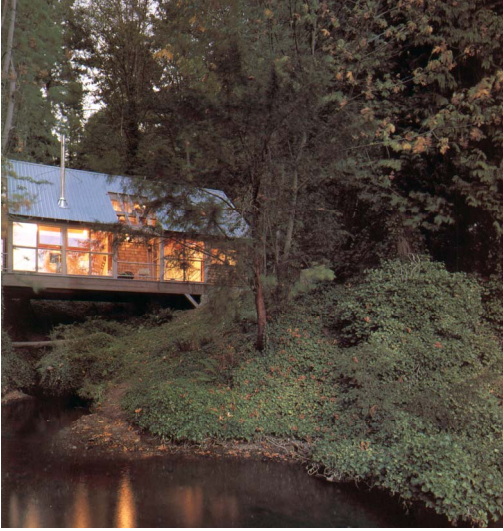


Fig 4: The Bridge House



Fig 5: The Clare Residence

The primary structure of this house is made from engineered heavy timber framing, and the secondary structure is primarily standard timber framing. In addition to the heavy timber columns supporting the inhabited container, the garage walls also serve as bearing walls in the absence of the columns. With regards to detailing, I wanted to take advantage of situations where there are connections between two different materials. One of the most beautiful and notable examples of this can be seen in James Cutlers' Bridge House. Note his detailing skill where he connects the wood beam with the stone bearing wall (fig. 6) aesthetically it is very pleasing to both architects and non-architects alike. Another example of his detail design skill can be seen in James Cutlers' Guest

House. In this instance a wood column connects to a stone on the ground (fig. 7). Based on Cutlers style of detailing these connections, I have decided to follow his example in the detailing of the Portland house. Although this type of detailing is an additional cost, I believe it to be necessary to my design as these connections will be seen by the public and the occupants of the home. In contrast, the other precedents I have shown take less care with regards to this type of detailing, because in most cases the areas below are inhabited by a river or plant life as opposed to human beings.



Fig 6: Detail from James Cutlers Bridge House.



Fig 7: Detail from James Cutlers Guest House.

The container of the house, which is occupied by the single family, is composed of the heavy timber frame wrapped with an exterior skin. This skin is a rain screen wall assembly with wood cladding. The main precedents for my approach of using a long rectangular wooden box are the Moosman House and the Summer Residence. In the case of the Summer Residence, the purpose of creating such an enclosed space is to control the light which enters as a result of the houses secondary use as a Gallery. As for the Moosman house, the idea was to work with the houses close proximity to the unit next door. In my case, I wanted the Portland house to read spatially as one continuous gesture, within the box and also outside the house.

With regards to the open ends of the container, the goal was to make a spatial connection with the inside and outside of the house. The placement of the glass partitions allowed for balconies on both ends of the house. These balconies are similar to those of the Moosman House (fig. 3) and Summer Residence (fig. 2). The images of both precedents show a good impression of how effective this spatial connection is.

The Roof of the house, which shelters the long rectangular wooden box, is peaked and has asphalt shingle cladding. The roof is supported by the main structure of the wooden box, and is horizontally braced by the beams within the box. In contrast to the Moosman house and the Summer Residence, the addition of a peaked roof to the Portland house adds a more open spatial quality to the interior and a more interesting façade on the exterior. The main inspiration behind the form of this roof was James Cutlers Bridge House (fig. 4). Aside from the obvious function of drainage, this roof also gives a more appropriate scale to the building when compared to the Moosman and Summer Residence. This scale is crucial to the context of a more dense residential area versus the natural landscape the precedents are located in.

Environmental Considerations:

“Sustainable design is ecological design with our responsibility to the future made apparent. The definition of the word sustainable is to ‘keep in existence, prolong, and maintain.’ When the word sustainable is combined with the word design, a dimension of time and its future implications are overlaid on the making of the built environment. We can longer view architecture as disposable or something that can be thrown away as though it has little material, cultural, or emotional value. We have a responsibility to keep, maintain, and nurture environments through time.”¹⁰ In the words of Mary Guzowski, we see that the architects’ job does not end once the building is built. The architect has a responsibility of considering how the building he or she designs will function over time. Many considerations come into play; how does the building interact with the environment, how is the building contributing to the future generations, how long will it be there, does it take advantage of free and renewable sources of energy, are the materials it is made from reusable once the building is demolished, and does the building provide a healthy and comfortable environment for the family living in it? These are questions that all architects should consider when designing a building, as opposed to focusing primarily on abstract architectonic and conceptual factors.

The design of the Portland house was not only driven by abstract and conceptual forms, it was influenced by many environmental factors and devices as well. These factors and devices include; efficiency of floor area use, how light penetrates the building, and how air moves through it. This is where the design of this house becomes a new precedent for the city of Portland, a new model focussing on environmental issues and more sustainable construction practices.

In the case of the Portland project, one of my goals was to maximize the use of the floor area using the minimal allotted space. This factor of efficiency is derived from the limits found in the competitions program requirements and also

from my own personal belief that we as architects must maximize the use of materials we use in our designs, and reduce any materials that serve no purpose. With respect to the floor layout of the building, I followed the philosophy of Alejandro Bahamon, writer of the book *Mini House* from which two precedents are found, the Soivio Bridge, and the Summer Residence. His belief is that the first step to designing a mini house is to establish the basic functions of the house, especially the ones most important to the client.¹¹ The purpose of this is to simplify the task of laying out the floor as much as possible. The next step is to see if it is possible to use mechanisms or components that serve two or more functions at the same time. He goes on to state that, “from a formal standpoint, the minimal house must be based on a very rational plan. Pure shapes, generally orthogonal, adapt best, since they optimize the use of space. Inside, divisions created by walls are avoided to the maximum possible extent.”¹² Alejandro asserts that walls make spaces seem smaller, so as an alternative; single, open, continuous spaces are more desirable as a result of their ability to accommodate more functions.

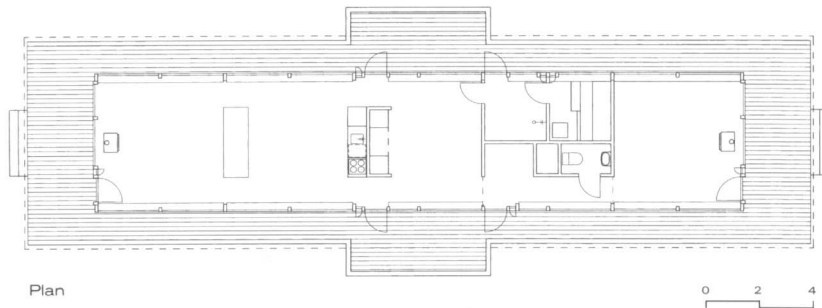


Fig 8: Soivio Bridge Floor Plan

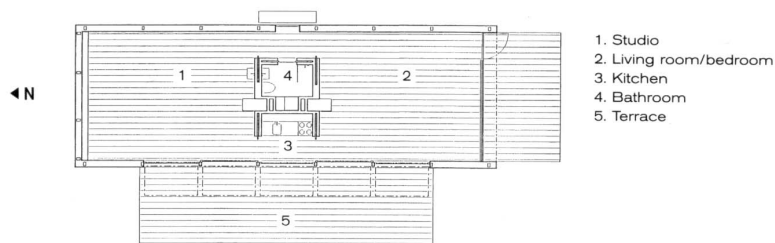


Fig 9: Summer Residence Floor Plan

The layout for the Portland house is inspired by the Soivio Bridge (fig. 8 & 11), and the Summer Residence (fig. 9). In both cases, the plans are very simple, and follow the design intent of Bahamon as noted previously. Note that the plans are composed of one continuous space, in the form of a pure rectangular shape. These spaces are divided at the middle of the structure using smaller rooms found in the program. This creates a sense of separation within the larger space, giving definition to the larger functions of the home. In a sense the secondary rooms become the partitions, giving them dual purposes as functional enclosed rooms and visual separations from one space to the next. In order to maintain the continuity of the space found in both precedents, the partitions from which the smaller spaces are composed of are substantially lower than the ceiling of the structure. This gives a sense of openness and continuity to the larger spaces. In the case of the Portland house, the secondary spaces; the bedroom, washroom and kitchen, serve as the spatial separators and the larger spaces defined by these separators are the master bedroom, dining room and room living.



Fig 10: Summer House screens



Fig 11: Soivio Bridge interior

Another Environmental consideration for the Portland house was the use of natural lighting as a free form of energy. My strategy was to use architectural devices which control the quality and intensity of light entering the building. These devices include; clerestory skylights, window walls, punched windows, screens and overhangs. The precedents which inspired me to use these devices are the Summer Residence (fig. 2) and the Clare House (fig. 5). In the case of the Summer Residence screens and overhangs are used to control the amount

of light entering the studio spaces (fig. 10). In the case of the Clare House, its main focus is on flexibility of layout and maximizing the use of natural lighting. As a result the house makes use of clerestories as an alternative to windows, since windows tend to compromise the placement of partitions. My strategy for the Portland house was to strategically allow as much sunlight as possible into the long and narrow container without compromising the comfort of the family within. The design approach was to use a variety of architectural devices to achieve this goal. The first example is the use of clerestories to illuminate the living spaces and master bedroom. Another example is the use of large window walls at both ends of the container, and in the middle of the rectangular box where the dining area is located. In the case of the Master Bedrooms window wall, the northern light which enters the room is indirect, thus making it more comfortable for the occupants. The direct southern light entering the living room is shaded by the large overhang of the roof and the extended walls off the balcony, allowing for ambient light to enter the living room. The dining room which should be the darkest part of the interior volume is illuminated with large window walls; the eastern and western light in that situation are controlled by interior wooden screens similar to those found in the Summer House (fig. 10).

The final environmental consideration for the Portland house is the use of natural ventilation to passively cool the house and provide natural ventilation. The inspiration behind this design consideration is the C.K. Choi institute of Asian research. This building contains a series of two storey atria. "Natural ventilation is facilitated by the stack effect, which draws air from operable windows and fresh-air vents on the lower level of the second floor to be exhausted through the outlets at the top of the atria."¹³ (fig.12) The Portland house uses a simple form of the stack effect, based on operable windows on the lower level and operable clerestories up above (fig.13). The inside of the building is heated with sunlight during the day and radiant floor heating at night. The difference in pressure created by the heat within the tall space allows for the stack effect to take place and force the air to move through the house. Similarly to quality of light entering

the building, the quality of air is also a very important factor to the comfort of the people inhabiting the house. This is a good opportunity to move on to the next design topic for the Portland house, human considerations.

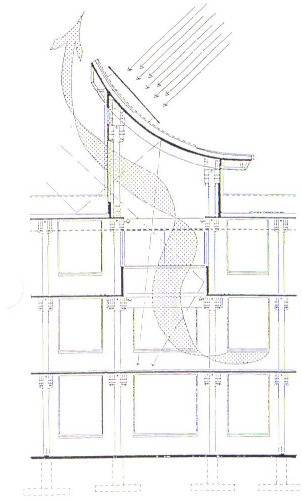


Fig 12: C.K. Choi Institute Stack effect diagram

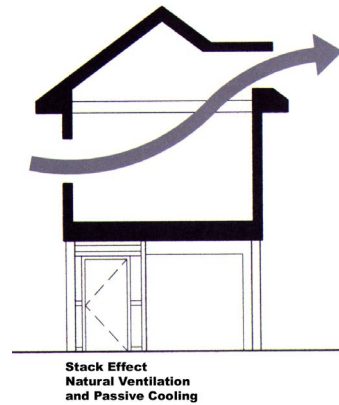


Fig 13: Portland House Stack effect diagram

Human Considerations:

Human consideration is a very complex aspect of design. It is based on multiple variables, many of which have already been discussed in this essay. The purpose of this section is to show how the environmental and architectonic aspects of this house relate to human perception within the context of Portland's residential streetscape. The environmental aspects which will be discussed are based on human comfort, with respects to the quality of light entering the building and also the quality of air and its temperature. As for the Architectonic characteristics of the house, the movement from private to public spaces will be discussed. In addition to the architectonic and environmental aspects of the design of the Portland house, other variables must be brought to attention. These include; the benefits of pedestrian friendly streetscapes versus streetscapes dominated by the presence of the automobile, the cost effectiveness of the home being built, and the evolution of the family and the building they inhabit over time

The quality of light and air within a building plays an important role with respect to human experience, comfort, and health. Most families spend nearly half their lives in their homes, so it is important to ensure a comfortable and healthy environment within it. Although this is a given, many buildings do not take these factors into considerations especially in the residential industry. Research has been done on the psychological and physical conditions of the human body as it interacts with natural and built environments, and many disorders have been discovered as a result of poorly designed buildings. These disorders include SAD, BRI and SBS.¹⁴

Being aware of these issues, my design approach for the Portland house is to maximize the quality of light and air entering the building in order to create a more comfortable and healthy living environment. I paid close attention to the placement of all architectural devices, which control the entry of light and the movement of air within the building. During the day the living spaces are well lit, and the large open areas allow for air movement. There is also a certain level of comfort with the openness of the living spaces, as opposed to the claustrophobic spaces created in the typical suburban homes of today.

This brings us to the next aspect of the home, the architectonics of the building and how they relate to the transition from public to private. In our culture the house is considered a very private place, a sanctuary for the family that inhabits the space. The challenge in designing the Portland house is maintaining the sanctified space of the family and also satisfying the requirements in the Better Living program of having a connection with the neighbours and community from within the home. My solution to this can be found in the organization of the architectonic elements of the home.

The first element is the most public, namely the sidewalk and street. These spaces are considered to be infrastructure, occupied by pedestrians and

vehicles. The element immediately off of the street is the threshold, which is considered to be semi-public. Traditionally only guests of the home may enter this space. As described previously, the threshold space is defined by the structure of columns supporting the rectangular box up above. This clear vertical separation from the first storey to the second separates the public spaces from the private family spaces. The only physical connection from the semi public threshold to the private second storey is the set of stairs enclosed by a glass box. The glass box represents two worlds, the privacy of an enclosure physically, and the openness of glass visually.

The second level is composed of the continuous space enclosed by the long rectangular container. This container is considered to be the sanctuary for the family, and is completely private. The container is subdivided into public and private spaces within the family starting with the living room off of the south end of the house where the street is located. Since the living room is a more public space within the house, I decided to use it as the mediator between the inside and outside of the container, in conjunction with the balcony off of the street. This gradation serves as a visual connection between the community and the family. If the family desires to socially interact with the neighbours, they can open part of the window wall separating the balcony and living room, thus visually extending their private space into the public street outside. As we move towards the dining space and kitchen the plan of the building becomes more private and enclosed. The most private spaces are found at the north end of the building, they are the bedrooms. These spaces are considered to be the most personal spaces on an individual level, even within the family. The Master Bedroom has the option of connecting to the backyard off of a balcony. This is similar to the relationship between the street and the living room but on a more private level. As a whole, the large rectangular box which is the sanctuary of the family unites the public spaces with the private spaces and gives the family living within the best of both worlds.

In addition to the well-being and privacy of the family, there is also a responsibility for the house to send a message to the people living within the community. As discussed in the Living Smart Competition brief, it is important to minimize the presence of the automobile on the streetscape, and to create more pedestrian friendly streetscape. This mode of thinking promotes a healthier social environment and makes a statement that we must change our view on the role of the automobile in our lives. Essentially the main goal is to promote other modes of transportation by deemphasizing the automobile as the most common form of transportation. In the Portland house my approach to taking emphasis away from the presence of the automobile was to move the garage back away from the front entrance. The challenge was to work with the rigid setbacks imposed in the program and still maintain access for the automobile to enter the garage. As a replacement, the dominating feature of the houses façade is the front entrance in the form of a glass box during the day and a glowing lamp at night. This gives more value to the pedestrian experience when walking along the street.

Another very important consideration for the family unit is the cost effectiveness of the home, in addition to good design. This anticipates a solution to John Browns concern that architects are not major players in the residential industry due to the lack of understanding the economics of the construction industry. My solution to this problem is also stated in the Living Smart Brief; to provide a cost effective alternative to the typical developer built home. My approach to cost effective design is embodied in the simplicity of the shape of the house and the repetitive structural elements. This makes the construction process much easier and allows for mass production of the primary components. Another aspect I considered was the high cost of excavation. This bridge style house minimizes the impact of excavation which ultimately minimizes the expense of excavation vehicles and ground work.

The final human consideration being addressed is the need for the flexibility of mass customization. Families evolve over time along with their homes. According to David Owens “Every house is a work in progress...it begins in the imaginations of the people who build it and is gradually transformed, for better and for worse, by the people who occupy it down through the years, decades, centuries. To tinker with a house is to commune with the people who have lived in it before and to leave messages for those who will in it later. Every house is a living museum of habitation, and a monument to all lives and aspirations that have flickered within it.”¹⁵ This is yet another issue considered in the Living Smart Brief where future flexibility is important. Many of the precedents I have used in the design of the Portland house are designed as very open and flexible spaces. This ensures that the occupants of the home can change arrangements over time.

To conclude this paper, I would like restate the importance of the typology of the house with regards to its representation of the family unit. By evaluating the dwelling unit of a family, we evaluate their beliefs as individuals and as community as well. Every so often there comes a time for re-evaluation of these values and beliefs. In order for this to take place, a small group of heroic individuals with new ideas must come forward and guide the way. This is the goal of the Living Smart Design Competition, a call for an improved, environmentally and socially sensitive lifestyle, propelled by the creativity of artists and designers. In essence I believe that just as Frank Lloyd Wrights Prairie Style home became the new representation of change in values at the turn of the century, so will the newly designed dwelling units found in the Living Smart Design Competition. In essence, the archetypal hero of this story is that of the dwelling unit, embodying in its form a new way of thinking, becoming a precedent for the next generation of our evolving society.

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- ⁴ Frampton, Kenneth. "Modern Architecture: A Critical History Third Edition" New York: Thames and Hudson, 1995 p. 57
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- ⁷ Canadian Architect, October 2002, "The Architect and the Single Family House John Brown p.24
- ⁸ Canadian Architect, October 2002, "The Architect and the Single Family House John Brown p.24
- ⁹ Guzowski, Mary. "Daylighting for Sustainable Design" New York: McGraw Hill 1999 p.xxvi *Introduction*
- ¹⁰ Guzowski, Mary. "Daylighting for Sustainable Design" New York: McGraw Hill 1999 p.xxiv *Introduction*
- ¹¹ Bahamon, Alejandro. "Mini House" New York: Harper Collins Publishers p. 7
- ¹² Bahamon, Alejandro. "Mini House" New York: Harper Collins Publishers p. 7
- ¹³ Guzowski, Mary. "Daylighting for Sustainable Design" New York: McGraw Hill 1999 p.96
- ¹⁴ Guzowski, Mary. "Daylighting for Sustainable Design" New York: McGraw Hill 1999 p.291
- ¹⁵ Guzowski, Mary. "Daylighting for Sustainable Design" New York: McGraw Hill 1999 p.165

Images:

Fig 1: Bahamon, Alejandro. "Mini House"
New York: Harper Collins Publishers p. 76

Fig 2: Bahamon, Alejandro. "Mini House"
New York: Harper Collins Publishers p. 72

Fig 3: Bahamon, Alejandro. "Mini House"
New York: Harper Collins Publishers p. 30

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- Fig 4: Rockport Publishers. "James Cutler"
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- Fig 5: Guzowski, Mary. "Daylighting for Sustainable Design"
New York: McGraw Hill 1999 p.162
- Fig 6: Rockport Publishers. "James Cutler"
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- Fig 10: Bahamon, Alejandro. "Mini House"
New York: Harper Collins Publishers p. 74/75
- Fig 11: Bahamon, Alejandro. "Mini House"
New York: Harper Collins Publishers p. 80
- Fig 12: Guzowski, Mary. "Daylighting for Sustainable Design"
New York: McGraw Hill 1999 p.97
- Fig 13: "Big Ideas for Small Lots" Competition Submission