

## **The Millennium Dream Home – *combining quality of life and quality of surroundings***

The applied combination of beauty and function has long been the standard of interior design. A necessity when considering residential design, the parameters of function continue to expand and challenge the performance criteria of contemporary design solutions. In addition to the many practicalities such as spatial adjacencies, storage solutions, entertainment value and privacy the ideal home for this millennium must be progressive in defining programmatic requirements. That means addressing paradigms such as sustainability and inclusiveness, exploring the changing societal norms that address family structure and an aging population that desires to age in place. The Millennium Dream Home is an inspired space seeking luxury solutions for a practical outcome.

The American culture values freedom and independence and this is epitomized and evidenced in the American Dream: - ownership of the single family home. As the United States was recovering from the depression and welcoming the return of war veterans in the mid 1940's, a long-term program for economic recovery was intertwined with planned communities and suburban home ownership. (Whitaker 1996) The results are evidenced in the American residential landscape and the homes were designed to meet the perceived requirements of the era. According to Witold Rybczynski, the ideal home needs "a sense of domesticity....a feeling of privacy....and atmosphere of coziness...." These were addressed together with efficiency in building practices and affordability to the public.

Today's ideal home must address an expanded set of requirements that define the new comfort zone. Universal design is not just a way to design, but also a way of thinking. In the 1970's, people with disabilities began to challenge societal barriers that were creating an environment of exclusion. Parents of children with disabilities spoke out against segregation and began to advocate for their rights. The independent living movement was established and led to legislation such as the Americans with Disabilities Act (ADA) for commercial buildings and public spaces. (Mayerson 1992) In the 1990's a standard for design was set by a group of experts assembled by the Center for Universal Design. They drafted the seven "Principles of Universal Design" which include equitable use, flexibility, intuitiveness, perception, tolerance for error, ease and spatial requirements.

In the case of designing the home for the future, a study of domestic design philosophy and practice that has influenced innovation requires attention. At any point in time, which includes the future as well, the domicile can be understood as the metaphor of that society. (Cromley 1995) In order to determine a divergent path for domestic design and an understanding of factors that would define the basis for aesthetic judgment, an understanding of development over time and historical and cultural context must be explored as a significant component of the design process and a precursor to true innovation. Consideration must be given to the mitigating factors that inspired change and the consequent effects on women, family and community. One must understand why the current condition exists and the impact of contemporary cultural and societal norms in order to envision the design of the future.

## **Domesticity in historical perspective**

The aesthetics and spatial organization of American homes was influenced by women of financial means and social status. Between 1900 and 1925 the American home firmly established gender-specific spaces. (Spain 1992) Billiard rooms for recreation and libraries as symbols of knowledge were male environments with morning rooms, kitchens and boudoirs defined as women's spaces. Influential women such as Emily Post were avid supporters of reinforcing the traditional family through symbolic imagery and literal organization. (Post 1933) This translated into masculine and feminine stereotyping through home decoration.

Healthy interior spaces as a precursor to principles of 'green' design was heavily influenced by a response to the health concerns that arose from the Industrial Revolution. A response to the health and welfare of the public gave rise to the concern for quality indoor air and proper ventilation during the Victorian era. Greenhouses and indoor plants as well as outdoor sleeping berths were design features of this time period. The Industrial Revolution had given rise to discomforts from smells and led to illness and epidemics brought on by mitigating environmental conditions. A comparison can be made to current concern regarding volatile organic compounds (VOC), building related disease (BRD) and sick building syndrome (SBS) and the health and economic impact.

Design efficiencies, ergonomics and sustainability were topics of concern for domestic feminist ideology led by Catherine Beecher and others in the late 19<sup>th</sup> and early 20<sup>th</sup> century, which supported female supremacy in the home. (Weisman 1992) Many of their design solutions were incorporated into residential construction and continue to impact current design decisions. Environmentally sensitive design, ergonomics and the feminist perspective relative to architecture and design, possess a natural affinity that when optimized result in residential design which more effectively meets the needs of today's types of families. Beecher's technological innovations and comprehensive spatial designs are well documented and were intended to reduce the hours of domestic work while raising domestic standards.

### **Learning from the Early Feminists**

In 1869, Catherine Beecher, together with Harriet Beecher Stowe, wrote The American Woman's Home, emphasizing simplified interior elements and streamlined kitchens. Evidence of green design and ergonomics are testimony to the progressiveness of the early feminists. The two paradigms, user-friendliness and earth-friendliness were already being combined to improve the human condition. Beecher's strategies included the health and well being of the family as well as the ergonomics of expediting domestic duties. Features of the kitchen included a single surface workspace, and significant mechanical equipment at the core of the house. Inventions proliferated to provide the most advanced technology for the servant-less woman. Beecher endeavored to specify domestic design improvements that had been unaddressed by the architects of the day. "There is no point of domestic economy, which more seriously involved the health and daily comfort of American women, than the proper construction of houses". (Beecher 1896)

The lessons from the past firmly place creativity and innovation together with sustainability and functionality into a contextual framework for the students that directs them to begin their own explorations. Universal design as the next level of required performance criteria is readily understood. Improving the range of capabilities for people with limited abilities (Joines 2009) was expanded to include the full range of age requirements from the very young to the very old, as well as a broader range of disabilities including the temporary as well as the degenerative and permanent and extending beyond issues of physical mobility. Not lost on the

students was the financial burden of care for elderly, both to the individual as well as the state and the impact design can have to address this condition. (Rosenfeld 2008)

There was a second wave of feminist activity in the 20<sup>th</sup> century. Domestic design once again had a role in defining the societal shifts in the 1960's and 1970's. The contemporary women of that day challenged the gender specific domestic burden, but faced difficulties in identifying a design solution. However, a strongly held belief that egalitarianism within the household division of labor continued as a commonly identified goal. Dolores Hayden's movement called the 'domestic feminists', accepted the female domestic role but were committed to designing the model private kitchen and redeeming woman's profession from dishonor.

In response to social and cultural conditions, architect Rudolph Schindler attempted to direct design to address egalitarianism and inclusiveness in the home with a cooperative dwelling he designed and built in California for his wife Pauline and their friends, Clyde and Marion Chase. The hope was to establish a prototypical dwelling for modern adult life that offered several individual workspaces, two shared sleeping spaces for couples and a shared domestic workplace. His definition of cooperative dwelling translated into design that provided a private studio space for each individual as the background for their lives. (Curtis 1996) A significant flaw to Schindler's design was failure to understand the problems of domestic cooperation in practice. With one kitchen to share between the two families, the intent was that only the wives would take turns cooking and performing household tasks, and the women's private spaces were designed with direct adjacencies and access to the kitchen. Nonetheless, this provides a learning moment for students in re-thinking the ideal for domesticity.

The contemporary feminist perspective can be defined by a multitude of factors but foremost by freedom and equality. Domestic liberation achieved by the egalitarian division of labor within the family, regardless of family form, can be articulated architecturally and through design to promote gender neutrality and inclusiveness, and has a natural affinity with the principles and pragmatics of universal design. The safety, health and sustenance of the family have traditionally been associated with the female and as such are also included within the feminist perspective, but can be gender neutral today. By addressing these issues through design the house can take on a level of responsibility associated with each of these concerns and reduce the domestic parenting burden. Within the realms of family dynamics, respect for the individual and acceptance of diversity and change is a means of demonstrating egalitarianism. The architectural articulation of private, social/public and family space, incorporating concepts of flexibility and adaptability is a means of creating design as a metaphor for equality. To adopt these ideas in residential design is to align with universal and sustainable design and address past perspectives to create the ideal home for the millennium.

### **The Studio Project Statement**

Students were challenged to reject a design of inequality and exclusion and embrace the creation of an effective transformation that would result in a satisfying, environmentally friendly domicile for people of all abilities, particularly addressing requirements across a range of ages and capabilities. The search for solutions would lead to an exploration of design implications of appropriate housing for an ever increasing, aging population. Design solutions were required to reflect creativity and an innovative approach.

Students worked collaboratively to gather and share information, learning from research and documentation as well as case studies and design applications from architects and interior designers. Topics of specific study ranged from an exploration of kitchen and bathroom

performance criteria, vertical circulation, color theory, design impact on healing and wellness and the principles of aesthetics. Students will become familiar with the reactive response that is gaining in direct proportion to the size of the aging population, which continues the classification and segregation of dwelling types. This will be challenged by a proactive strategy which builds on the positive lessons from past design innovators and uses the paradigm of universal design to create an ideal home for a general population without segregation or discrimination.

The studio teaching and learning environment uses a popular project management system in the form of a closed Wiki. The Wiki is a communication tool as well as a collaborative platform. Faculty serve as administrators and students are writers who can upload documents, write messages, post notices, access information, link to web pages, video sites and post pictures. It serves our student population well, since our course management system does not allow students to upload documents and the Wiki can be accessed anywhere the internet connection is available.

### **Concept development**

“Development of ideas in the early stage of the design process is critical to the final success of a design idea. Designers must be adept at both visual and verbal reasoning in order to convey a creative concept for a design...” Kathleen Ryan, ASID, Washington State University

An integral component of the project was to combine the aesthetics of the project with the physical requirements. The premise of the ideal home was to implicitly incorporate the functionality of universal design while explicitly focusing on quality of aesthetics and substance of style. Concept development was seen as integral to the overall success of the project. Fine art was accepted as the basis for the development of the concept, with the intent to emphasize the implicitness of universal design. The Albright Knox Art Gallery is dedicated to enhancing the understanding of contemporary and modern art. It is a renowned gallery with an extensive art collection. A gallery visit was required where each individual student selected a work of art for review and analysis. Considerations included formal qualities such as physical properties; conceptual qualities that addressed the spirit of the art; and an appreciation of the historical and cultural context. Based on the analysis, students would then re-interpret their selected art piece in the glass atelier as a fused glass tile. This would form the basis of their design interpretation and influence the aesthetics of their final design.

Using art as a source of inspiration has relevance not only to the demographics of typical luxury home owners, but also to the necessity of student knowledge regarding fine art and stylistic movements of art. Engaging in a formal analysis as a component of concept development increases their ability to think critically and articulating their observations increases their ability to write clearly. Synthesizing this into a successful design proposal is evidence of mastery.

The application of design-based learning in this exercise has a history of success resulting in confidence and increased motivation on the part of the students, as well as a substantive appreciation and understanding of art analysis and critique. It is a key element in maintaining emphasis on an over-arching aesthetic vision for the final design. Students have the option of incorporating the glass tile into their design or simply reserving it as an inspiration piece. Incorporation into the final project has ranged from privacy screens in window treatments, mosaic designs for signature walls, custom knobs for drawer pulls, tiles for back splashes, and so on.

### **Example 1**

As inspiration for her project, the student used Georgia O’Keeffe’s painting, *Green Patio Door*, 1955. She then interpreted the work in fused glass to use as her concept image for the project.



Fig. 1 Student interpretation in fused glass

In exploring the imagery and meaning of the painting by American artist Georgia O’Keeffe, the student gravitated to the significance of ‘passageways’ as the connectors of space and the relevance to universal design and accessibility. She imagined a passageway as an integral component in overcoming barriers and providing the means for accessibility as well as entry. By manipulating passageways she could affect the use, feel, and impression of a space. The painting provided her with a color palette for her design as well as a driving force for a variety of spatial conditions that revolved around courtyards, both traditional exterior courtyards as well as inspired interior courtyards. The interior courtyard was a flexible space with multiple uses that varied over time based on age and occupants.

The exterior courtyards and their accessibility have a direct relationship to historical precedent leading back to the Victorian era and relating to health and healing. Current research in healthcare design has linked a connection with the outdoors and an improved rate of healing. This is an example of a student working with the complexities of the study project and making the appropriate connections to create functional, innovative, and beautiful environments to promote quality of life and quality of surroundings.

An aesthetically pleasing color palette was inspired by the art work as well. While addressing the psychology of color as well as the principles of color theory the student was able to create interior environments that addressed a contemporary stylistic movement and incorporated the elements of comfort and relaxation as appropriate for a residential environment.

### **Example 2**

The second student selected a bold, geometric piece by Kenneth Noland entitled *Yellow Half*, 1963. As part of his analysis exercise, he considered the static qualities of the original image and through a series of rotations incorporated dynamic movement into a print image and then further interpreted his own work into an opaque glass tile.

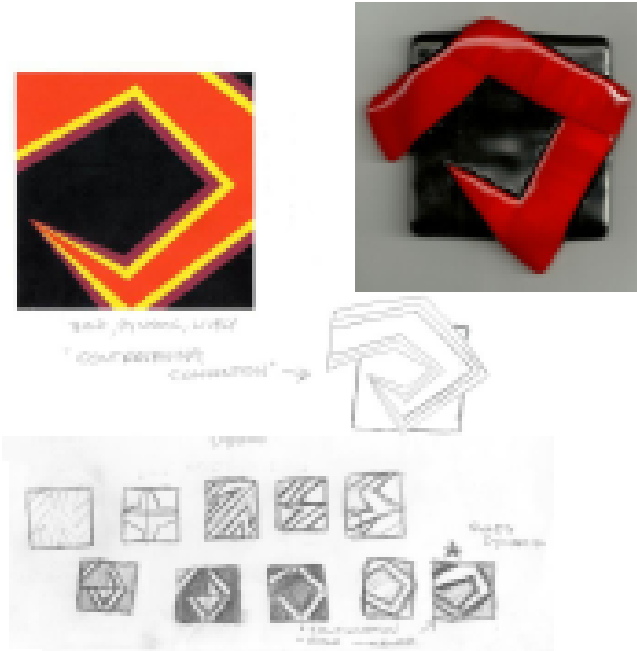


Fig. 4 Student Interpretation and Study Sketches

This student, through the analysis of the existing floor plan, concluded that “homes today are built with only one type of use in mind”. Through the interpretation of the Noland piece, the student was inspired to “break out of what is considered conventional design to meet the needs of users from all walks of life”. A series of design manipulations based on rotation and documented in Figure 7 explains the transformation from the existing floor plans to the re-designed Millennium Home.

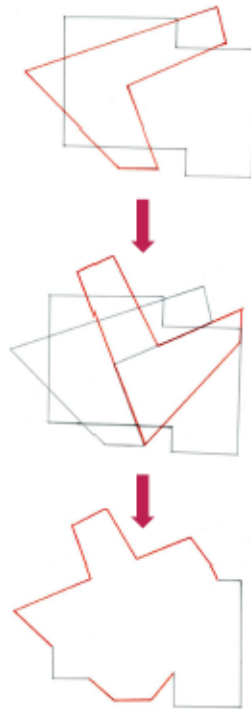


Fig. 5 Diagrammatic analysis of design development



Fig. 6 Resulting Floor Plan – First Floor



Fig. 7 Second Floor Plan

**Design strategies addressing the seven principles**

Within the project objectives a significant component was the application of the seven principles of universal design. Strategies were varied and complemented each individual concept, drawing inspiration from the art work. Creativity and innovation was encouraged and sustainability was required. In a review of the seven principles I will describe a range of the student solutions. Each year students discover new and improved strategies for improving the human condition.

1. Equitable Use. Students place a high emphasis on accessibility and egalitarianism from initial space planning, to furniture placement and including kitchen and bath design. Equitable horizontal circulation requires appropriate hallway widths, provides the ability for wheelchairs to turn around in hallways or adjacent spaces and includes appropriate doorway widths. Vertical circulation is addressed in various ways, including 12:1 ramps, elevators or space for future elevators and stair lifts. Stairways have handrails at a minimum of two heights and designed to look visually interesting. The dual height above the finished floor is of particular benefit to children.

Furniture placement allows for natural wheelchair inclusion. This means there is an open space, which is natural in the arrangement of furniture and does not infer an absence. An individual in a wheel chair can join the group and the impact on circulation or conversation is neutral.

Furniture selection includes chairs with arms. This is beneficial to individuals who need to push up on the arms to rise to an upright position.

Kitchens incorporate an aesthetically pleasing range of counter heights. This allows people in wheelchairs to easily join the group, as well as provide an appropriate work surface. It is also beneficial for children. Open lower cabinet options allow for wheelchair access. This can be achieved by cabinet fronts that can be recessed to provide appropriate spatial accommodations. Appliance selection will address both child and wheelchair access. This can be accomplished by specifying under counter drawers or side by side refrigerators, dishwasher drawers, microwave drawers and front loading washers and dryers. Bathroom design will also address under counter clearances and roll-in or curb-less showers with hand-held shower spray. Closets will have adjustable shelves and closet rods, which help children be autonomous and independent as well as a disabled adult.

Students also explore equitable access to the outdoors. In addition to flush entryways and paved patios, many student designs also provide for access to balconies from second storey bedrooms. This accommodates people with limited mobility as well as illness and can provide a means of egress.

2. Flexibility in use. Since the ideal home must address multiple ages and family stages multi-purpose space as well as re-purposed space is a desirable feature. First floor guest bedrooms can become first floor master suites. Children's bedrooms with adjacent playrooms can become suites for adult children, care providers or renters. Open plans can allow spatial definition through furniture placement and increase flexibility. Sliding and pivoting panels can open and close space providing visual and acoustical privacy.



Bathroom and kitchen fixtures are selected to accommodate a range of ability. Handrails are installed on both sides of stairways to accommodate right- or left-handed use.

3. Simple and Intuitive Use. Spatial adjacencies are considered from an intuitive perspective as well as historical context, since in many cases the historical context will be the basis for intuitive knowledge. Students also particularly focus on this principle in kitchen design and adhere to basic design principles including the work triangle.
4. Perceptible information. The use of color for way-finding is a popular strategy and students have incorporated this strategy in both horizontal and vertical surfaces. Varying floor texture to signify spatial differentiation is also well used. To aid in visual depth of field students avoid dark counters and floors. Contrasting stair treads improve visibility.

Kitchen and bath design include multiple design applications, including high contrast edges on counters and grab bars for both visibility and visual interest. Glass panels on cabinet doors allow visual identification of cabinet contents.

5. Tolerance for Error. When considering strategies to promote safety students focus on material selection, particularly with flooring and slip resistance. In bathrooms this is critical. Thick area rugs are avoided as well as other tripping hazards. Textural floor treatments at critical junctures such as stairways and steps are effective warnings. Kitchen design includes careful study of traffic patterns, to avoid general circulation through the area of the work triangle. This can avoid contact with hot ovens etc. Day lighting in all rooms is essential for sustainability and safety, in the event of power failure. In the event of interior rooms natural light can be introduced with clerestory windows, skylights, light tubes and other lighting strategies.

6. Low physical effort. Levels of fatigue will vary with age, infirmity and disability. Students incorporate seating and built in benches at strategic locations to address this principle. Entry ways have seating for ease of dressing. Hallways may have alcoves with a bench or seat for resting. Circulation paths will avoid excessive turns and sharp corners. Doorways can be offset for privacy thus limiting the use of traditional doors. Sliding doors, pocket doors, and pivoting doors are easier to manipulate. Lever handles for doors are also easier to grasp or push. Casement windows have ease of operation. Showers will include benches and faucets can be side mounted. Grab bars surrounding toilets and tubs are essential. Frequently these have an institutional appearance. Student have explored a variety of options to create artistic and aesthetically interesting grab bar solutions, which include horizontal design motifs, multiple use strategies including towel bars and shelves, color blending and pattern making for increased visibility and decreased practical application.

Kitchens have a multitude of design strategies to reduce physical effort. Placement of appliances such as ovens and microwaves next to counters will allow easy transfer of hot items. Sliding shelves below these appliances are alternatives to achieve the same result. Pot fillers at the cook-top surface as well as in-counter steamers with water drains at the cook-top are specific appliance features, of limited use, but potentially beneficial to specific cultural and individual criteria. Built-in ovens with side-hinged doors are also available and these reduce back strain for all individuals. Front-mounted controls are

beneficial for individuals with limited reach, however, care must be applied in households with children since their abilities to manipulate the dials must be controlled.

7. Size and space for approach and use. Students have a tendency to use the five foot radius as a frequent indicator of spatial accommodation, particularly in bathrooms. Although in most cases this is an adequate assessment, additional strategies are required. Hallway and doorway widths are identified early on in the design process. Front doors with moveable panel sidelights are a practical alternative to double doors. Sightlines and vistas are helpful design features as well.

Seating selection includes furniture at various heights and firmness for varied accommodations. Ergonomic fixtures and hardware are explored for all spaces, but with particular attention to kitchens and bathrooms. Details such as drawer pulls and higher toe kicks, toilet paper dispensers, light switch and outlet placements are all important details to making a home inclusive and universal.

This is a sampling of strategies that students have used in their designs. In assessing the impact on quality of life students have also discovered that the utilitarian aspects of universal design are beneficial for a broad range of ages and abilities, and provide a better way to live for all people. Many texts provide examples of institutional fixtures and practical solutions. One of the challenges that students face is the incorporation of these necessary features while addressing the need to fulfill the same aesthetic requirements as all other aspects of their design proposal.

The goal of the Millennium Dream home project is to expand the students' critical awareness of their daily environments from an historical perspective as well as an experiential perspective and explore the broad range of human abilities over a lifetime to introduce a fundamental understanding of the significance of universal design to improve people's health and welfare (Baker and Weidegreen 1996). The essence of domesticity, historically and currently, the qualities of aesthetics and an exploration of comfort are interconnected with the application of universal design. These domestic dwellers will have the ability to raise a family and adapt to life as aging empty nesters. At the conclusion students demonstrated the ability to creatively and innovatively identify spatial requirements, select finishes, furnishings and products, and design interiors that are beautiful, usable and accessible for a range of ages and abilities.

#### Reference List

- Adams, Annmarie, *Architecture in the Family Way, Doctors, Houses, and Women, 1870-1900* (Montreal and Kingston: McGill-Queen's University Press 1996).
- Allen, Polly Wynn, *Building Domestic Liberty*, (Amherst: The University of Massachusetts Press 1988)
- Beecher, Catherine E., and Harriet Beecher Stowe, *American Woman's Home or Principles of Domestic Science Being A Guide to the Formation and Maintenance of Economical, Healthful Beautiful and Christian Homes*, (Harford: Stowe-Day Foundation, 1869)
- Center for Universal Design <<http://www.ncsu.edu/project/design-projects/udi/>>
- Cowan, Ruth Schwartz, *More Work for Mother, the Ironies of Household Technology from the Open Hearth to the Microwave*, (New York: Basic Books 1983)
- Cromley, Elizabeth Collins and Carter L. Hudgins ed., *Gender, Class and Shelter, Perspectives in Vernacular Architecture*, (Knoxville, university of Tennessee Press, 1995)
- Curtis, *Modern Architecture Since 1900*, (London, Phaidon Press, 1996)
- Hayden, Dolores, *The Grand Domestic Revolution: A History of Feminist Design for American Homes, Neighborhoods, and Cities*, (Boston: The MIT Press 1981)

Joines, Sharon, "Enhancing Quality of Life Through Universal Design", *NeuroRehabilitation*, 25 (2009)

Jordan, Wendy A., *Universal Design for the Home, Great Looking, Great-Living Design for All Ages, Abilities and Circumstances*, (Beverly, Massachusetts: Quarry Books, 2008)

Lawlor, Drue, and Michael A. Thomas, *Residential Design for Aging in Place* (Hoboken, New Jersey, John Wiley & Sons Inc., 2008)

Marshall-Baker, Anna and Eric A. Weidegreen, "Developing Students' Awareness of Universal Design", *Journal of Interior Design*, 22-1 (May 1996)

Mayerson, Arlene. "The History of the ADA: A Movement Perspective." *Disability Rights Education & Defense Fund 1992* <[http://www.dredf.org/publications/ada\\_history.shtml](http://www.dredf.org/publications/ada_history.shtml) >

Mullick, Abir and Edward Steinfeld "Universal Design: What it is and isn't", *Innovation* (Spring 2009)

Post, Emily, *The Personality of a House: The Blue Book of Home Design and Decoration*, (Funk & Wagnall's, 1933)

Peterson, Mary Jo, *Universal Kitchen and Bathroom Planning, Design that Adapts to People* (New York: McGraw-Hill, 1998)

Reicis, Sandra, *Domestic Affairs*, (State University of New York at Buffalo M. Arch Thesis, 1998)

Roberts, Marion, *Living in a Man-Made World, Gender Assumptions in Modern Housing Design*, (London 1991)

Robertson, Cheryl, "Male and Female Agendas for Domestic Reform, The Middle Class Bungalow in Gendered Perspective", *Winterthur Portfolio* 26.2-3 (Summer-Autumn 1991): 123-141

Rosenfeld, Jeffrey P. and Wid Chapman, *Home Design in an Aging World*, (New York: Fairchild Books, 2008)

Rybczynski, Witold, *Home, a Short History of an Idea*, (New York: Penguin Books, 1986)

Spain, Daphne, *Gendered Spaces*, (Chapel Hill: The University of North Carolina Press, 1992)

Steinfeld, Edward, Jonathan White, Danise Levine, *Inclusive Housing: A Pattern Book: Design for Diversity and Equality*, (New York: W.W. Norton & Co. Inc, 2010)

Weisman, Leslie Kanés, *Discrimination by Design: A Feminist Critique of the Man-Made Environment* (Chicago: Urbana 1992)

Whitaker, Craig, *Architecture and the American Dream*, (New York: Clarkson N. Potter Publisher, 1996)