Net Zero Housing: The Architects’ Small House Service Bureau and Contemporary Sustainable Single-Family House Design Methods for the United States

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ABSTRACT

Perhaps, the single biggest issue facing the design professions in the United States, and interior design in particular, is consumption. According to Phil Harrison, President and CEO of Perkins + Will (2010), architects today can easily handle the challenges of sustainable materials, water, and site using known technologies. The major challenge to sustainability is to produce a zero energy use, carbon-neutral solutions. Harrison argues there is no excuse for architects and designers in the twenty-first century not to use the easily available innovative water strategies, nontoxic, renewable, and recyclable materials and apply common knowledge about how to best site a building to maximize natural daylighting, prevailing winds, and sun cycles for thermal heating and natural cooling. This paper addresses how the approach of the Architects’ Small House Service Bureau (ASHSB) to single-family houses during the early twentieth century offers a significant model for addressing some of the challenges of net zero carbon housing solutions and sustainable houses in the United States. The ASHSB incorporated in St. Paul, Minnesota, in 1919 in response to the need for affordable small houses that were also designed well. The principles upon which the ASHSB defined design excellence inform today’s need for sustainable and smaller single-family house design. Members of the ASHSB dedicated themselves to the production of small house designs that maximized materials, minimized waste, and capitalized on synergies with manufacturers and builders. The members believed in social equity, economy, and ecology—the three-part approach informing twenty-first century sustainable design, including residential design efforts. Thus, the organization and its members’ designs provide a template for how to approach this daunting issue.

Perhaps, the single biggest issue facing the design professions in the United States, and interior design in particular, is the issue of consumption. According to the Environmental Protection Agency, there were almost 128 million residential housing units in the United States (2007) and nearly 4.9 million office buildings (2003) (Environmental Protection Agency, 2009). “Every year 170,000 commercial buildings are constructed, and nearly 44,000 commercial buildings are demolished (1995)” (Environmental Protection Agency, 2009, 1). In addition, nearly 7.188 million new housing units were built between 2005 and 2009 or 1.797 million a year (Environmental Protection Agency). The impact on both resource use and waste contributions from the design and construction industry are staggering. “Sources of building-related C&D (construction and demolition) debris waste stream include demolition (accounting for approximately 48% of the waste stream per year), renovation (44%), and new construction (8%)” (Environmental Protection Agency, 2009, 6). Of this amount, only 20–30% is recovered for recycling. The authors of the report specifically state that architects and builders do not design for easy renovation or deconstruction of homes despite the fact that the average family moves every 10 years leading to renovation or demolition in many cases (Environmental Protection Agency, 2009). A recent
Lessons from the Architects’ Small House Service Bureau (ASHSB) proposed in the early twentieth century offer a model for addressing contemporary sustainable housing solutions in the United States.

Online magazine article in “Green Building Elements” summarized that the construction of the average 2000 square foot house resulted in 8000 pounds of waste (greenbuildingelements.com). Similarly, demolition yields approximately 155 pounds of waste per square foot of building (Monroe 2008). “On an national scale, total building-related construction and demolition (CD) waste is estimated to be 135.5 million tons—a figure that represents, at 30%, the largest single source in the waste stream” (Monroe, 2008).

Interior Design has a reputation for being trendy, style based, and always changing—all concepts that could be construed as wasteful and unsustainable. This paper seeks to address a methodology for rethinking and thus overcoming these seemingly insurmountable obstacles by looking to a successful historical model. Many of the innovations to save materials and square footage introduced by the ASHSB included interior elements such as efficient space planning, well-designed built-ins, carefully placed windows, and minimal circulation. Thus, interior design is a key contributor to the sustainable house design model provided by the ASHSB.

Background
According to Phil Harrison, President and CEO of Perkins + Will (Harrison, 2010), architects can handle the challenges of materials, water, and site with little effort using known technologies. The major challenge to sustainability is to produce a zero energy use, carbon-neutral solutions. Harrison argues there is no excuse for architects and designers in the twenty-first century not to use the easily available innovative water strategies, nontoxic, renewable, and recyclable materials and to use what is common knowledge about how to best site a building to maximize natural daylighting, account for the prevailing winds, and best use sun cycles for thermal heating and natural cooling. This paper addresses how the approach of the Architects’ Small House Service Bureau (ASHSB) to architect-designed, single-family houses during the early twentieth century might help meet the challenges of net zero carbon housing solutions and sustainable houses in the United States.

The thesis of this paper is that today’s architects and interior designers can learn from the sustainable design model for economical, well-designed, small houses that was developed by the architect members of the ASHSB. The methods and solutions that the ASHSB members evolved over time provide a workable structure for single-family house design solutions for the twenty-first century. One of the biggest challenges facing sustainability in the United States relates directly to the housing market.

It can be argued that the single most important issue that citizens in the United States must address is to define an ethic of “enough.” The size of the single-family house in the United States has grown substantially over the last century (228%). As a society, the United States has solved its needs by adding square footage instead of through good design. According to the U.S. Census Bureau, the size of the average single-family house across the United States increased from 1525 square feet in 1973 to 2135 in 2009. The highest reported average occurred in 2007 when the average square footage rose to 2277 (U.S. Census 2010). The largest houses were to be found in the northeast followed closely by the south while the smallest square footages occurred in the Midwest. At the beginning of the twentieth century, the average house size was between 700 and 1200 square feet. In 1950, the average square footage was 1000 square feet (Mason, 2011). In other words, during the twentieth century the single-family house in the United States more than doubled in size. Between 1900 and 1950, the single-family house size remained relatively constant at approximately 1000 square feet. It is within this context that the ASHSB was producing single-family house designs that were limited to six principal rooms and 30,000 cubic feet (equates to approximately 2200 square feet on two floors—including porches—with a full utilitarian basement).

Today, the single-family house market could easily be described as increasingly larger and lacking good design. As attested to by the recent mortgage default
To improve the design of the single-family house and capture a new market share for the professional designer, a group of four architects from Minneapolis started the ASHSB in 1919.

These include zero-energy, net zero building, carbon neutral, and others. These terms can refer to different outcomes in a building. According to the Renewable Energy Institute, a “Net Zero Energy Building” is one which generates as much power and energy as it consumes (Renewable Energy Institute, 2007). The Renewable Energy Institute also explains that there is no such thing as a zero-energy house because all buildings use some energy. Thus, it is perhaps more accurate to avoid the use of this term. Carbon neutral design relies on a reduced carbon footprint. This might occur through sitting and orientation of a building to take advantage of passive solar gain, the use of/purchase of carbon offsets, and the use of sustainable materials (Carbon Neutral Building, 2011).

Why the ASHSB?
A Brief History of the ASHSB

Following World War I, there was a critical shortage of housing in the United States. Returning home from the war, U.S. soldiers and their families sought houses of their own. This phenomenon coupled with an ever-increasing number of European immigrants led to an estimated housing shortage of between 1 and 2 million units (Thornton, 2002). In an effort to improve the design of the single-family house and capture a new market share for the professional designer, a group of four architects from Minneapolis, Minnesota, started the ASHSB in 1919. The four founding architects were Carl A. Gage, Beaver Wade Day, Frederick M. Mann, and Roy Childs Jones. (Shrenck, 1988, p. 8)

This group of architects sought to provide better-designed houses through the vehicle of the plan book, a well-established tradition by 1919. The options offered ranged from homes with three primary rooms up to those with six primary rooms. The maximum cubic footage was 30,000. The intended homeowner also ranged from those seeking a starter home to those of the newly emerging middle class. Stylistically, the house design ranged from Colonial Revival to Spanish- or Italianate-inspired dwellings.
The principles upon which the ASHSB based their definition of design excellence inform today’s need for sustainable and smaller single-family house designs.

The constitution of the bureau indicated its purpose:

*The corporation is formed for the primary purpose of advancing the present widespread movement to encourage persons of limited means to build and own their own homes; to assist such persons in obtaining, at the lowest possible cost, desirable and attractive plans therefore which shall conform to correct architectural theories of construction and embody artistic principles of design, and to enable such persons to secure the benefit of the advice and skill of architects of experience and recognized standing in their profession, through the cooperation, to such ends, of all the members of the corporation.* (ASHSB Incorporation Documents, 1921, Article II, 1.)

The ASHSB members disseminated their plans through newspapers, magazines, and plan books. The publications all included detailed information about the need for an architect and eventually the endorsements of the American Institute of Architects and the Department of Commerce. *Your Future Home,* as well as several other ASHSB publications, included the endorsement letters signed by William Faville, President of the American Institute of Architects (AIA), as well as an endorsement statement signed by Herbert Hoover, then representing the Department of Commerce. An explanation of the ASHSB logo follows the table of contents and introduction. At the end of the book, following the plan designs, is an article entitled “What the Architects’ Small House Service Bureau has to Offer: A Real Service at a Moderate Cost.” This supplement describes in detail the benefits of using the ASHSB and having an architect to customize the plan chosen to the actual site. The package a customer of the bureau received included a set of working drawings and details, written specifications, a quantity survey (materials list), and a form of agreement (contract) (ASHSB, *Your Future Home,* 1923a, reprint 1992, p. 154). An actual reduced drawing set for Home Plan number 6A20 followed the description of services and showed actual samples of all included documents.

The Small Home, monthly bulletin of the ASHSB, frequently contained articles about the benefits of using the ASHSB as well as client testimonials.

The ASHSB was formally incorporated in St. Paul, Minnesota, in 1919 in response to the need for well-designed affordable small houses. Architect members of the ASHSB dedicated themselves to the production of small house plan designs that maximized materials, minimized waste, and capitalized on synergies with manufacturers and builders.

The archives of the ASHSB are stored in 64 boxes at the Minnesota Historical Society. These boxes have been sorted and cataloged in a cursory manner that states the overall basic contents within each box without detail. The process by which these archives were examined included a week of intense perusal on location followed by months of analysis of the hundred of photocopies made while at the archives in addition to several original publications acquired by the researcher. Each book publication was examined for individual content, plan types, and themes. A total of 4 original plan books and 12 photocopied plan book publications as well as the complete set of *The Small Home* magazine were analyzed as a part of this research. In addition to completed plan sets, correspondence, advertising campaign materials, inter-office memoranda, and other documents were also examined.

Principles

The principles upon which the ASHSB based their definition of design excellence inform today’s need for sustainable and smaller single-family house designs. Correspondence within the archives reveals the commitment of the ASHSB members to making their small homes both affordable and economical in terms of material usage and available to all. The three-legged stool of sustainability often invoked today—economy, equity, and environment—provided the foundation for the designs produced by architect members. They felt it was their duty as trained design professionals to provide a well-designed and soundly constructed affordable house for all.
In 1924, the ASHSB joined forces with the Better Homes in America Campaign, whose stated purpose: “Inexpensive but attractive and convenient small homes should be accessible to all families”

Partnerships

During a review of these materials, a pattern emerged demonstrating a strong commitment by members of the ASHSB to working with others in the industry (concrete, steel and wood manufacturers, and builders) on minimizing material waste and maximizing good design through partnership and collaboration. Specific collaborations occurred with the Home Builder’s Library (Homes of Brick), the Arkansas Soft Pine Bureau, Redwood Manufacturers, Morgan Woodworking Organization, the Structural Clay Tile Association, the Finzer Brothers Clay Company, the National Lead Company, Dierk’s Lumber and Coal Company, the Estate Stove Company, the Southern Pine Association, the American Institute of Architects, and many others from across the United States and Canada.

Typically, the ASHSB would collaborate with a materials’ manufacturer to include a specific product into a built project. Examples of such project collaborations frequented the advertisements in the back of The Small Home monthly service bulletin. Common advertisers included Hoosier, General Electric, Murphy “In-A-Dor” Beds, Humphrey Gas Water Heaters, Waterbury Seamless Furnaces, Union Fibre Company Insulation, Cabot’s Shingles, the Southern Pine Association, Mason City Brick and Tile Company, Common Brick Manufacturers’ Association of America, and others (ASHSB, 1922a, 1922b). Another way in which the ASHSB brokered collaboration was through the production of house plan books sponsored by large manufacturers such as the Southern Pine Association or the Common Brick Manufacturers’ Association of America. In fact, the Southern Pine Association sponsored the first hard-cover book of ASHSB plans entitled How to Plan, Finance and Build Your Home published in 1921 (Figure 1).

In 1924, the ASHSB joined forces with the Better Homes in America Campaign whose stated purpose: “Inexpensive but attractive and convenient small homes should be accessible to all families” (Ford, 1924). Following the introduction, the first chapter of the book, entitled “Purpose of this Plan Book,” reiterated the goals of the ASHSB:

First, it illustrates and tells of the work of the Regional Bureaus of the Architects’ Small House Service Bureau of the United States, Inc.

Second, it suggests what the ‘Better Homers in America’ organization believes are basic needs for smaller homes; namely, a good plan prepared by a competent designer, to insure sound construction and architectural direction in the building of even the smallest home.

Third, it offers every one, no matter how small the home or purse, an opportunity to enjoy many of the privileges or architectural service at low cost (Ford, 1924).

The plans presented ranged from a Pennsylvania Colonial four-room house to a five-room house...
The architect members of the ASHSB used multiple techniques to design houses that rested “lightly on the land,” used minimal materials and took advantage of site characteristics.

The ASHSB used a well-organized advertising campaign that rested on three primary vehicles of communication—the monthly magazine, *The Small Home*; the weekly Homebuilder’s Clinic articles; and designs in newspapers, and the published plan books. The extent of influence of the ASHSB extended to all 50 states and several other countries including Canada, Russia, France, Germany, England, Spain, Australia, China, Japan, and South America (ASHSB, “Who Reads the Small Home: How the Bureau Gets in Touch with Home Builders,” Editorial Policy, 1926).

Methods Used in the ASHSB Designs

The architect members of the ASHSB used multiple techniques to design houses that rested “lightly on the land,” used minimal materials and took advantage of site characteristics. Of primary interest to members was the reduction of square footage to allow for homeownership as a social equity issue. This was accomplished in several ways including minimized interior circulation, maximized use of built-ins and closets backed up together between rooms. Reduction of materials and a properly assembled building envelope resulted in reduced energy demands by well-designed smaller houses. Each design was to be customized to the site to take advantage of natural ventilation and solar design strategies.

An Example: The Best Seller

The most appropriate example to demonstrate the ASHSB embodiment of sustainable building principles might be the best-selling plan model, number 669, later renumbered 6-A-37. The best-selling design of the ASHSB was a two-story Colonial Revival house with six principle rooms, making it one of the largest of the designs. The promotional materials promised “A Home of New England Ancestry.” In *How to Plan, Finance and Build Your Home*, the authors explain why the Colonial Revival is so popular: “It is easy to understand why the New England Colonial type of home makes such a lasting, popular appeal to the tastes of American home builders. Not alone because of its traditions, its
Emphasis is placed on economy of materials, such as the reduced masonry used in the centrally placed fireplace and abundant natural light coming in from strategically placed windows. The living room receives natural light from a strategically spaced window in the stair hall and entry. The plumbing is also stacked for economy of space and materials.

At the beginning of the first plan book, containing number 669, is advice to potential homeowners in how to select a proper site for their new home. Buyers are advised to look at the character of the lot including such features as its slope, altitude, and availability of water. They are specifically advised “Don’t overlook the value of trees.” The article concludes with advice to use the ASHSB member services for unbiased opinions on the suitability of the site for the house” (ASHSB, 1921). The members of the ASHSB worked collaboratively to provide the best possible assistance to a potential homebuyer. A key way in which they accomplished this was through peer review.

ASHSB Mechanisms for Quality: How Designs Were Chosen, Corrected and Modified

It will be apparent to every architect that all this work involved a close collaboration between individual firms—a subordination, even, of professional individuality, such as architects have probably never before voluntarily assumed. This factor introduced a difficult problem particularly for the Sketch Committee. It seemed a delicate matter to play the role of critic to a professional colleague. The Committee put forth its first judgments with fear and trembling.

With what a relief then it found that the difficulties lay largely in its own imagination! Incredible as it may seem, a dozen or more normal, human, architects—rivals, in many senses of the word—rampant individualists all—suffered the dictums of delegated authorities with a cheerfulness, and obeyed them with a patience. The diplomatic problem was the most easily solved of all! (Child, 1920).

The following describes the design process practiced by members of the ASHSB. When first formed the process by which architects designed houses for the bureau was not carefully prescribed. Following the request to prepare 100 plans for the Southern Pine Association in 1920, the need for quality
The lessons to be learned from the ASHSB are not necessarily esthetic as much as about a process for single-family house design that maximized space usage, minimized material use and included industry and designer cooperation.

control became evident. These 100 plans resulted in the first major book publication of plans by the Bureau, How to Plan, Finance and Build Your Home (1921). Reports made by Sketch Committee Chairman, Roy Childs Jones outline the failures and successes involved with the preparation of the first book of plans as well as provided recommendations for future plan preparation review work (Figure 4).

A series of six memoranda outlined the preparation of drawings for the ASHSB. The first of these contained general instructions for preparing working drawings and included a list of drawings, border and margin guidelines, material notation suggestions, numbering and labeling criteria, and construction specifications. Instruction set number II provided additional general instructions for making working drawings and tracings for the Southern Pine Association. This bulletin included specific requests from the Southern Pine Association with regard to siding as well as clarification of some items in the earlier set of instructions. Instruction guidelines number VI provided General Instruction for Revisions of Tracings. This reminded designers to check dimensions, check plans and elevations for accuracy and agreement, and other reminders to make the drawings agree with one another. Specific instructions also outlined how to count the square footage of porches in the overall tally.

Despite this involved process, members remained committed to selling affordable single-family house designs. “ASHSB has been created from start to finish to protect the home builder from unsound building practices and to assure him the sort of house he wants and should have for the money he will invest” (ASHSB, 1926, p. 5). What could be better for the U.S. housing market today than smaller, well-designed and well-constructed, energy efficient homes?

The ASHSB Approach

Three major contributions characterize the ASHSB’s approach to changing the face of single-family house design in the United States. First, the members forged relationships with industry and sought partnerships with organizations, material manufacturers, and builders. Second, members of the ASHSB were committed to offering the public service of good design for all. And finally, the organization and its members focused on public relations. They had an organized and successful publicity campaign to forward both their ideas about good design and the designs themselves through books, newspapers, flyers, and a monthly home magazine (Figure 5).

Ten Lessons Learned from the ASHSB

The lessons to be learned from the ASHSB are not necessarily esthetic as much as about a process
Today, like never before in our history, we have the need for smaller, more efficient, and sustainable houses. One hundred years ago, this was the goal of the ASHSB.

Figure 4. Promotion materials for the ASHSB, ca. 1926 showing their main message “When you Build—Build Right!”

When You Build—Build Right!

A Group of Selected Plans
for Small Homes

Published by
The Architect’s Small House Service Bureau
Northwestern Division, Inc.

for single-family house design that maximized space usage, minimized material use and included industry and designer cooperation. Today, like never before in our history, we have the need for smaller, more efficient, and sustainable houses. One hundred years ago, this was the goal of the ASHSB. Never in the history of single-family house design in the United States has a group of trained design professionals focused on this problem with this one exception, the work of the ASHSB.

The ASHSB represents the best of the design professions—socially just, beholden to a higher principle and conscientious about resource use as enumerated in the following ten lessons.
Figure 5. Progress report for the ASHSB on "The Movement to Improve Small House Architecture," the primary mission of the organization, ca. 1921.
The ASHSB represents the best of the design professions—socially just, beholden to a higher principle, and conscientious about resource use...

1. **Small and efficient housing is better than large and inefficient housing.** The name of the ASHSB expresses the central effort to make houses small and efficient. A small house consisted of 30,000 cubic feet (equates to roughly 2200 square feet on two floors with a full utilitarian basement) or smaller with no more than six principal rooms.

2. **Built-ins maximize space usage.** A principal feature of ASHSB designs includes a plethora of built-ins: cabinets, closets, fold-down ironing boards and tables, and other details designed specifically to maximize the interior spaces of the house. These built-ins allowed rooms to be smaller and more efficient while serving their intended purposes.

3. **Materials should be chosen to last.** Multiple articles throughout the years discuss the importance of choosing the appropriate materials that would last. Articles on wood flooring, linoleum, wood trim, pipes, heating systems, roofing materials, insulation, and many other topics instructed both homeowners and contractors in the importance of long-lasting durable materials.

4. **Good design upfront eliminates waste during the construction process.** Probably the single most important message from the bureau was the importance of a well-thought-out design. By spending the time and money to properly design the house, fewer mistakes would be made on site thus saving materials, money, and time.

5. **A trained design professional providing a complete plan and building services saves time and money.** The need to use a trained designed professional is reiterated in all materials distributed by the ASHSB. “Why You Need an Architect,” was a common subject in *The Small Home* monthly. In the final piece of each month entitled “Help for Small Home Builders,” the first sentence reads “Only from an individual practicing architect, who designs your home to order, could you possibly get a more complete plan and building service, that the Bureau provides for a comparatively modest fee. It is only because Bureau plans are produced cooperatively and sold in quantity that the price is kept low.” (ASHSB, *The Small Home*, July 1923b, p. 25.)

6. **Builders are not designers.** One of the most interesting and entertaining articles included in *The Small Home* was about the “carpetech.” The author inquires “why is it that a man who would never think of entrusting the removal of his appendix to the village butcher will nevertheless entrust the designing of his home to the village carpenter? The “carpetech” consists of a builder, carpenter, or contractor who offers design services. “The characterless, hit-or-miss appearance of the average American residence section stands as a rebuking monument to the efforts of the amateur Carpetech” (ASHSB, 1922a, 1992b, p. 3). In the December 1922 issue of *The Small Home,* a similar article written by the chairman of the Committee on Public Information of the American Institute of Architects addresses the topic “Why the Home Builder Needs the Architect.” (ASHSB, 1922a, 1992b, p. 13.)

7. **Choosing a house is one of the biggest decisions a prospective homeowner will ever make.** Throughout the publications of the ASHSB, the authors and editors frequently acknowledged the enormous expense and commitment of the new homeowner. Advice on how to make the best decisions about choosing a plan, a builder, and saving money were frequent themes.

8. **Design adds value and quality.** In “Building Value into Your Home: Adding Extra Value,” this point is reinforced: “Value, good taste, economy of space, are not built in after a dwelling is completed—they must be specified before it is started. The fate of a house is sealed in its blue prints and specifications before the ground is broken” (ASHSB, 1926, p. 3).

9. **The ASHSB and its advice is practical.** In their promotional materials about advertising in *The Small Home* monthly, the editors wrote about their advertising policy. “When *The Small Home* talks about building materials—it talks about function, about grades, even about prices. All discussions are from the point of view of the reader—they are practical—helpful—technically accurate, no free publicity—manufacturers puffs—or sales propaganda is ever allowed to creep into editorial columns” (ASHSB, *The
The key elements that contributed to the success of the ASHSB approach included a focus on detail, minimizing waste in design and construction, and providing practical and affordable options.

Figure 6. Example photographs used by the ASHSB to demonstrate how little changes can severely impact the exterior esthetics of the home. “How Minor Changes Affect True Quality,” ca. 1926.


10. Good design shows. In their illustrated flyer, “Building Value Into your Home: How Minor Changes Affect True Quality,” the ASHSB demonstrates how little decisions about the exterior of the home—made by nondesigners—can impact the overall appearance. They reiterate “simple forms look better, often cost less, and last longer” (Figure 6) (ASHSB, 1926, pp. 14–15).

The members of the ASHSB were committed to providing small dwellings of high-architectural quality for all people through the use of good design principles. The members worked collaboratively and subjected themselves to peer review in fulfillment of a higher purpose. The key elements that contributed to the success of their approach included a focus on detail, minimizing waste in design and construction, and providing a practical and affordable option for people.

The Demise of the ASHSB

Despite the noble efforts of the members of the ASHSB, the AIA voted in 1934 to rescind their official endorsement of the ASHSB. The AIA decided that the ASHSB was in competition with its members (although many ASHSB members were also AIA members). Once the AIA revoked its endorsement, the Department of Commerce followed. By 1941, the ASHSB was struggling financially and was forced to
The design proposals made by members of the ASHSB were regionally appropriate, small, and well designed. The members believed in social equity, economy, and ecology—the three-part approach required of sustainable designs of today.

close its doors. In 1942, the National Association of Homebuilders was founded.

The State of Net Zero Houses in the United States

In her book *Towards Zero Energy Architecture*, Guzowski (2010) outlines five inherent themes in net zero buildings of today. First, a new zero building has a design that inspires change. Second, each building responds to its individual site and place. Third, the houses are modest in size and scope. Fourth, each project focuses on the exterior envelope or skin. Finally, the projects are beautiful. As demonstrated, these same five characteristics can be found in the design of the ASHSB houses.

One group that is experimenting with the design and construction of net zero houses in the United States is the Army. According to Kanellos (2009), the Army is constructing two net zero duplexes at Fort Campbell in Kentucky that will use 54% less energy and may meet the LEED platinum level. Three additional case study homes in the United States can be found on the Greenbuilding.com website. These three homes are located in Brainbridge, Seattle, Washington; Boulder, Colorado; and Ferrier, Texas. These houses explore new technologies and materials that also them to be “near” net zero. According to *Toward a Zero Energy Home* authors Johnston and Gibson (2010), “the world of zero energy homes is all about rethinking the envelope, or outer layer, of the building, which includes the roof, walls, and foundation.” Unfortunately, even though there have been some advances in the area of net zero construction in the United States, Kanellos summarizes the main problem as follows: “To date, net zero homes have largely been the status symbol for the rich and famous.” And, despite the four above-mentioned examples, the progress toward net zero housing in the United States is limited. Unlike actions taken in some European countries, there is no current cohesive plan to make United States housing comply with net zero standards. Intervention by the trained design community into single-family houses, and as modeled by the ASHSB in the last century, may provide a vehicle for progress in this arena.

Conclusions

The architect members of the ASHSB were determined to improve the state of single-family houses in the United States. Like the challenges they faced 100 years ago, we are facing similar daunting challenges with regard to single-family house design in the United States today. If we ask whether the housing stock currently being constructed meets the following five criteria outlined by Guzowski: The answer is a resounding “no.”

1. The building designs inspire change.
2. Each building responds to its individual site and place.
3. The houses are modest in size and scope.
4. The project focuses on the exterior envelope or skin.
5. The projects are beautiful.

The design proposals made by members of the ASHSB were regionally appropriate, small, and well-designed. The members believed in social equity, economy, and ecology—the three-part approach required of sustainable designs of today. As such, the organization and its member designs provide a template for how to approach this daunting issue.

Future research directions on the ASHSB and the many contributions that can be made to single-family housing in the United States include lessons currently in progress on landscape and site design, the possibility of creating Revit (or another Building Information Modeling program) models of actual best-selling house designs and energy modeling them in different regions of the country to demonstrate energy cost-saving potential, and a complete compilation of lessons for the interior including instructions on space planning, built-in designs, decorating, and materials and furniture placement. The author’s recent acquisition of the complete library holdings
The lessons that the ASHSB has for interior design are many. The first, and perhaps most important lesson, taught by the ASHSB was one of cooperation—cooperation with private and government entities. They consistently aligned themselves with agencies and groups that helped forward their primary goals. An emphasis on smaller and better detailed houses necessarily focused on the interior and the design of interior built-ins, storage solutions, minimized circulation and featured a host of other solutions intended to reduce waste in materials while meeting the many needs of the homeowner of the day. Special attention was given to training new members of the ASHSB organization as well as outside constituents (home owners, builders, and manufacturers) in the basics of good design and how it could ultimately reduced waste and minimize material use. Although not always easy or popular, an internal Design/Sketch Committee reviewed all proposed designs; comments were provided to improve the designs and maintain a level of quality control. These contributions of the ASHSB are as pertinent today as they were nearly 100 years ago when the organization first formed.

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