

MHI URBAN DESIGN PROJECT

The goal of this project is to display the potential for manufactured homes to provide affordable housing in an urban setting that is architecturally appropriate. Wilkinsburg, Pennsylvania, was the first demonstration site for MHI's Urban Design Project with other homes in Washington, D.C. and Louisville, Kentucky. The Wilkinsburg design is made up of three sections, providing main living areas and a kitchen on the ground floor and two bedrooms on the second floor for a total of 1,475 square feet. The second story has a 5-in-12 hinged roof, while the single story and porch have 4-in-12 shed roofs. The sections are supported at the perimeter and marriage wall. A site-built porch with decorative railing wraps the front corner of the home.

This home provided a model of how indistinguishable a manufactured home could be from a site-built dwelling. Initially there was concern about the impact a manufactured home would have on neighboring property values by some local residents in Wilkinsburg. Ultimately the home sold for about \$5,000 more than comparable local properties.

The second Urban Design Project was installed in Washington, D.C. on two lots, in a moderate-income urban neighborhood in the city's Northeast section. A two-story and a one-story unit were constructed.

The design appropriateness of these homes in this neighborhood was verified without the use of focus groups thanks to the active involvement of the Marshall Heights Community Development Organization, which had its hand on the pulse of the community, and gave valuable guidance as to what was best for these sites. The bungalow style one-story house can be considered affordable, but it was not priced significantly lower than neighboring homes in this market. Specification of R-19 walls, R-30 ceilings, and R-30 floors all exceed HUD minimum insulation values, and all windows included low-e glazing.

The 1,440-square-foot floor plan makes good use of available space while minimizing first-cost expenditures. To save on material costs, interior partitions are kept to a minimum in the living, dining, and kitchen areas of the house. This lends an open, airy feel to the home, making it seem larger than it actually is.



Two-story home built in Wilkinsburg, PA as part of MHI's Urban Design Project.

The two-story home built in Wilkinsburg became the model for the second home built in Washington. It was decided that instead of concrete slab construction (as was used in Wilkinsburg) this model would have a full walk-out basement, which would also be heated.

This single-story house was built by joining two 14' wide by 52' long units side by side on a concrete block foundation. Once the units were in place, the roof was hinged up to a 7-in-12 pitch. The bulk of the house was factory-built and erected on the lot with conventional set-up methods. Site-built construction (the front porch) adheres to BOCA standards. The two-story house was constructed in a similar way, although the stacking arrangement of the sections on this small site allowed a bit more room for maneuverability around the house.

Initial reaction from the community was less than enthusiastic. Once the house was finished and open for view, public response was far more favorable. In fact, the one-story house sold within a few days of completion.

Advance notice of 48 hours (and a permit) was required to close the street for setting the home, but was not obtained. This resulted in overtime expenses and delayed construction time. Although contingency expenses were allocated at 5% of construction costs, actual cost overrun was closer to 7.5%. On future projects, it may be advisable to provide a fairly detailed listing of the manufacturer's responsibilities, so as to avoid any confusion as the project proceeds. Getting everyone on the same page from the outset (either contractually or by some other means) should be given a high priority during the planning stages of future projects

In Louisville, hard cost savings were anticipated, but not realized on the first home. The developer is confident that the four additional units planned will come in at a cost savings as compared to site-built. Three of those homes will be single story designs and a fourth will be two-story. This project required a change to the local zoning ordinance to define manufactured homes with permanent foundations, a minimum roof pitch of 4-in-12, and approved building materials as being eligible for placement in residential districts.

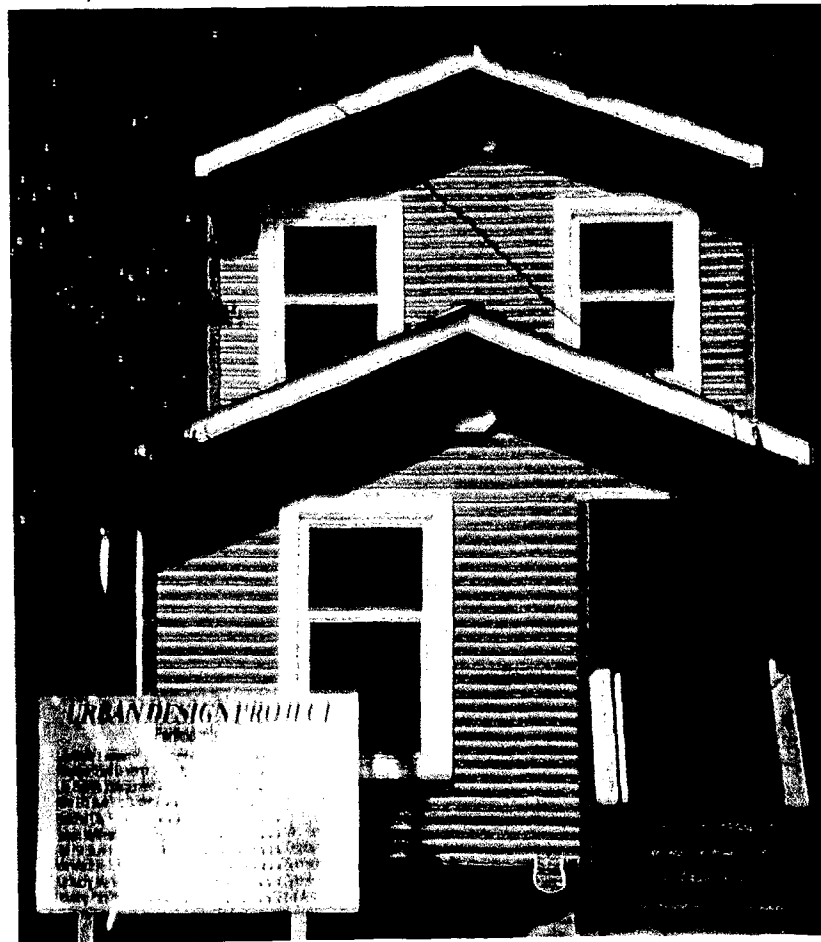


Bungalow-style home in its Washington, DC neighborhood.



Two-story home in Washington, DC.

Two-story unit in Louisville, KY.



Housing Type

Detached single family homes on infill urban lots

Technology and Design

Manufactured components

Single- and two-story HUD-Code homes

On-site work

Perimeter foundations of crawlspaces, basements, and porches

Traditional home features

Varied window size and trim, wide corner boards, decorative porches with contextual detailing, steep roof pitches

Project Size

Wilkinsburg, PA 4 homes

Washington, D.C. 2 homes

Louisville, KY 4 homes

Zoning

Wilkinsburg, PA

Single-family home

Washington, D.C.

Single-family home, factory-built housing is not addressed in local zoning

Louisville, KY

Single-family home, with change in zoning ordinance and prescribed elements of a design palette

Inspection coordination

Louisville, KY

Foundation, side porch, electrical and plumbing inspected by the city of Louisville

Financing

All

Conventional mortgages

Manufacturer

Wilkinsburg, PA

New Era Building Systems, Inc.

Washington, D.C.

Schult Homes Corporation

Louisville, KY

New Era Building Systems, Inc.

Developer

Wilkinsburg, PA

ACTION Housing, Inc.

Washington, D.C.

Marshall Heights Community Development Corporation

Louisville, KY

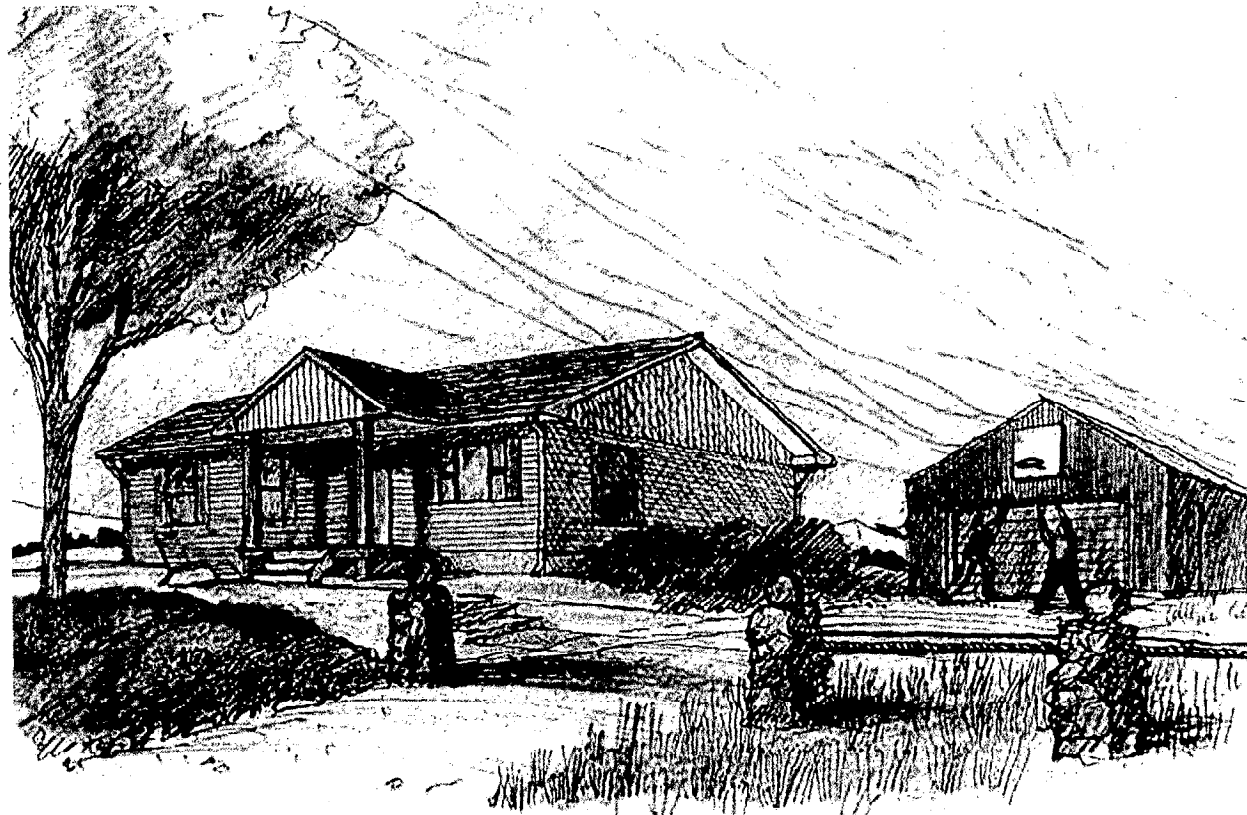
Neighborhood Development Corporation.

Designer

Susan Maxman and Partners, Ltd., Architects

PINE RIDGE

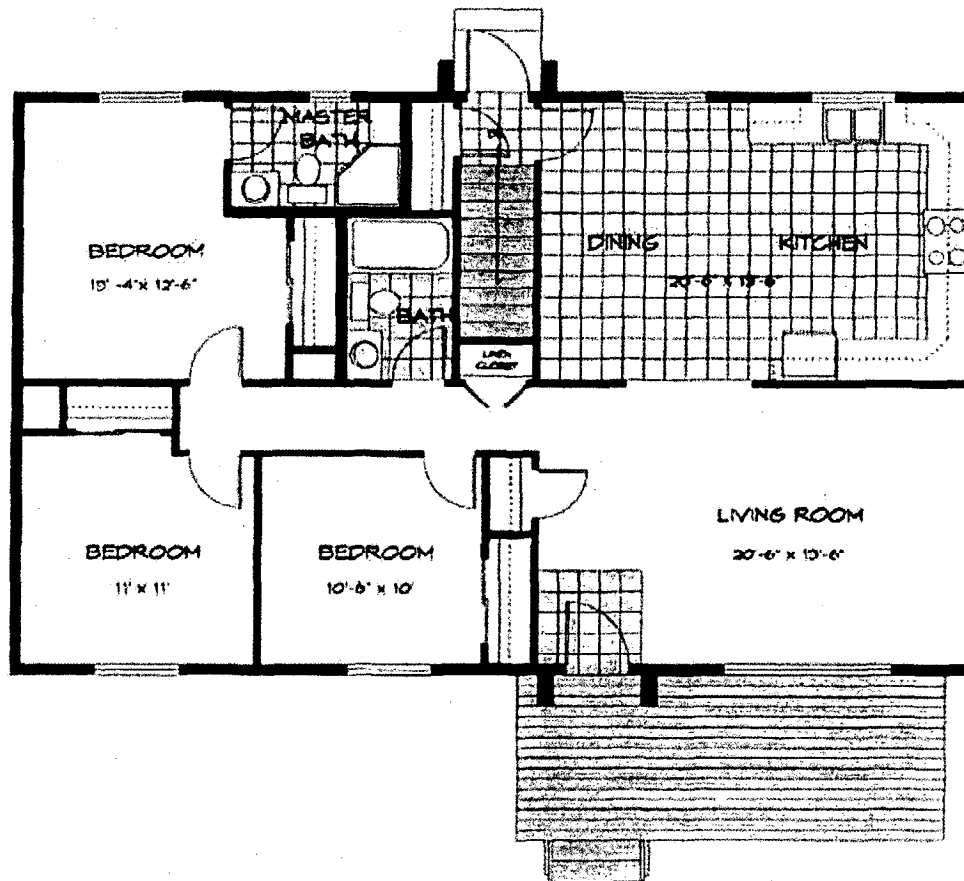
This Native American Reservation is located near Rapid City, South Dakota. Pine Ridge Reservation's remote location and severe need for affordable housing made manufactured homes a clear choice. Ultimately a mix of 300 new site-built, modular, and manufactured homes is expected to be constructed. This project came about through the Shared Visions initiative of HUD Secretary Andrew Cuomo, in close coordination with tribal leaders across the country, to develop a model for promoting home ownership among American Indians. At the Pine Ridge Indian Reservation, the Oglala Sioux Tribe Partnership for Housing, Inc., a non profit organization, was formed to act as the developer for the project. As part of HUD's efforts at Pine Ridge, a PATH (Partnership for Advancing Technology in Housing) program demonstration project, the houses will contain an assortment of PATH technologies, which can be found on the PATH website (www.pathnet.org). The plans were developed by Archambault & Company with assistance from Steven Winter Associates, Inc., on the design parameters of manufactured homes. The plans were fine tuned to work with the home manufacturing and delivery process. The developed designs are three- and four-bedroom, two-bath homes of approximately 1,288 square feet, with overall dimensions of 28'x48'. The homes were and will continue to be set on permanent foundations of either basements or crawlspaces and have the option of site-built decks and or detached garages. Initially the land for each unit will be leased from the tribe. Two manufacturers were selected from qualifications and proposals submitted to the Oglala Sioux Tribe Partnership, each meeting specification and performance criteria. At HUD's Shared Vision conference on July 7, 1999 President Clinton toured one of four manufactured homes installed at the Reservation.



Pine Ridge Building Summit

3-bedroom home with porch and garage option

Home Build 1999



Pine Ridge Building Summit

3-bedroom home with porch option

Home Build 1999

Housing Type

Detached single-family homes on suburban lots

Technology and Design

Manufactured components

Single-story HUD-Code homes; chassis accommodates basement stair perpendicular to long axis of home; chassis recessed to accommodate perimeter foundation; hinged roof

On-site work

Perimeter foundations of both crawlspaces and basements, decks and detached garages, insulated crawl spaces

Traditional home features

Overhangs of 12" at eaves and side walls; upgraded shingles, low-e windows; "residential" grade door casings, jambs and hardware; drywall; "residential" grade cabinets, sinks and plumbing.

Project Size

300 homes are proposed, the majority of which are to be manufactured.

Zoning

Tribal land, typical zoning issues did not apply.

Inspection coordination

The Oglala Sioux Tribe Partnership for Housing, Inc. coordinated with HUD on inspections.

Housing Price

In the range of \$60,000 to \$70,000 depending on features and options

Financing

Conventional mortgages with federal subsidies

Manufacturer

Champion Enterprises and Wick Building Systems

Developer

Oglala Sioux Tribe Partnership for Housing, Inc.

Designers

Archambault & Company (architect), Steven Winter Associates, Inc. (consultant)

Manufacturers Comments

The systemization of procedures offered by the manufactured home industry gives us the ability to serve a wider range of customers than what we as an industry realize.

NEXTGEN PROJECT

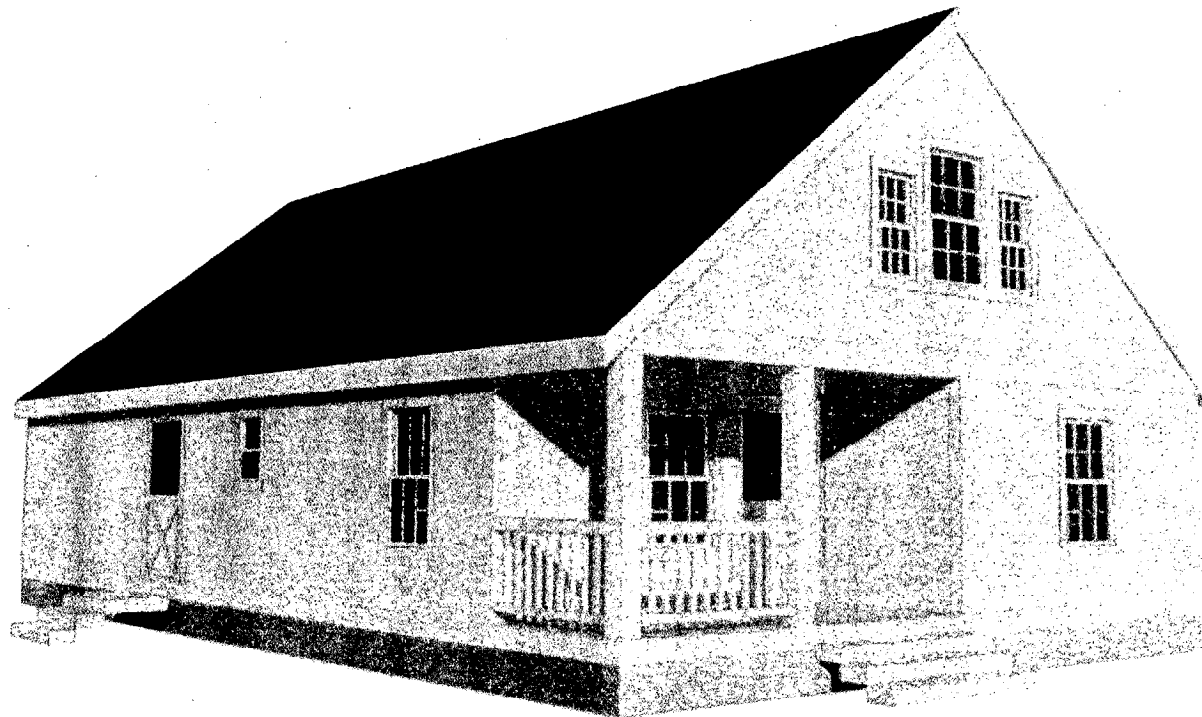
A factory-built house installed in Danbury, Connecticut, is a demonstration of what the future of affordable, manufactured housing can be. Dubbed NextGen, (Next Generation of Manufactured Housing) the house is a prototype model built by New Era Building Systems, Strattanville, Pennsylvania. It blends energy conserving techniques and equipment with interior space efficiency and an exterior steep-roof profile that sets it apart from traditional manufactured HUD-Code housing.

The idea for a NextGen house grew out of a Steven Winter Associates, Inc. (SWA) research project, funded by HUD, that explored ways to improve energy efficiency, affordability, and the design features of manufactured housing. The research resulted in a book *The Next Generation of Manufactured Housing: Design Phase HUD, 1998 SWA*, which is available from HUD USER, 800 245 2691. The owner, the Danbury Housing Authority, placed the home on a small lot in a mixed single- and multi-family Danbury neighborhood. The attractive, wooded site required tree grubbing and extensive grading before site development occurred.

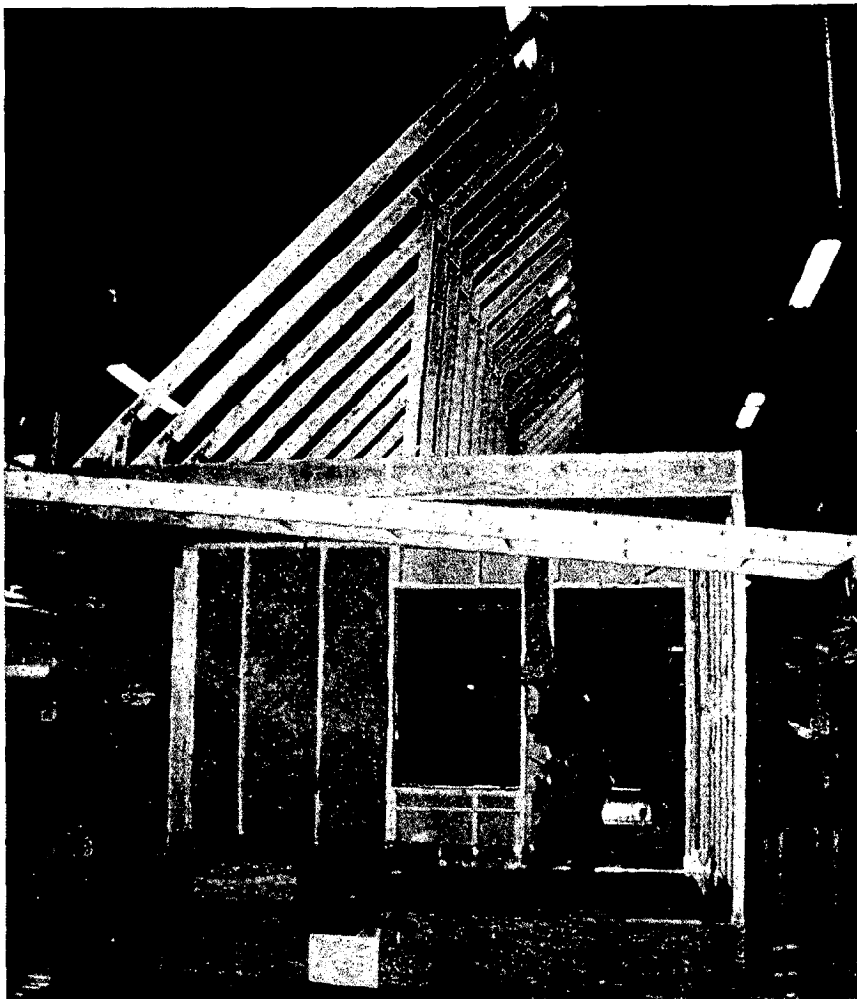
The NextGen house was designed by SWA with technical assistance from the New Era engineering staff. Product donations from Stanley, Owens Corning, and GE helped reduce costs. Also helping are HUD-Code specialists Fabwell, Tamarack, and LaSalle-Bristol. New Era's president, Elliot Fabri kept profit margins low, and Danbury Housing Authority's contribution of land helped to reduce the final cost of the home.

The 28' x 48' home is entered from the street-front porch. Side and rear doors provide access to more private outdoor yard areas. The plan has two bedrooms and two baths downstairs with a third bedroom and unfinished attic storage space on the second floor. The kitchen and dining room are separated from the large living-room by an open stairway. Adding a bath and fourth bedroom on the second floor gives this house special appeal for the owner-occupant with a growing family.

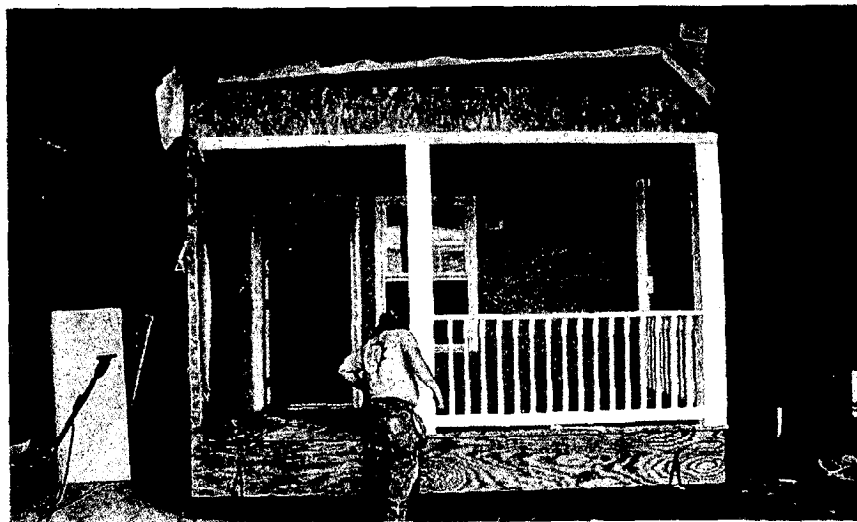
NextGen is built on a poured concrete stem wall, which provides a crawl space under the insulated floor. For additional dollars, the home buyer who wants more storage space can opt for



NextGen house, Danbury, CT.
Steven Winter Associates, Inc.



NextGen House fabrication in factory.
Steven Winter Associates, Inc.



a full basement. In both cases the exterior walls bear directly on the concrete foundations, which gives them greater wind and earthquake resistance and better resistance to pest infestation. This load-bearing exterior wall feature is gaining industry popularity for its overall durability, although it does carry a cost premium.

The NextGen home is comprised of two factory-built sections joined in the field. Energy-efficient appliances, lighting, windows, and high levels of insulation contribute energy saving that earn this home the EPA/DOE Energy Star label. The washing machine, refrigerator, and dishwasher appliances carry the Energy Star label for low energy use, and the front loading washing machine uses 40% less water than top loaders.

In this house, home heating comes from heat exchanged from the hot water heater instead of a furnace. Because the entire heating system, including ducts, is contained within the heated space of the dwelling, there are no duct losses to reduce operating efficiency. (A recent study by the Alternative Energy Corporation, *Air of Importance*, AEC, 1998, concluded that current HUD-Code homes had duct losses that average 40% of total heating costs.) Air quality is regulated by a mechanical ventilation system using continuous, low-velocity fans. Residents may boost ventilation levels when needed and the system returns to programmed levels once comfort is achieved.

The 12-in-12 roof pitch permits use of the second floor attic space for bedrooms and gives the home its traditional Cape appearance. The one-and-a-half-story profile distinguishes it from almost any other HUD-Code home being built today. (There are two-floor stacking models in production but they are less space- and cost-efficient than the NextGen.) Aside from the architectural character, the NextGen tilt-up Cape provides more usable space under a single roof than any comparable manufactured home.

Housing Type:

Detached single family homes

Technology and Design

Manufacturing components

One-and-a-half-story HUD-Code homes

On-site work

Perimeter foundations, stairs and landings.

Traditional home features

Conventional residential roof, siding, doors and windows, railings and landscaping.

Project size

Single-family house

Zoning:

Single-family detached

Inspection coordination

By local building code officials and project manager.

Housing price

Base price without Energy Star features: approximately \$52,000 delivered.

Financing

Internally funded; would qualify for conventional market financing if private venture.

Manufacturer

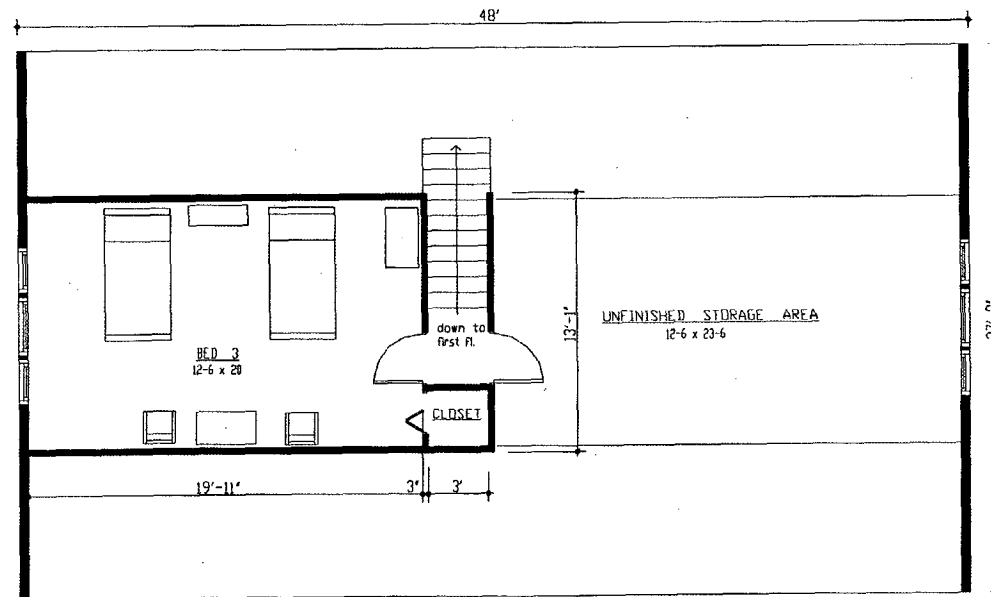
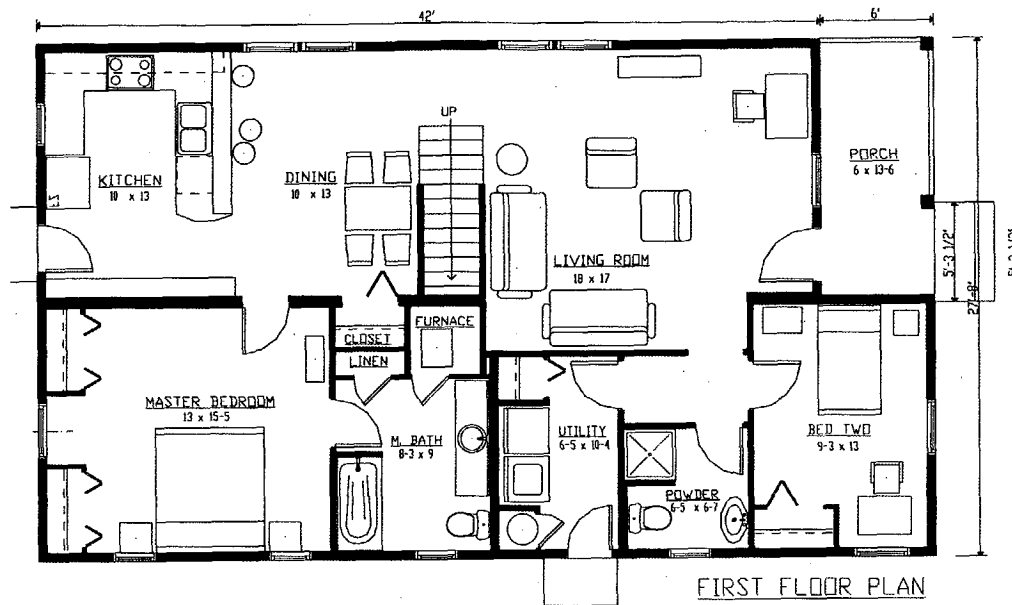
New Era Building Systems, Strattanville, PA

Developer

Danbury Housing Authority, City of Danbury, CT.

Designers

Steven Winter Associates, Inc.



NextGen

SECOND FLOOR

Danbury Housing Authority