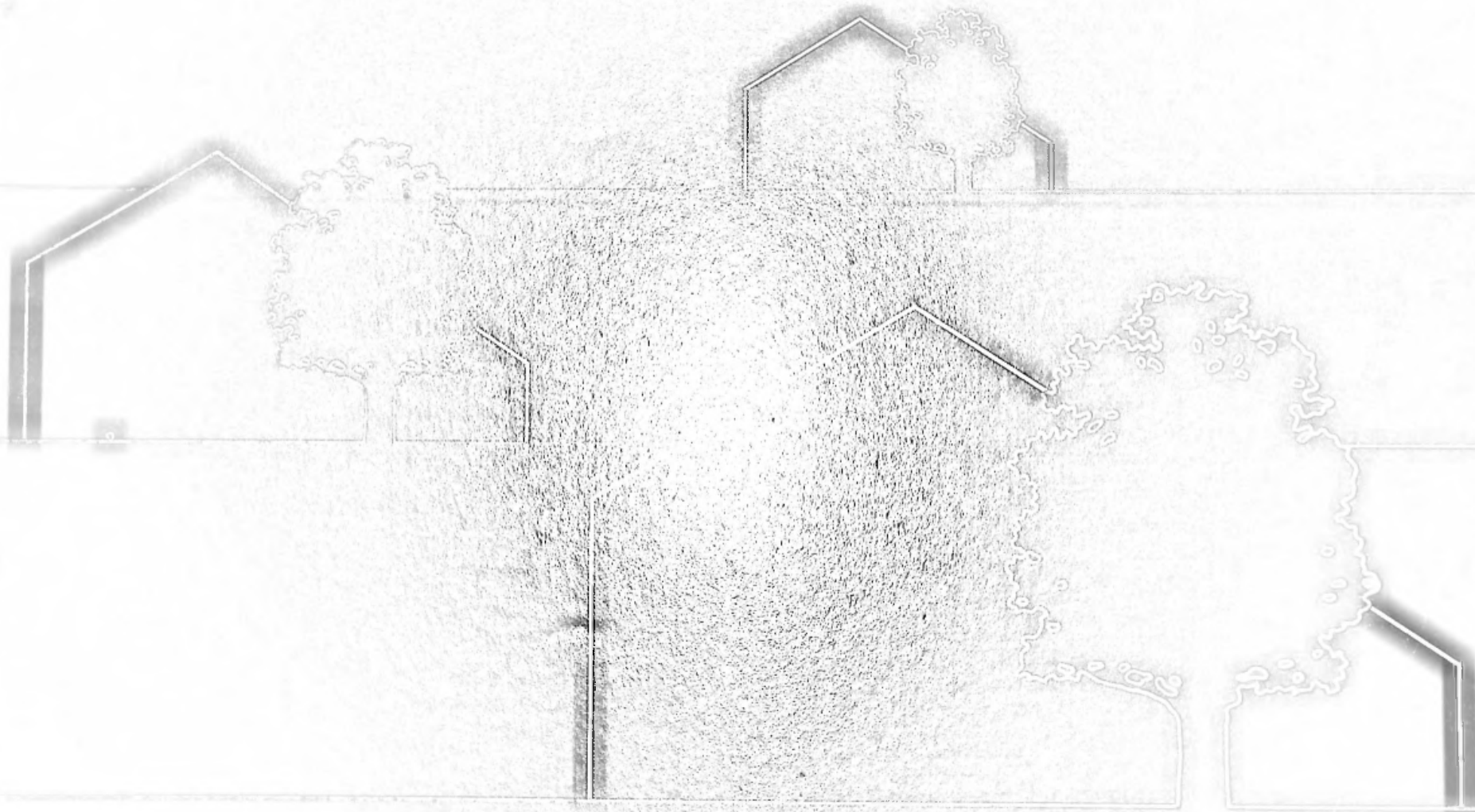




U.S. Department of Housing and Urban Development  
Office of Policy Development and Research

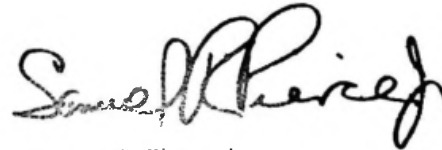
## Design for Affordable Housing: Cost Effective/Energy Conserving Homes



## Foreword

The most troublesome housing problem facing the American family today is affordability. One of the ways HUD is addressing this problem is through the "Joint Venture for Affordable Housing," a demonstration project that involves the housing industry, State and local governments and the Federal Government working in partnership to make housing more affordable. The "Joint Venture" has used streamlined regulations and processing procedures, carefully developed site plans, and cost saving construction technologies to build housing at lower cost.

Many of the techniques used have resulted from past research and demonstration projects, some of which also produced house plans. This catalog presents a range of designs that fit today's lifestyles, and help to make housing more affordable for all Americans. I am pleased to present it for your use.



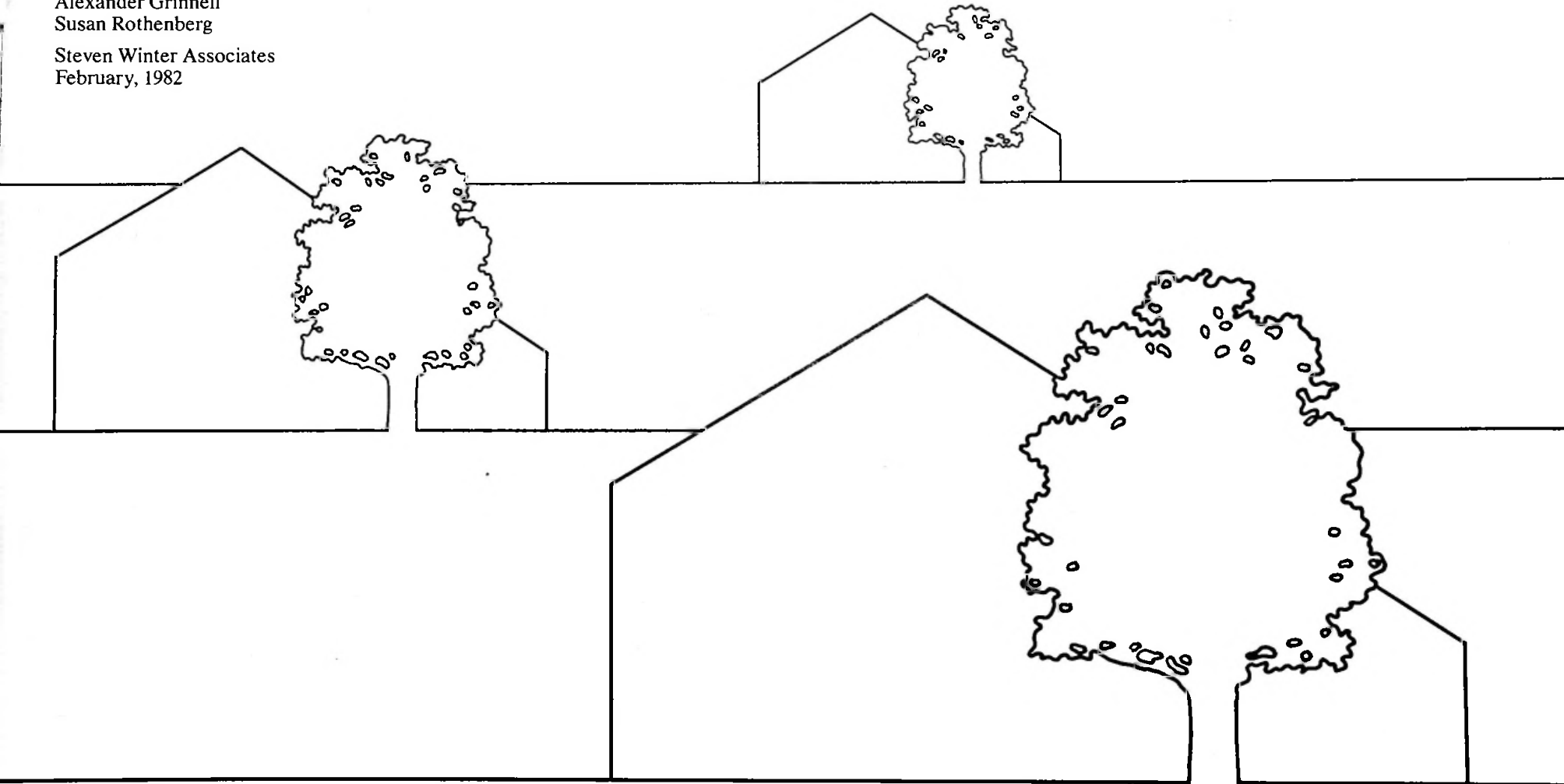
Samuel R. Pierce, Jr.  
Secretary

The plans in this catalog and the drawings available for sale were compiled by Steven Winter Associates, Inc., under contract to the U.S. Department of Housing and Urban Development, neither of whom warrants the accuracy, merchantability or fitness of these drawings and specifications. Users are cautioned that local site, code, climatic and seismic requirements may necessitate alternative designs or details.

Steven Winter  
Alexander Grinnell  
Susan Rothenberg

Steven Winter Associates  
February, 1982

## Design for Affordable Housing: Cost Effective/Energy Conserving Homes



# Introduction

The objective of this house plan catalog is to make available to builders, designers, and the general public "affordable" house plans and construction drawings that have been developed through federally funded research programs.

Ordering information for these House Plans can be found on the last page of this catalogue.

In the process of preparing this catalog, federal departments, government supported laboratories, independent establishments and government sponsored corporations were researched to obtain appropriate plans. In order for plans to be selected it was required that they be:

- Representative of small or efficiently designed houses.
- Cost-effective in detailing and construction methods.
- For construction with conventional materials.
- Energy efficient. The catalog was oriented primarily toward non-solar homes, although a number of houses which indicated optional passive and active solar technologies were included.
- Single family attached or detached houses.
- Representative of varying regional style preferences.
- Available with working drawings (a number of federally sponsored programs produced design proposals without construction details).

Not surprisingly, the federal departments that generated the most qualifying plans were respectively the Department of Housing and Urban Development (HUD) and the Department of Energy (DOE). Both departments have had an ongoing commitment to affordable, energy efficient housing. Some departments, such as the Department of Defense (DOD), have sponsored interesting and technologically innovative research test houses, but they are not included here as they are considered too specialized to be of broad interest.

Another federal department which for many years produced and disseminated house plans is the Department of Agriculture. Since these plans are oriented toward the rural homeowner and are publically available through the Farmer's Home Administration Plan Service, they have not been included in this catalog.

For those interested in obtaining additional plans, other governmental plan services include:

Tennessee Valley Authority  
Architectural Design Branch  
400 Commerce Ave.  
Knoxville, Tennessee 37902

HUD USER  
P.O. Box 280  
Germantown, Maryland 20874

Appalachian Regional Commission  
1666 Connecticut Avenue  
Washington, DC 20235

Solar Energy Research Institute (SERI)  
1617 Cole Boulevard  
Golden, Colorado 80401

State Energy Offices

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A4 Building Value Into Housing III	Richard Larry Medlin, AIA
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B2 Approach '80 III	National Association of Home Builders (NAHB)
B3 Minimum Energy Dwelling	Mission Viejo Corporation
B4 Cost Buster	National Association of Home Builders (NAHB)
B5 Energy Efficient Residence I	NAHB Research Foundation, Inc.
B6 Building Value Into Housing V	Minchew Homes Corporation
B7 Denver Metro Program I	Brothers Redevelopment Corporation
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B9 Cycle 4 Demonstration	Winrock Homes, Inc.
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<b>C Large Size Houses (Over 2,000 sq. ft.)</b>	
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C2 Cycle 2 Demonstration	Washington Natural Gas Company
C3 Brookhaven House	Total Environmental Action, Inc.
C4 Energy Efficient Residence II	NAHB Research Foundation, Inc.

# A1/Building Value Into Housing I

*sq. ft.:* 648

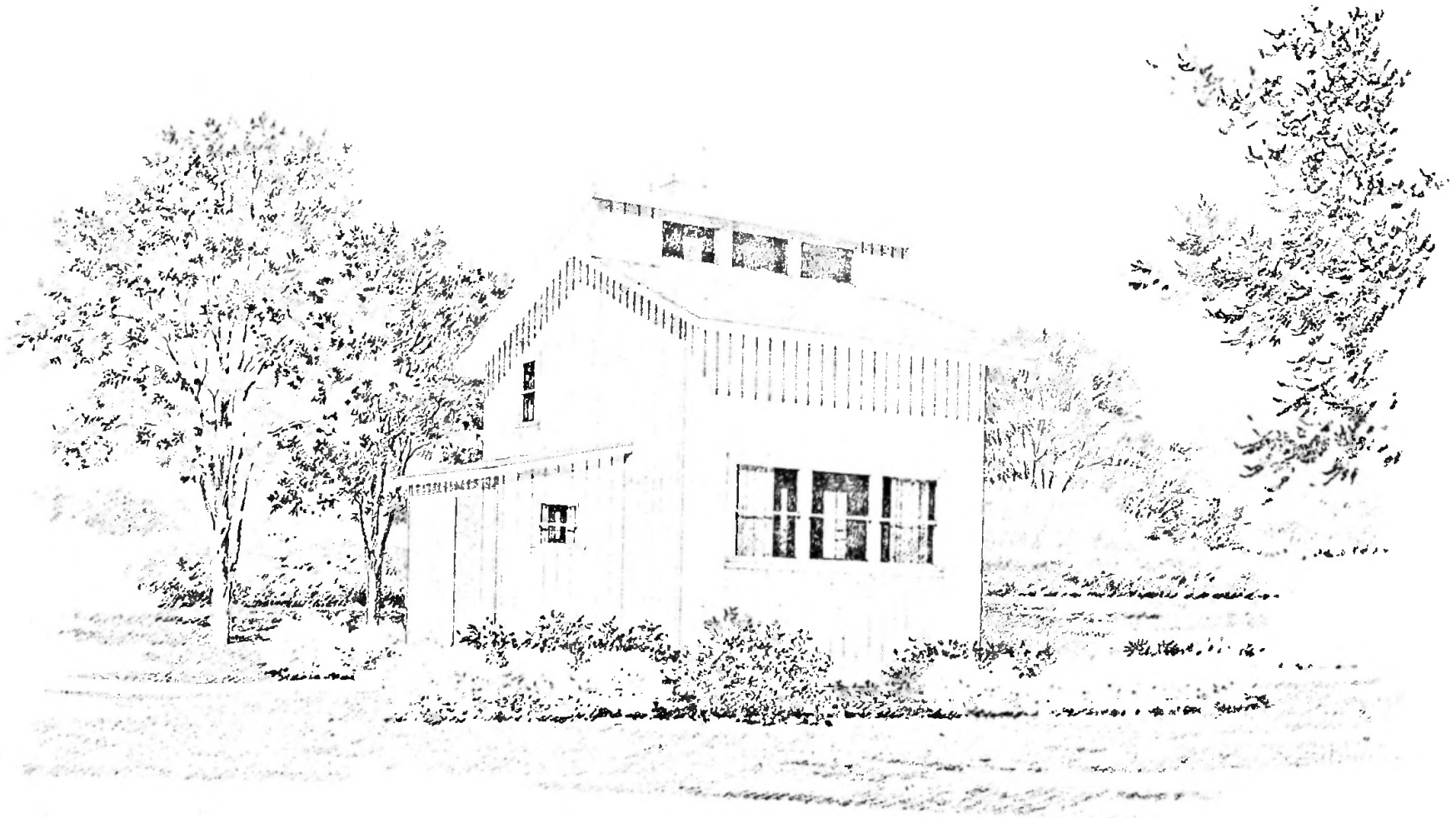
*Program:* Building Value into Housing

*Designer:* David Knepper

*Contractor:* Rural America, Wash-  
ington, DC

*Sponsor:* HUD

*Purpose:* To foster the use of innovative design, construction techniques and materials that would lead to marketable houses with reduced construction costs, low maintenance and energy conserving ideas.

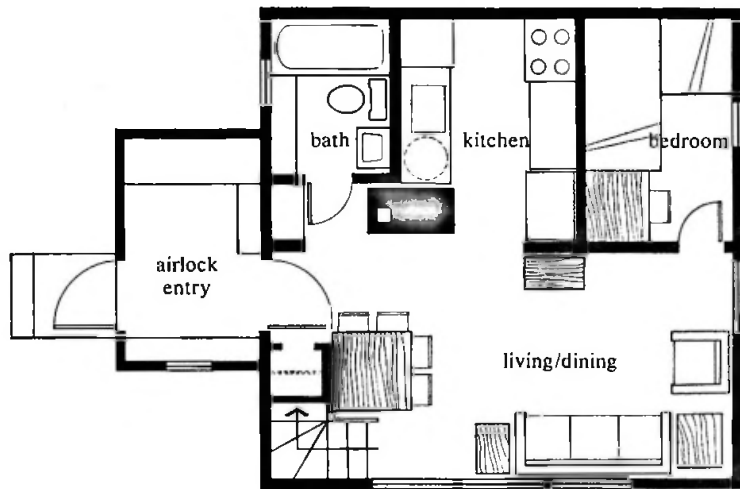


The house illustrated is one of three minimal "starter" homes designed to be expandable by means of subsequent additions.

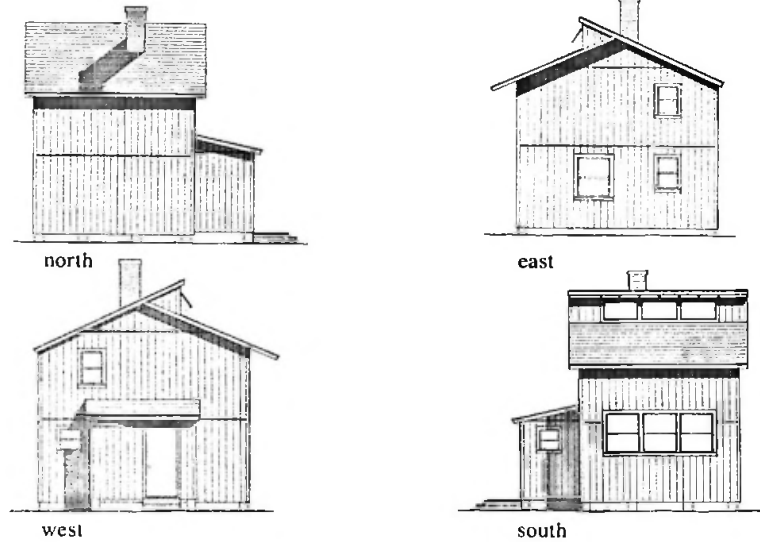
Construction drawings include plans for the three configurations: A. a one bedroom 16' x 20' module; B. a two bedroom 18' x 20' module; and C. a 20' x 20' three bedroom module.

Simple, basic framing and cost effective construction detailing have been specified with the intent that these houses could be owner-built. A pier foundation reduces the need for site excavation.

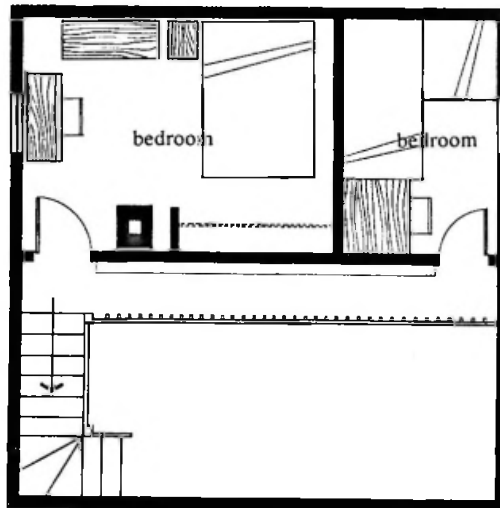
First floor



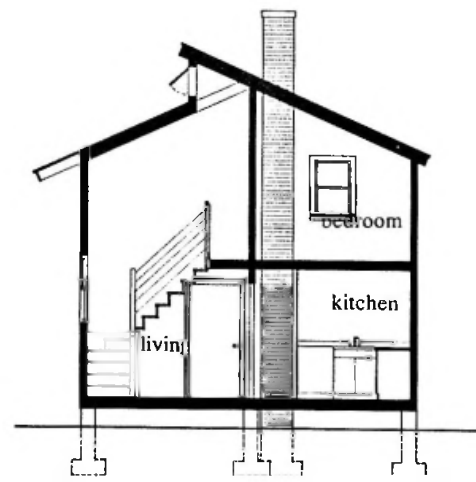
Elevations



Second floor



Section



## A2/Approach '80 I

*sq. ft.: 782*

*Program: Approach '80*

*Contractor: National Association of  
Home Builders*

*Sponsor: NAHB, HUD*

*Purpose: To demonstrate to the nation's  
builders, developers and local public officials  
that land development and housing  
costs can be reduced, without a corresponding  
lowering of the quality of life.*

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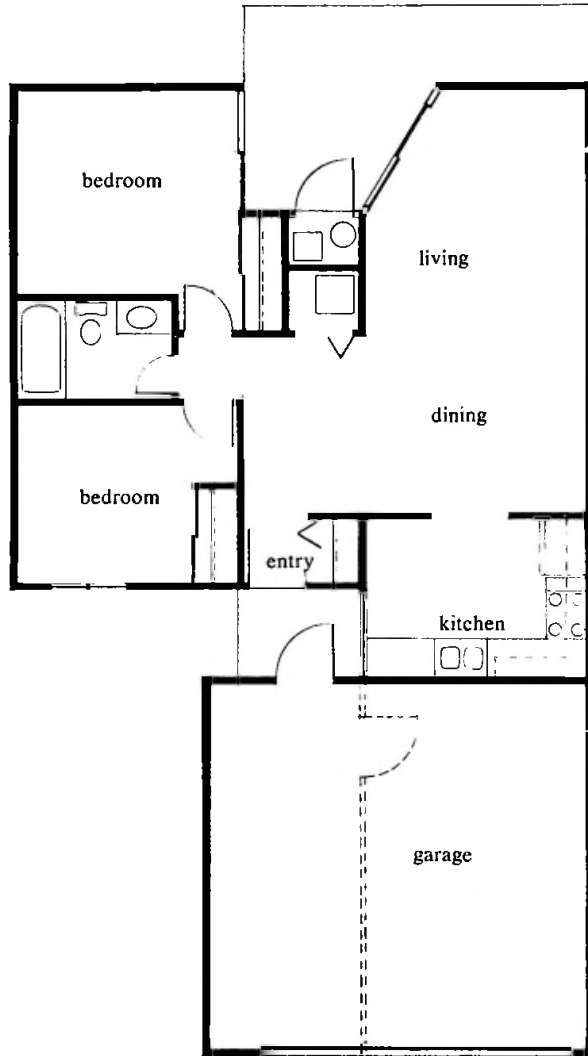


Compact and efficient, this two bedroom home was designed for zero lot line planning with an emphasis on privacy.

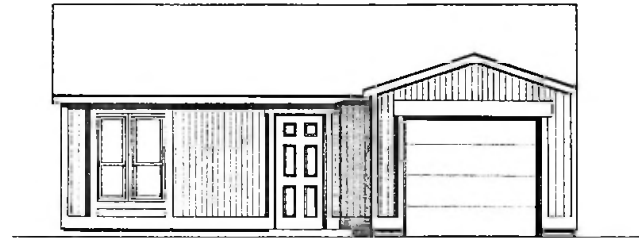
The living room and bedroom open onto a recessed deck, and serve to open the internal circulation to the outside while restricting the view from neighboring homes.

The construction drawings reflect current cost-effective framing practices, underfloor plenum heating/cooling systems, and pressure treated wood foundation techniques.

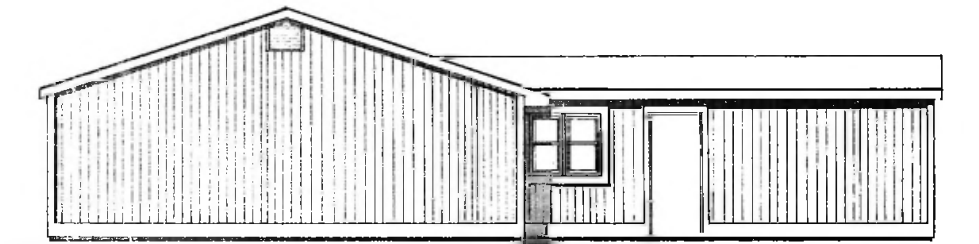
Floor plan



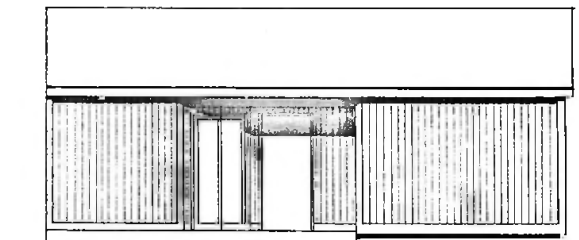
Elevations



front



side



back

## A3/Building Value Into Housing II

*sq. ft.:* 825  
*Program:* Building Value into Housing  
*Designer:* Jane Galblum; Ed McGrath,  
Consultant, Fairbanks, Alaska  
*Contractor:* Superinsulated Homes, Inc.  
*Sponsor:* HUD

*Purpose:* To foster the use of innovative design, construction techniques and materials that would lead to marketable houses with reduced construction costs, low maintenance and energy conserving ideas.

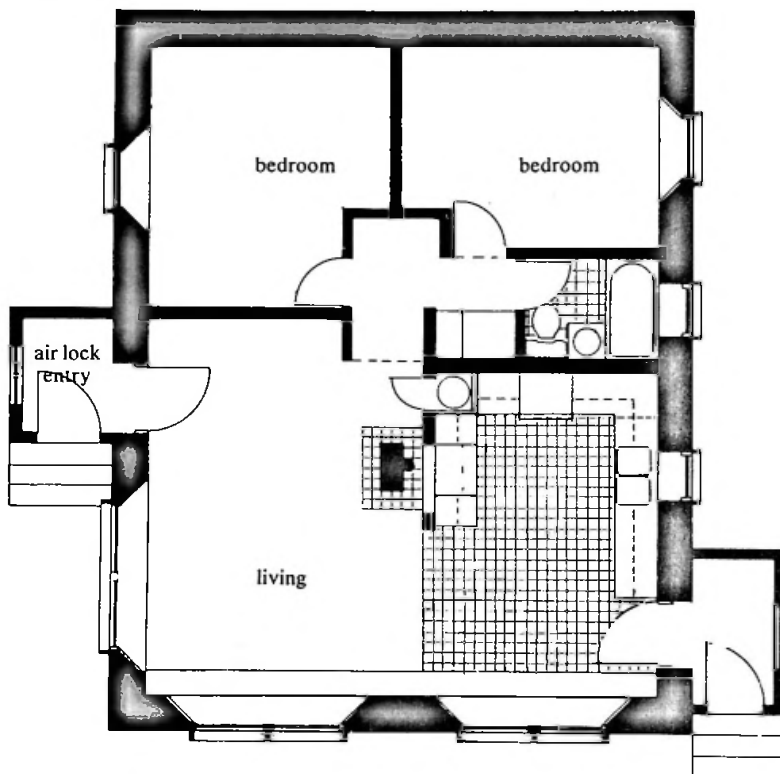


Designed for energy efficiency in an arctic climate, this house demonstrates the concept of superinsulation.

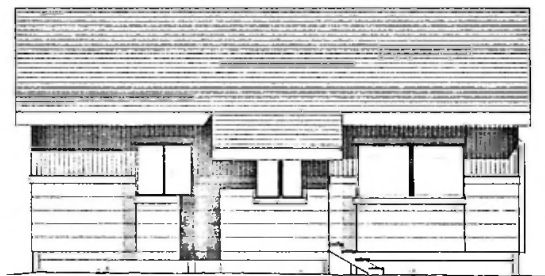
Superinsulation is a double-walled construction technique which allows for the installation of greater than normal amounts of insulation in the walls, ceilings, and floors.

The functionally well-defined living, dining and kitchen spaces are visually open and oriented to the south to take maximum advantage of solar gain. Small bedroom windows appear larger through the use of angled adjacent wall surfaces.

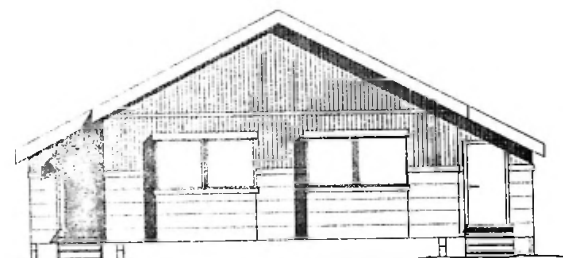
Floor plan



Elevations

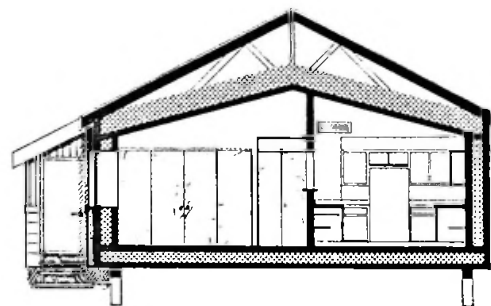


front



side

Section



# A4/Building Value Into Housing III

*sq. ft.:* 840

*Program:* Building Value into Housing  
*Designers:* Richard Larry Medlin, AIA,  
Tucson, Az.; William Wilde, FAIA,  
Tucson, Az., Consultant  
*Sponsor:* HUD

*Purpose:* To foster the use of innovative design, construction techniques and materials that would lead to marketable houses with reduced construction costs, low maintenance and energy conserving ideas.

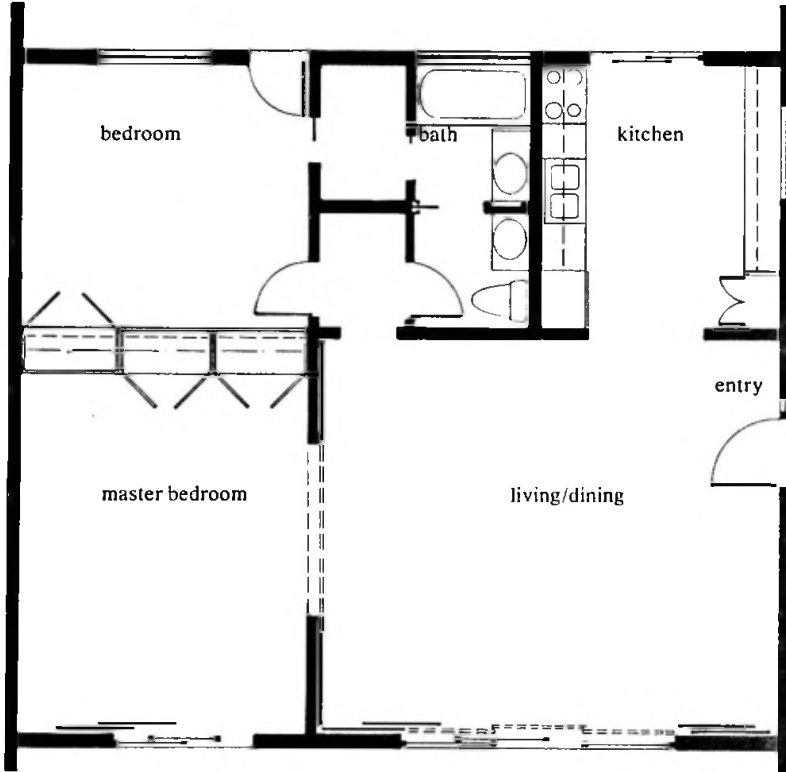


The Medlin house is designed to interact with the seasonal and daily climatic variations of the arid southwest.

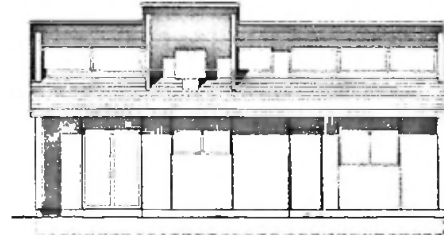
Sliding glass doors lead to shaded adjacent exterior patios, extending rooms outdoors. The sloped ceilings create natural convection currents of rising warm air, which are expelled in the summer and recirculated in the winter.

Modularized, this house is designed for quick on-site construction with steel-framed sandwich wall panels and a pre-fabricated utility core. This plan can be adapted to post and beam as well as to conventional wood framing.

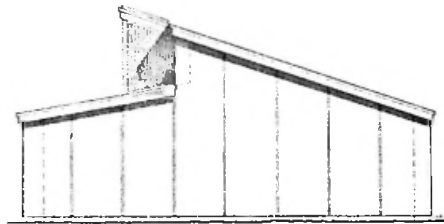
Floor plan



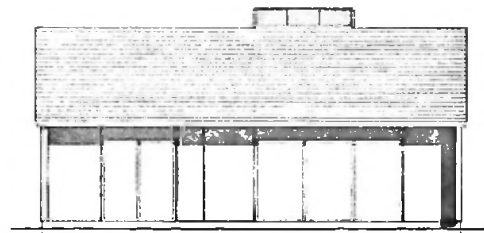
Elevations



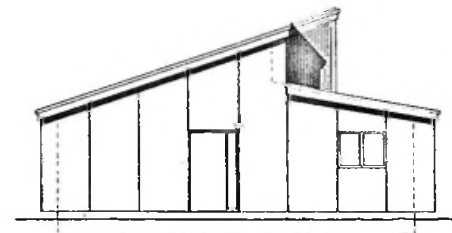
front



side



back



side

# A5/Optimum Value Engineered House

*sq. ft.: 952*  
*Program: Optimum Value Engineered House*  
*Designer: NAHB Research Foundation, Inc., Washington, DC*  
*Sponsor: HUD, NAHB Research*

Foundation, Inc., Washington, DC  
*Purpose: To demonstrate the potential cost-savings of the design and construction concepts developed under the Optimum Value Engineered Building System research program.*

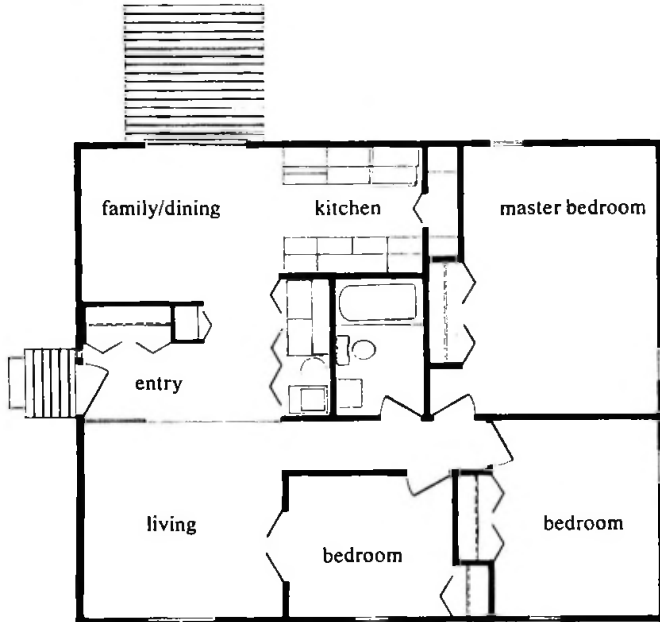


The OVE house was designed as a small, basic home that would be economical to build and maintain.

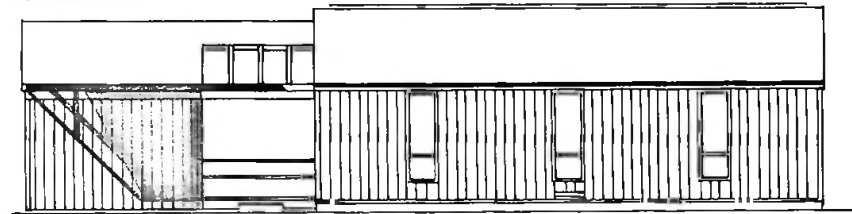
Hallways are minimized by combination with living and dining/family rooms. A compact core backed up to the kitchen and bathroom provides significant cost savings over other plan arrangements.

The construction drawings illustrate the OVE building techniques, including 24" o.c. framing, single top plates, box beam headers, and 22½" windows to fit between studs.

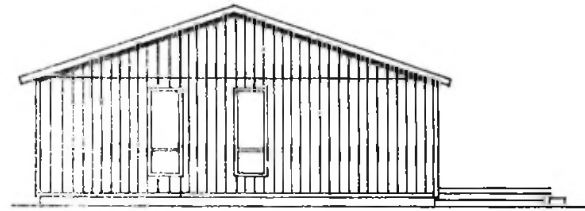
Floor plan



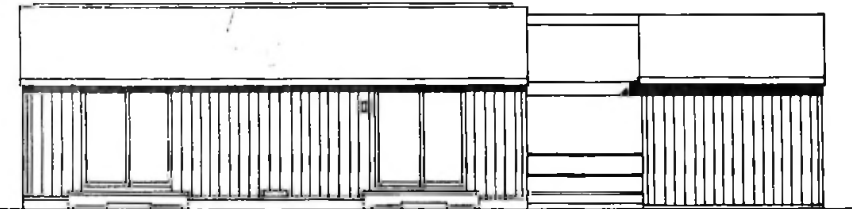
Elevations



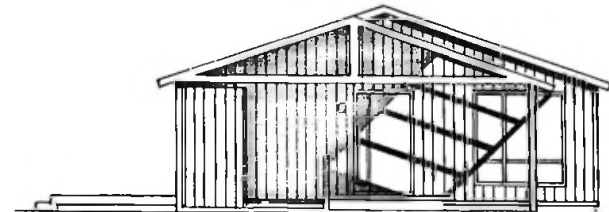
front



side



back



side

## A6/Building Value Into Housing IV

*sq. ft.: 968*

*Program: Building Value into Housing*

*Designer: CLB Associates, Inc., Architects/Planners, Kirkland, Wa.*

*Sponsor: HUD*

*Purpose: To foster the use of innovative design, construction techniques and materials that would lead to marketable houses with reduced construction costs, low maintenance and energy conserving ideas.*





The two story plan is traditionally arranged with upper level bedrooms and lower level living/dining/kitchen spaces.

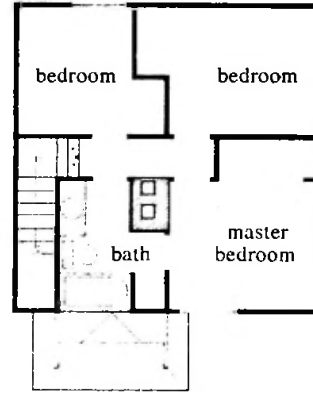
Passive solar concepts integrated into the house include mass walls and floors to retain solar heat, south-oriented glazing, and deep, shading overhangs.

This plan could be adapted to sloping sites; varying solar orientation requirements; house, garage and exterior finish styles; and single family, attached or multifamily configurations.

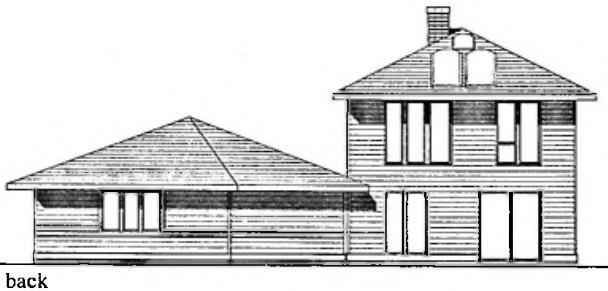
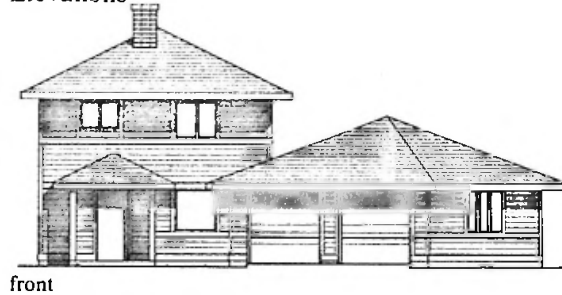
First floor



Second floor



Elevations



## B1/Approach '80 II

*sq. ft.:* 1,000

*Program:* Approach '80

*Designer:* National Association of  
Home Builders, Washington, DC

*Contractor:* National Association of  
Home Builders, Washington, DC

*Sponsor:* HUD

*Purpose:* To provide affordable, quality  
single family housing, incorporating a  
variety of innovative principles and tech-  
niques in the design.

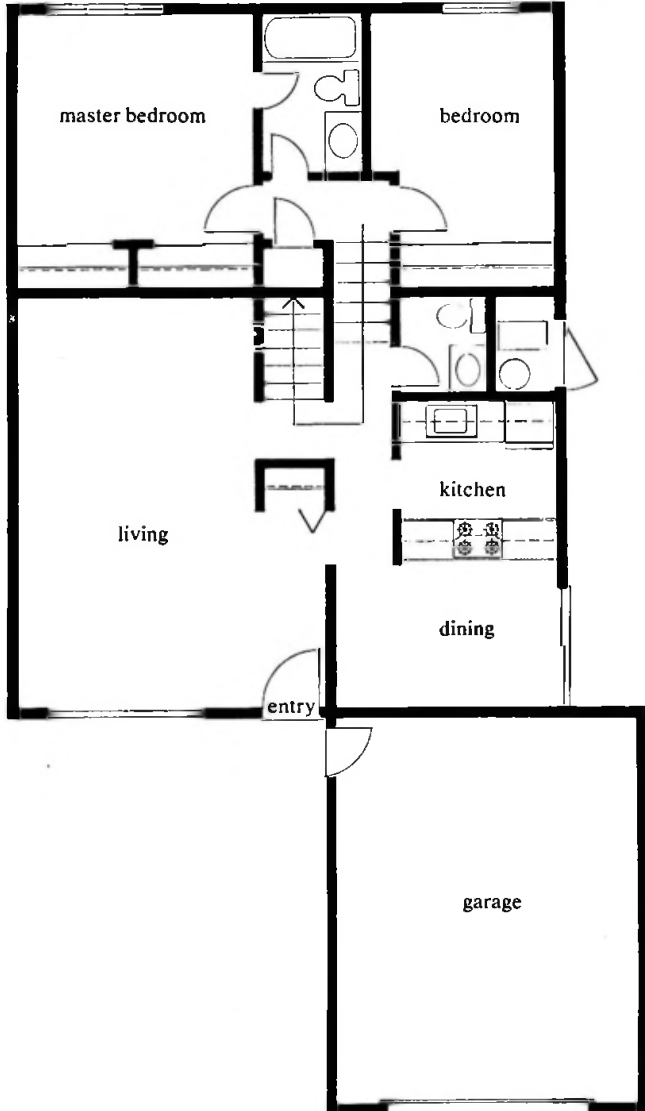


Approach '80 II can be built either as an attached 1,400 sq. ft. split level house or as a 1,000 sq. ft. ranch.

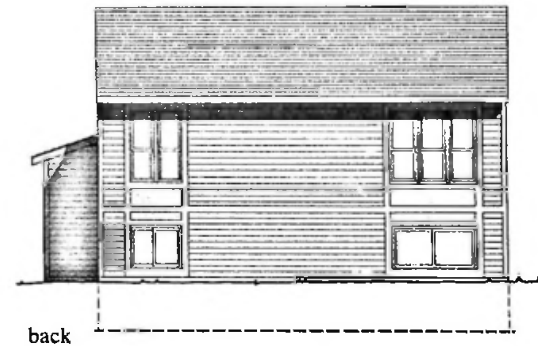
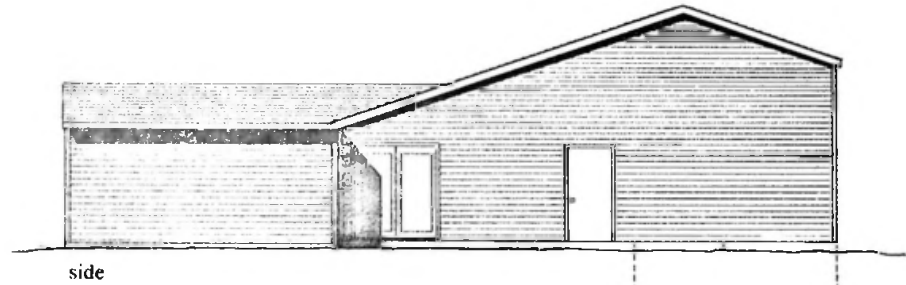
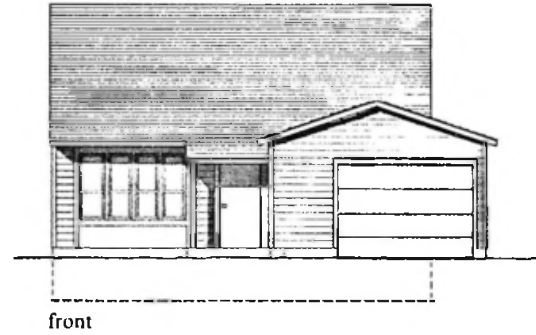
The large living room allows for the elimination of corridors, and provides flexibility in furniture and spatial arrangements. This compact house is suitable for construction as a detached or attached residence.

Working drawings indicate in-line floor joists, a pressure treated wood foundation, and 24" o.c. framing on a 2'-0" planning module.

Floor plan



Elevations



## B2/Approach '80 III

*sq. ft.:* 1,104

*Program:* Approach '80

*Designer:* National Association of  
Home Builders, Washington, DC

*Contractor:* National Association of  
Home Builders, Washington, DC

*Sponsor:* HUD

*Purpose:* To provide affordable, quality  
single family housing, incorporating a  
variety of innovative principles and tech-  
niques in the design.

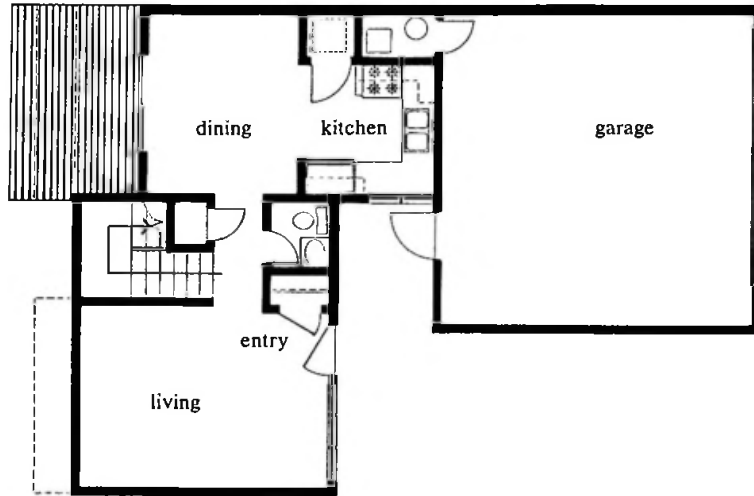


Compact and efficient, Approach '80 III is a modern two story house that reflects the increasing use of zero-lot line planning strategies.

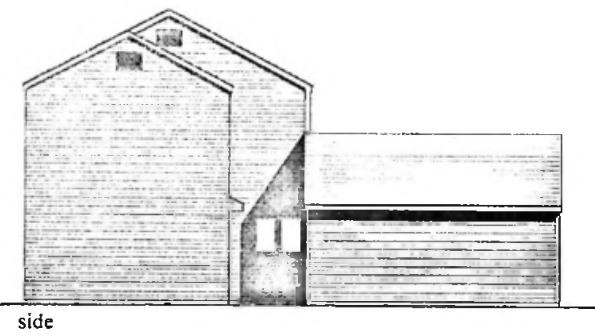
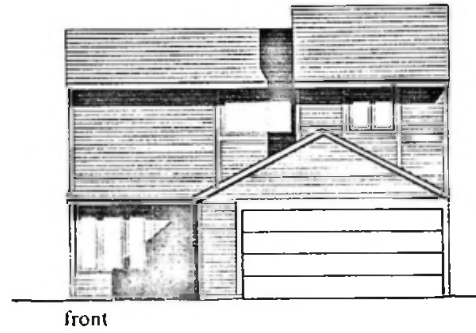
This 1,104 sq. ft. house demonstrates economical design and construction practices including 24" o.c. planning

modules with 24" o.c. stud spacing, a glue-nailed plywood floor system and in-line floor joists.

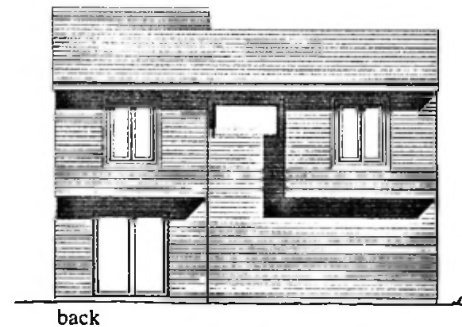
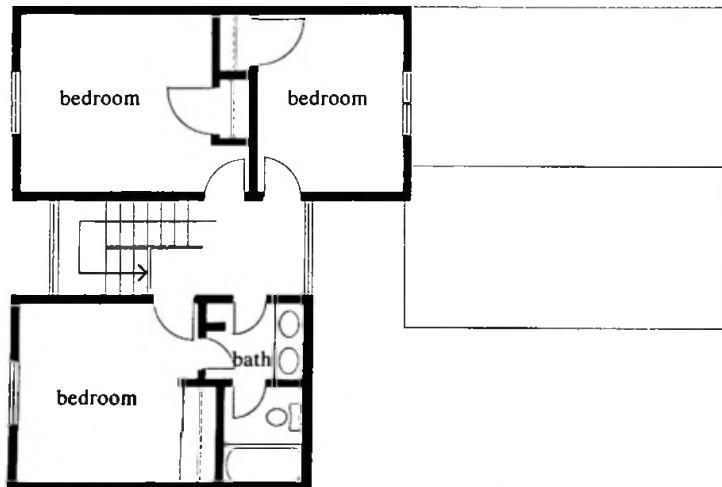
First floor



Elevations



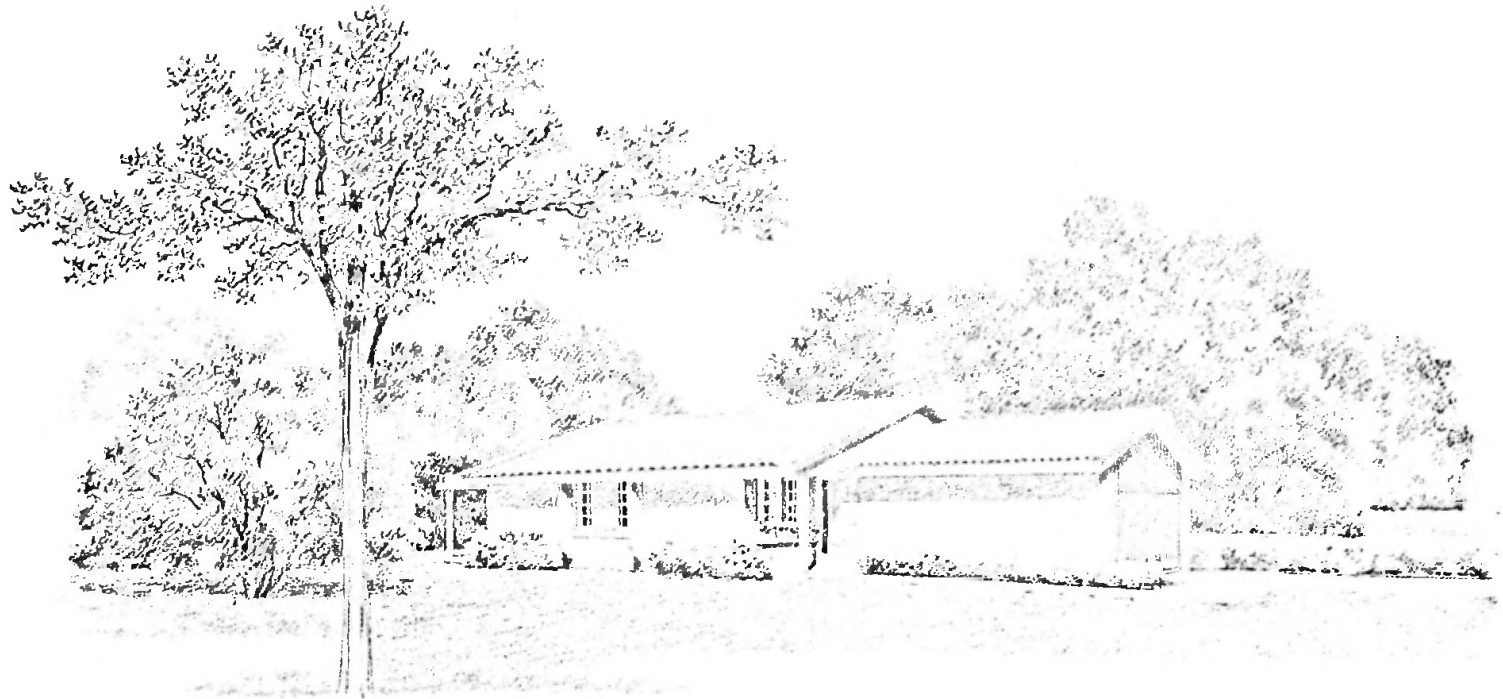
Second floor



## B3/Minimum Energy Dwelling

*sq. ft.:* 1,109  
*Program:* Minimum Energy Dwelling  
*Designer:* Southern California Gas  
Company  
*Contractor:* Mission Viejo Company,

Mission Viejo, Ca.  
*Sponsor:* DOE  
*Purpose:* To design, construct, and test a  
compact house with minimum energy  
consumption requirements.

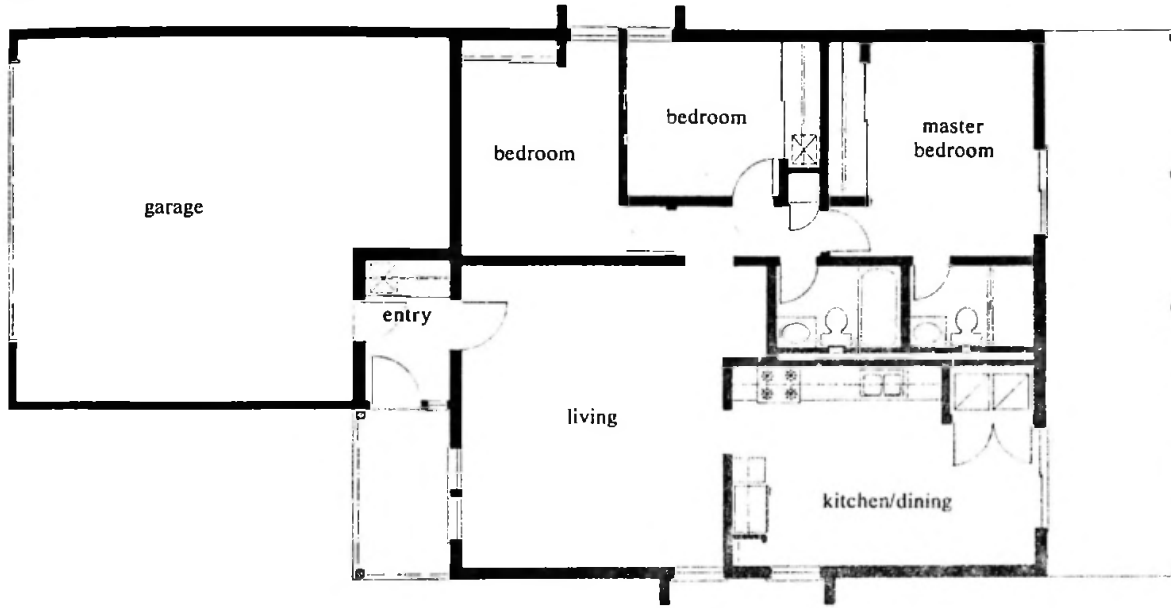


This southwest style house is characterized by deep porches, overhangs, a tile roof, and stuccoed walls.

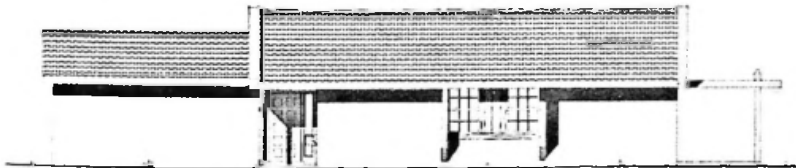
The plan is oriented towards a patio lifestyle through the use of kitchen and bedroom sliding glass doors which open onto

adjacent outdoor decks. These decks connect indoor and outdoor living spaces and increase the apparent size of the house.

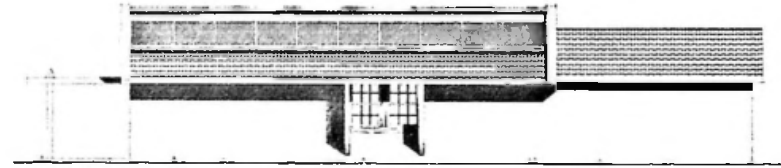
Floor plan



Elevations



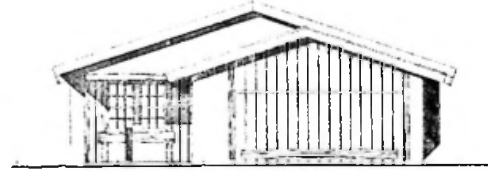
front



back



side



side

## B4/Cost Buster

*sq. ft.:* 1,120

*Program:* Cost Buster

*Contractor:* National Association of  
Home Builders, Washington, DC;

Dudley Smith, Builder

*Sponsor:* National Association of Home

Builders Research Foundation, Inc.,  
Washington, DC

*Purpose:* To demonstrate modern,  
economical construction, free from  
unnecessary codes and regulations.

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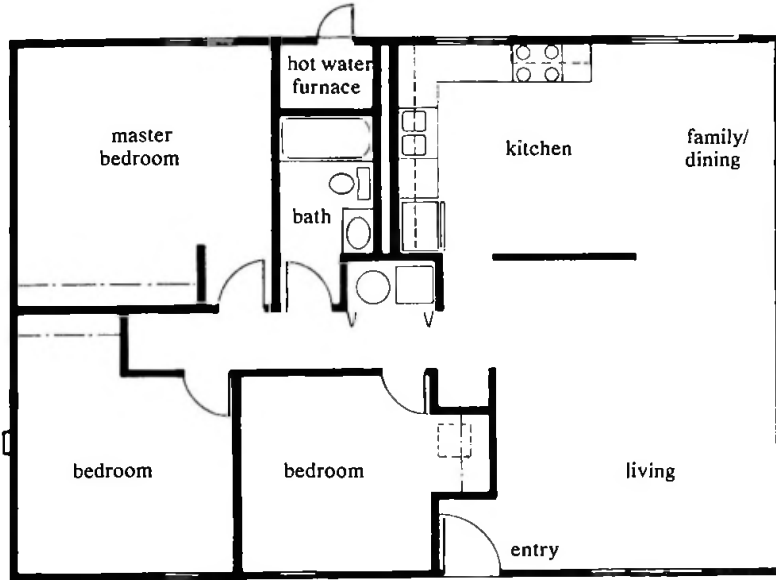


This compact, modularly planned ranch style house was designed as an affordable alternative to larger, conventionally built houses.

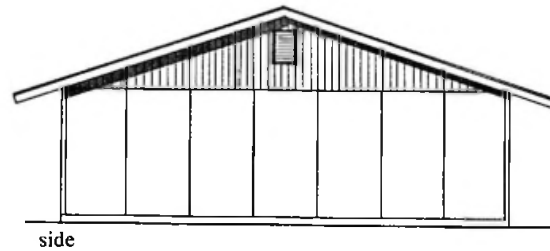
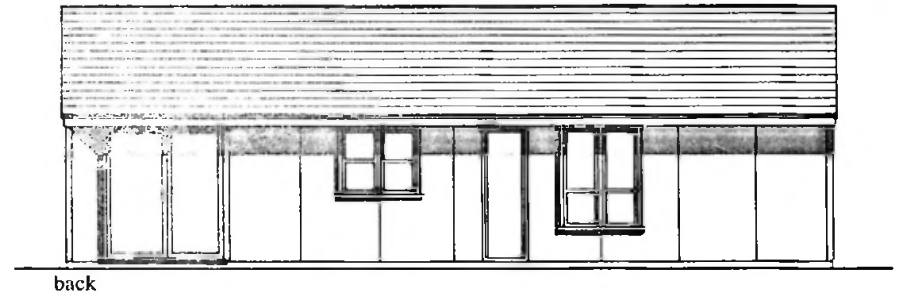
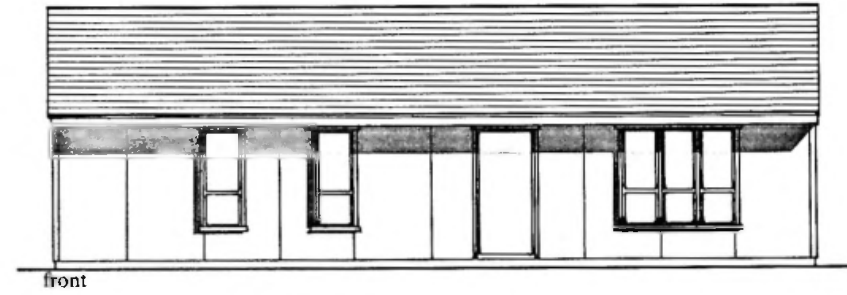
The construction drawings document the many innovative design and detailing features, including: 24" o.c. framing,

prefabricated DWV plumbing trees, simplified construction details, and modularized windows.

Floor plan



Elevations



# B5/Energy Efficient Residence I

*sq. ft.:* 1,196

*Program:* Energy Efficient Residence I

*Designer:* NAHB Research

Foundation, Inc., Washington, DC

*Contractor:* NAHB Research

Foundation, Inc., Washington, DC

*Sponsor:* HUD

*Purpose:* To demonstrate and measure residential energy conservation potential and cost effective construction through the design and evaluation of a typical new, one-story home.

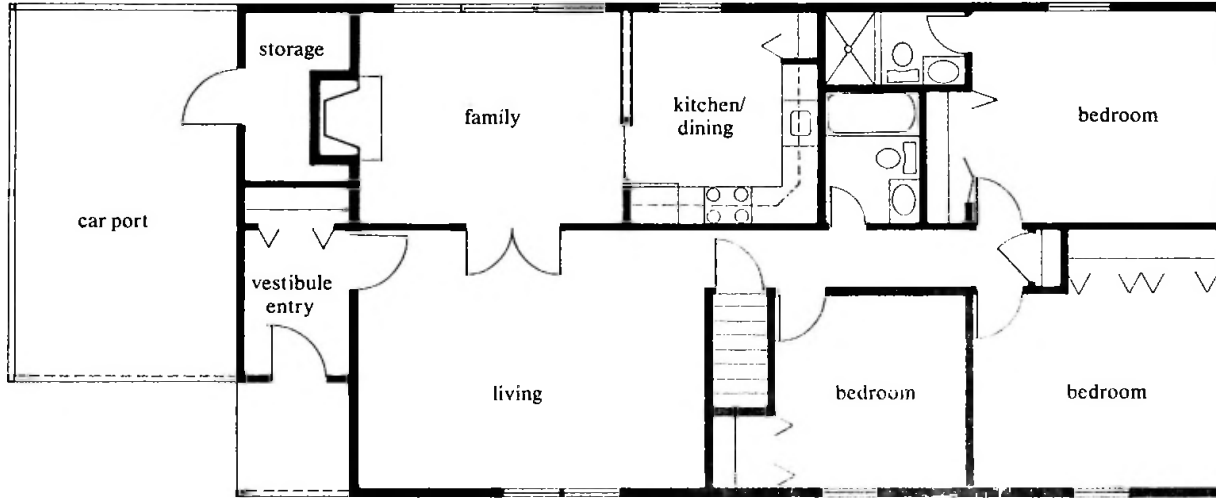


The first Energy Efficient Residence (EER I) was designed to maximize fuel savings and decrease construction costs in a plan adapted from a builder's best selling model.

The EER I combines a southern orientation and increased insulation with OVE (Optimum Value Engineering) construction techniques to produce a house proven more cost-effective to build and maintain than the original model.

Energy conserving plan features include an airlock vestibule entry and a family room which can be closed off to become a solarium.

Floor plan



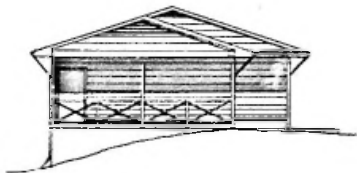
Elevations



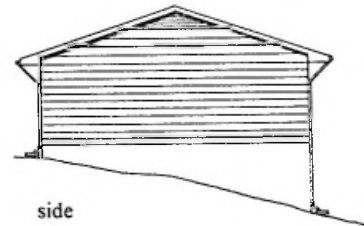
back



front



side



side

## B6/Building Value Into Housing V

*sq. ft.:* 1,312

*Program:* Building Value into Housing

*Designer:* Jim Jamison, Valdosta, Ga.

*Contractor:* Minchew Homes Corporation, Valdosta, Ga.

*Sponsor:* HUD

*Purpose:* To foster the use of innovative design, construction techniques and materials that would lead to marketable houses with reduced construction costs, low maintenance and energy conserving ideas.



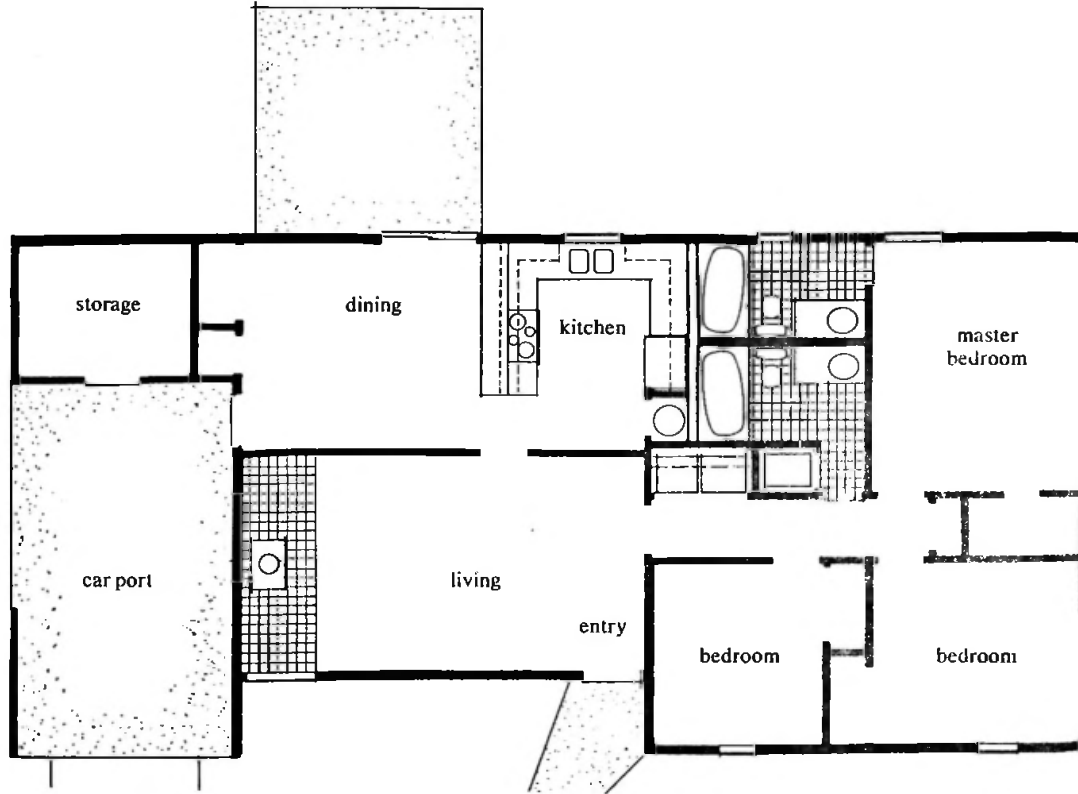
Designed by a builder with a reputation for economical, efficient homes, the floor plan of this house is well organized with a minimum of wasted space.

It has been planned on a module for cost effectiveness in material usage, and simplicity of construction.

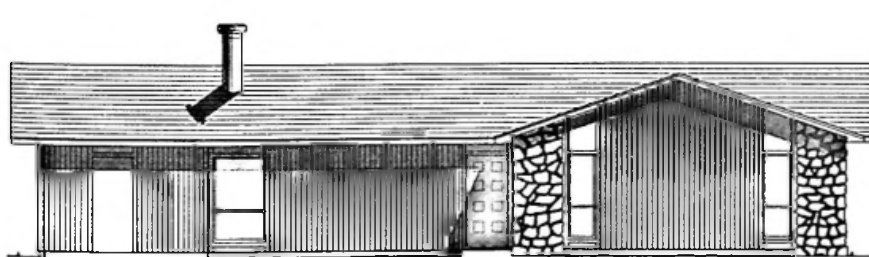
The house is designed to be constructed of many cost saving techniques including

2" x 6" framing @ 24" o.c., two stud corners, drywall clips, and itemized lumber and materials cutting lists. Exterior finishes and materials can easily be altered to provide for style preferences in different parts of the country.

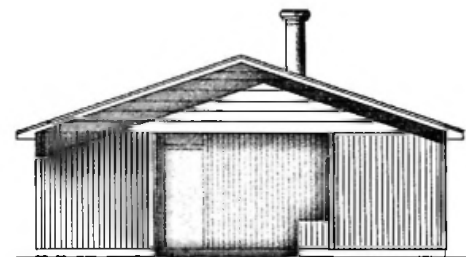
Floor plan



Elevations



front



side

# B7/Denver Metro Program I

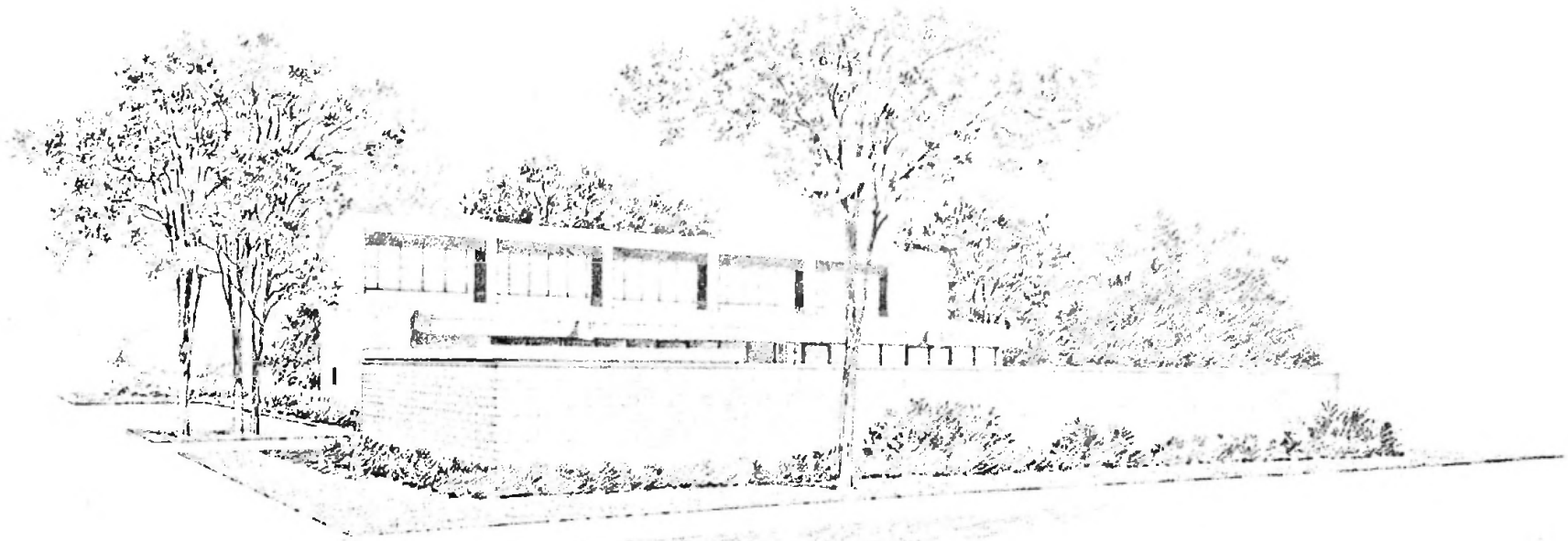
*sq. ft.:* 1,334

*Program:* Denver Metro Program

*Designers:* Brothers Redevelopment Corporation; Alan Brown, Architect

*Sponsor:* Solar Energy Research Institute

*Purpose:* To design a zero lot line house for an urban corner site, incorporating the planning consideration of outdoor privacy and passive solar energy collection and storage.

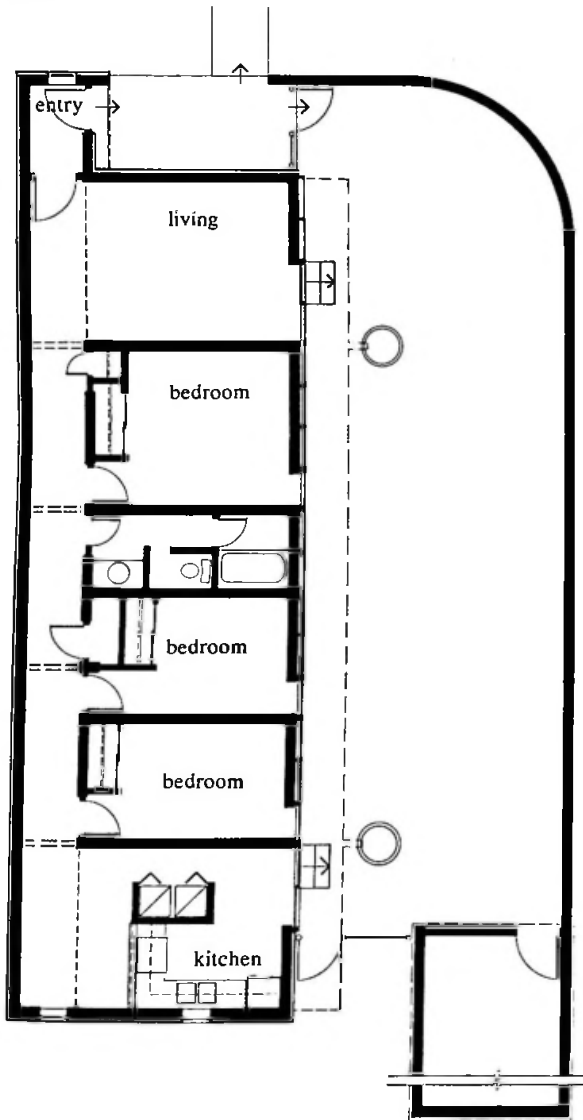


This passive solar house reflects an unconventional linear plan with all rooms oriented to a sunlit, mass wall corridor on one side and a courtyard on the other.

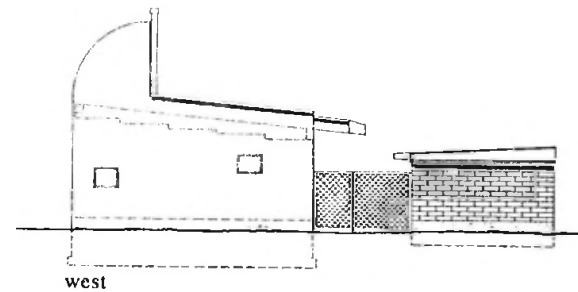
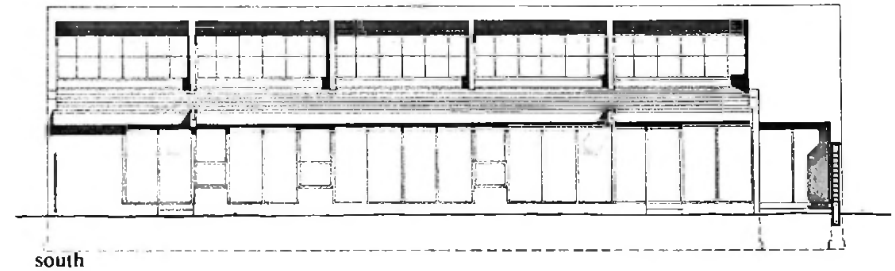
Planned for high density land use, the house can utilize zero lot line sites. The exterior is designed with finishes typical of the southwest style, including stuc-

coed walls and projecting wooden downspouts. Deep overhangs shade interior rooms during the summer, and allow solar penetration during the winter.

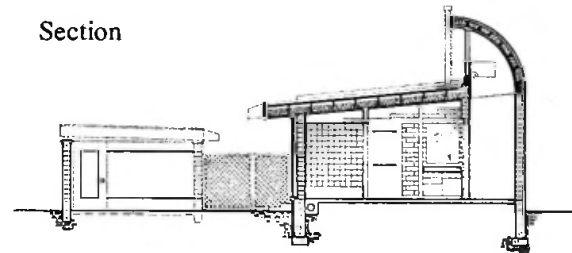
Floor plan



Elevations



Section



## B8/Building Value Into Housing VI

*sq. ft.:* 1,504

*Program:* Building Value into Housing

*Designers:* Huth Westwood Builders  
and Environmental Design Alternatives –  
Architects, Akron, Oh.

*Contractor:* Huth Westwood Builders

*Sponsor:* HUD

*Purpose:* To foster the use of innovative  
design, construction techniques and  
materials that would lead to marketable  
houses with reduced construction costs,  
low maintenance and energy conserving  
ideas.

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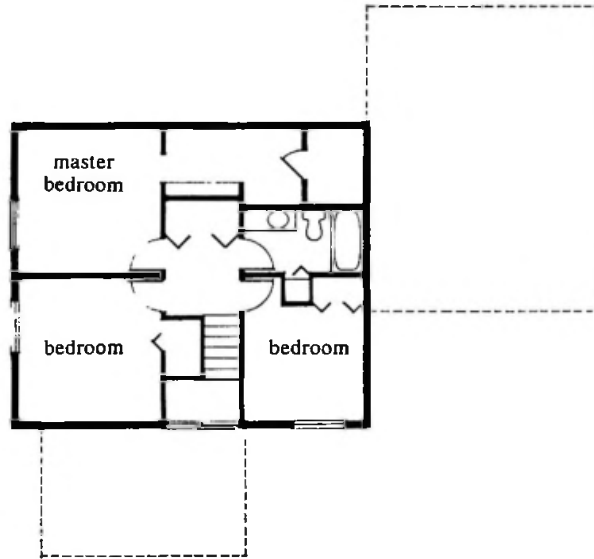
The bi-level Huth Westwood house is organized around a mid-level, double height sunspace which serves as an air-lock entry, a sitting area and a solar heat collector.

The sunspace also provides light and a visual focus for the upper level living room.

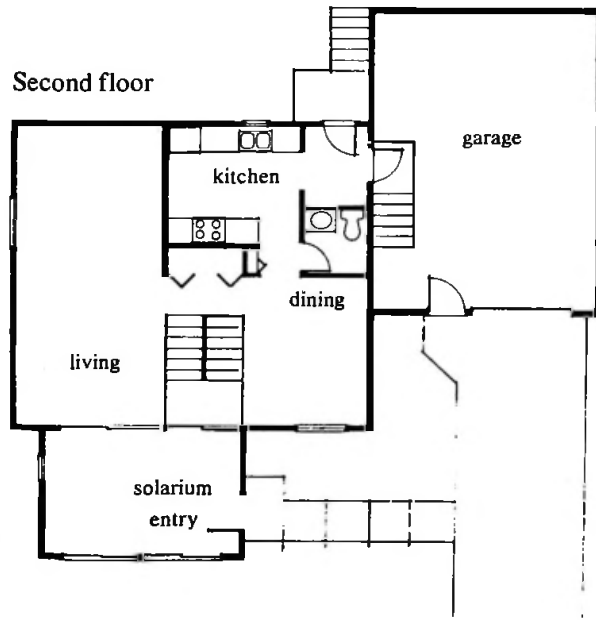
tion, and is detailed with an all-weather wood foundation and other cost savings features.

This house is designed on a 2 foot module for conventional or panelized construc-

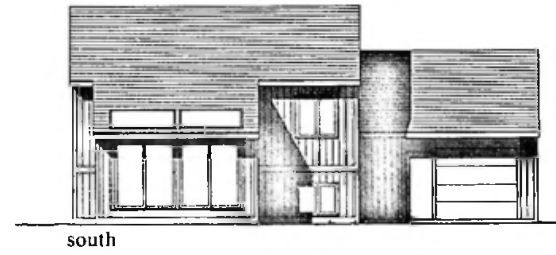
First floor



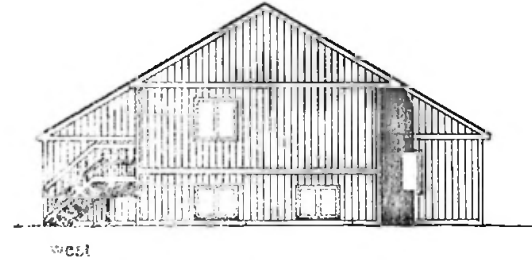
Second floor



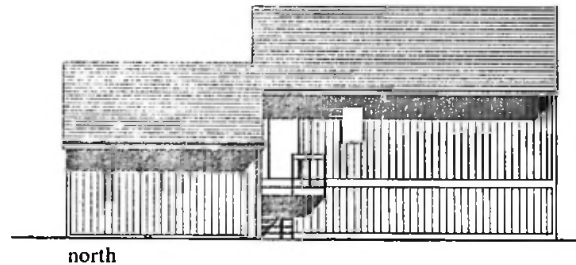
Elevations



south

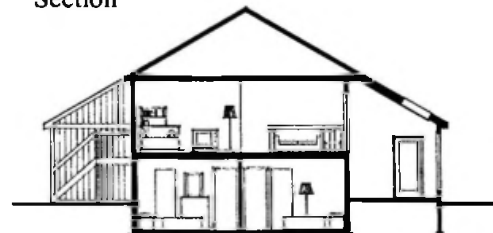


west



north

Section



## B9/Cycle 4 Demonstration

*sq. ft.: 1,515*  
*Program: Cycle 4 HUD Solar Heating and Cooling Demonstration*  
*Designers: Arkansas Ark Builders, Inc., Little Rock, Ar.; Bob Bland, Little Rock, Ar., Solar Consultant*

*Contractor: Winrock Homes, Inc.*  
*Sponsor: HUD*  
*Purpose: To demonstrate the incorporation of passive solar technology into a contemporary style house which has a popular floor plan.*



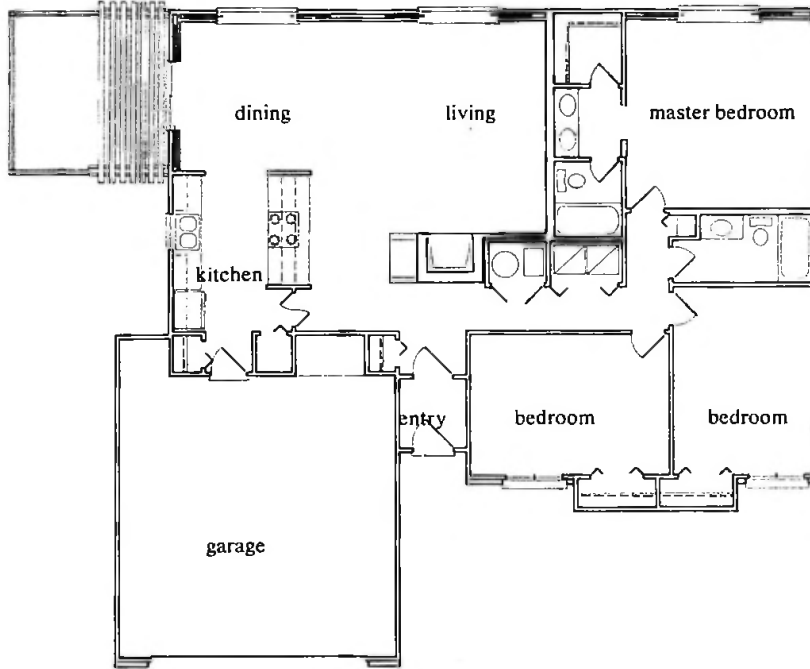
*South (rear) view*

A contemporary style house with a modern, open plan, the Winrock Homes house was designed to maximize winter solar gain through windows and doors.

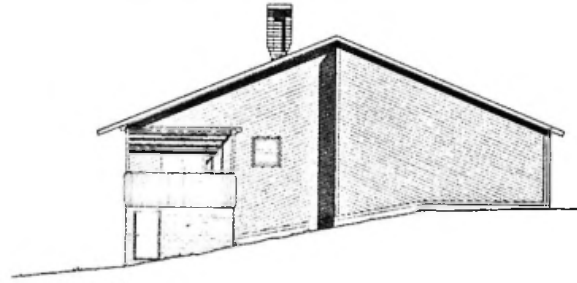
The kitchen living/dining room is oriented to the south and adjoins an outdoor deck or optional greenhouse. Night insulation and summer shading is provided

for all south-facing windows through the use of sliding pocket window shutters in the south wall.

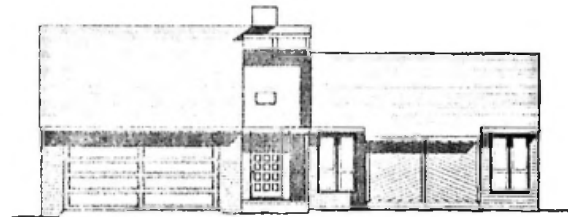
Floor plan



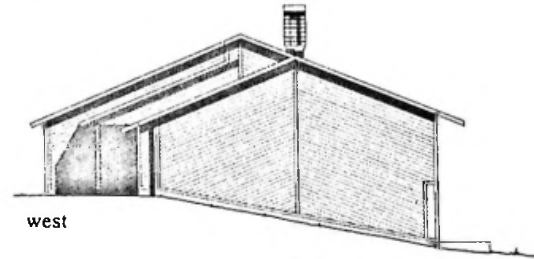
Elevations



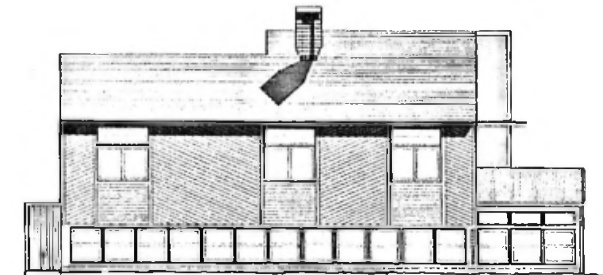
east



north



west



south

# B10/Tennessee Valley Authority I

*sq. ft.: 1,578*

*Program: Solar Homes for the Valley*

*Designer: TVA Solar Applications  
Branch, Architectural Design Branch*

*Sponsor: Tennessee Valley Authority*

*Purpose: To encourage the development of solar assisted housing in the Tennessee Valley*



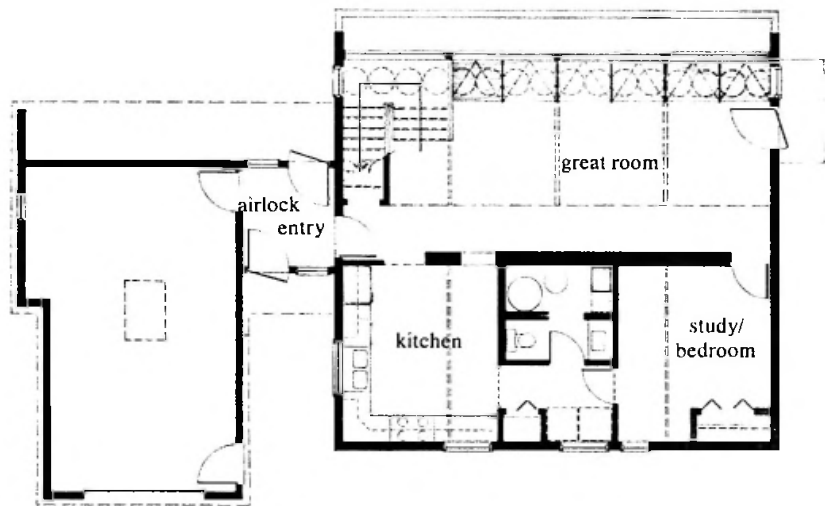
*South (rear) view*

A traditional saltbox on the exterior, the TVA I has a contemporary interior and plan.

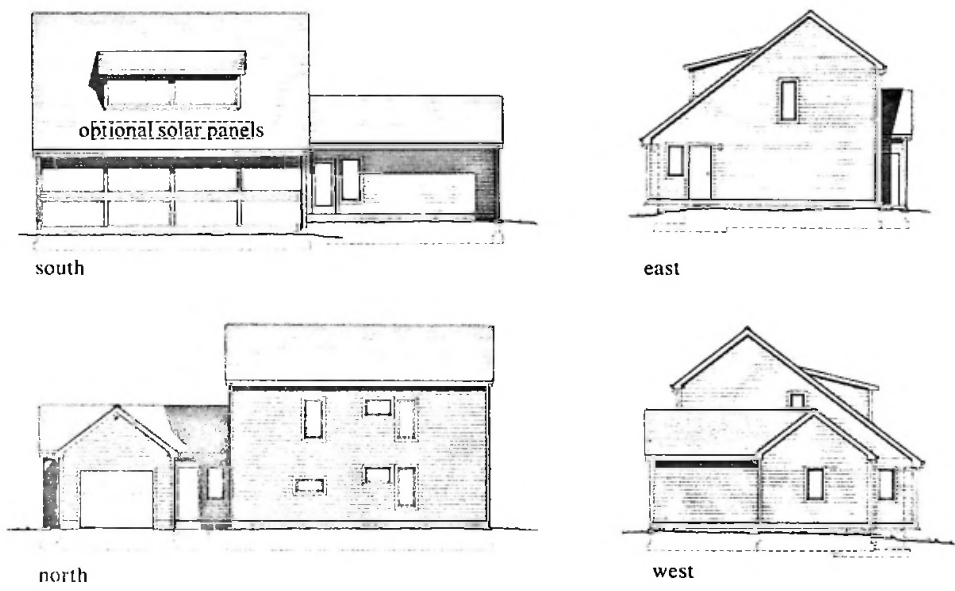
The interior rooms orient to a south facing great room, which combines the traditional dining, living and family rooms into one multipurpose space. Full height south facing windows allow for maxi-

mum solar radiation on the water drums, concrete floor and mass wall, which act as thermal storage. Natural convection in the double height great room carries warm air to upstairs bedrooms.

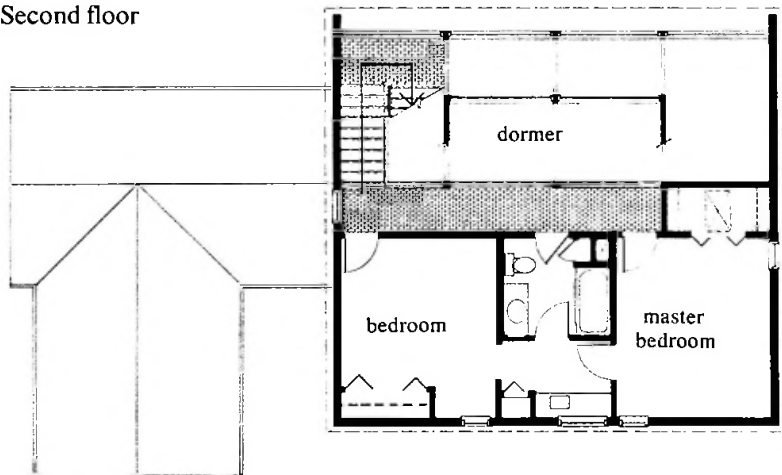
First floor



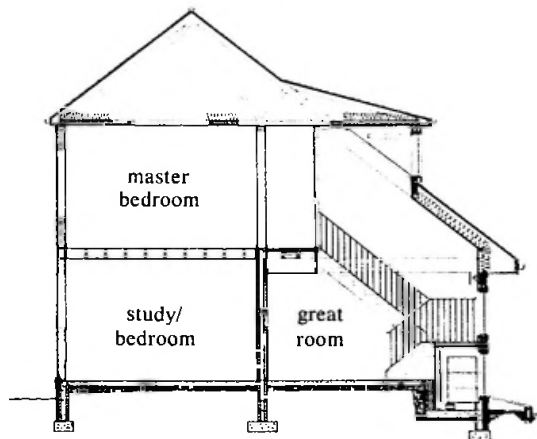
Elevations



Second floor



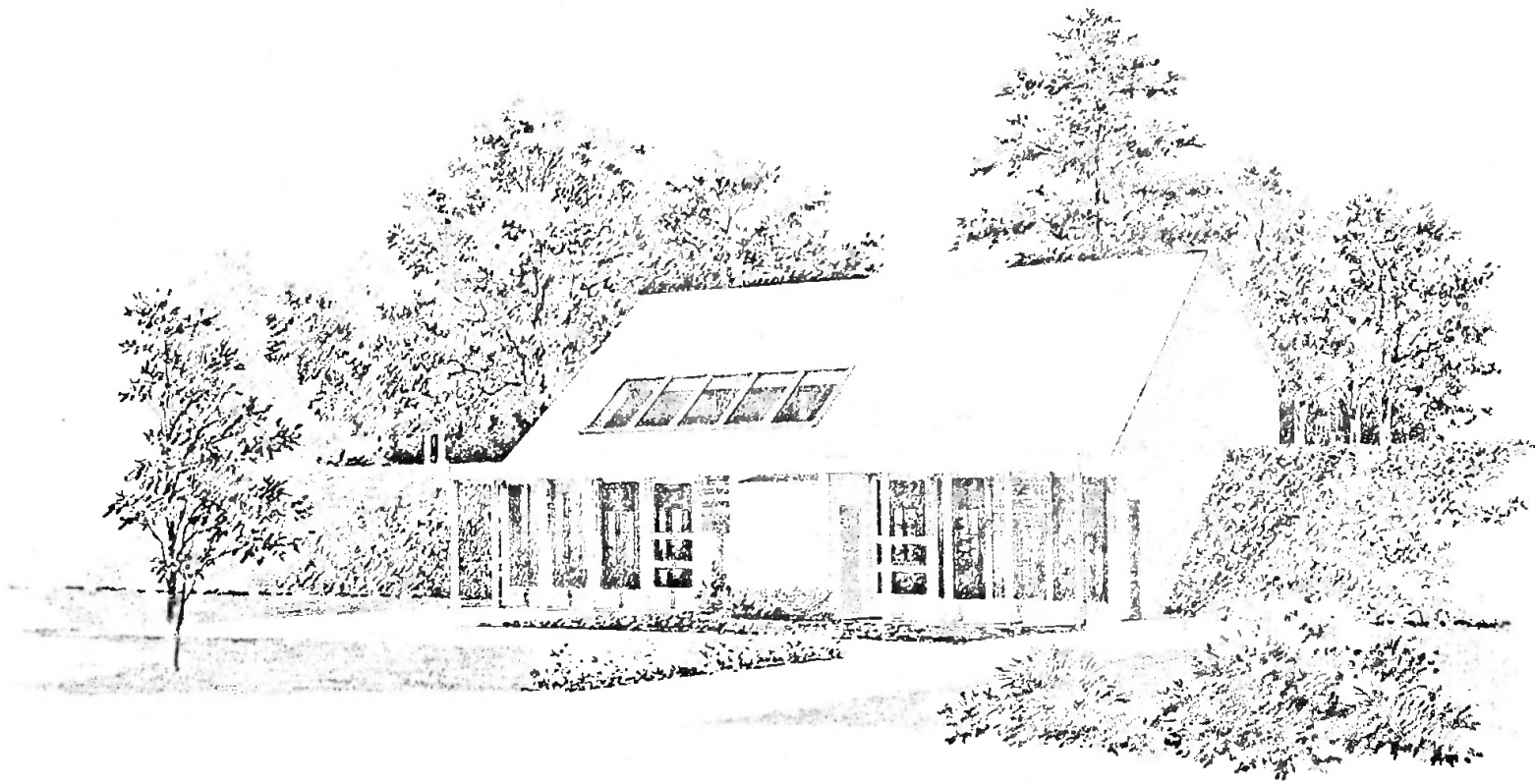
Section



# B11/Tennessee Valley Authority II

*sq. ft.:* 1,664  
*Program:* Solar Homes for the Valley  
*Designer:* TVA Solar Applications  
Branch, Architectural Design Branch

*Sponsor:* Tennessee Valley Authority  
*Purpose:* To encourage the development of solar assisted housing in the Tennessee Valley

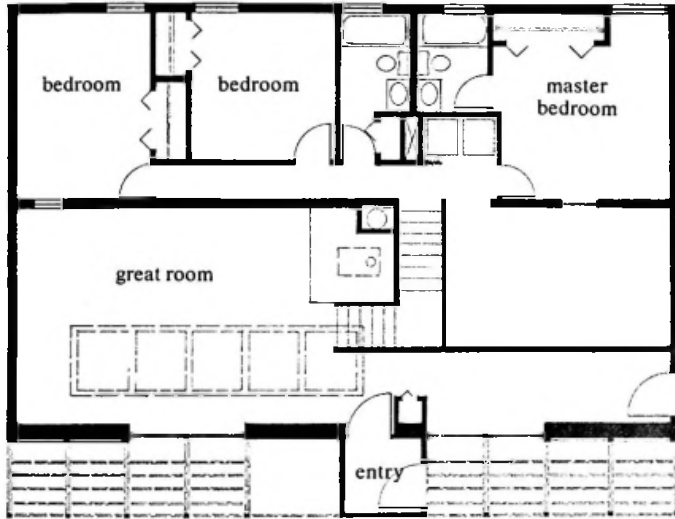


Designed for construction on a south-facing sloping site, this two-level TVA home is a split one story plan.

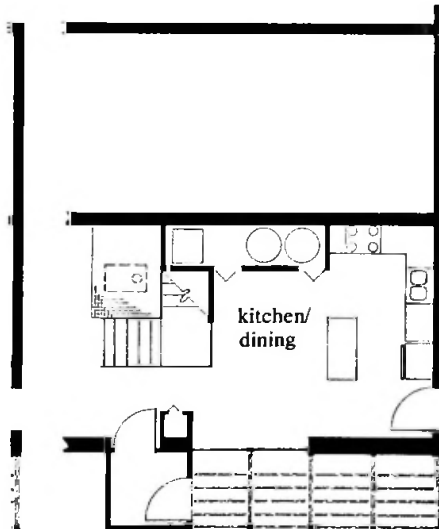
The lower level double height "great room" serves as a living room, while accommodating the multipurpose family room functions as well. Both the great room and adjacent kitchen are located between thermal mass walls, which

absorb daytime solar heat for nighttime radiant warmth. Skylights above the great room provide a window for views to the south from the 2nd floor open hallway.

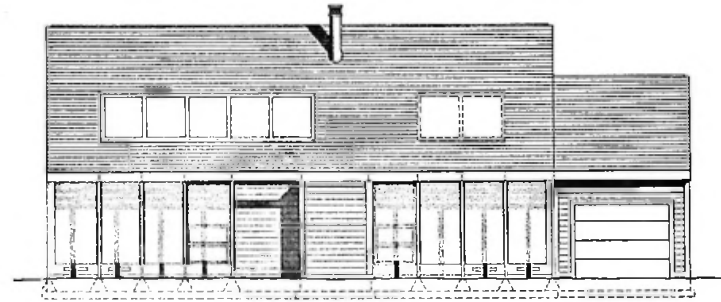
Second floor



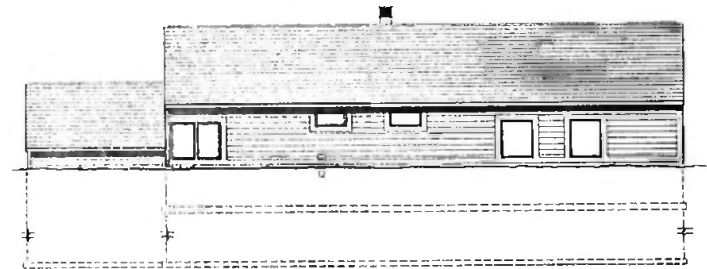
First floor



Elevations

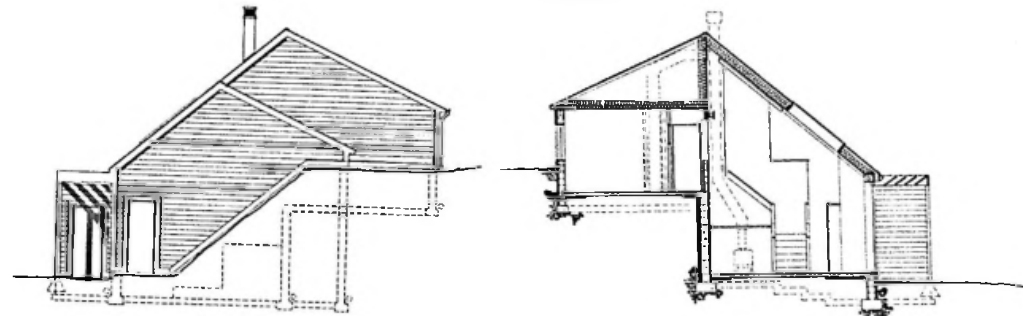


south



north

Section

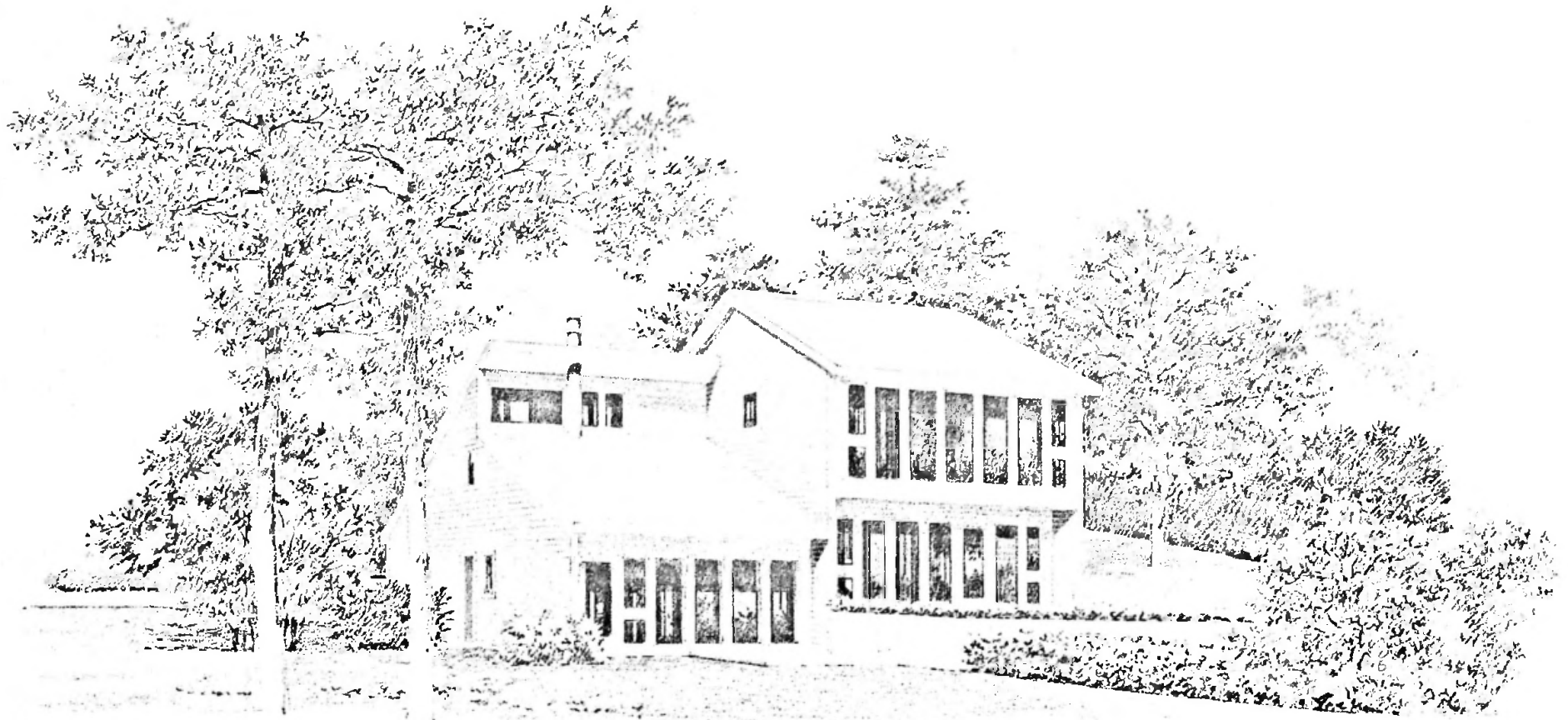


east

# B12/Tennessee Valley Authority III

*sq. ft.: 1,824*  
*Program: Solar Homes for the Valley*  
*Designer: TVA Solar Applications*  
*Branch, Architectural Design Branch*

*Sponsor: Tennessee Valley Authority*  
*Purpose: To encourage the develop-*  
*ment of solar assisted housing in the*  
*Tennessee Valley*



*South (rear) view*

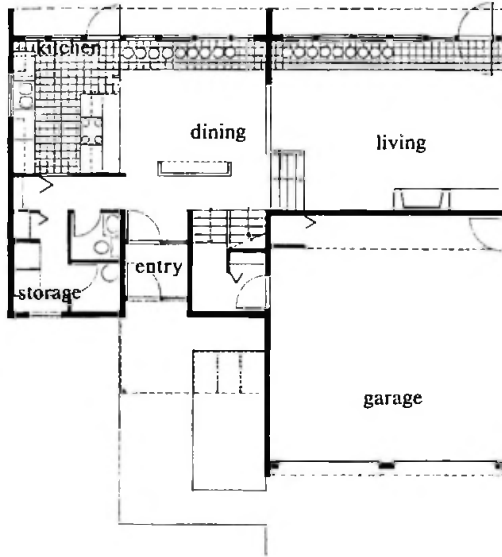


TVA III is a contemporary split-level home with modern, spacious room arrangements.

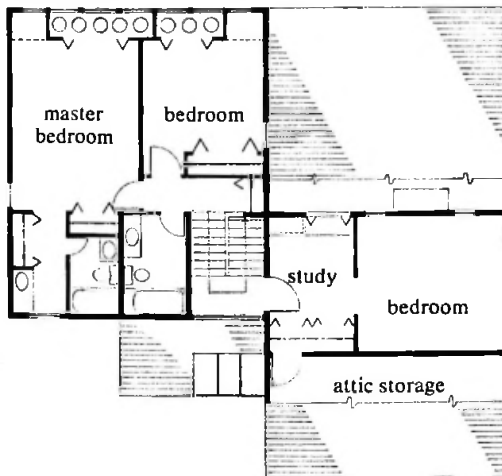
The first floor features a large kitchen/dining room overlooking a sunken living room. The second floor plan includes two full baths and two bedrooms; the third bedroom is above the garage on the intermediate level. All rooms are ori-

ented toward the south for energy efficiency, natural lighting and solar assisted heating. Optional water storage tubes can be used for solar heat retention and night reradiation.

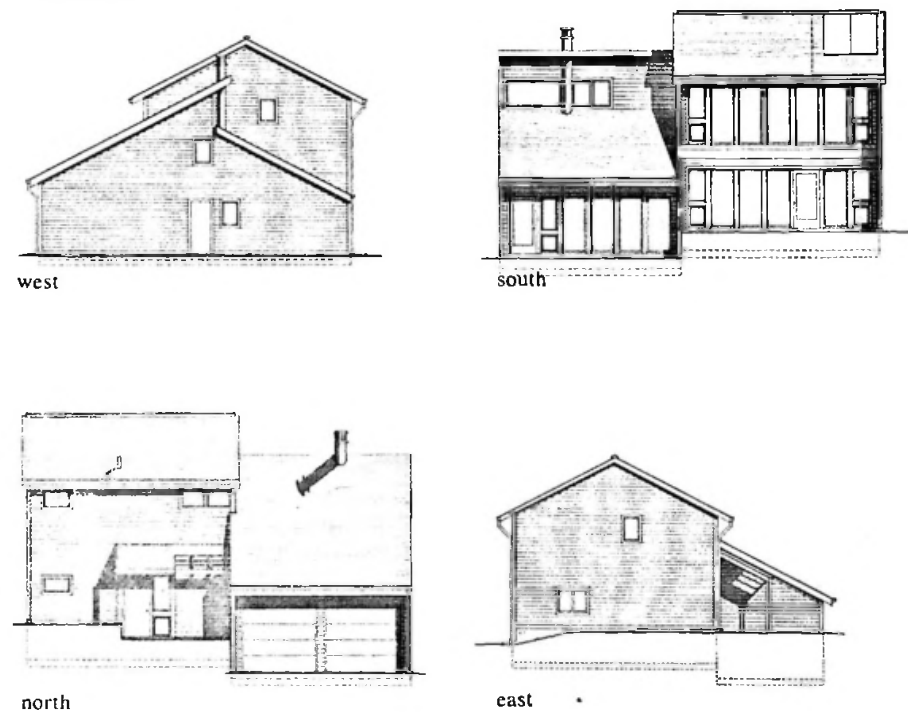
First floor



Second floor



Elevations



# C1/Denver Metro Program II

*sq. ft.: 2,200*

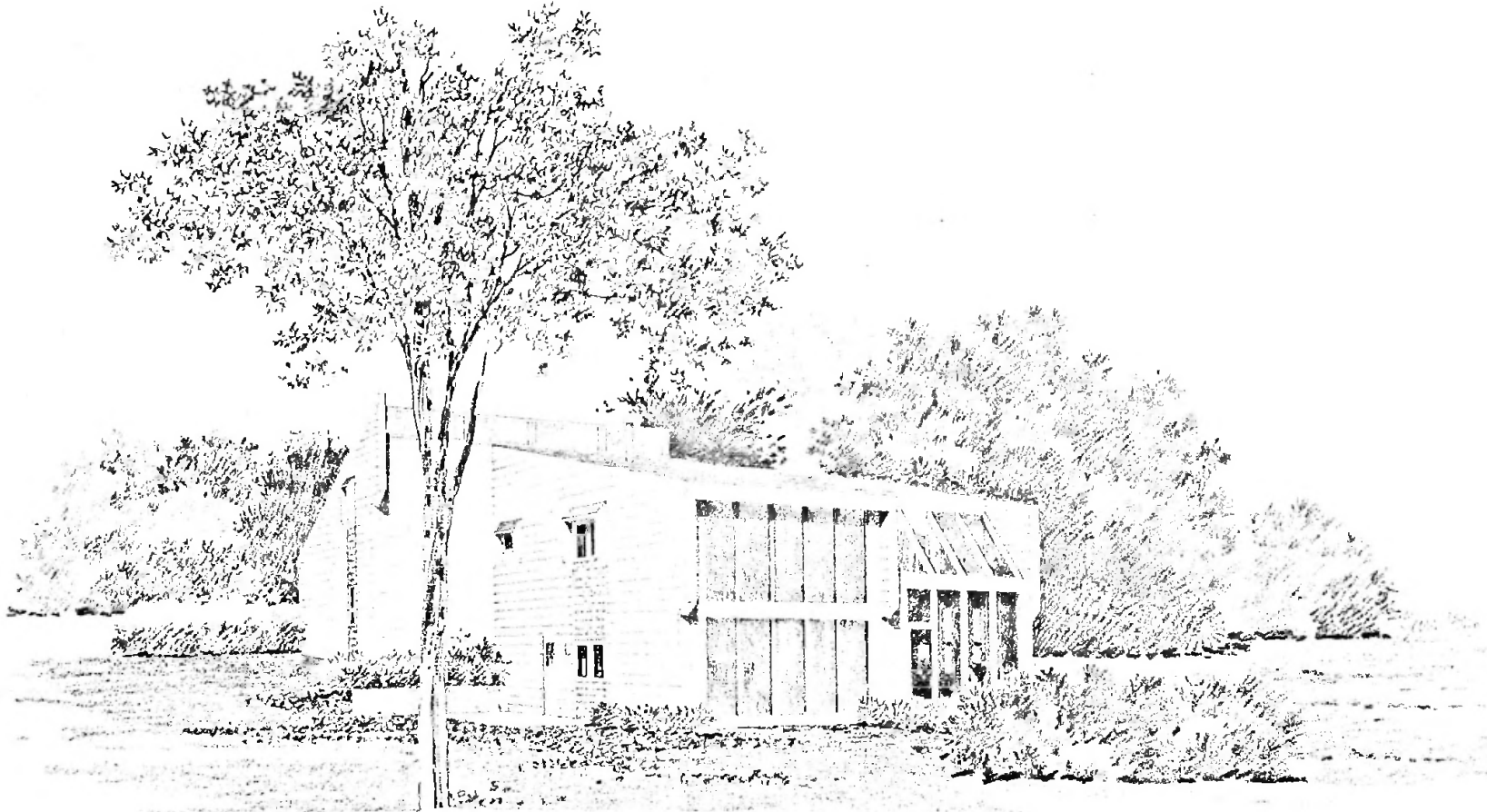
*Program: Denver Metro Program*

*Designer: Rudolph B. Lobato Associates, Longmont, CO*

*Contractor: Heritage Construction and Management Inc.*

*Sponsor: Solar Energy Research Institute*

*Purpose: To encourage the construction of energy conserving, passive solar and active solar homes in the Metropolitan Denver area.*



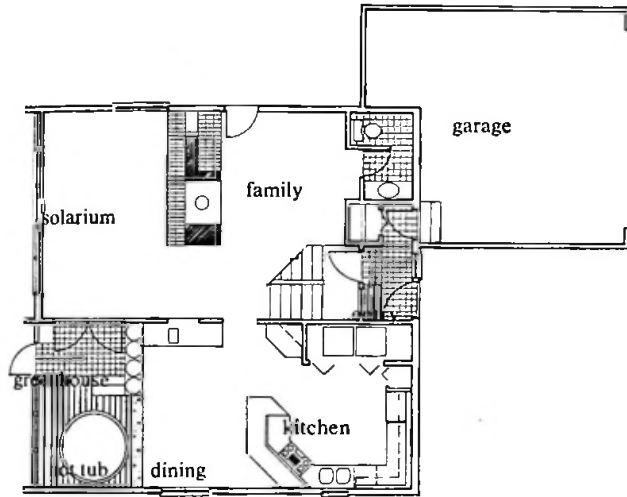
*South (rear) view*

Designed to take maximum advantage of available solar energy, the Heritage One house combines many techniques of solar design.

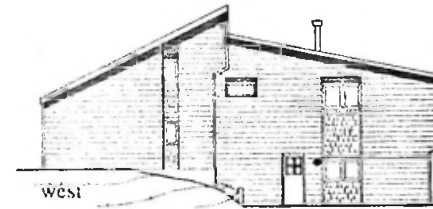
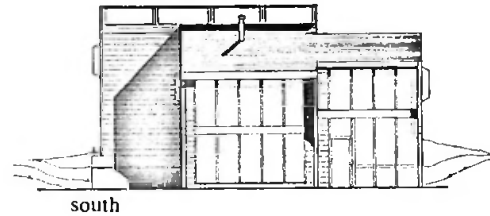
The south elevation has an optional trombe wall and a two story greenhouse. Other optional solar technologies include a rock storage bed, underslab hot air ducts, hot tub solar collectors and a greenhouse waterwall.

The waterwall, vertical mass wall and water storage tubes are centrally located allowing adjacent living spaces to realize full benefit of stored solar energy.

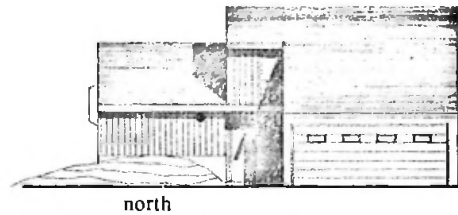
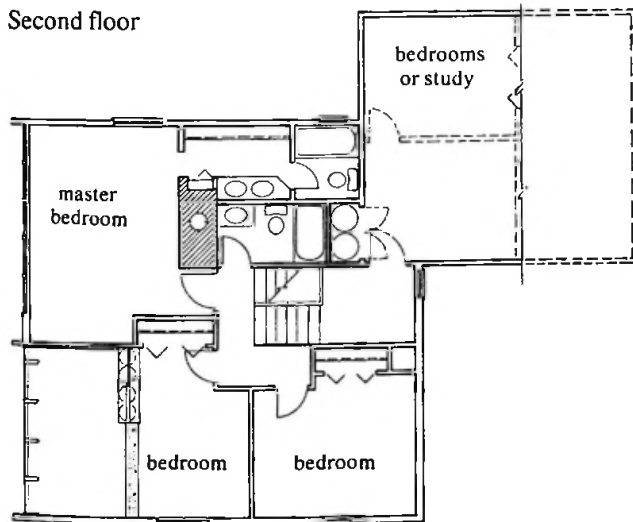
First floor



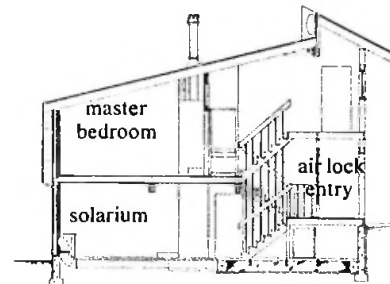
Elevations



Second floor



Section



# C2/Cycle 2 Demonstration

*sq. ft.: 2,607*

*Program: Cycle 2 HUD Solar Heating  
and Cooling Demonstration*

*Designer: The Mithune Associates,  
Seattle, Wa.*

*Contractor: Washington Natural Gas Co.*

*Sponsor: HUD*

*Purpose: To establish solar energy  
as a usable energy alternative, and to  
encourage the use of solar energy by the  
designer, the builder and the consumer in  
residential applications.*



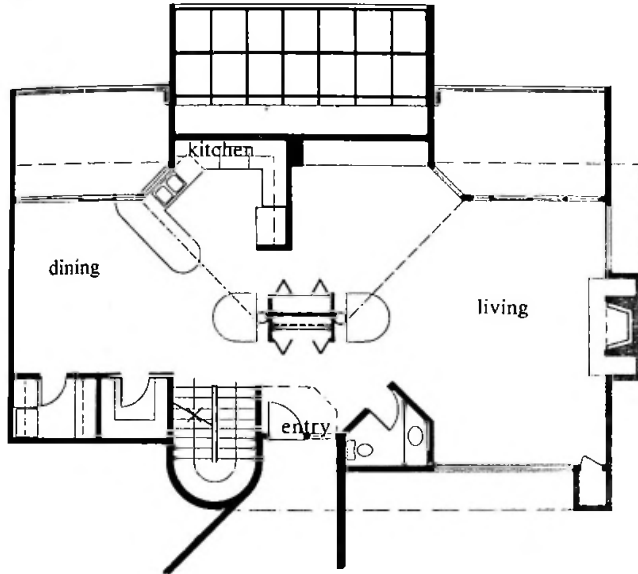
*South (rear) view*

Dramatic in both plan and elevation, the Washington Natural Gas house features flowing spaces, angled walls and south-facing balconies.

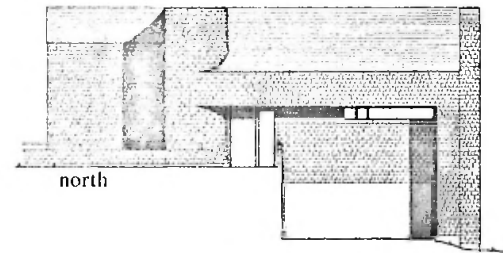
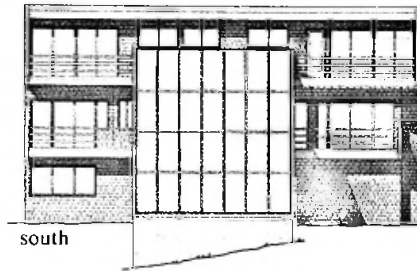
On the first floor a curved freestanding cabinet acts as both a room divider and a multi-purpose storage unit. The unusually shaped rooms and curved stairwell accent the contemporary styling.

The house is designed with an angled solar collector wall which supplies hot air to the basement rock storage bin.

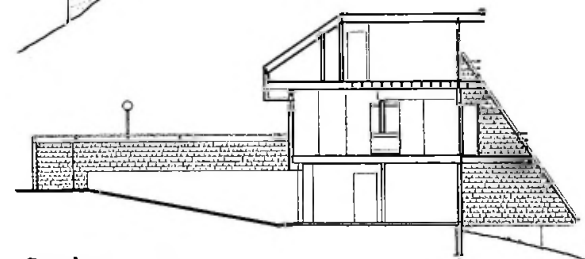
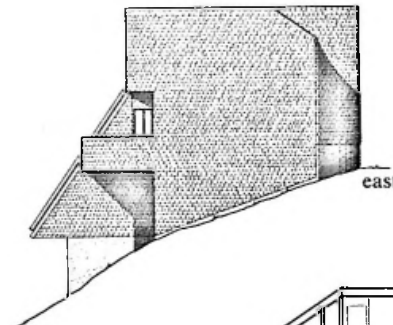
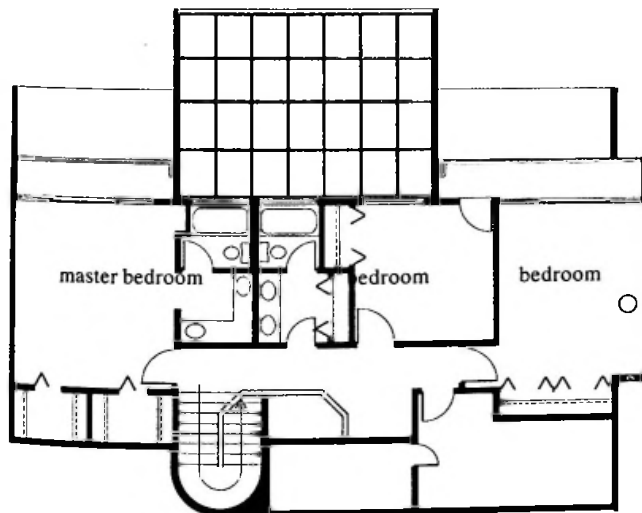
First floor



Elevations



Second floor



# C3/Brookhaven House

*sq. ft.: 3,022*

*Program: National Thermal Storage  
Research Project*

*Designer: Total Environmental Action,  
Inc., Harrisville, NH*

*Sponsor: Department of Energy and*

Brookhaven National Laboratory  
*Purpose: To demonstrate how thermal  
mass materials can be used to cut heating  
costs in conventional single family  
housing.*



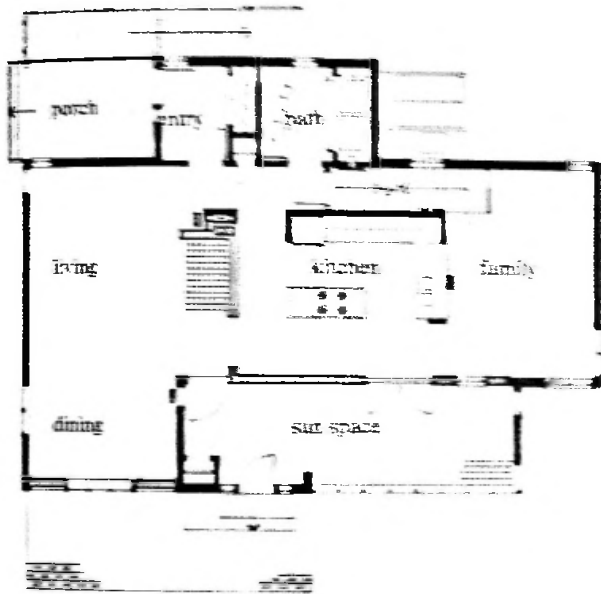
*South view*

The Brookhaven house blends traditional architectural styling with passive solar detailing and an open floor plan to provide for a contemporary lifestyle.

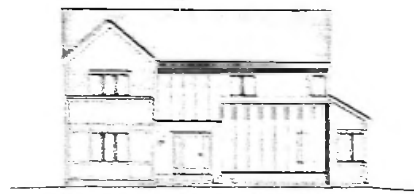
The gabled roofs, arched fan window, use of porches, and the centrally organized kitchen all reflect historic precedents. The optional south facing

sunspace provides a "conservatory" link between dining and living rooms, and acts as a passive solar collector.

First floor



Elevations



south



east

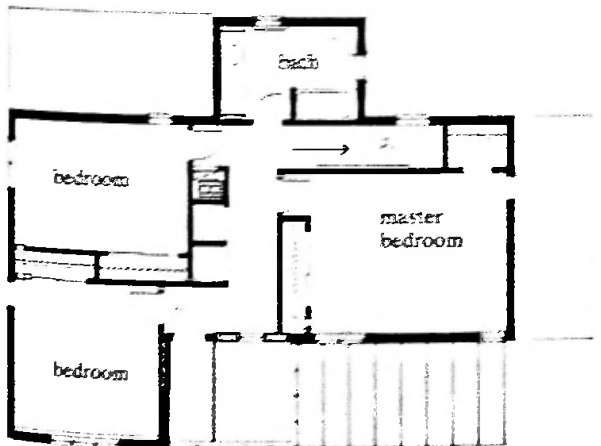


north

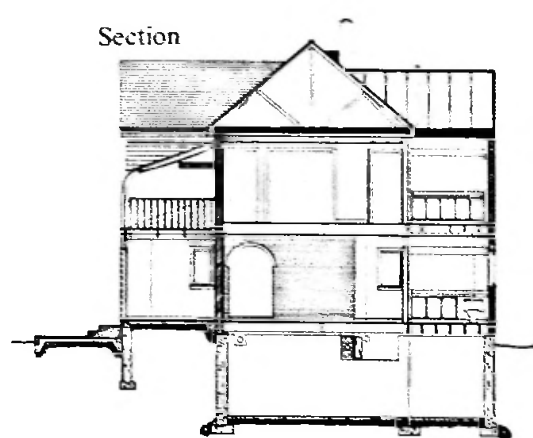


west

Second floor



Section



## C4/Energy Efficient Residence II

*sq. ft.: 3,052*  
*Program: Energy Efficient Residence II*  
*Designer: NAHB Research*  
*Foundation, Inc., Washington, DC*  
*Contractor: NAHB Research*  
*Foundation, Inc., Washington, DC*

*Sponsor: HUD*

*Purpose: To demonstrate and measure residential energy conservation potential and cost effective construction through the design and evaluation of a typical, new, two-story home.*



*South (rear) view*

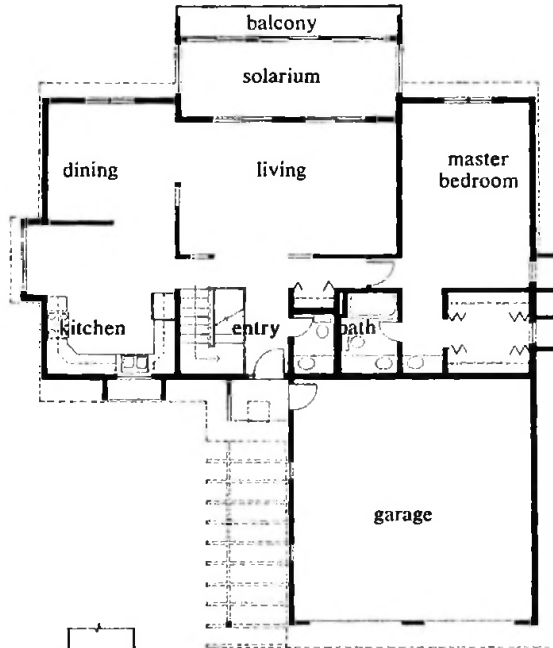


The second Energy Efficient Residence (EER II) is a two story house, designed to demonstrate energy conserving detailing and (OVE) Optimum Value Engineering construction techniques.

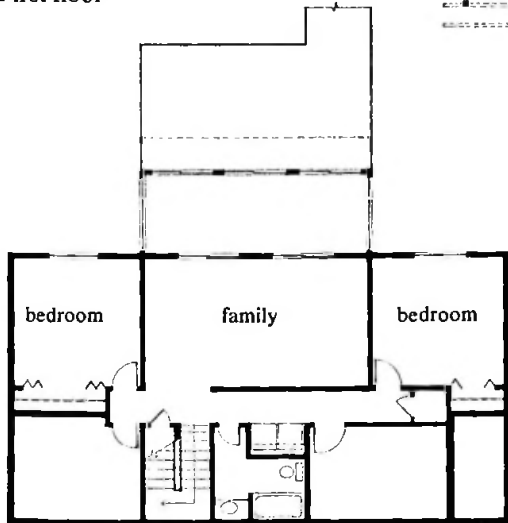
This contemporary styled house is divided into an upper level living room and master bedroom and lower level secondary bedrooms/guest rooms oriented around a family room.

The solarium additions to the living room and family room act as solar collectors. Other energy conserving features include an optional rock storage bed to store solar heat gain, and a partially bermed lower level.

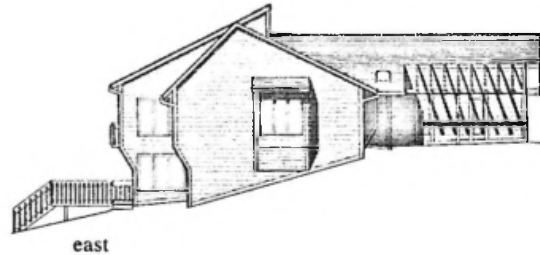
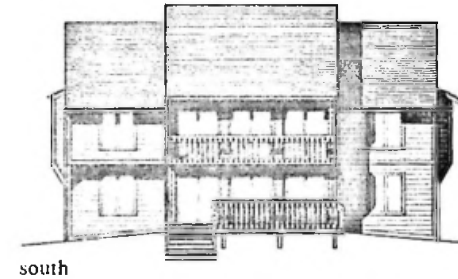
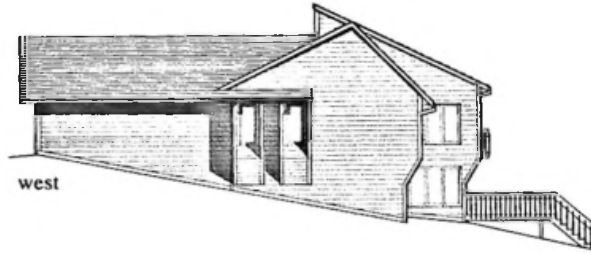
Second floor



First floor



Elevations



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B7	Denver Metro Program I—6 18x24 sheets	\$20
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B10	Tennessee Valley Authority I—10 18x24 sheets	\$35
B11	Tennessee Valley Authority II—13 18x24 sheets	\$45
B12	Tennessee Valley Authority III—10 18x24 sheets	\$35
<b>C Large Size Houses (Over 2,000 sq. ft.)</b>		
C1	Denver Metro Program II—9 18x24 sheets	\$30
C2	Cycle 2 Demonstration—11 18x24 sheets	\$40
C3	Brookhaven House—13 18x24 sheets	\$45
C4	Energy Efficient Residence II—9 18x24 sheets	\$30

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