

# The Perfect Cape



Imagine living in a house...

...that uses minimal fossil fuels.

...that produces all the energy required to stay warm in winter and cool in summer, one that can produce *more* energy than it requires.

...built almost entirely of natural, non-toxic materials.

...that is perfectly sustainable and is an asset to the environment rather than a liability.





**E**VERY GREEN ARCHITECT'S mission should be to design a house that is completely energy autonomous.

Several months ago, (during the winter of 2008) those of us working at TIA Architects sat down to design a house that would use minimal to no fossil fuels, and would be capable of producing even more energy than it requires. The house's energy management would be an asset to the environment rather than a liability. As for addressing our concerns on health and well being, the house would be built entirely of natural, non-toxic materials. Considering several options, we concluded that the structure of a cape would best fulfill these goals.

# Why a cape?

THE FORM OF the house needed to be kept basic for both economical and environmental reasons. For one, a cape has a good deal of habitable volume with minimal exterior surface. This, in itself, reduces heat loss. Additionally, optimal winter solar gain is achieved by elongating the cape (which has a footprint that is essentially a rectangle) on its east-west axis. The steep roof pitch - a characteristic of the cape's design - also accommodates photovoltaic panels extremely well. In order for these panels to receive optimal sunlight, the roof must be oriented at true south.

When we try to build both economically and ecologically, complexity of form is counterproductive. Fortunately, the cape is simple in form, and easy to build. Most builders are quite familiar with cape designs: just lift up four walls, frame a triangular roof and you are done. The economical use of materials in building a cape is as relevant today as it was in colonial times.

The cape designed by TIA Architects is all about details. Conceptually, a cape

is a cape. Consequently, the structure's proportions and spacial definitions - with varied ceilings heights and soffits, designated window proportions and placement, and materials of the floors, walls and ceilings - all must be composed into one aesthetically coherent statement.

Notice there are shoji screens in several rooms. In my estimation, the Japanese have achieved an unmatched level of perfection in their residential architecture. While conducting seminars in Japan, I stayed in ancient houses that were absolutely beautiful. Each was an exceptional example of residential detail, displayed through the use of wood, cedar (*sugi*), tatami mats, shoji screens and intricate structural connections. We intentionally incorporate much of that vernacular into the houses we design.

The cost of building an energy autonomous house is much more than that of a typical house, but the extra cost can be thought of as a significant investment in our environmental welfare. After all, we need to save some energy for our grandchildren. Generally, residential construction today costs about \$200 per square foot. The Perfect Cape will cost an additional \$75,000 for the

photovoltaic panels, geothermal heating and cooling, radiant heating, additional insulation, metal roof and the use of natural materials. This is an investment that pays off in only several years due to the substantial reduction in utility costs.

- Tullio Inglesse AIA

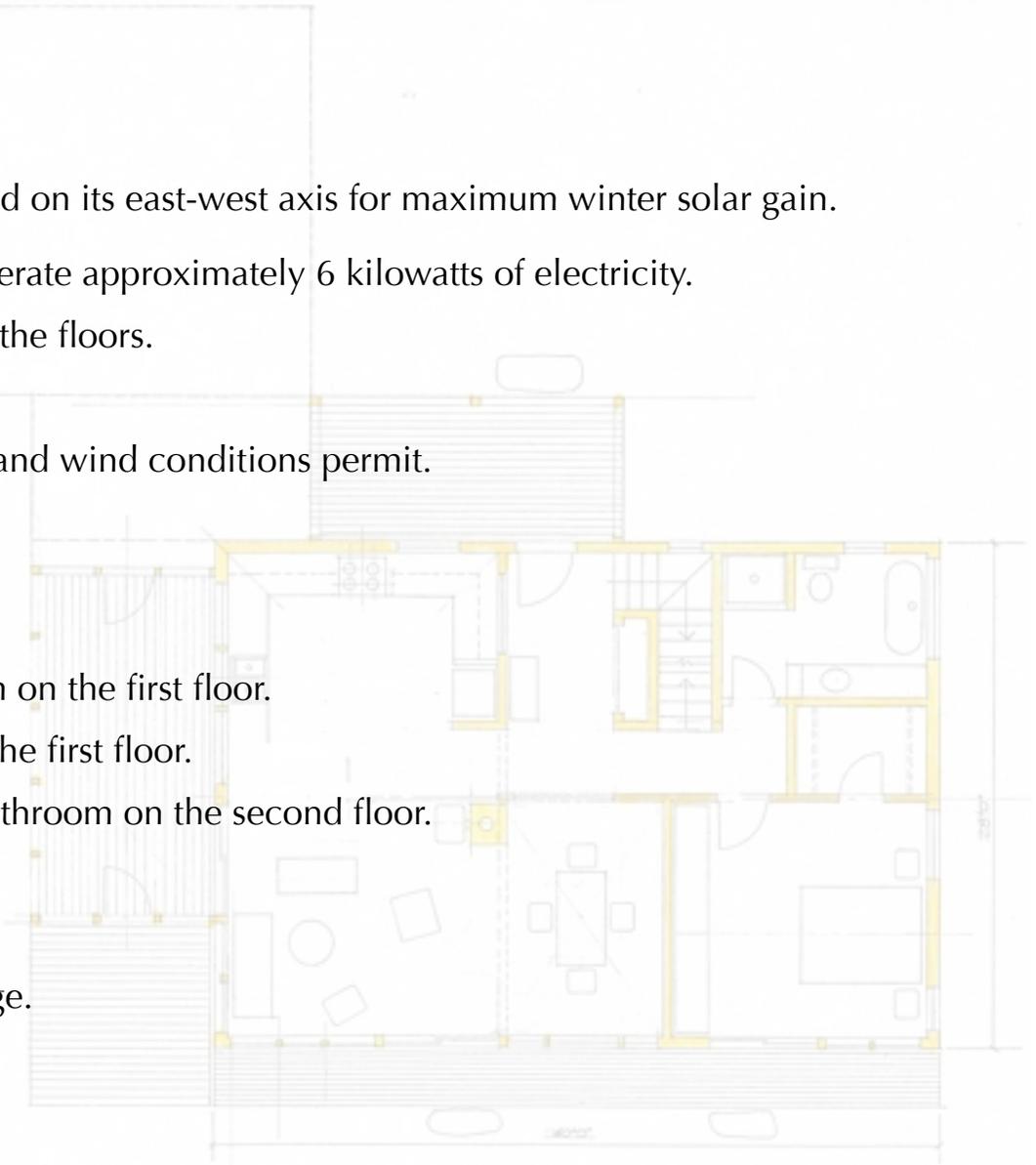


## The Perfect Cape Features:

- A basic, easy-to-construct form elongated on its east-west axis for maximum winter solar gain.
- An array of photovoltaic panels that generate approximately 6 kilowatts of electricity.
- Geothermal heating and radiant heat in the floors.
- Super-insulated building envelope.
- An optional wind turbine where zoning and wind conditions permit.

## The Perfect Cape Includes:

- An open kitchen, dining and living room on the first floor.
- A main bedroom and full bath, also on the first floor.
- Two bedrooms, bedroom/study and a bathroom on the second floor.
- A full basement.
- An optional screen porch.
- An optional semi-attached two car garage.
- Shoji screens and other custom details.



If you are interested in purchasing a comprehensive set of construction drawings and detailed specifications please contact TIA Architects. We are located on 592 Main Street in Amherst, Massachusetts and can be reached by phone, 413-256-8025 or email, [tiaarchitects@gmail.com](mailto:tiaarchitects@gmail.com). The cost of the package is \$5,000 and includes:

1. *A complete set of construction drawings with photographs of the model on the cover sheet:*

- a. schematic site plan
- b. foundation plan
- c. basement, first and second floor plans
- d. east, west, north and south elevations
- e. first floor, second floor and roof framing plans
- f. sections and details
- g. interior wall elevations
- h. door and window schedules
- i. structural calculations for beams, joists and rafters
- j. electrical plans
- k. mechanical information
- l. kitchen design
- m. bathroom design
- n. door and window schedule
- o. plumbing fixture schedule
- p. light fixture schedule
- q. room finish schedule

2. *Specifications:*

Provides a detailed description of materials, equipment and methods of construction.

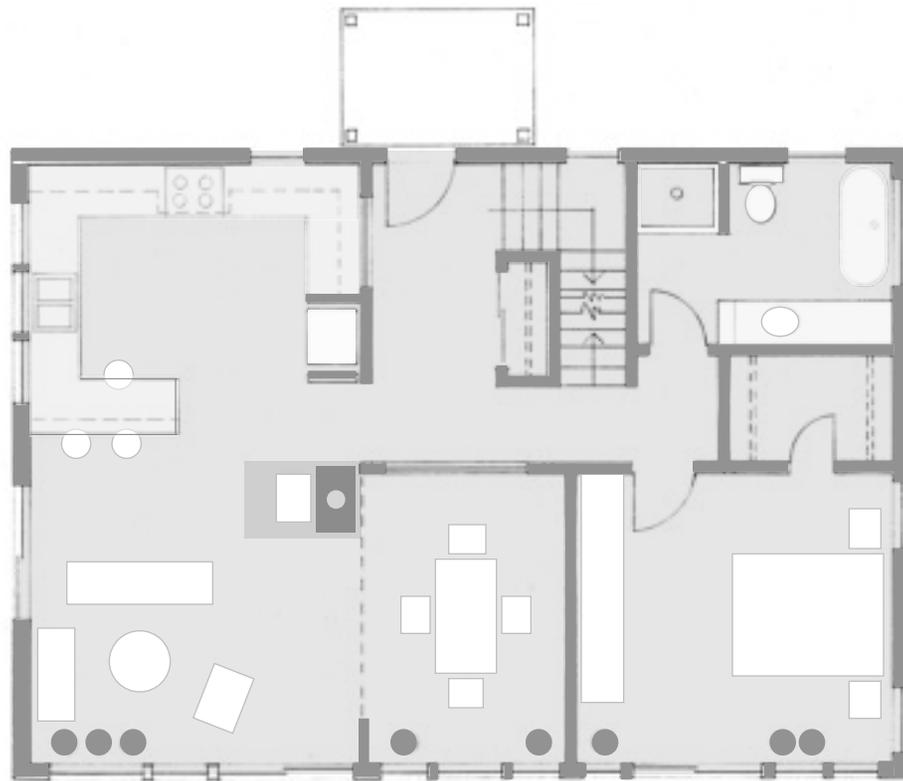
3. *Catalogues of products and equipment specified.*

For example: windows, refrigerator, stove, mechanical equipment, skylights, kitchen cabinets, etc.

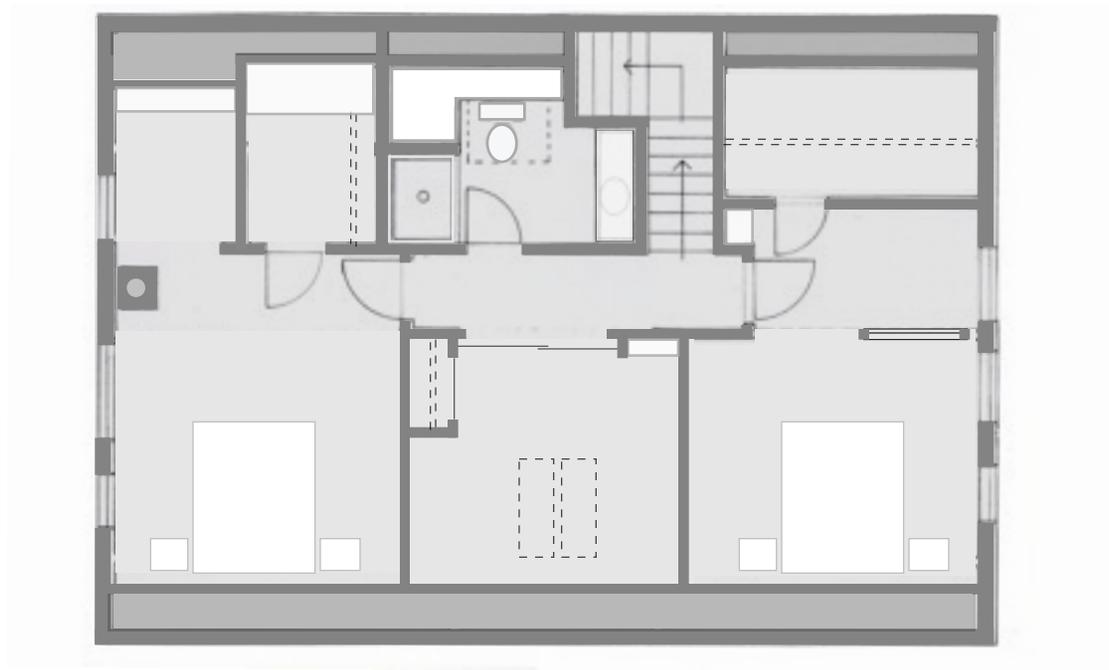




First Floor Plan Option A; Area = 40' x 28' = 1120 S.F.  
*(option A drawings and specifications are completed)*



First Floor Plan Option B; Area = 40' x 28' = 1120 S.F.  
*(Option B drawings are currently in process)*



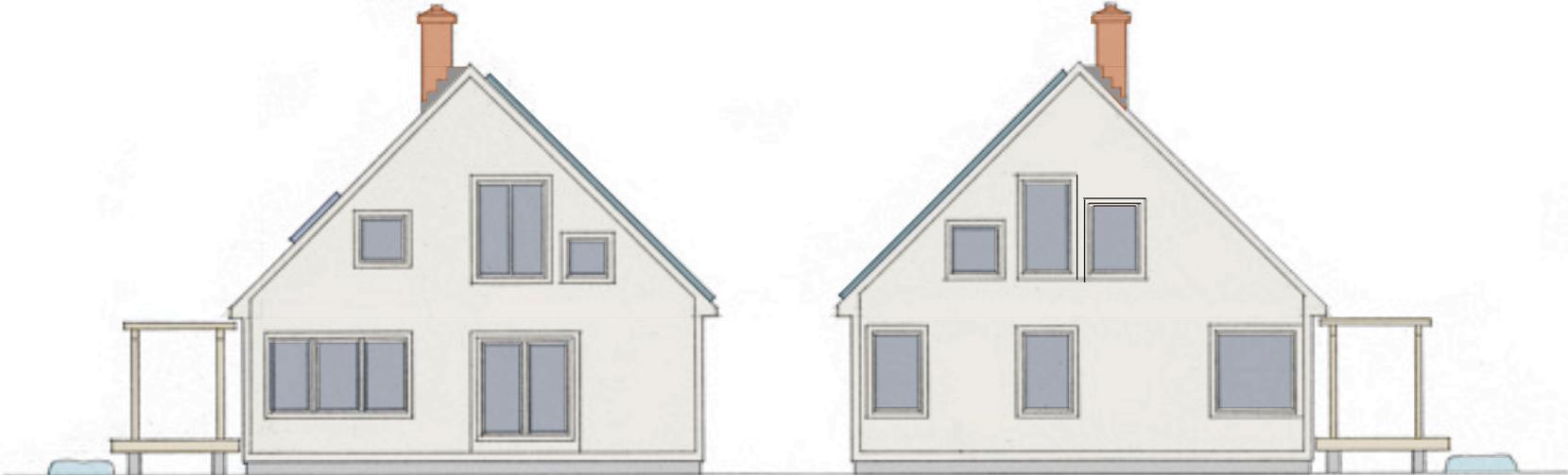
Second Floor Plan; Area = 40' x 20' = 800 S.F.

# Elevations



SOUTH

NORTH



WEST

EAST



## Model of The Perfect Cape

*Basswood, Balsa,  
foam core and  
paper*





## The Perfect Cape

1 October 2008

### Green Team:

Tullio Inglese...Project Architect

Aiko Nishioka.....Associate

Margaux Fischer.....Intern

Brienne Cosman.....Intern

Leah Boisvert.....Intern

TIA ARCHITECTS • NAACUL CENTER

592 Main Street • Amherst, MA 01002 USA • (413)256-8025 • [tiaarchitects@gmail.com](mailto:tiaarchitects@gmail.com) • [www.tiaarchitects.com](http://www.tiaarchitects.com)

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