the HARMONY SOLAR COMMUNITY

presented by
DESIGN NORTHWEST

ABSTRACT

In the following pages and in the film, attached, Design Northwest will present the case for passive solar design and construction as well as the inclusion of earth sheltering. This presentation is both specific to the proposed project, the Harmony Solar Community in Strathmore CA, and general in that the concepts presented herein are applicable worldwide and are adaptable to many varying climatic conditions.

The system is proven.

- Design Northwest has a thirty year history of designing earth sheltered passive solar buildings.
- These buildings are light, airy and extremely efficient in their heating and cooling requirements.
- The structures are erected using standard materials and methods at costs similar to conventional construction.

Invitation

Design Northwest is looking forward to hearing from individuals and developers worldwide. It is our vision and goal to increase the use of this highly efficient, cost effective, sustainable and environmentally friendly building system.

Thank you,

Felix Misch and the Design Team
Design Northwest

DESIGN NORTHWEST
Project Information and Conceptual Drawings

Table of Contents

Video Presentation: Please see the Project Concept Video, included with this presentation.

Item Description	Page
Abstract	I
Table of Contents	II
Project Overview	1
Introduction, Project Vision	2
Developer Solicitation, Alliances, Project Status	3
Preliminary Cost Review	4
Project Site	5
Site and Subdivision Information	6
Subdivision Plan	7
Conceptual Site Plan	8
Design Concept #1: Townhouse Units	9
Perspective	10
Plans: First and Second Floor Plans	11
Design Concept #2: Multifamily: Two, Four and Five Units	12
Elevation: Duplex South	13
Site Plan: Fourplex	14
Site Plan: Fiveplex	15
Design Concept #3: Courtyard: Single Family and Duplex	16
Perspective: Conceptual Duplex	17
Floor Plan: Duplex	18
Flor Plan: Single Family	19
Design Concept #4: Commons	20
Elevation: Commons West	21
Site Plan: Commons and Greenhouses	22
Appendix A	23
Passive Solar Frequently Asked Questions	24-28
Appendix B Suporting Documents	29
Dr. Ken Gibbs, Ass't Superintendent PUSD	
Alejandra Tres Conulting	

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introduction
PROJECT OVERVIEW

Introduction

Buildings use approximately forty percent of all energy consumed in America. Residences account for nearly half of that figure. Amid rising energy costs, and mounting concern for the environment, there is growing incentive to find alternatives.

One alternative, frequently used today, is to employ solar panels on the roof, producing electricity. These systems, though an asset to any building, are costly. Frequently, the initial expense of these systems is not amortized within their warranted lifetime.

Design Northwest has developed a building system that uses solar energy in a different manner. Our designs have significantly reduced energy requirements for heating, cooling and lighting. This is accomplished by incorporating passive solar techniques of:

- Building orientation, for solar collection
- Thermal mass, for heat storage and cooling
- Earth sheltering, for temperature moderation

Using standard building materials and methods our passive solar residential, single and multi-family residences as well as our commercial designs are built at conventional construction costs. The efficiency of our buildings is realized immediately. There is no amortization period.

We can add solar panels for generating electricity to these inherently efficient passive solar buildings, creating zero energy homes and light commercial buildings at an affordable cost.

Project Vision: The Harmony Solar Community

The Harmony Magnet Academy, sited in a community of largely substandard, low cost housing, is a school that is nationally recognized for its excellence. This highly acclaimed school is running at less than full capacity due to lack of affordable family housing nearby.

We propose to design a pioneering model community directly across the street from this school; pioneering in design, energy use, and in its direct relationship with The Harmony Magnet Academy.

Our vision includes quality, affordable, highly energy efficient passive solar homes. Design Northwest's preliminary conceptual designs for the neighborhood include single and mult-family homes constructed on one or two levels.

By incorporating our time tested passive solar design concepts these homes will use very little energy for heating and cooling. Using conventional materials, such as reinforced concrete and prefabricated trusses, the buildings will be durable, require little upkeep, yet be very affordable to construct.

In addition to housing the design will include a community center, community greenhouses and shared open space. The site planning and housing layouts will incorporate concepts that facilitate communal and individual food production. It is envisioned that the community center and green houses will have programs involving the students attending the Harmony Magnet Academy. Student and family participation will be encouraged during the project's design and continued operation.

Developer Solicitation

Design Northwest is looking for a development partner to build on the relationships and research we have already undertaken to solidify the funding and support for the project. In addition to bringing funding prowess, our development partner will bring long-term property management expertise to ensure the on-going success of the project. Design Northwest will remain responsible for the project's architectural design, working with the development partner in the realization of the vision for the Harmony Solar Community.

Support and Alliances

Beginning in the Fall of 2011 Design Northwest began working with key parties in building a foundation for the realization of the project. We have gained wide support in both the public and private sectors, including, but not limited to:

- Mr. Edgar Morales, USDA Rural Development, has indicated the project qualifies for the USDA 538 rural development programs.
- Mr. Fred Smith, USDA Appraiser has verified that the project also qualifies for the USDA 514 and 515 Rural Development programs.
- Mr. Pat Sabelhaus and Mr. Joel Rice of Sabelhaus Law: have been helpful in reviewing the project and outlining the various options for successful tax credit application.
- Dr Ken Gibbs, Assistant Superintendent of the Porterville Unified School District has offered his full support for the project. A presentation of the proposed project was given in March by Felix Misch of Design Northwest to Dr. Gibbs, the heads of his financial and granting departments and the land owners. Subsequent to that meeting, Dr. Gibbs suggested that he would help seek funding and additionally has pledged the support of his chief grant writer, Mr. Owen Fish.
- Halpern Industries owns the subject property. Design Northwest has a close working relationship with the partners and has been authorized to open discussions on a purchase and sale agreement.
- Mr. Robert Land, Principal of the Harmony Magnet Academy through the 2012 academic year, is in full support of the project. During an on site visit, Mr. Land indicated that the proposed project would meet a need for local family housing and would allow the school operate at full capacity. Additionally he indicated that the project would be a great boon to the school, both academically and culturally.
- See Appendix A for letters of support.

Project Status

The site is available for purchase and ready for development. The Tulare County Planning Department has an "Approval for Filing" letter on file for the subdivision. There are 46 water shares allocated to the project by the Strathmore PUD. Additionally, the site has a well with a 350-400 gal/min flow rate. This site is one of the few R3 zoned properties in the area.

Preliminary Cost Review: The Harmony Solar Community

During this conceptual phase any cost projection is, of necessity, a broad preliminary estimate. With our background of many years in construction as well as architectural work, Design Northwest has identified and researched many of the cost variables of the project.

An overview of the items taken into consideration when developing the preliminary cost review include:

- Acquisition of the 8.8 acres (approx.) of R3 zoned land will be in the range of $ 800,000. The owners, Halpern Industries have indicated an openness to discussing a range of terms for the purchase and sale agreement. The cost will include all subdivision engineering, water share transfer, legal documents and all associated site and subdivision materials.
- Professional and permitting fees
- Site improvements and associated assessments
- Construction costs for 46 single and/or multifamily homes averaging approximately 1200 square feet
- Construction of a Community Center and associated greenhouses
- Administrative and supervision fees
- Design and construction contingencies

A preliminary cost range of $5,800,000 to $7,500,000 was derived from these preliminary cost reviews.

Additional Information

The following pages contain additional information and conceptual drawings based, in part, on the owners' original concept of single family residences.

project site

SUBDIVISION AND SITE INFORMATION

Site and Subdivision information

The entire property is composed of two parcels, totaling 11.65 acres and was originally zoned R3. A subdivision was completed and approved three years ago dividing the entire property (11.65 acres) into 46 parcels. There is a Tulare Planning Department "Approval For Filing" letter on file for the subdivision, Tract 773. All extensions, both owner applied and automatic have been approved.

The drawings of this subdivision were given to Design Northwest and are the basis of the conceptual drawings on the following pages. Subsequently, however, the owners have sought and received a rezone of a portion of the site, the southeast 2.85 acres (see the "Subdivision Plan" following) into a C zoning designation, leaving 8.8 acres in the R3 classification.

These remaining 8.8 acres of R3 zoning are available for the Harmony Solar Community project. Again, please note that the conceptual drawings following were prepared for the owners, at their request, using the entire 11.65 acre site for housing.

The Strathmore PUD has allocated 46 water shares for the R3 site. These water shares have been purchased by the owners and will be transferred with the acquisition of the R3 building site. It is Design Northwest's understanding that these are the last water shares presently available in the area.

Additionally, the C zoned portion of the property contains a 350 to 400 gallon per minute well. The owners have indicated that the use of this well for the Harmony Solar Community project's landscaping or other development purposes is open to negotiation.

The portion of the property now zoned C (2.85 acres) could optionally also be purchased (APN: 215-260-013) for future housing or commercial development. In a meeting with the Tulare Planning Department in March it was determined that the C zoning could be returned to the initial R3 zone if requested. Reverting to the previous R3 zoning would require a rezone application and review rather than an administrative zoning change.

Site and Subdivision Summary

Project Site

- Gross Acreage: 8.8 Acres
- Zoning: R3
- APN: 215-260-012
- Water Shares: 46 water shares have been allocated to the site and would be transferred with the acquisition of the site.
- Well Water may be available for the use by the Harmony Solar Community project.

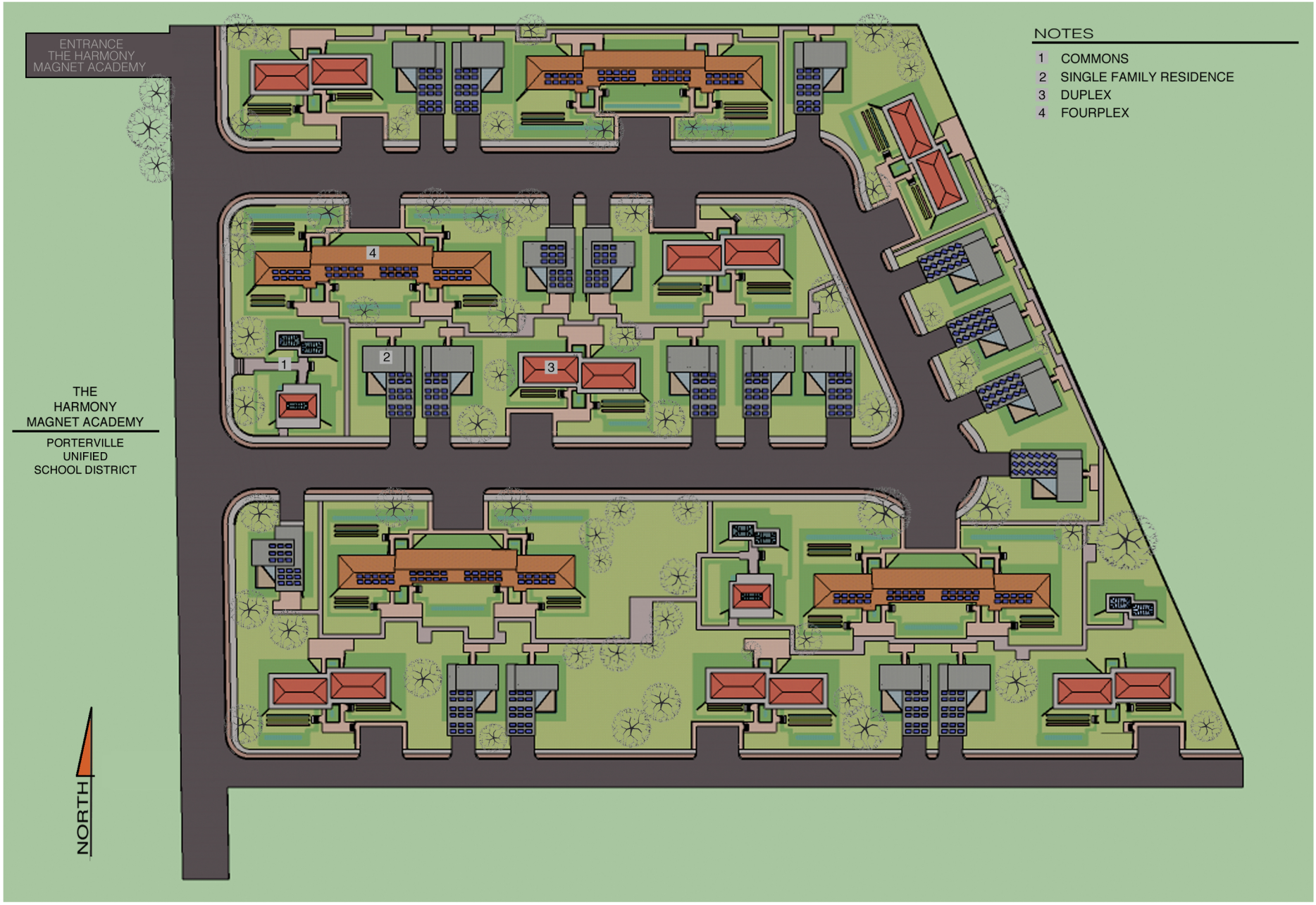
Subdivision

- Subdivision Status: A 2009 "Approval for Filing" letter for Tract No. 773 is on file with Tulare County Planning Department.
- Subsequent subdivision extensions, both by the owner and automatic county extensions, have been granted.
- The original subdivision was prepared by the California Planning and Engineering Corporation, Visalia CA.
- The rezone of a portion of the property to a C zoning designation was prepared by Mr. Lyle Brewer, a Fresno based civil engineer.

SUBDIVISION PLAN

THE HARMONY SOLAR COMMUNITY, STRATHMORE CALIFORNIA

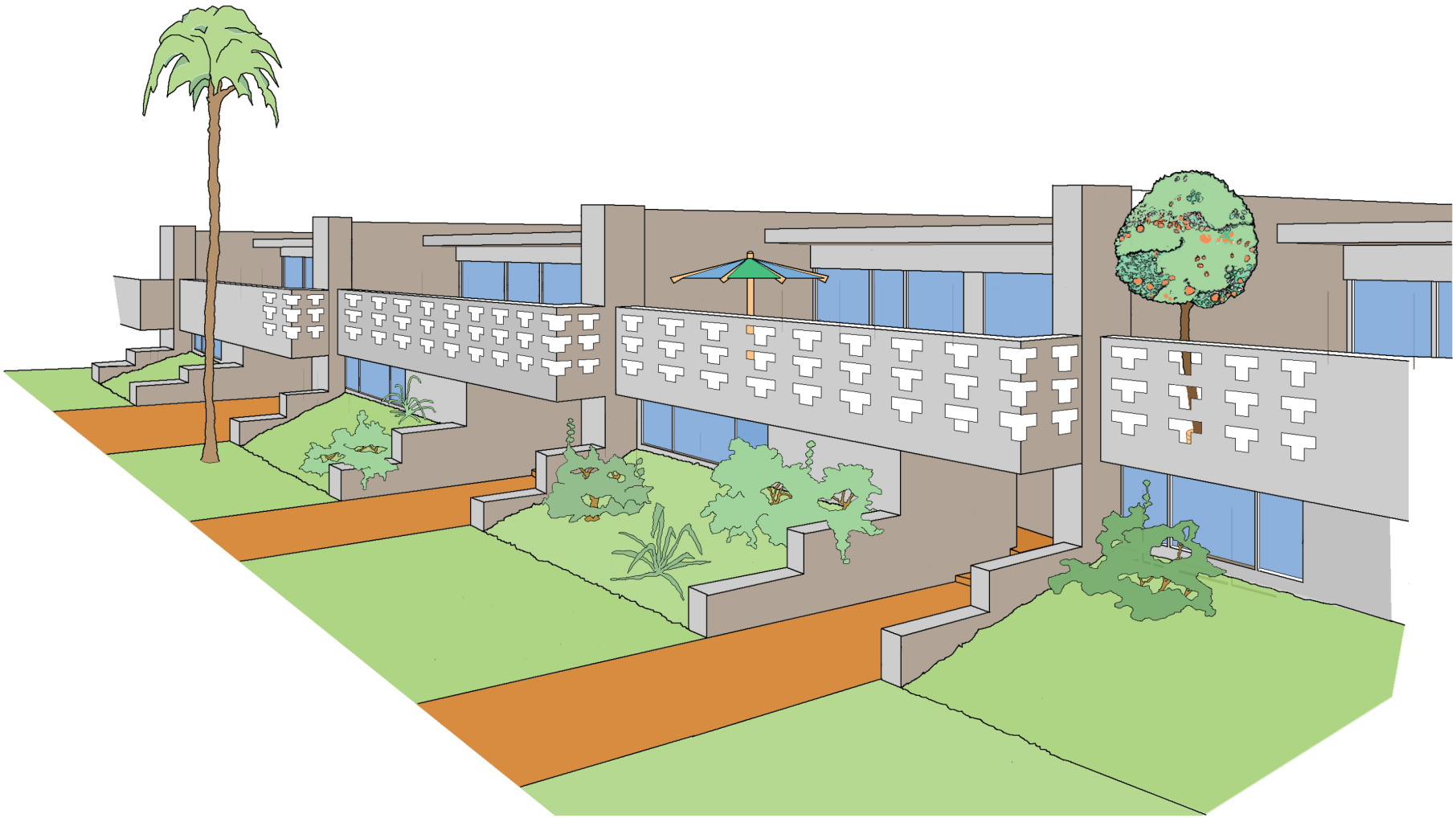
DESIGN NORTHWEST



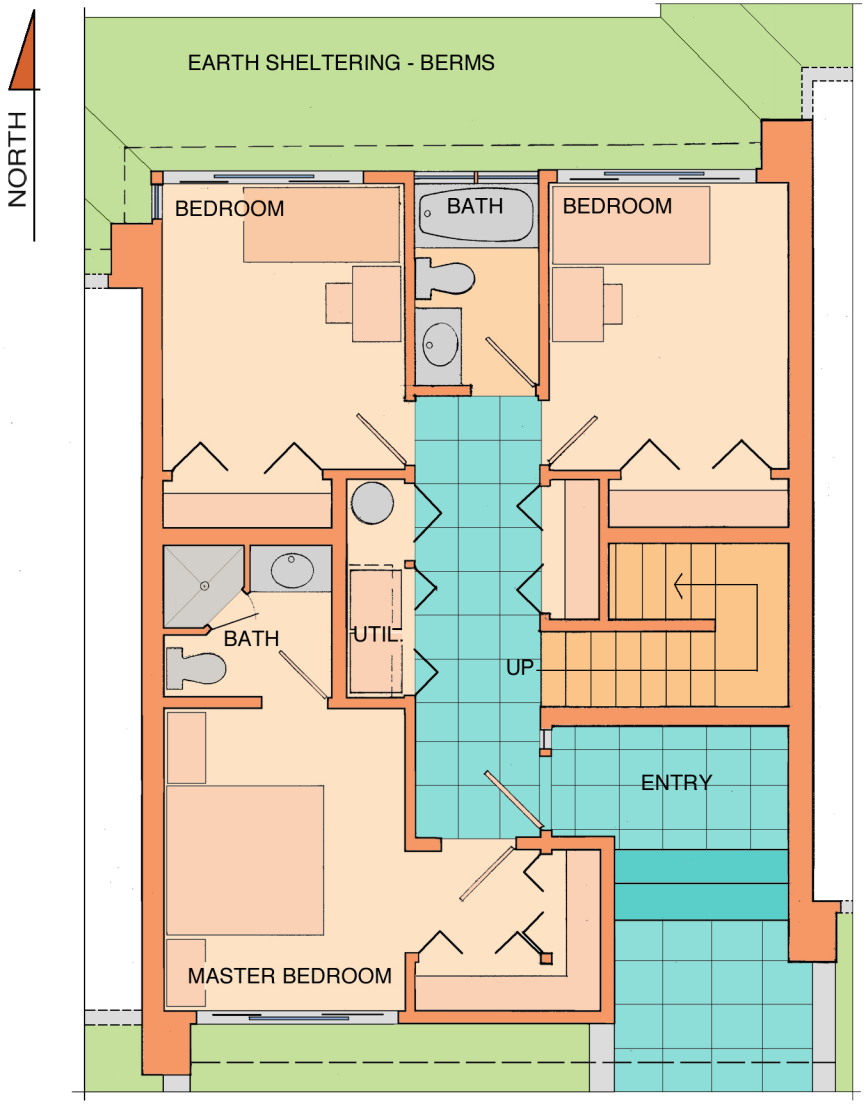
THE HARMONY SOLAR COMMUNITY

CONCEPTUAL SUBDIVISION PLAN

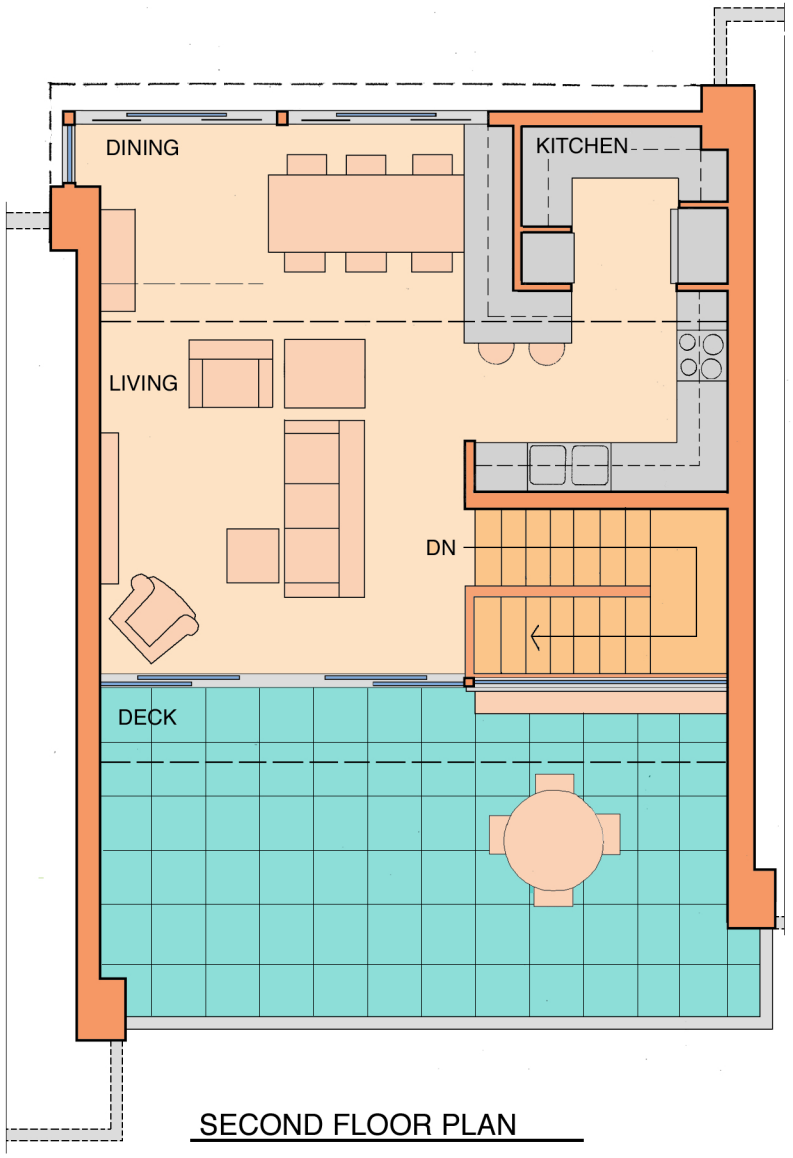
design concept #1
TOWNHOUSE UNITS



TOWNHOUSE CONCEPT - PERSPECTIVE



FIRST FLOOR PLAN

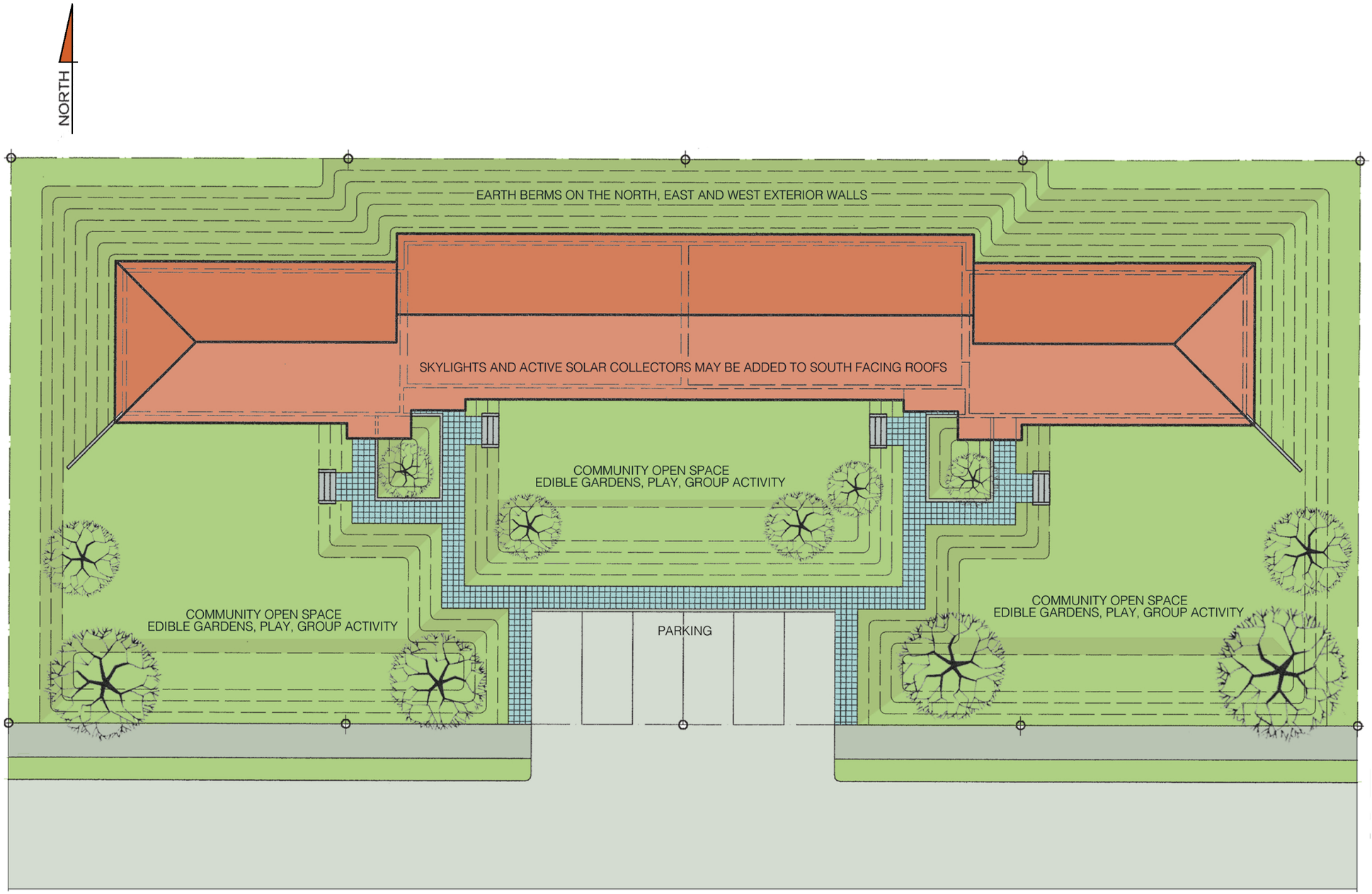


SECOND FLOOR PLAN

CONCEPT PLAN - TOWNHOUSE

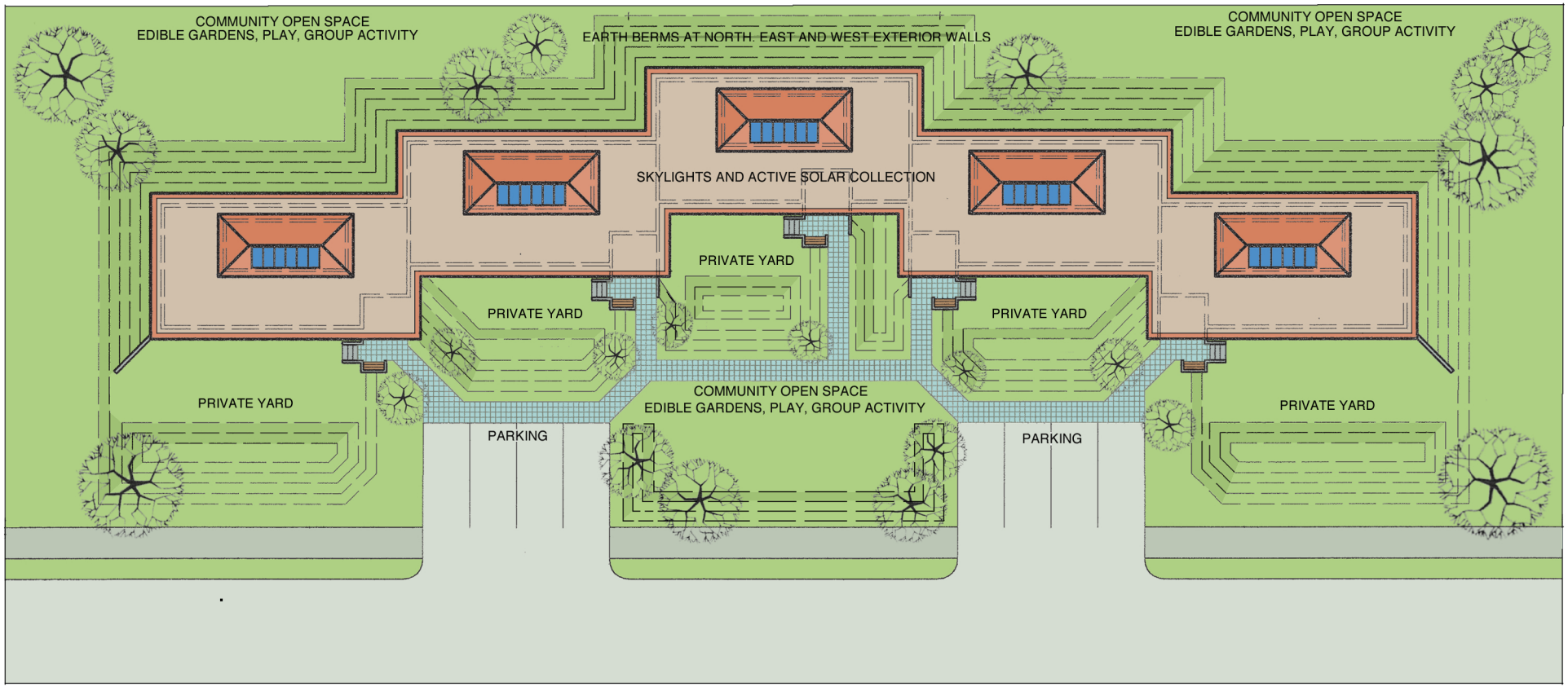
design concept #2
MULTIFAMILY: TWO, FOUR AND FIVE UNITS

SOUTH ELEVATION - DUPLEX
CONVERTIBLE FIVE PLEX



CONCEPT SITE PLAN - FOURPLEX

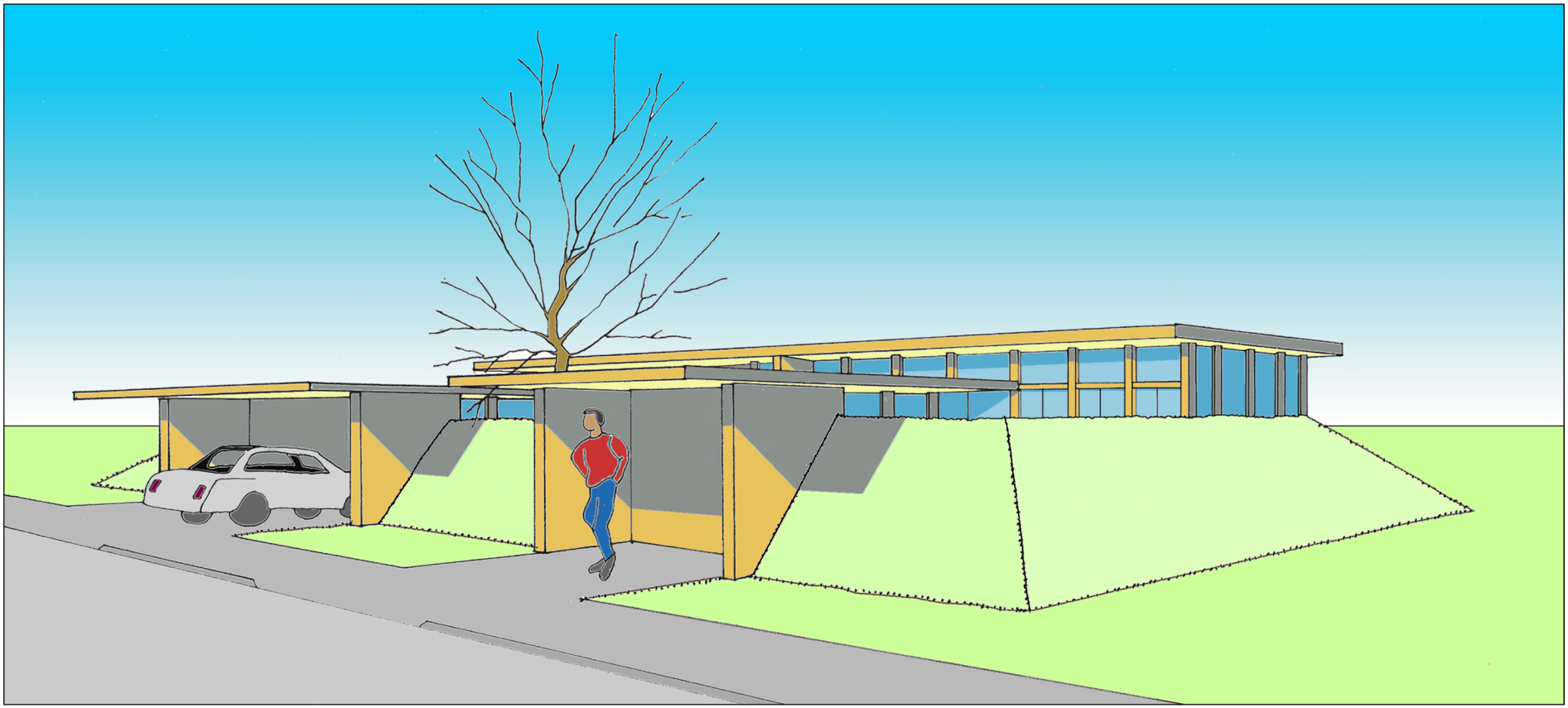
CONVERTIBLE TO SINGLE UNIT OR DUPLEX



CONCEPT SITE PLAN - FIVEPLEX

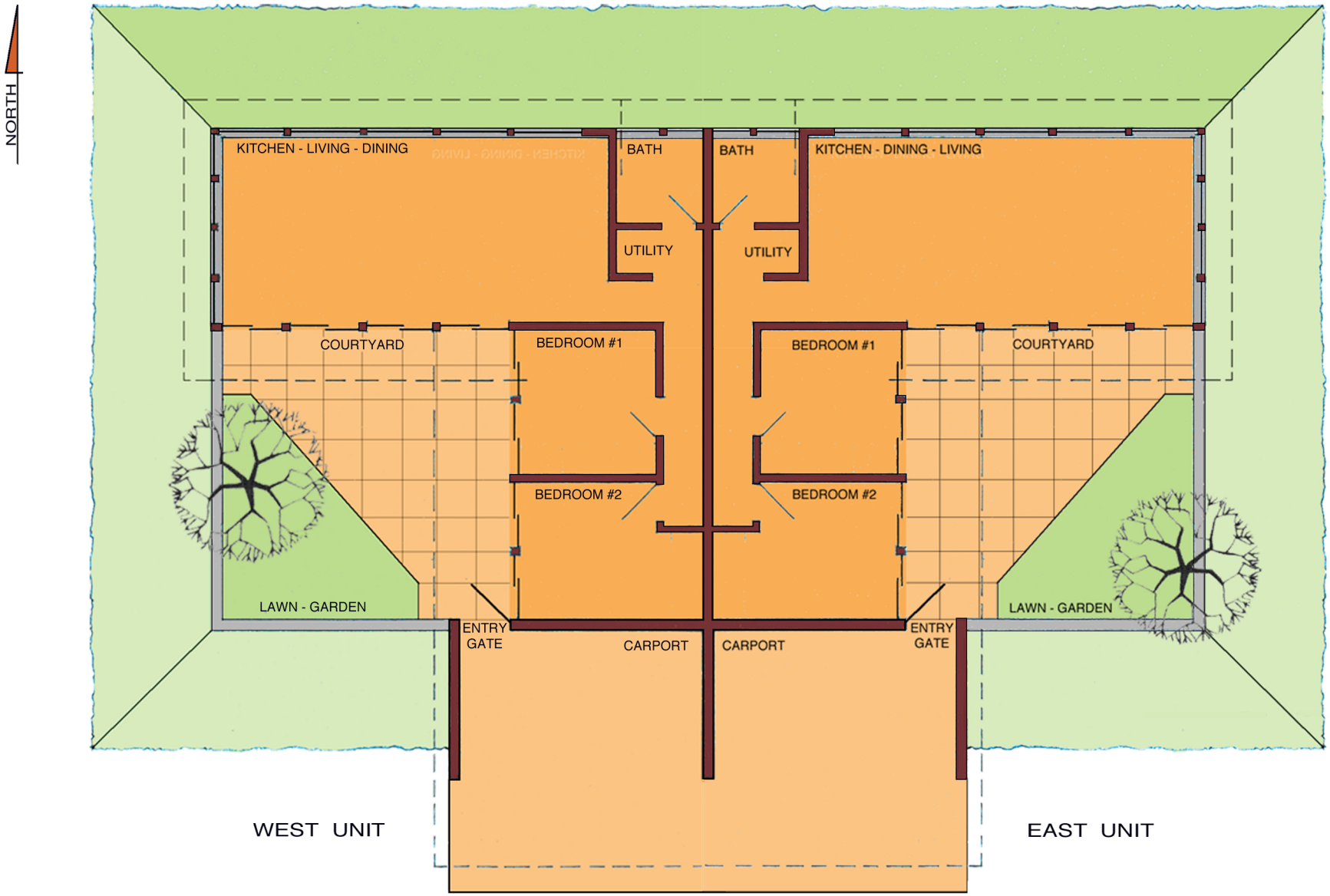
CONVERTIBLE TO SINGLE UNIT, DUPLEX OR TRIPLEX

design concept #3
COURTYARD, SINGLE FAMILY AND DUPLEX



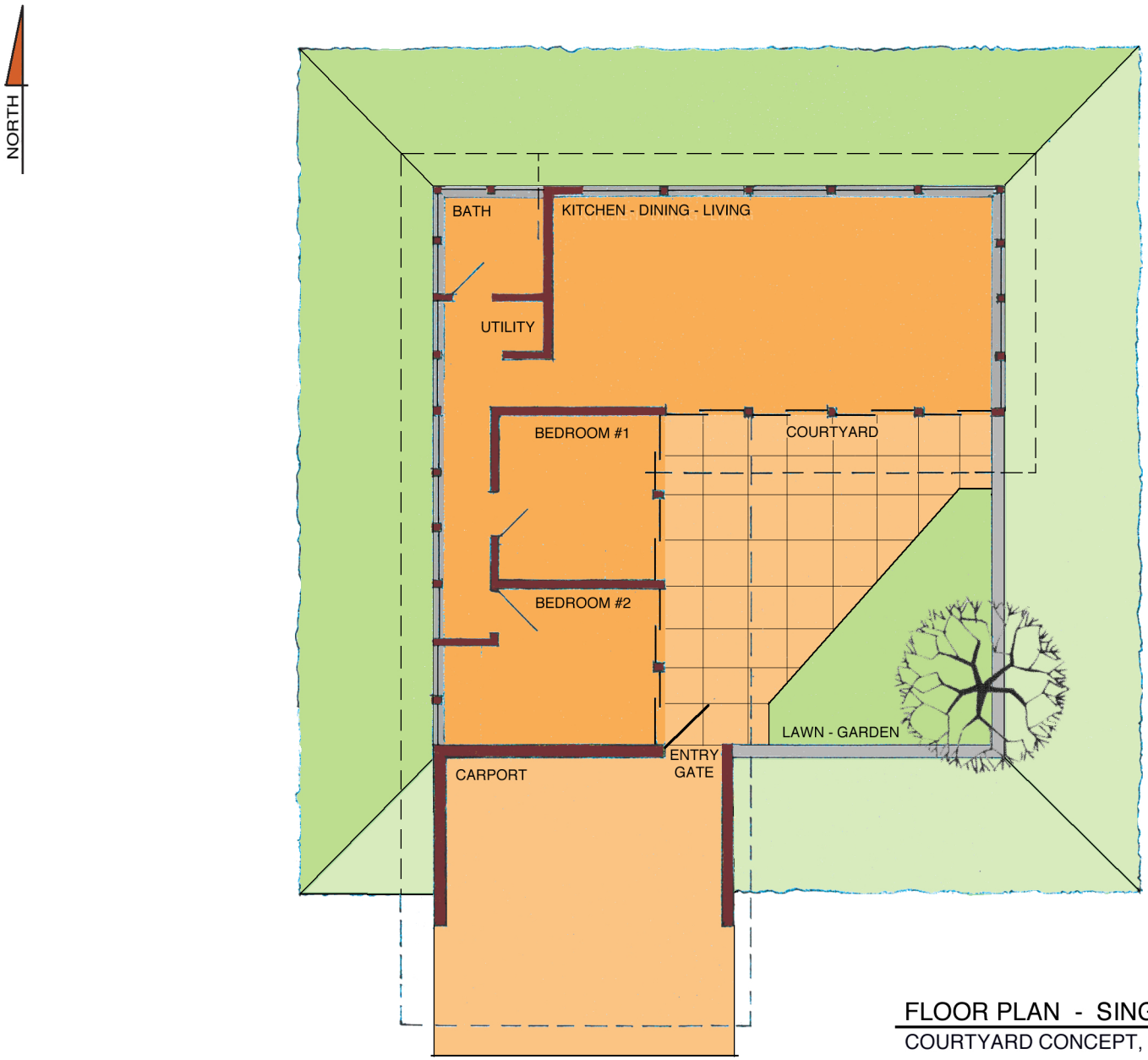
PERSPECTIVE VIEW

DUPLEX - COURTYARD CONCEPT



FLOOR PLAN - DUPLEX UNIT

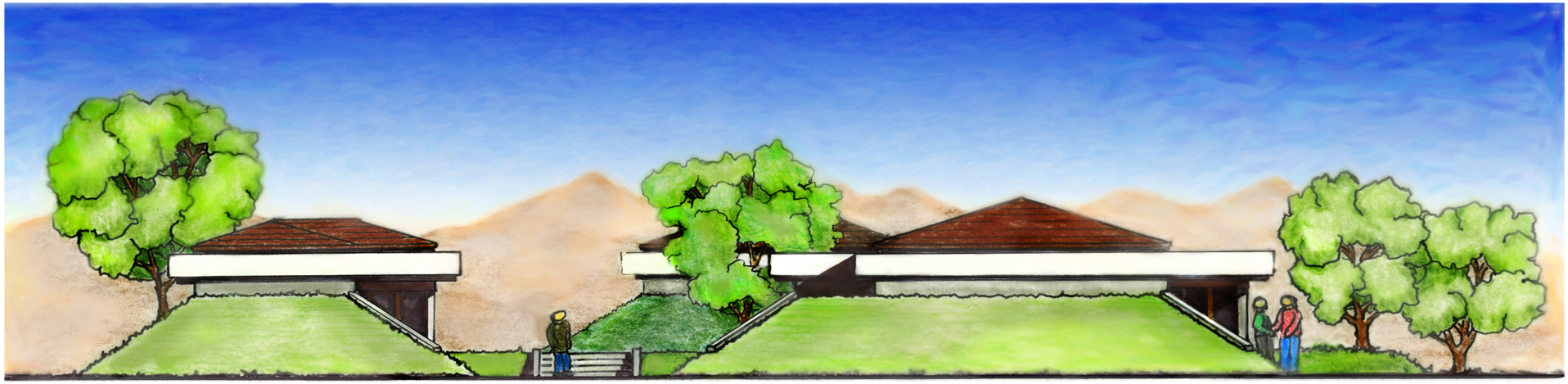
COURTYARD CONCEPT, CONVERTIBLE TO SINGLE UNIT



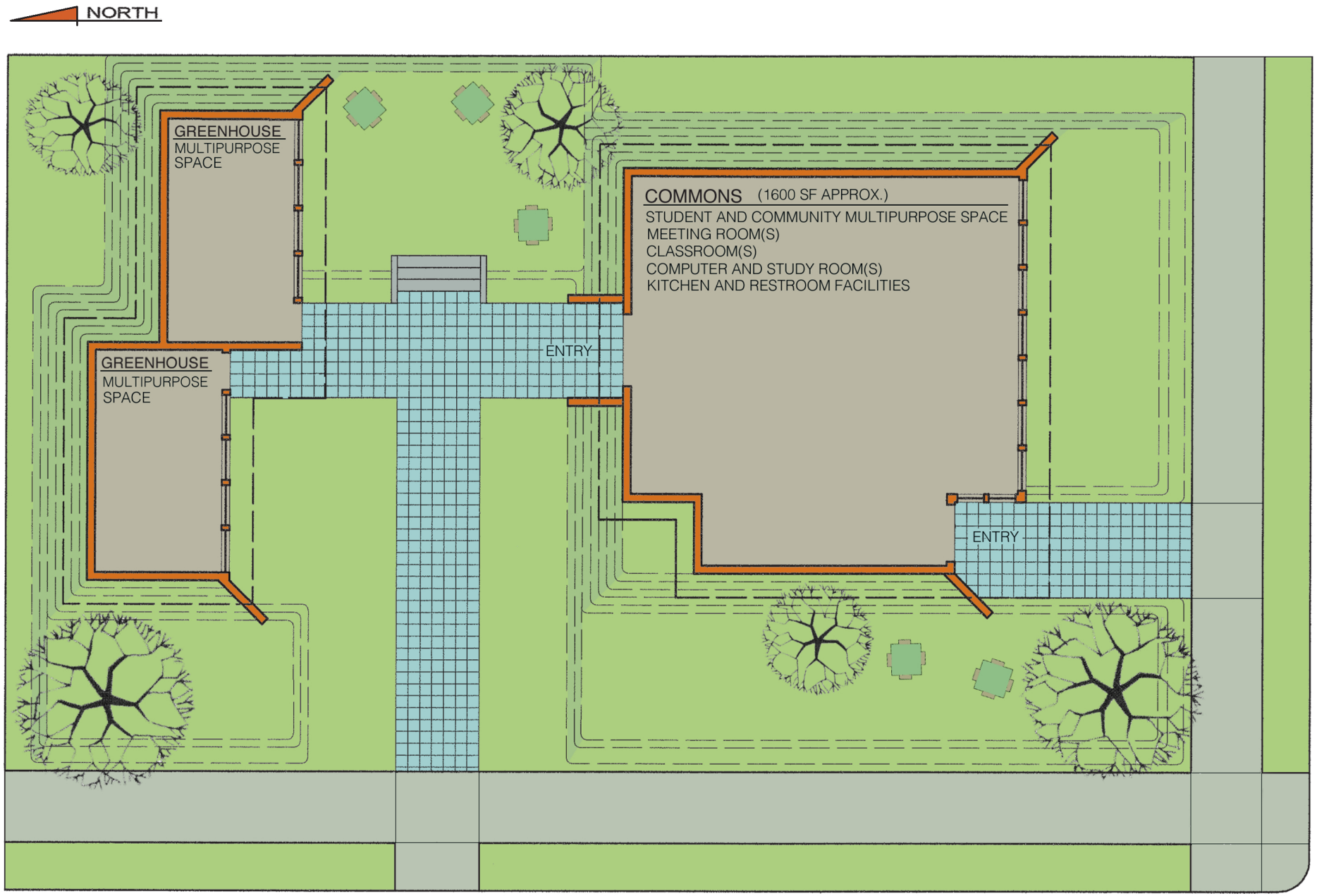
FLOOR PLAN - SINGLE UNIT

COURTYARD CONCEPT, CONVERTIBLE TO DUPLEX UNIT

design concept #4
COMMONS



WEST ELEVATION - COMMONS



CONCEPT SITE PLAN - COMMONS

COMMUNITY AND STUDENT MULTIPURPOSE BUILDINGS

appendix a
PASSIVE SOLAR FREQUENTLY ASKED QUESTIONS

Passive Solar Technical FAQ

What is Passive Solar?
Does it Cost More to Build?
How is it Different from Solar Panels?
How Does Passive Solar Work?
What is Earth Sheltering?
What are the Advantages of Passive Solar?

What Is Passive Solar?

Passive solar architecture is the practice of designing and constructing a building in such a way as to take full advantage of the heating and cooling properties of the natural surroundings. Passive solar heating and cooling significantly reduce the energy consumption of a home, office or retail space, through design and the creative arrangement of standard construction materials and methods.

Passive solar design uses the building as a system for collecting and storing the sun's heat during the winter and dissipating unwanted heat during the summer. Passive solar techniques include orienting the building to the sun and including thermal mass in the building. Passive solar buildings rely on the inherent thermal properties of the design to function. No external energy is added to the system. The building itself becomes the core of the heating and cooling system.

Does it Cost More to Build?

In a word, no. The passive solar heating and cooling concepts that significantly reduce the energy consumption of a home, office or retail space are accomplished through design and the creative arrangement of standard construction materials and methods. Because we utilize conventional building materials, such as reinforced concrete and prefabricated trusses, our structures are built at conventional construction costs. Rather than employing expensive, potentially complex, applied and evolving technologies, the buildings are efficient by design.

Simply put, any building represents a certain financial cost. That cost is contained in the labor and materials used in its construction. Those materials can be arranged into a conventional building that will have predictably higher future energy requirements. Alternatively, those very same materials can be arranged, at no additional cost, into a passive solar structure that will have significantly lower future energy requirements, reducing the building's impact on the environment and the owner's pocket book.

How is it Different from Solar Panels?

When people think of solar energy, they often think of roof mounted solar panels, producing electricity that can be used for heating, cooling and lighting the building. These systems, also called photovoltaic panels, are a method of generating electricity by converting solar radiation directly to electricity. The use of photovoltaic panels is widespread as they become an integral aspect of sustainable architecture. However,
these systems may take years to amortize and are based on ever changing technologies.

At Design Northwest we have devised a passive solar design system that is a more direct and cost effective way of using solar energy to provide for the heating, cooling and lighting needs of a building.

Through creative design and the economic use of conventional materials. our passive solar designs employ the time tested elements of 1) orientation for solar collection, 2) thermal mass for heat storage and 3)earth sheltering for temperature moderation to harness and store the sun's energy and to employ the tempering qualities of earth sheltering.

How is it Different from Solar Panels? (continued)

Because a high level of efficiency is achieved at standard construction costs, the benefits are immediate - there is no amortization period. As a comparison, providing electricity for heating and cooling by adding photovoltaic panels to a conventionally constructed building can require many years of operation before cost benefits are realized.

How Does Passive Solar Work?

Operation

Passive solar architecture is a building design system that uses solar energy directly to reduce heating and cooling costs. The passive solar building operates in two modes, one during the winter heating season, the other during the summer cooling season.

During the winter, the sun is relatively low in the sky. Windows and skylights are oriented to admit as much of the solar energy as possible. This radiant energy, or insolation, shines on the building's floor and walls, its thermal mass. During the day, the sun's energy is absorbed (figure 1).

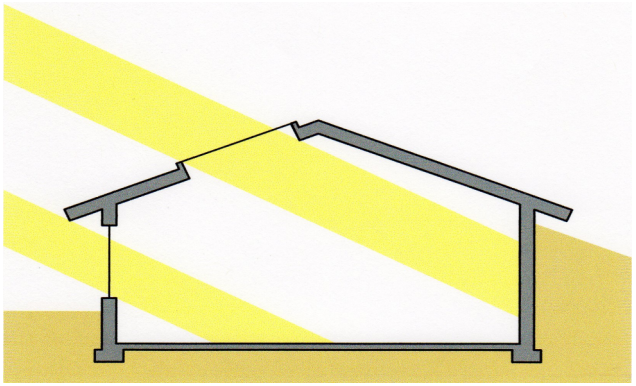


Figure 1. Winter Insolation

In the evening, as the interior air cools, the thermal mass radiates this stored heat back into the building (figure 2).

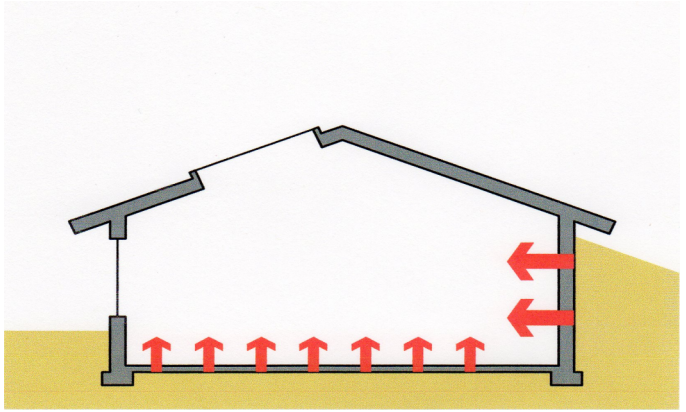


Figure 2. Winter Radiation

Even during cloudy days, there is considerable insolation and subsequent heating of the thermal mass. Furthermore, in many climates, the coldest weather occurs during periods of high atmospheric pressures that are typically accompanied by clear, cloud free days.

How Does Passive Solar Work? (continued)

Operation

In the summer, the sun is higher in the sky. Roof overhangs and shading devices for skylights prevent the sun from shining directly into the building (figure 3). The large thermal mass is shaded, and not warmed by the sun's energy.

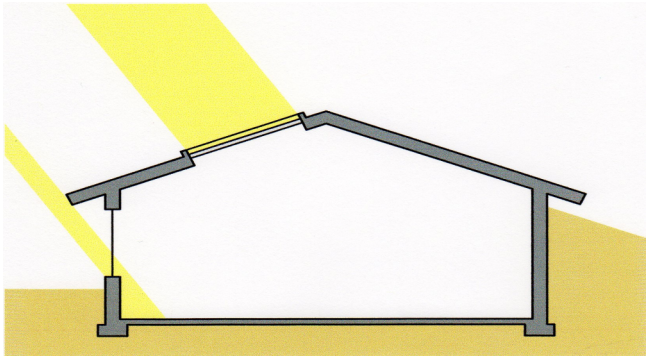


Figure 3. Summer Shading

Remaining cool, the building's thermal mass absorbs excessive heat during the day and evening (figure 4).

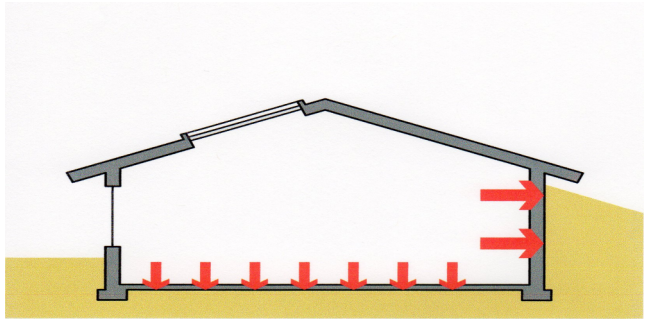


Figure 4. Summer Heat Absorbtion

Design considerations

The primary design elements in passive solar architecture include the orientation of the structure on the building site, correctly sizing windows and skylights, detailing roof overhangs with regard to summer and winter sunlight, the inclusion of thermal mass and careful detailing of insulation and drainage elements.

Solar design begins by considering the solar path and sun angles for the latitude of the building's location. Placement of the windows and skylights determine when and how much light is allowed into the structure. Solar angles determine the location and sizing of roof overhangs and shading devices, which can be manual or automatic, limit solar gain during summer operation. Thermal mass, the building's walls and floor, is used as a heat sink. In the winter, it absorbs heat during the day, and radiates it back into the structure, offsetting heating costs. In the summer, as the interior of the building warms, the thermal mass absorbs the heat build-up, helping to cool the interior and reducing mechanical system costs for cooling. The layout of the floor plan is carefully considered to optimize the passive heating and cooling characteristics of the building.

Thermal Mass

The key to the system is the thermal mass of the passive solar structure. Thermal mass is the ability of a body to store thermal energy, or heat. All objects have thermal mass (even air has thermal mass), however for passive solar structures we are interested in using materials that have a high thermal mass. Objects with high thermal mass are slow to heat up, and once warmed they are slow to cool down.

The thermal mass of a passive solar building is typically located in the floor slab and exterior walls, and usually constructed of concrete or other types of masonry. Water also has a high thermal mass and

Design considerations

Thermal Mass (continued)

can be used successfully in some design aspects, such as an internal trombe wall.

In the winter, the large thermal mass allows the building to absorb solar energy during the day and release it back into the building as the structure cools. Conversely, in the summer the large thermal mass is shaded from direct sun and absorbs excess heat in the building helping to cool the structure. Due to the large thermal mass of the passive solar structure, the interior is less susceptible to temperature fluctuations making the building more comfortable to inhabit in both summer and winter.

The ideal material for creating thermal mass is dense and takes a relatively long time to heat and cool. Water, brick, adobe, earth, stone, and concrete are all examples of materials fitting these criteria, and thus are excellent for creating thermal mass in passive solar structures. In modern building construction, concrete is a readily available. It is a ubiquitous building material with well-known structural and operational characteristics. It has a proven track record both in conventional and passive solar construction. It is the material most commonly used as the thermal mass in contemporary passive solar structures.

What is Earth Sheltering?

Living within earth shelters has been practiced for nearly as long as humans have been building dwellings, beginning with the utilization of caves. Today, earth sheltering is the architectural practice of placing earth, either fill or via the natural topography, against portions of a building's exterior wall.

Earth sheltering naturally insulates the building from large temperature swings, as soil maintains a fairly constant temperature throughout the year. Along with other benefits such as reduced infiltration and greatly reduced building maintenance costs, earth sheltering used in conjunction with passive solar design is a natural and cost effective way to dramatically reduce heating and cooling costs.

When a passive solar building is sheltered from the elements via the use of earth berms or the natural topography, the structure becomes an earth sheltered pasive solar building. While passive solar buildings can be constructed without earth sheltering, the two concepts are so complementary earth sheltering is a hallmark feature of Design Northwest's passive solar building architecture.

Stable Earth Temperature

The addition of earth sheltering to the building design further enhances the structure's solar operation. Because the temperature of the ground below the frost line is slow to change and remains relatively constant year round, the surrounding earth creates a blanket of stable temperature around the building. In the winter heating season, the temperature of the surrounding earth is invariably warmer than the outside air temperature. Thus, the building's heating system has a smaller temperature differential to overcome to maintain a comfortable temperature for the occupants. In the summer cooling season, the temperature of the surrounding earth is cooler than the outside air temperature, and the building remains comfortable with minimal to no use of air conditioning.

Reduced Infiltration

Earth sheltering also protects the structure from prevailing winter winds, further decreasing exterior surface heat loss in the winter. Because the earth largely protects the exterior walls of the building, very little wall surface area is exposed to the outside air. This mitigates warm air escaping and helps prevent unwanted air infiltration, which can be a major heat loss factor in a standard wood frame building.

What are the Advantages of Passive Solar?

Annual Energy Costs

Passive solar design principles take advantage of the sun's energy for solar heating and lighting resulting in highly energy efficient buildings that require very little additional energy for heating and cooling.

During its first years of operation, monitoring was an important aspect of tracking energy use at the Vashon Dental Clinic, a Design Northwest earth sheltered passive solar building. The 2600 square foot clinic portion of the building required an annual expenditure of only $70 for supplemental heating and cooling. Adjusted for today's cost of electricity, that amounts to a total annual cost for heating and cooling of $130.

Low Maintenance Costs

Conventionally constructed wood structures require periodic expensive exterior maintenance to protect them from the elements and possible eventual structural damage. Earth sheltered passive solar buildings have greatly reduced maintenance requirements and increased longevity by the nature of their design.

The durable exterior walls constructed of concrete or other masonry materials are largely protected from the elements by the earth sheltering of the structure. The exterior maintenance costs of an earth sheltered passive solar building are negligible compared to a conventional building. Low maintenance cost and durability have proven to be the case beginning with our early earth sheltered passive solar buildings dating from the 1980's.

Stable Temperature

Due to the thermal mass inherent in the design, as well as reduced air infiltration, a result of earth sheltering, temperature swings are minimized. The temperature of the internal spaces remains stable, increasing the occupant's comfort.

Light and Airy

The intent of passive solar design is to flood the building with natural light. If anything, an earth sheltered passive solar building is brighter, more airy and spacious feeling than a conventional structure. Careful placement of window wells on the earth sheltered sides ensures that abundant natural daylight enters all sides of the building.

Noise Insulation

An additional advantage of earth sheltering the building is the substantial quieting of the interior. Soil provides effective acoustic protection against unwanted outside noise. The offices of Design Northwest are located adjacent to a busy highway, but because the side of the building facing the road is earth sheltered, noise from passing traffic goes completely unnoticed. The experience of privacy for the dwelling's occupants is greatly enhanced.

appendix b
SUPPORTING DOCUMENTS

PORTERVILLE UNIFIED SCHOOL DISTRICT

Creating Opportunities: Changing Lives

DISTRICT BOARD OF TRUSTEES

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PETE LARA, JR.
Vice President

PAT GARCIA CONTRERAS
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Porterville, CA 93257
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DISTRICT SUPERINTENDENT
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(559) 793-1088 FAX

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(559) 791-0401 FAX

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Asst. Superintendent
Instructional Services
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(559) 793-1083 FAX

June 25, 2012

Felix Misch, President
Design Northwest
13522 SW 170th Street
Vashon, WA 98070

To Whom It May Concern:

Porterville Unified School District is intrigued by the potential for the Solar Community project in conjunction with Harmony Magnet Academy in Strathmore. We have met with Halpern Industries and Felix Misch of Design Northwest to discuss the potential and possibilities of the project. The unique opportunity exists to meld the School District, local community and business interests to design and build an innovative green community. Included as a blended focus are educational opportunities, low cost housing, and unique environmental features. We wholly support the effort to continue building the coalition necessary to bring this project to fruition.

The Porterville Unified School District is forging an excellent relationship with Design Northwest, Halpern Industries and the local community. Together we hope to create a model for an environmentally designed community with quality housing, innovative educational facilities and state of the art green features.

Sincerely,

Ken Gibbs, Ed.D.
Assistant Superintendent,
Business Services

KG/mv
Corres – Misc
Design Northwest

ALEJANDRA TRES CONSULTING

TO:
Felix Misch
Design Northwest
RE: Harmony Solar Community

June 25, 2012

Dear Prospective Partner

My name is Alejandra Tres and I worked as a consultant in the initial exploratory stages of this project. In my discussions during this phase I spoke with numerous for profit, non-profit, and government leaders in affordable housing. They each shared their interest and approval for the project noting their support in enthusiastic comments such as declaring it a "pioneering project" and "not only feasible but exciting - exactly what the field is looking for".

Thanks

Alejandra Tres
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