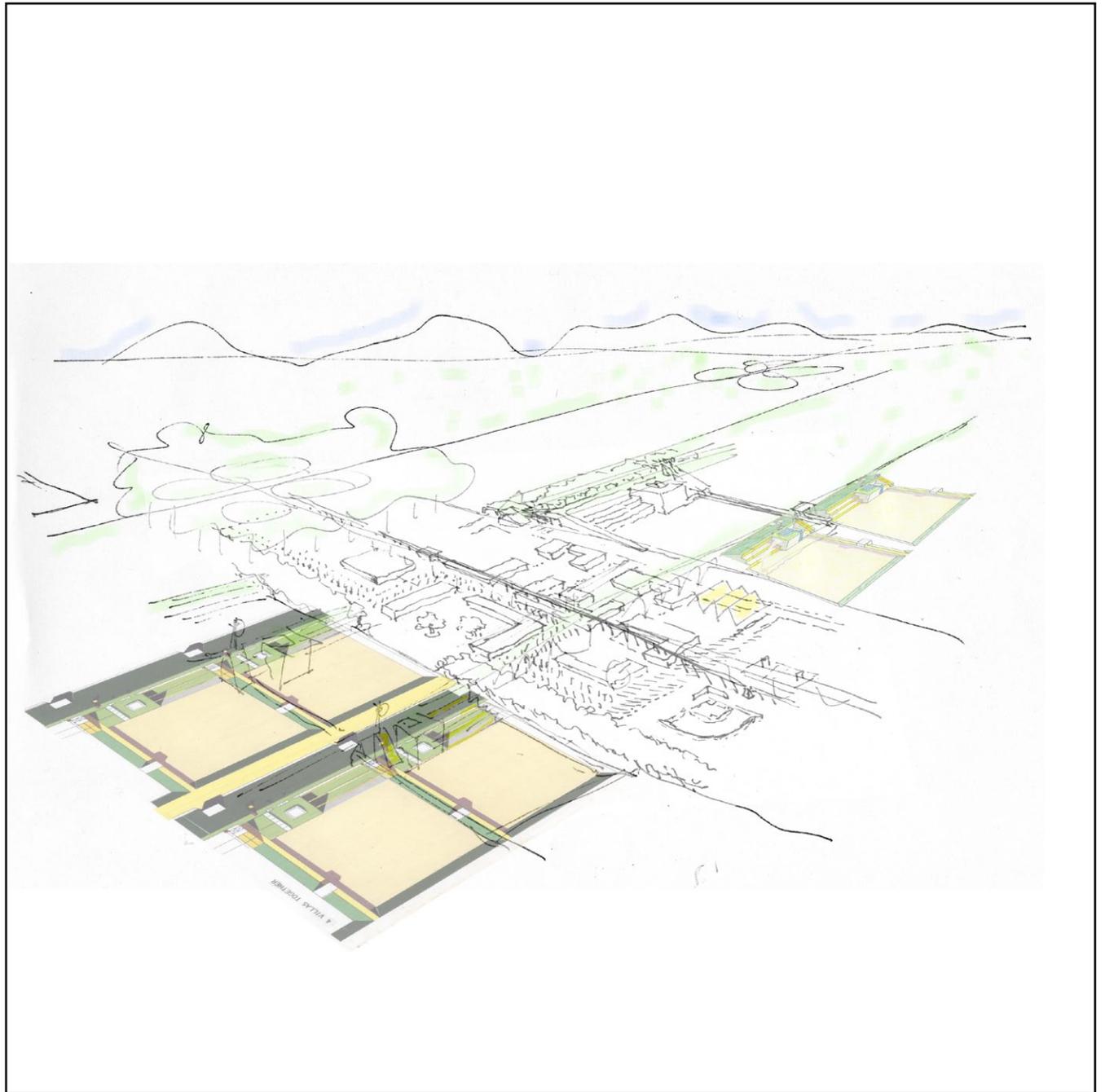
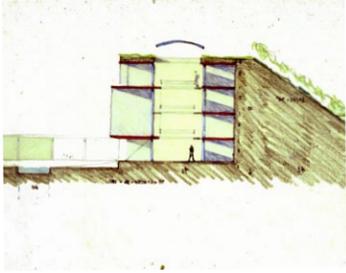
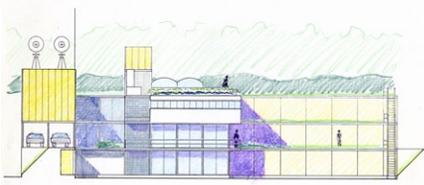


**HOME
FOR
GENERATIONS**



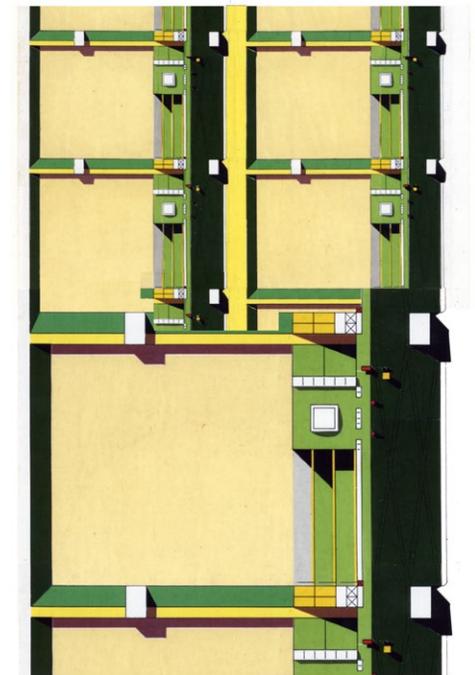
JONATHAN BLOCK FRIEDMAN



HOME FOR GENERATIONS

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A GLEAM IN THE EYE

"Where there is no vision the people perish." Isaiah

From the era of the Bering Straits landbridge until the time of Columbus, from the great European immigrations of the 18th and 19th centuries to the continued influx from all over the world today, America has been a destination for people who roam. We have been good at picking up and going. But our strength is also our weakness. We don't always know how to settle.

Gary Snyder and others make strong arguments that when a large number of generations live in a relatively stable and unchanging environment, the accumulated experience of the elders is distilled and passed on to youngsters, who then apply and improve on what they have learned. If not, they will lose out to [their better adapted territorial rivals. Thus something like "in my lifetime every time I've planted corn before freezing weather ends in the spring means a poor harvest in the fall and hunger in the winter" eventually translates into "never plant until the full moon after the last frost".

But now we face a new problem, one we are in danger of spreading to and infecting the rest of the world. It is only in the last 2 or 3 generations, since 1946, that most Americans are living in a new and historically unique environment-- the post-industrial middle-density detached home, with automotively dispersed services like electricity sewage disposal and public education. These putative "settlements" are of course the suburbs.

The suburbs of America may be where most of us live. But the suburbs are a long way from home. Because the major means of connection, the private automobile, disenfranchises and isolates so many of its residents, including the old, the young, and the inebriated, while at the same time renders so much of the landscape uninhabitable-- parking lots, superhighways, clover leafs, service roads, strip shopping roads, and driveways, the undeniable pleasures of the suburbs-- privacy indoors and out, a personal patch of green earth, neighbors who are likely social and economic peers-- are seriously compromised by its losses including the lack of real public places for political gathering, the intense variety of culture found in cities, or the true liberation of a wilderness continuous to the horizon.

It is the rare suburban community that supports its own opera or ballet company. Looking to a neighbor's back fence, however well tended, does not provide the open plains needed by free herds of elk or bison, and the private police forces at shopping malls all too often discourage free speech as a disturbance of the peace. It is time for a new vision of how such land may work for our posterity. We present here one possible version of that vision called A HOME FOR GENERATIONS.



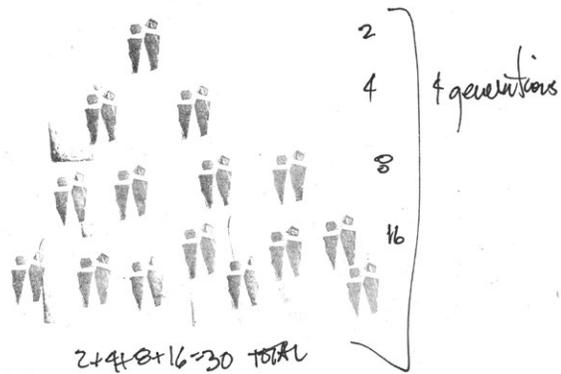
A STAR IS BORN

There was a very special reason a documentary film crew was on hand early yesterday to record the birth of a seven pound girl in Redwood City, California. The baby, Tara Kathlene Peters, born at 3:07 AM, became the sixth living generation in a family line going back to 1891.

Tara's 19-year-old mother, Kathlene Peters, gave birth at Kaiser Foundation Hospital, making Frankie Underwood, 90, of Fitzgerald GA, a great-great-great-grandmother. The child's father is George A. Peters, Jr., 21. Except for Mrs. Underwood and her daughter, Olene Cox, 73, of Macon, GA, the members of the family all live in California. Mrs. Cox's daughter, Kathlene Langella, 55, lives in Burlingame, and her daughter, JoAnn Jacobi, 37, lives in Foster City. Mrs. Jacobi, to keep matters straight, is the baby's grandmother.

Mrs. Underwood, who now has 59 living descendants, said of the new arrival, "The good Lord has blessed me. It's wonderful to be blessed with a family like that." Michael Colozzi, who is making a documentary about the family, said a reunion of Mrs. Underwood's descendants would be held in Georgia in the spring, when the baby is able to travel.

New York Times, Saturday, March 13, 1982



*"Doing things right
means living as though your grandchildren
would also be alive, in this land,
carrying on the work we are doing right now,
with deepening delight."*

Gary Snyder "Reinhabitation" *The Old Ways* 1977

AN IDEA: HOME FOR GENERATIONS

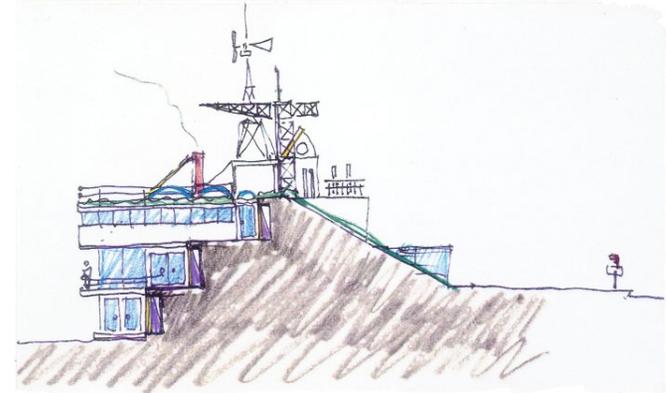
A house is a place to live a long and full life. Well-built homes bequeath success in living to our posterity. The cell of private shelter must grow into community culture extending through birth and death beyond any single lifetime. A house must enhance the quality of human existence or its form is unimportant.

Evidence from the mountain communities of Vilcabamba Peru, Hunza Kashmir, and Abkhazian Georgia SSR documents an unusually large number of elders who live full and vigorous lives for 100 years and more. Rugged terrain, pure air and water, and low cholesterol diet appear to be the significant environmental factors all these communities share. Their isolation from the world below have made for an intense social life with large supporting extended families central to their entire lives. The centenarians consistently suggest that usefulness and belonging to a family group are important factors in sustaining their will to live in good health.

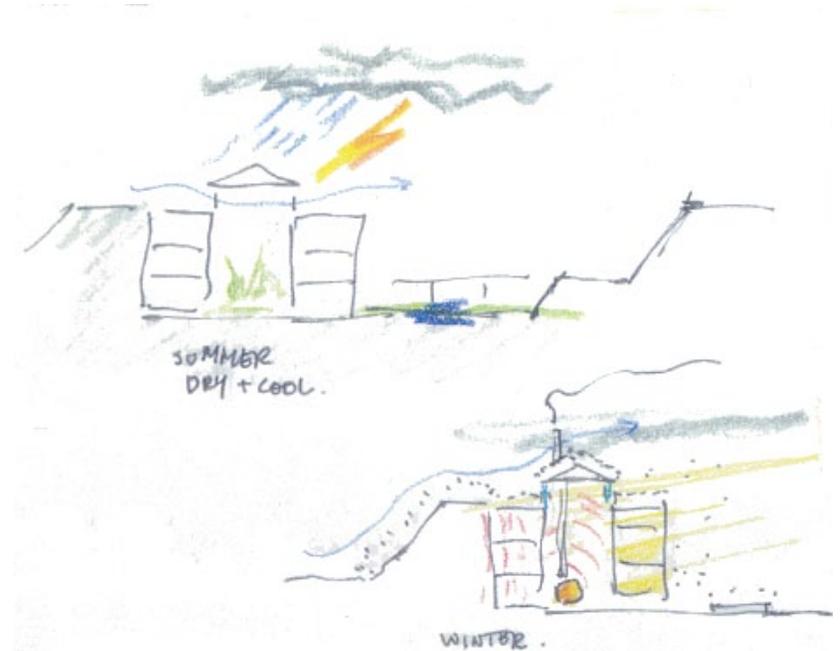
The problem that we face is that much of the industrial world's population lives in conditions almost totally opposed to these mountainous cultivators of longevity. People live in flat sites for reasons of building economy, surrounded by lethal fossil fuel pollutants, isolated in dwellings for small nuclear families that become empty and burdensome to maintain as their children leave and the parents grow older. Sedentary consumers commute to work, bus children to school, and drive to purchase daily supplies, too much dependent upon the car and too little upon the products of their own craft and labor.

Such is the situation in suburbia, where too often people live static lives in shallow surroundings. It is a testimony to the spark of life intrinsic to the dream of suburbia that so many have survived and even thrived in such surroundings.

THIS PROPOSAL OFFERS A SUBURBAN RENEWAL: A RATIONAL REOCCUPATION OF THE SUBURBS BASED UPON A SEEDPOD OF POSSIBILITY WHICH GROWS INTO THE FORM OF HOUSE LIKE ROOTS AND BRANCHES OF TREES... OUTWARD, GENERAL, AND TOWARD A NATURAL NICHE OF HUMAN ECOLOGY.

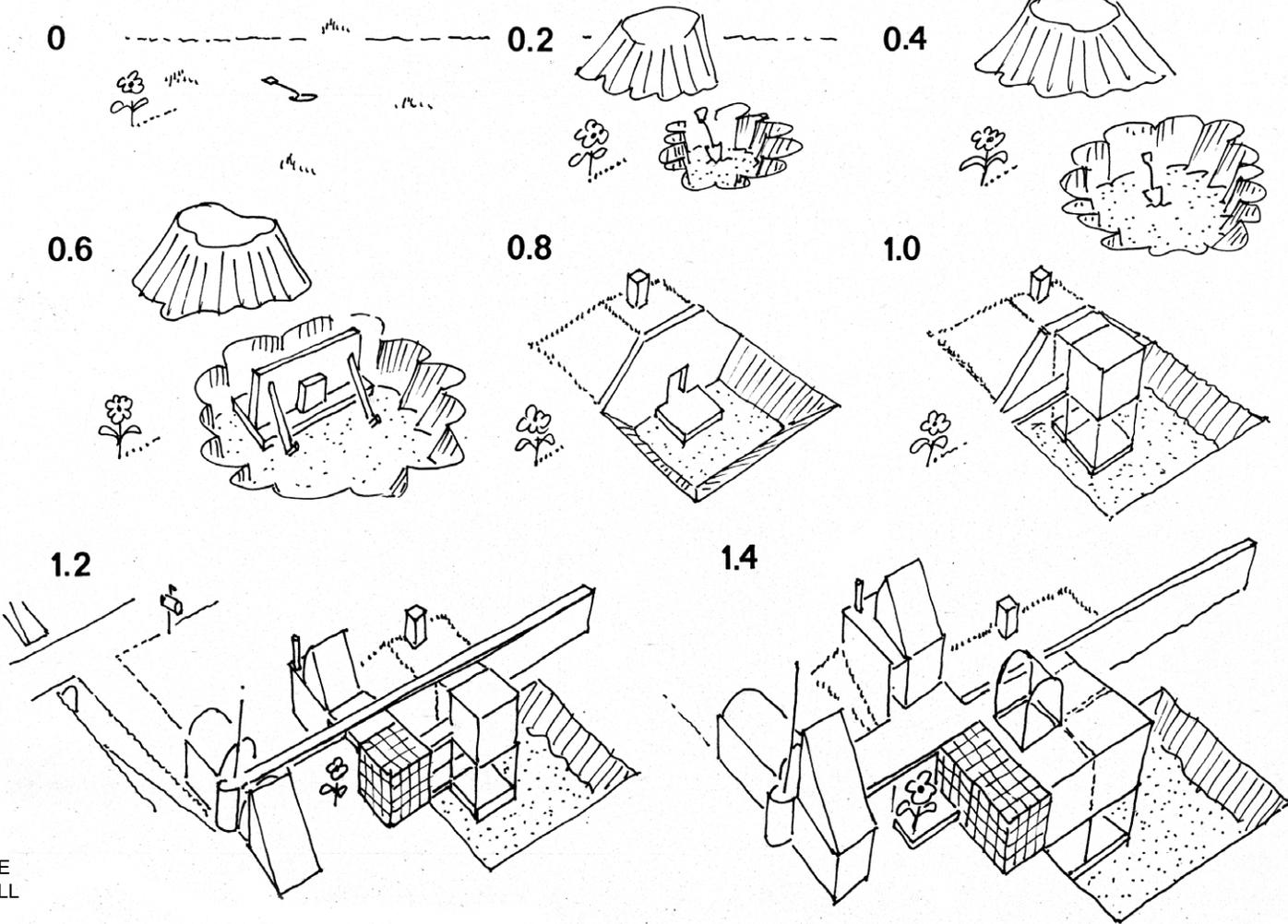


A LANDSCAPE OF LOFTINESS AND DEPTH
A VILLA UP TO SIX STORIES
EVERY ROOM IS IN THE SKY
EVERY LEVEL IS ON THE GROUND
EVERY FLOOR HAS DIRECT ACCESS TO GRADE
CENTRAL ATRIUM TEMPERS THE CLIMATE



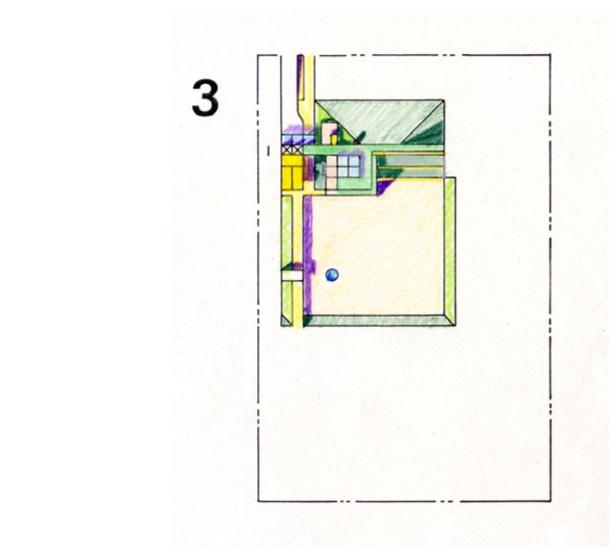
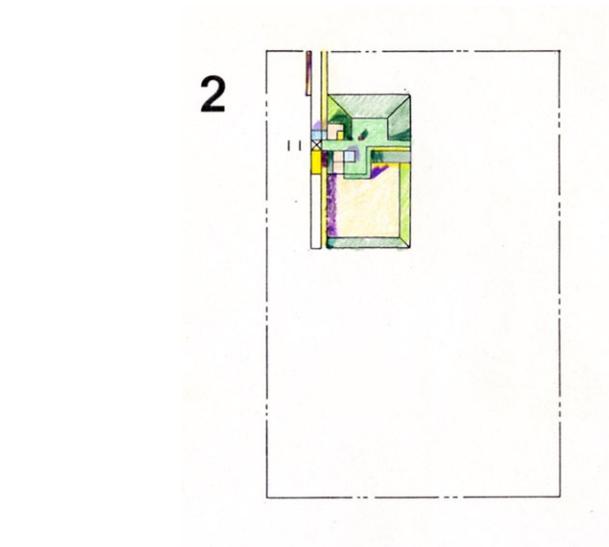
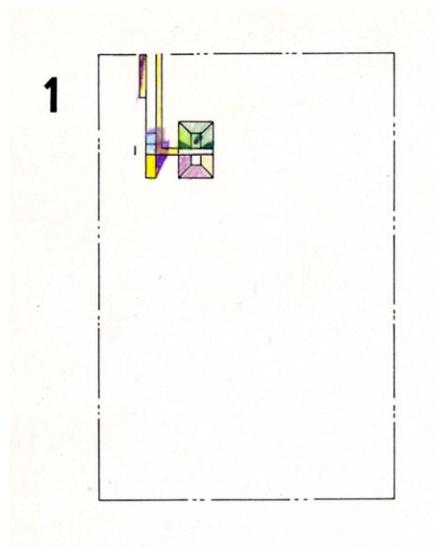
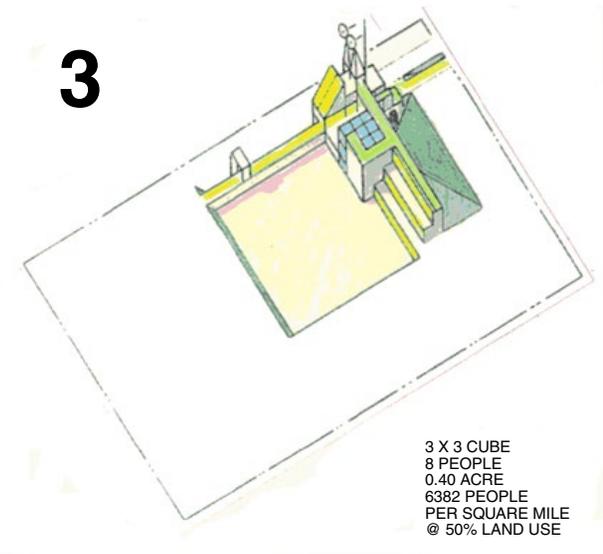
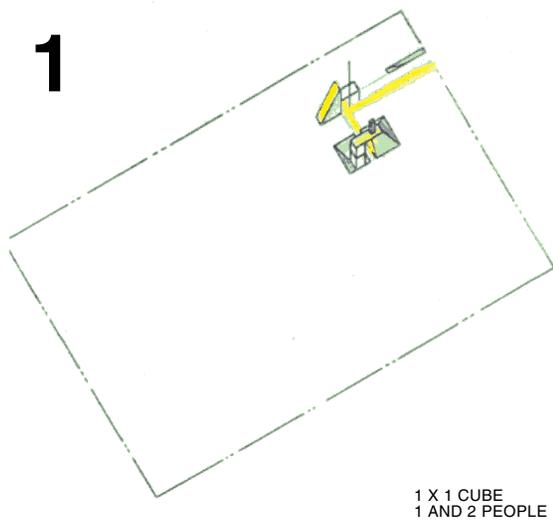
CONCEPTION

CONCEPTION

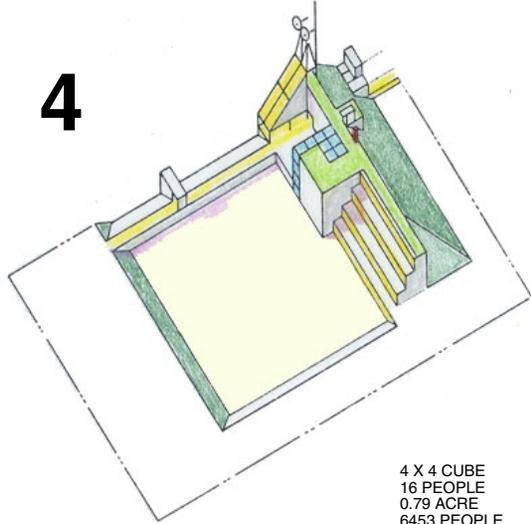


DIG A HOLE
 PUT THE DIRT ON THE NORTH SIDE
 BUILD A MASONRY RETAINING WALL
 PAINT ITS SOUTH FACE BLACK,
 COVER WITH GLASS
 TO MAKE TROMBE WALL SOLAR COLLECTOR
 BACK FILL THE EARTH TO MAKE NORTH HILL
 PIT GROW OUT NOT DEEP; HILL GROWS UP
 EACH SYSTEM EXPANDS INDEPENDENTLY

AN EMBRYOLOGY OF DWELLING

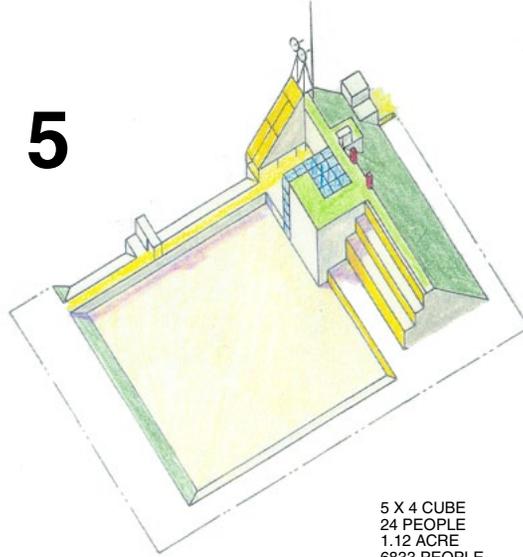


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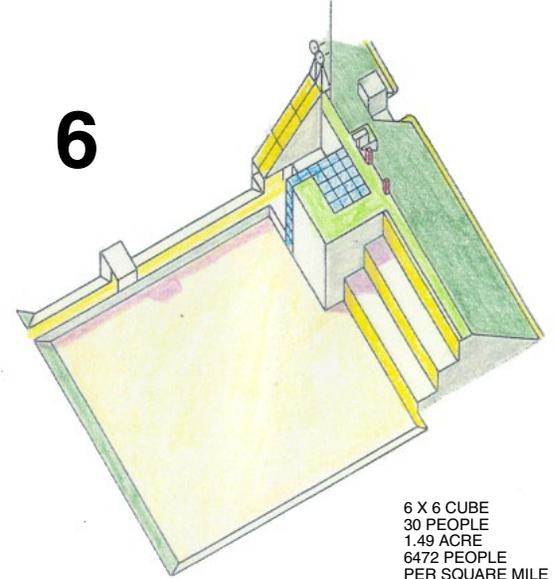
4 X 4 CUBE
 16 PEOPLE
 0.79 ACRE
 6453 PEOPLE
 PER SQUARE MILE
 @ 50% LAND USE

5



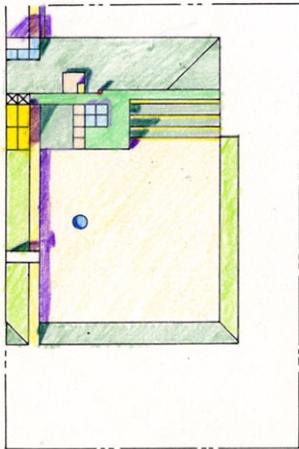
5 X 4 CUBE
 24 PEOPLE
 1.12 ACRE
 6833 PEOPLE
 PER SQUARE MILE
 @ 50% LAND USE

6

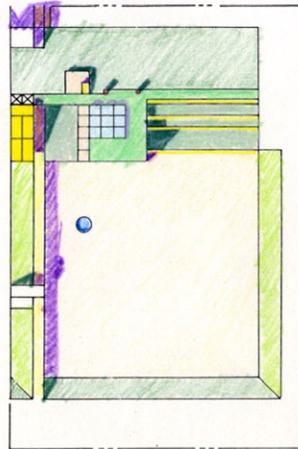


6 X 6 CUBE
 30 PEOPLE
 1.49 ACRE
 6472 PEOPLE
 PER SQUARE MILE
 @ 50% LAND USE

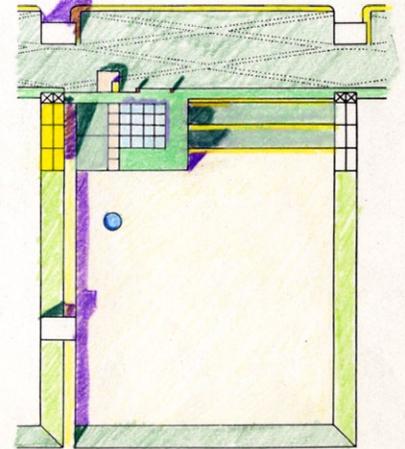
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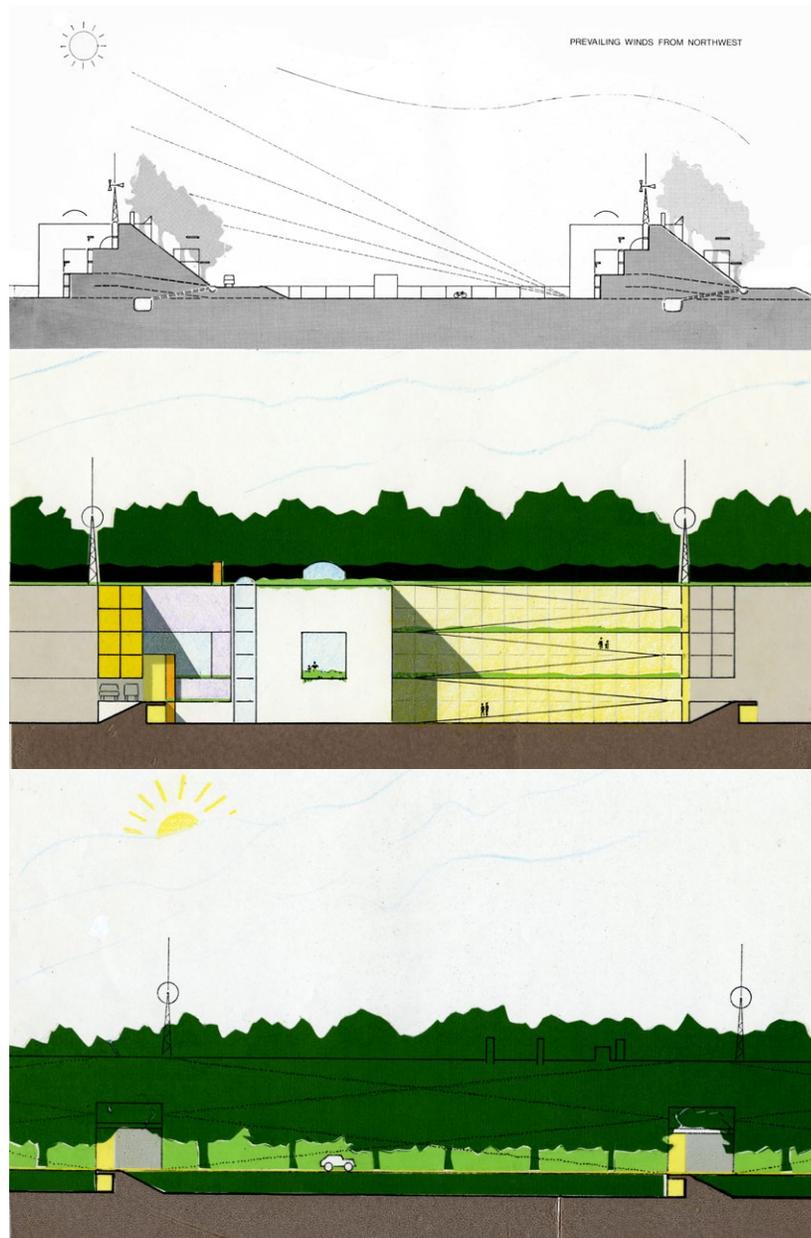
5



6



MAXIMUM TREE HEIGHT
 NOON SUN DECEMBER 21
 100' AT 40° LATITUDE
 64' AT 45°
 30' AT 50°
 12' AT 55°



PALAZZO ALDOBRANDINI



EXPANSE, EARTH, SKY, LIGHT AND SPACE.
 WHO WOULDN'T WANT THESE FOR THE HOME?

VISION AND DREAM

At six weeks old I moved with my parents into our new home-- a new suburban house in Freeport Long Island New York. I looked across the street at the trees and open space of a golf course to the south, until a "developer" replaced it with hundreds of single family homes. At six years old I left suburbia. My parents took me "out West." The Rockies, Badlands, Yellowstone, changed forever my vision of what our homes could be. Since then, I dream of living in loftiness and depth, not only in the shallows of shrub and roof across the street, where water towers are the only landmarks.

I dream that all mid-density suburban housing can enjoy domestic living at the scale and prospect of the great Palazzo Aldobrandini, outside of Rome. A place where people might live IN the landscape and OF the landscape, with grandeur outside the doorstep, yet always at a human scale. How can we get there? Who has the time or the money? What young family can afford the mortgage to build on such a large scale, to create far more than immediate needs demand? The answer lies in a phased and planned growth: step after step, one stage at a time. Thus may we achieve magnificent scale-- for modest families!! So may the undeniable pleasures of mid-density dwelling (access to both nature and culture) also promote healthy longevity and mutual human support.

What is offered here is a strategy, not a style. The design proposes a fully realized villa for each multi-generational family or home group. The home at its final sixth phase may take up to 80 years to realize. It is set in an acre and a half of combined open fields and wooded hillsides, with sunny terraces easily accessible from every level of the dwelling. The main building will provide over 12,000 square feet of usable floor space. The out-buildings and extensions can easily add another 4000 square feet for the home. Garage space is provided for up to 6 vehicles. Each villa enjoys real privacy, with views from the main two story living room window of only the woods of the neighbors' back slope a full football field away to the south.

HOME FOR GENERATIONS

PRINCIPLES OF AN INTEGRATED APPROACH

We must create not one object but a harmonious range of dwelling spaces for various climates, topographies, and human settlements. The plan becomes an animation scenario.

Architecture takes time.

1. Make a home for many generations living together.

Treat the home as an object of solace" that grows and endures from generation to generation. All ages may thrive together and find meaning in the daily living presence of elders and offspring, in extended families, biological and otherwise.

2. Increase the level of personal control in daily life.

Incorporate flexibility through elements at a scale that permits additions and removals of space by homeowners to provide means for personal control of shelter and its variations. Safe environments encourage independence from early age to late in life. Free the body in space.

3. Create topographies of loftiness and depth.

Design sites to reproduce highs and lows of mountains with access at grade to every level of house and site. Families cultivate dreams in large sunny fields to the south and dark woods to the north. Peaks and valleys are within easy access to all, regardless of handicap or infirmity.

4. Maximize resources through geometrodynamic form.

Use earth berms and excavation for insulation from cold. Use terraces, walls, windmills, and solar cells to collect energy and locate them to maximize their mutual effect (for example windmills over garage at point of greatest thermal gradient north to south.) Harvest the potentials of wind, water, and biota.

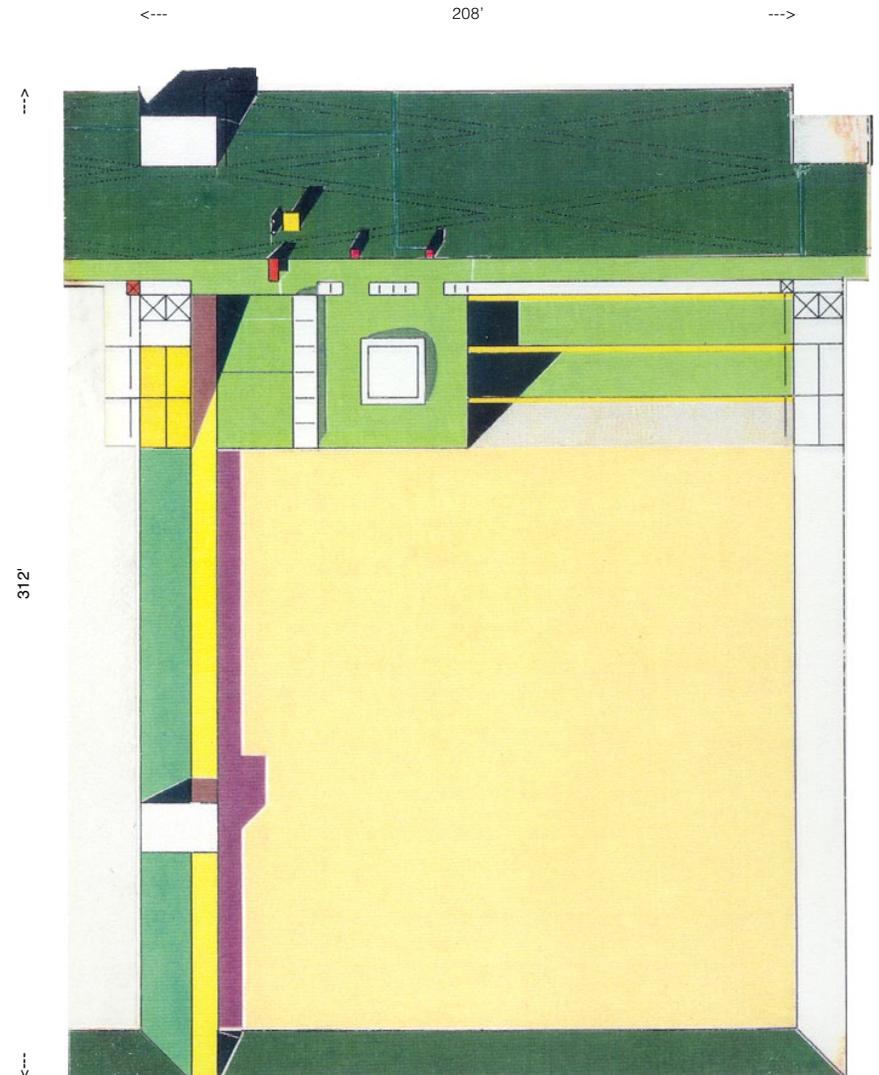
5. Use standard components and dimensions.

Make elements demountable and changeable. Let space be space user-defined and modified. Create architecture/dwelling component stores for trade-ins and upgrades.

6. Promote healthy actions and spaces.

Provide for aerobic exercise, community participation, extended families. Have safe, barrier-free environment. Free the total ground plane for people. Minimize toxic electric and traffic hazards. Generate and conserve energy. Photovoltaic garage eliminates car pollution and dependence on oil. Recycle: water, waste, building element

FULL VILLA, 6TH PHASE, 6 STORIES
1.5 ACRES, UP TO 30+ RESIDENTS



HOME IN THE LAND

DESIGN ELEMENTS TO INTEGRATE DWELLING AND LANDSCAPE

PIT AND HILL. Pit and hill create advantages of earth sheltered dwelling, insulating and deflecting cold north winds to the southern portion of the fields, reducing air turbulence immediately about the house. The north hill grows as the excavation increases. Prevailing winds tend to condense on the north slope as the air rises and cools so that shade tolerant plants will be well irrigated. Drainage pipe at the base of the hill collects runoff for the cistern below grade, and ultimately in tanks above, generating (with pumps for the tower) a slight positive pressure differential.

WALL. Use the earth dug from a pit to make a hill on the north side of a continuously growing retaining wall. South facing vertical surface reflects heat into the shelter and become Trombe wall collector that can enlarge with the needs of the house. Fans pull warm air into the house. Ducts embedded in the wall collect radiant heat from the wall at night when daytime ducts are closed.

TERRACE. Flat stepped sections south of the wall provide gardens, lawns, flower beds, grape arbors, patios, sun decks and greenhouses as needed, immediately accessible from every level of the house.

FIELD. To the southeast of the house is a field up to one acre in size, large enough for a major vegetable garden, a par 3 golf hole, a lake, or 1/4 mile race track. This dimension will produce its own spectral signature for study via remote sensing and application through GPS and GIS.

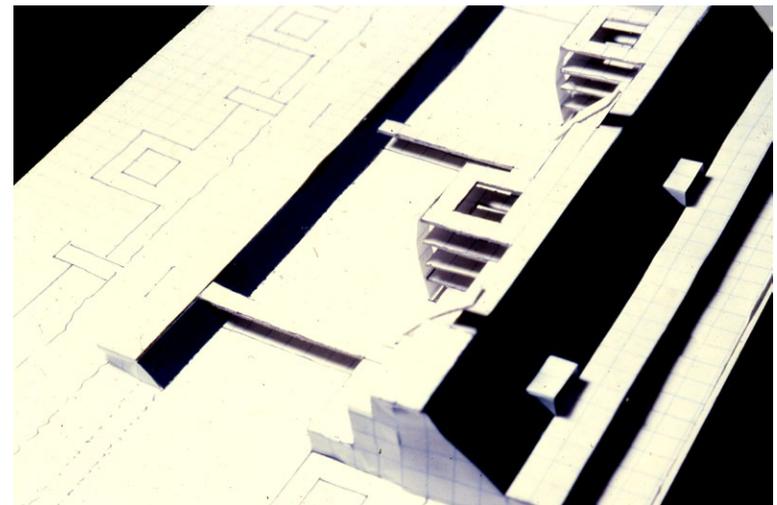
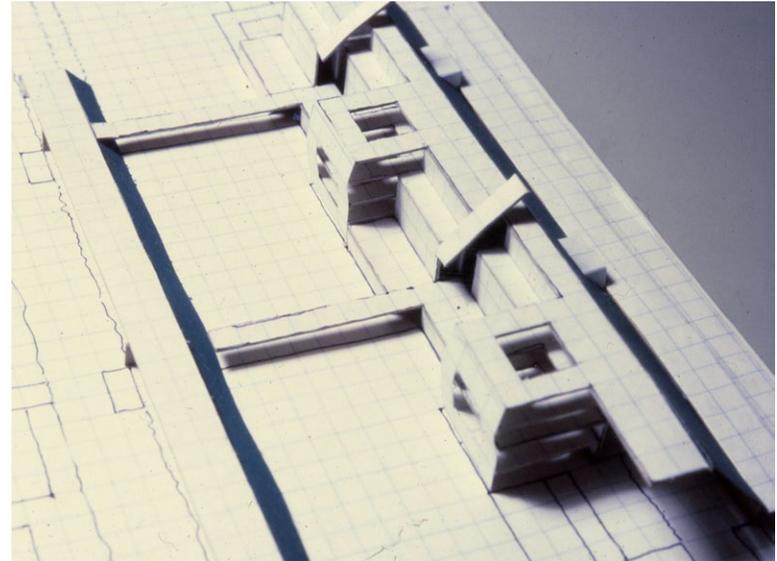
ATRIUM. A central hollow space for plants and exercise also gives privacy between members of the family. A translucent roof cap provides extensive interior lighting, and can be vented for chimney-effect cooling in summer.

STORAGE/SERVICE. Gallery, circulation, and wall to the west provide space for kitchen, laundry, sauna, and other equipment for the home.

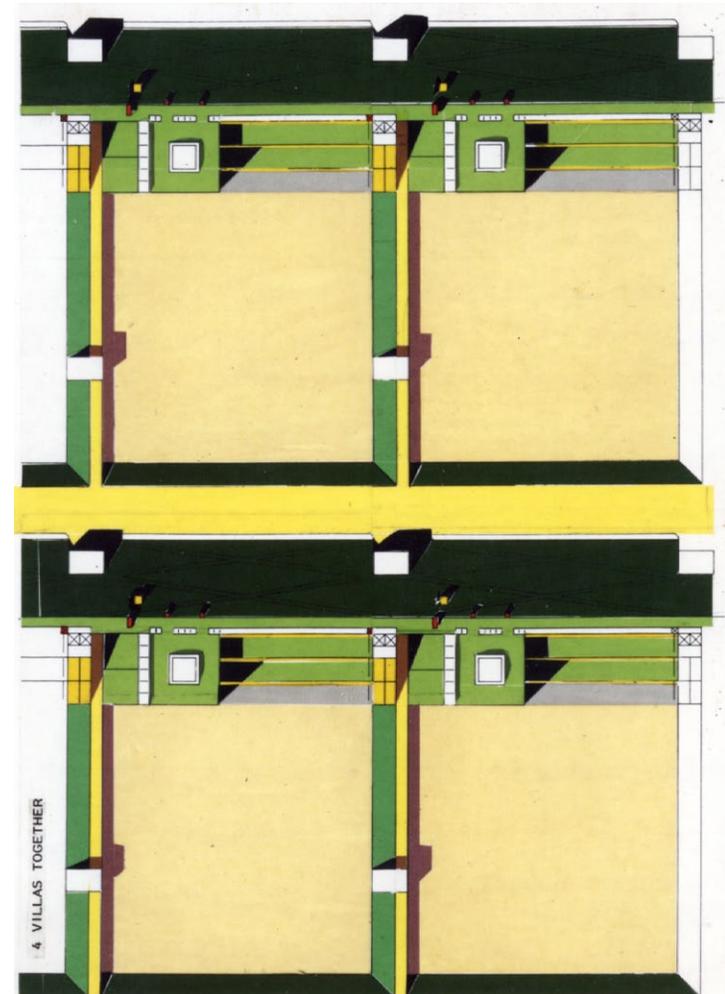
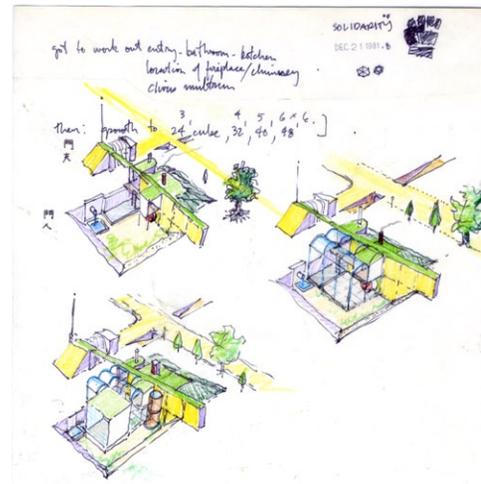
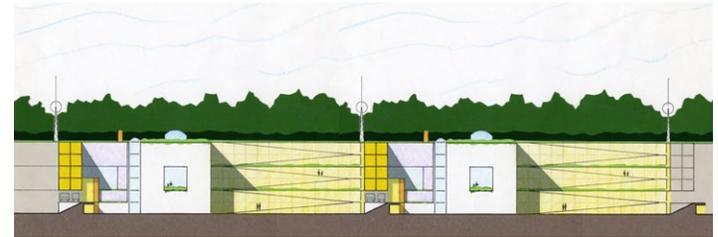
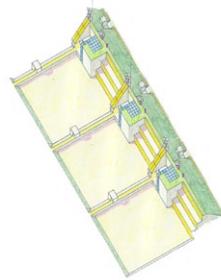
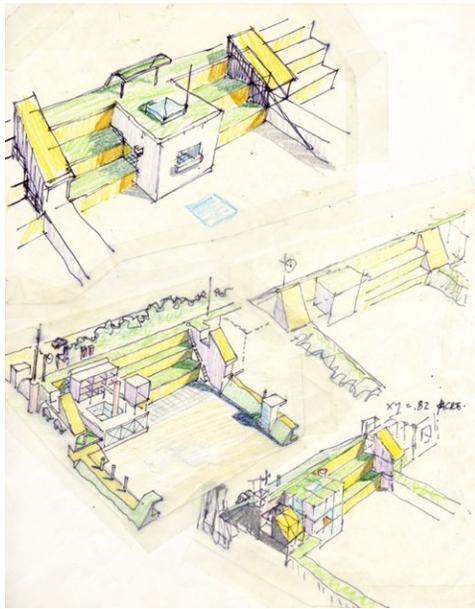
PATH. Car routes do not traverse pedestrian ways. A tunnel connects the north road to the house through the hill. Below that a path carries through a culvert beneath the road into a colonnade along the west edge of the field, providing safe continuous walking shelter from the weather. Ramps give access to both grade levels for bicycles and wheelchairs. Paths through the woods on the north slope are less than 1:10 pitch and connect existing grade with the east-west continuous ridge walk. A retreat to the southwest is accessible by covered path.

COMMUNICATION. The "Gate of Heaven" at the northwest includes a tower for weather station and electronic center. Broadcasting and receiving are monitored, adjacent to electrical energy sources. The windmill is located at the point of greatest wind velocity, above the heat updraft of the solar collector, at the ridge of the hill. Lodging for wanderers and separate rooms for adolescents are found closest to the wanderlust of coming of age.

TRANSPORTATION. Photovoltaic collectors power electric cars for everyday commutation. Hybrid cars are fitted with additional fuel tanks for longer trips

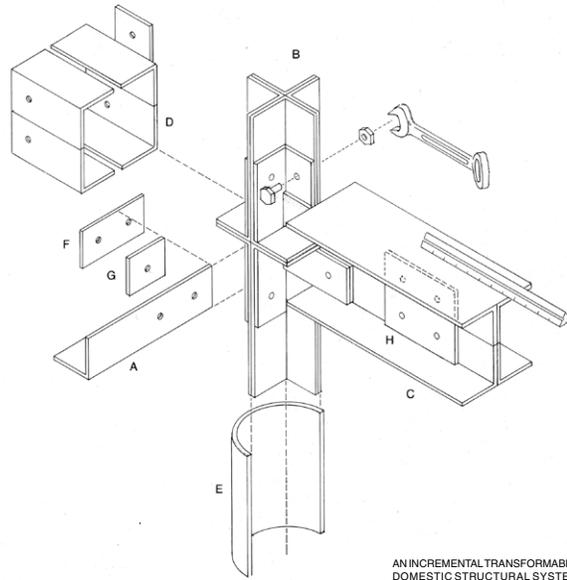


EARLY DESIGN STUDIES, BEFORE ASYMMETRY OF MORNING AND AFTERNOON LIGHT WAS ACKNOWLEDGED IN THE PLANS



ELEMENTS OF THE HOME FORM A LANDSCAPE OF LOFTINESS AND DEPTH. MODULATED LANDSCAPE EMBRACES THE HOME.

THE MEANS: COMPONENTS

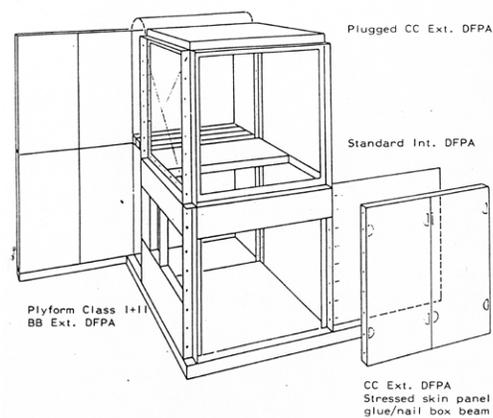


PROPORTION

A basic building and space volume of 8'-0" center to center, supported by metal structural angle channels, which in turn can support a variety of siding, floor and roof panels, with clear span between elements of 7'-6" creates a standard spatial module at human scale. The building components are based on American standard construction intervals and Le Corbusier's "Brevet" Modulor interval. A 12' spacing is implied as Golden Section and as 2:3 ratio. The standard tatami dimension of 3'x6" (3x6 shaku) is also readily derived. Major parts come as full, half, third, or double units and permit easy rearrangement.

The plans shown in this proposal are the volumetric integration of dwelling space areas, passive solar surface for home heating, photovoltaic collector surface for electricity and transport, cut and fill equalization, sun clearance between hill crests, and standard building component sizes useful to human and public scale.

As a result, the house is complete and compatible with others of its like type at any increment. The basic stages of growth illustrated herein are shown as full volume cubes but they are only snapshots of unique and idiosyncratic developments, whose extension vectors will rarely if ever grow symmetrically and simultaneously.



AN INCREMENTAL TRANSFORMABLE DOMESTIC STRUCTURAL SYSTEM

The HOME FOR GENERATIONS is based on a trabeated three-dimensional framework set on an 8' spacial grid. With structural members of about 6" the resulting spaces integrate Le Corbusier's Modulor with standard American construction elements. The primary component of the system is an equal angle channel. When 4 of them are combined into an **X** form, they may be used as a column. When combined in an **I** form, they act as a wide-flange beam. These basic components may be strengthened in a variety of ways, including web joint plates **H**, box beams made of 4 more channels **D** and column stiffener halves **E**. Overlapping intersections are made with shear plates **F** and spacer pads **G** at joints.

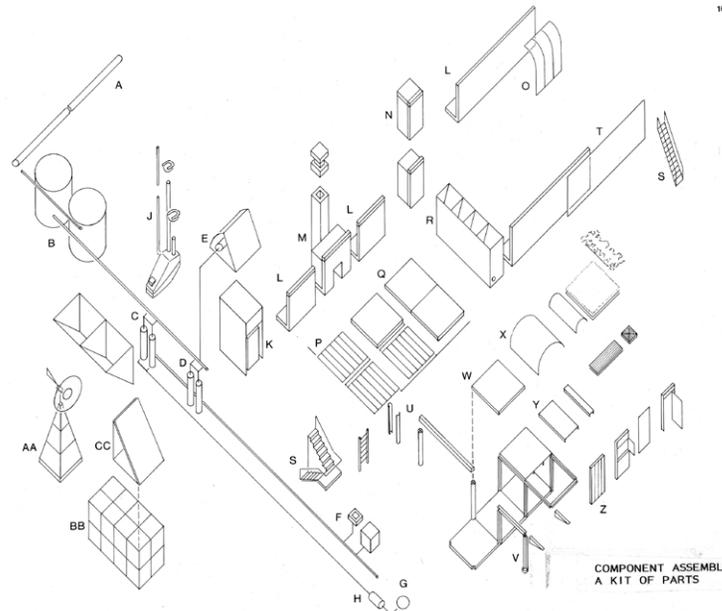
At 8' spans, the basic element **A** may be made of 1/4" thick 3"x3" equal angle A36 steel or 5/16" 3"x3" equal angle 6061 T6 aluminum alloy. These members will support 3 floors @ 40 psf live load without any additional stiffeners whatsoever. The weight of each 8' angle section in steel is 40 lb. In aluminum it is only about 17 lb, roughly the weight of a portable typewriter, or the weight of about 5 laptop computers. When treated with adequate fireproofing, aluminum remains competitive in cost and appears to be the material of choice. Dies are economical for relatively small quantity production runs and permit sufficient slots for a completely bolted structure to be contemplated.

A certain redundancy to the structure permits alterations and even removal of some structural elements. Thus the atrium can remain free of columns as it expands, the dining room span can increase to 12 or 16' as needed, cantilevers may be added, etc. All without endangering the basic structural integrity of the house.

The system is derived from Le Corbusier's brevet scheme, as used at his Zurich pavilion of 1965. An important modification has been made to the configuration of the beams, which have been rotated into the more traditional **I**-beam configuration to provide a more efficient section modulus.

It is possible to understand this post and beam structure rendered in fire-retardant coated domestic metal as a large and workable version of the well known erector set.

COMPONENT ASSEMBLY: KIT OF PARTS



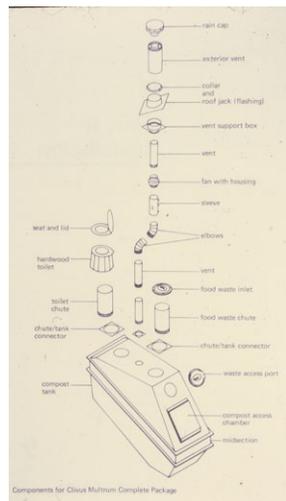
Drain pipe **A** catches run-off from north slope hill and conducts water to cisterns **B** and then to boilers **C** and hot water storage **D**. Solar hot water heater **E** above elevator **K** penthouse acts as primary heat source for hot water. Lavatories and washer appliances **F** are located directly on water mains, keeping plumbing to a minimum. Drain **G** may provide irrigation water to gardens. Recycling system and filters **H** return usable water to system.

Human sanitary waste and kitchen organic waste are composted in clivus multtrum digesting toilets **J** which create sanitary fertilizer as compost, requiring cleaning only once a year. Each multtrum is sufficient for the needs of up to 15 people.

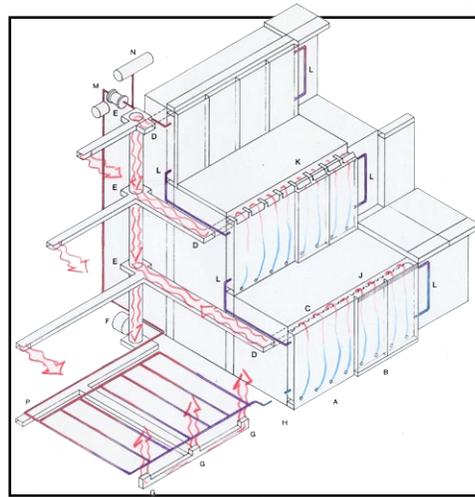
Retaining walls **L** grow with increase of excavation and mound and may include installation of heatilator-type heat circulating fireplaces **M**. The addition of glass **T** to the retaining walls create trombe wall solar heaters whose warm air is conducted into the house by ducts and fan units **N** alternatively, water pipes conduct the trombe wall heat through pumps to radiant floor heating **P** set into floor panels **Q**. Caisson-earth retainer **R** permits excavation and expansion into terraces to the east.

A variety of stairs and ladders **S** permit vertical circulation at critical points. Basic structural column **V** on 8" centers may be stiffened with external cylinder column halves **U** for increased loads or vertical (l/r) spans, and box beam cladding may permit increased horizontal spans. Thus the original 8' grid may be doubled to a 16' three dimensional spacing. A variety of roofing elements **W** and triple-glazed Kalwall-type skylights **X** minimize heat loss through roof while allowing high light transmission into the atrium. A variety of floor panels **Y** and interior and exterior wall panels **Z** enclose the dwelling volume.

Windmills **AA** set at the highest point of the structure and at the point of highest temperature differential (between north wind and photovoltaic collector) generates maximum possible electricity for domestic use. Storage batteries **BB** store windmill energy as well as electrical energy from photovoltaic collectors **CC** for automobile power.



THE MEANS: ENERGY



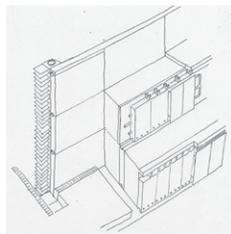
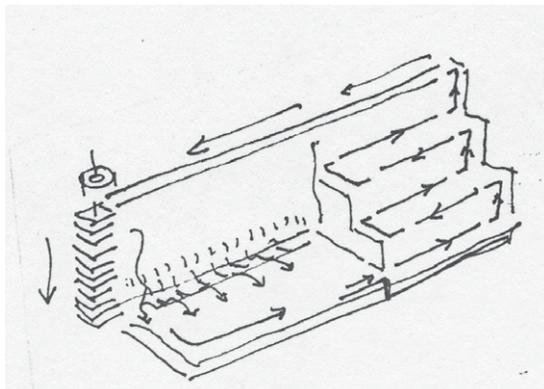
TROMBE WALL TERRACE SOLAR COLLECTION

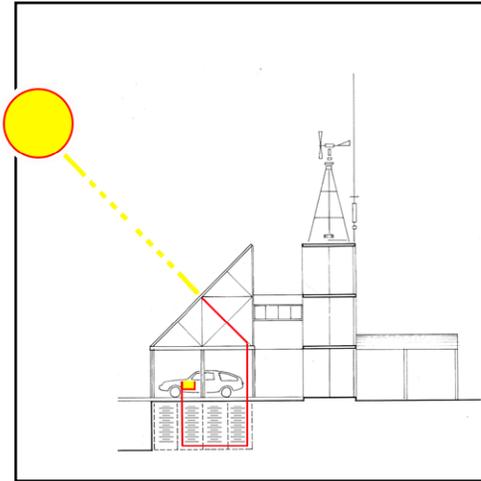
TROMBE-WALL TERRACE SOLAR COLLECTOR SYSTEM

The south facing retaining walls which create the insulating hill to the north of the house can also act as the main heat source for the living area of the house when the external vertical surfaces are painted black and glazed. The Trombe walls store heat in the thermal mass of the masonry as hot air rises A inside the glass B and circulates around the grooves C in the north face and across the south face of the wall. The earth behind the wall acts as additional heat sink, minimizing the need for large water or rock storage inside or below the house itself. This remote heat is drawn into the house either through a series of ducts D fans E and F which pull the warm air down to the floor registers G at needed levels of the house, and/or by a hot water conduit circuit which builds a pressure head and is raised to the highest level of the house by a pump M and overflow tank N and allowed to fall to the subfloor radiant heating pipes, from which the cooler water returns to the beginning of the cycle at the Trombe wall interior H. Since shadows appear to be unavoidable, modified "Sky Lids" K, developed by Steve Baer and the researchers at Zomeworks, automatically shut themselves and close their cells of the collector when the when the temperature in the air space between wall and glass is cooler than the temperature of the air being ducted into the house. This of course will occur when portions of the wall are in shade or when night falls.

The unique arrangement of the elements of this system allow the entire heat source to grow incrementally as the house itself expands, or as climate demands increase heating. When new terrace levels obscure earlier portions of the collector, the glass may be removed and placed on the new outermost surface. The stripped Trombe wall then reverts to its original function as simple retaining wall, minimizing the thrust on the southernmost sections.

Thus terrace, hill, collector area, and volume of the house may all grow proportionately together. The question remains whether these proportions will provide adequate heat for the house. Taking the worst case, which is the 6x6x6 volume, the area of the Trombe collector totals $80 \times 48 = 3840$ sq. ft. and the volume of the dwelling is about $48'$ cubed = 110592 cu.ft. The ratio of collector area to dwelling volume is thus 0.035. This compares favorably with Trombe's own recommendation for an $A:V = 0.028$, although admittedly it does not quite equal a well-known Trombe wall house by the architect Doug Kelbaugh, with $A:V = 0.042$. and where perhaps 80% of the total heating is supplied by the collector. Still we must point out that when the house is smaller, as for instance the 3x3x3 volume, the $A:V = 0.069$. We feel confident that the almost complete lack of exposure to the north, and ultimately complete insulation of the earth on the north, as well as much of the west and east sides of the house, as well as the passive heat gain of the house itself are all taken into account, a significant proportion (80 to 90%) of all heating requirements can be generated by the Trombe wall collectors. Insolation studies indicate these estimates may be reduced to about 75% when collection from shaded surfaces is eliminated. Still, we feel these are conservative figures which may be increased with extension of the terraces and collectors to the east as needed. Double glazing is standard, except in the atrium canopy, which may be triple glazed Kalwall or the like. Ventilation is achieved through vents in the atrium canopy. The Trombe walls too may air condition in hot weather through venting at the upper ducts. Knockouts for fireplaces and chimneys are installed at each new level of the north wall, and provide auxiliary heating. The wood which grows on the north slope may be harvested for this purpose.





SOLAR AUTO AND PHOTOVOLTAIC GARAGE

SOLAR AUTOMOBILE AND PHOTOVOLTAIC GARAGE

It is possible to build a garage whose roof will generate electrical energy from the sun by means of photovoltaic cells. This energy can be stored in batteries which may recharge an electric automobile while it is parked overnight, much as golf carts are currently powered. It appears that levels of efficiency can be obtained for both car and collector that allow, as a very rough rule of thumb, the guideline of ONE CAR AREA'S SURFACE OF COLLECTOR = ONE DAY'S COMMUTE. Such a development could transform the car into a benign form of personal transportation— quiet, nonpolluting, and best of all, consuming only renewable resources.

CALCULATIONS

1 kilowatt-hour = 3413 BTU

10 square meters = 107 square feet

@ 40 degrees N. Latitude, the sun provides 1690 BTU/ sq.ft./day

1. ENERGY CONSUMPTION FOR AN ELECTRIC CAR
(based on Los Angeles city driving, using lead/acid batteries)
With a range of about 75 miles, at about 50 miles per hour,
an electric car will use about 200 watt-hours/ mile.

2. YEARLY ELECTRICAL OUTPUTS FROM FIXED PHOTOVOLTAIC ARRAYS
For Cleveland, the average is 180 Kw-hr/sq. m./ year
For Albuquerque, the average is 300 Kw-hr/sq. m./year
Assume an average working figure of 200 Kw-hr/sq. m./year
[Check: $200(3413)/ 10.7(365) = 175$]

3. CAPACITY OF SOLAR GARAGE

Using the figures of 200 watt-hour/ mile and 200 Kw-hr/sq. m./year

10 square meters will produce 2000 Kw-hr/year
which will yield 10000 miles per year driving range @ 100% efficiency

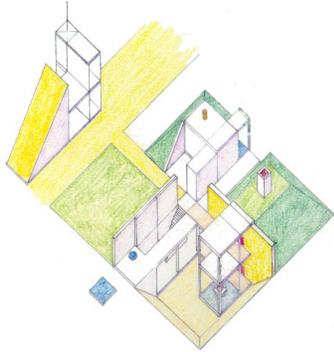
Assume 65% efficiency for complete transfer of solar energy to batteries:
then to provide 10000 miles per year of driving,
about 15 square meters or 150 sq.ft. (10'x15') is required.

This is sufficient for average commutation of over 50 miles/day.

SOURCES

1. Prospects for Electric Cars: Electric Vehicle Impact Assessment Study, US Department of Energy, Phase 1 Final Report, 1978 SAN 1213-1. Figure 5.14
2. "Photovoltaics and Materials" Report of the American Section of the International Solar Energy Society, Volume 6, 1976, p.98 Table 1

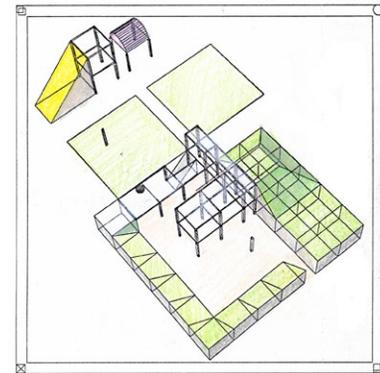
HOW IT CAN BE BUILT



HOME FOR GENERATIONS MAY BE REALIZED IN ONE OF TWO WAYS

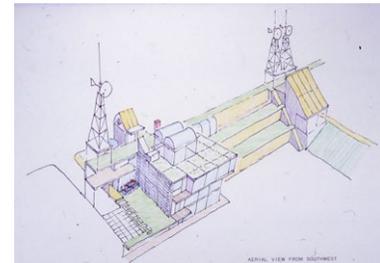
1. BY HOUSING PIONEERS AS SINGLE INFIL PROTOTYPES

A HOUSING PIONEER may obtain land and commence with the simplest quantum of dwelling, a single cell, and the simplest act of shelter making, to dig a hole in the ground and make a hill to its (north) side, and add wall and extend excavation and mound as time and resources permit. Waste treatment, water storage and heating, solar collectors, tower, and equipment as well as gardens, fields, and dwelling space may grow independently and incrementally without restriction on any other system. This approach has the advantage of taking immediate action with little capital outlay and an ultimately high return on the investment of time and labor.



2. BY DEVELOPER IN EXTENDED PARCELS

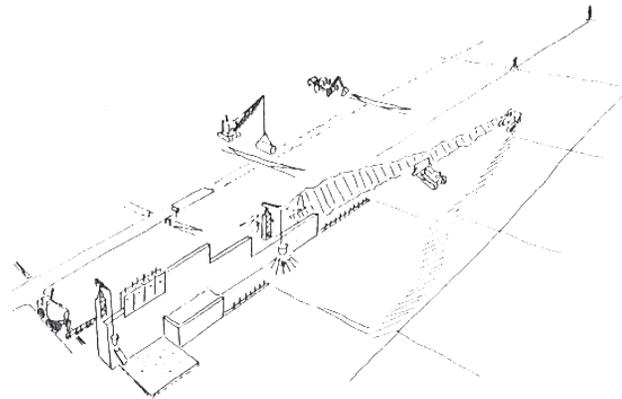
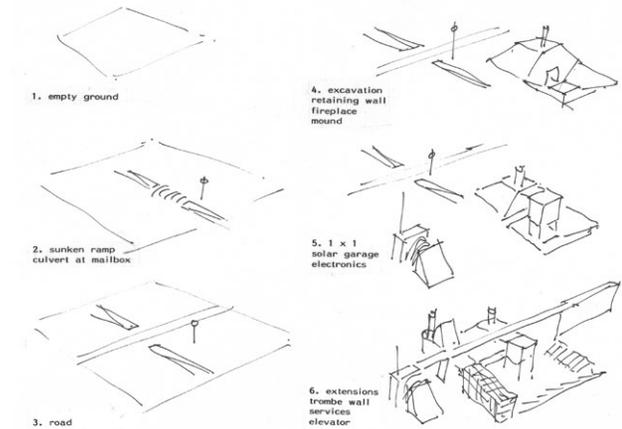
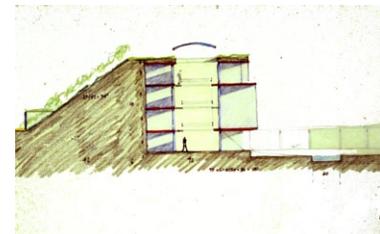
A DEVELOPER may use current building practices for tract housing with only minor modification. Continuous bulldozer excavation would essentially connect the basements of typical suburban housing developments. This cut would provide the fill for the hill to the north of the solar collectors/retaining walls. Thus a modulated landscape and complex topography of fields, hills, terraces, and collectors could be built in one continuous operation. "Starter" homes and Full Family Villas could be mixed with the other phases of growth to produce a community of great variety and heterogeneity.



FOR BOTH CASES:

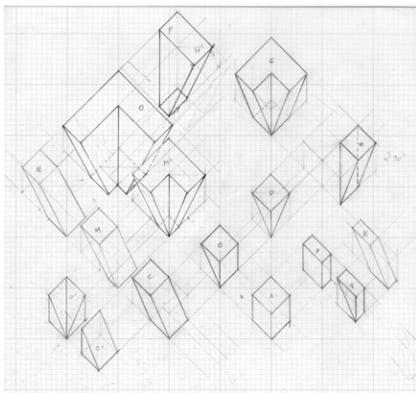
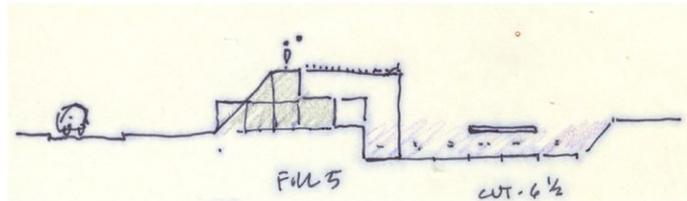
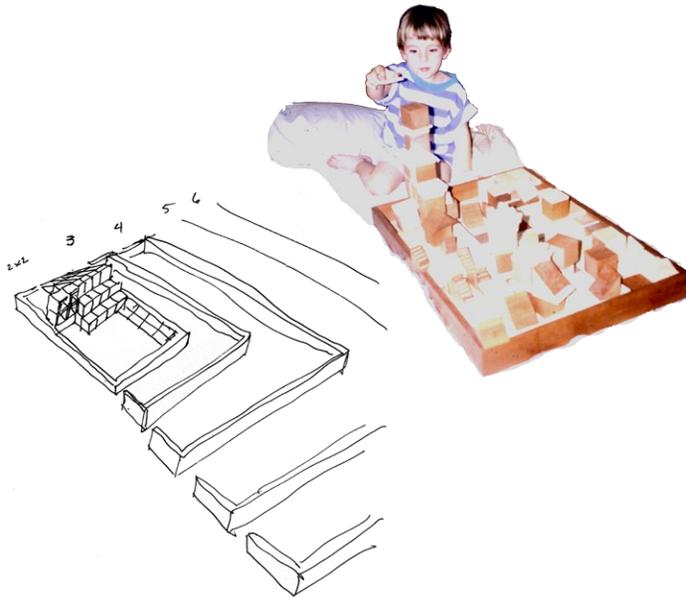
For both ways, the pit and hill evolve together. The pit only gets wider, never deeper than a single level excavation for a basement. In effect, the retaining wall holding back the hill to the north is a basement concrete wall unfolded and stretched out to face south.

For both cases it is suggested that large diameter culverts be placed in ramped trenches across the vehicular right of way before the road itself is actually installed. This will allow complete separation of pedestrian and vehicle in residential communities without entailing the great expense of elevated road structures. As the neighboring villas grow, this subterranean level becomes the major residential datum and vehicles hover between hill and valley without leaving the ground.



MASS PRODUCTION TRACT HOUSING

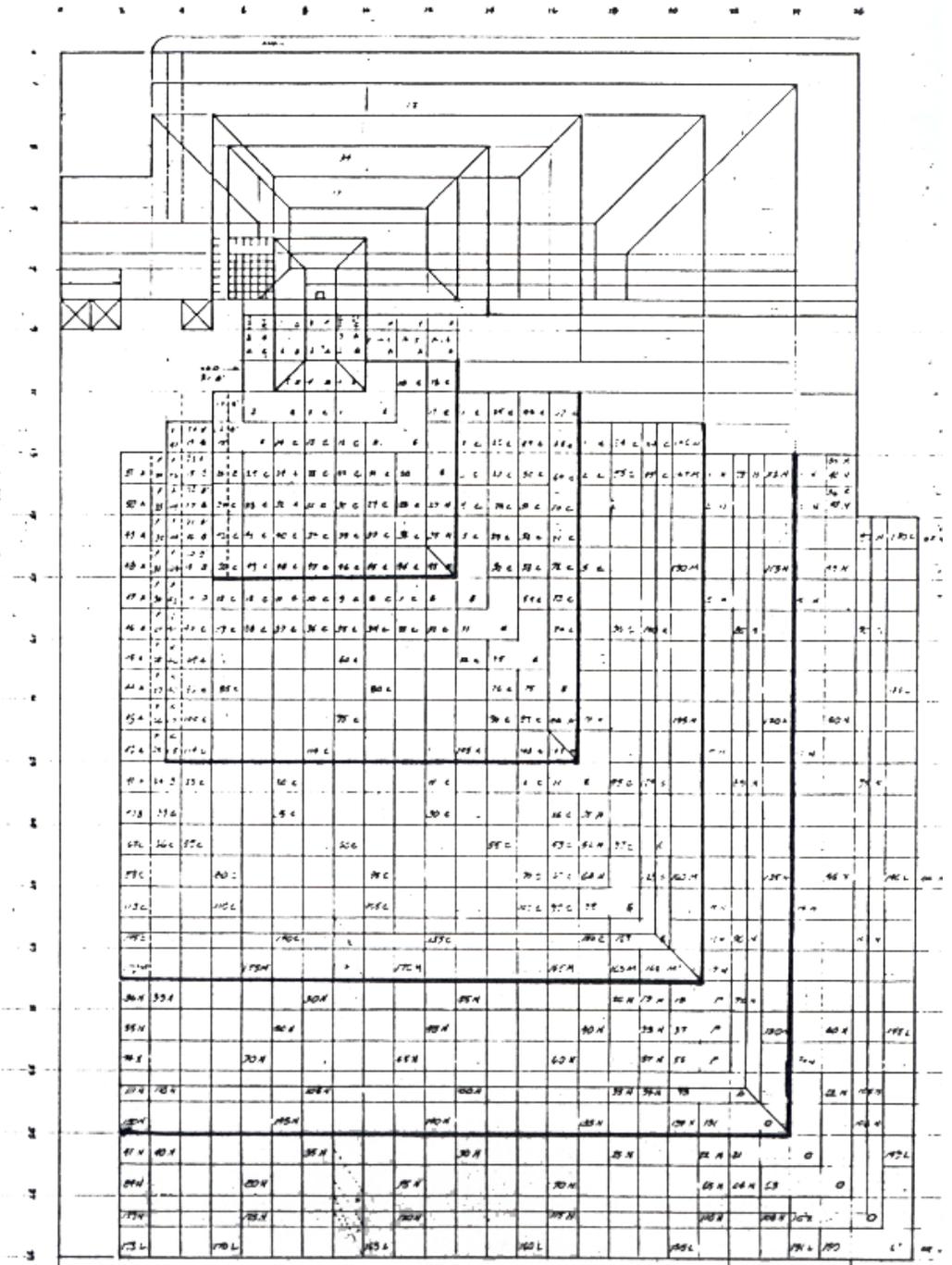
Continuous excavation provides fill for north hill. "Unfold" basement walls of typical single family house into continuous solar collector retaining Trombe wall. Fields, hills, terraces, and solar collectors are built together. Custom built "starter" homes and fill villas may be mixed.

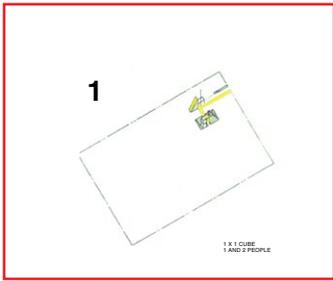


CUT = FILL

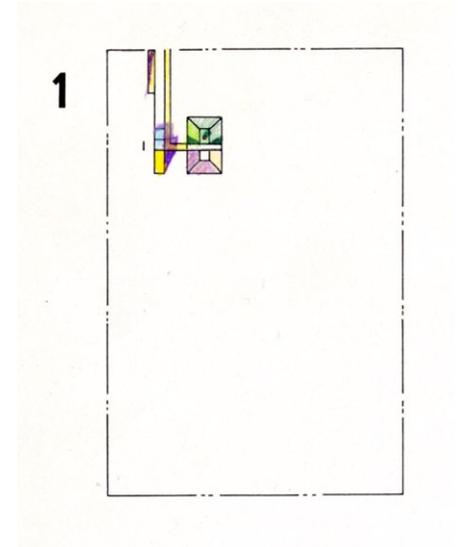
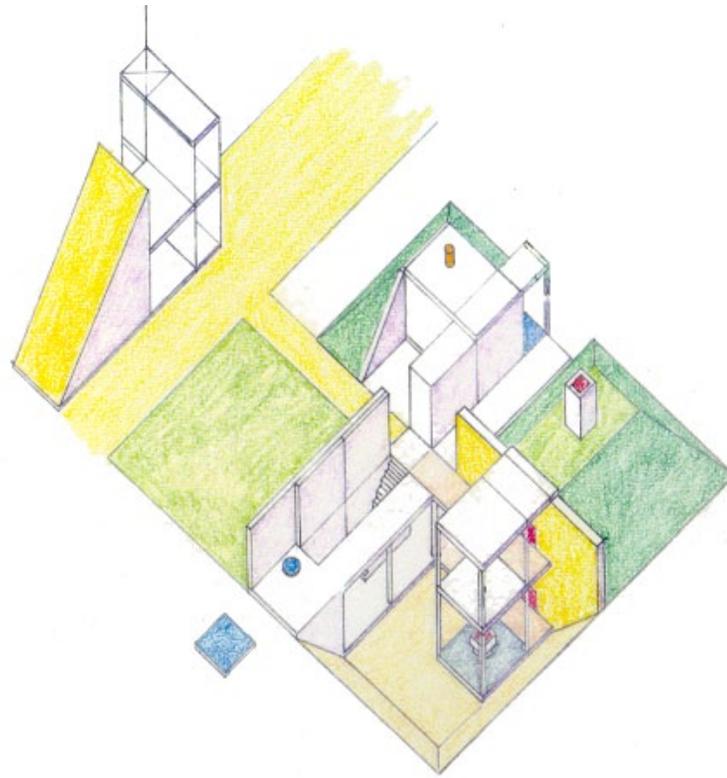
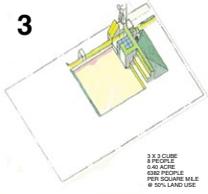
AT EVERY STAGE
PHASE 1 THROUGH 6

GEOMETRY CALCULATIONS
FOR COMPUTER ANIMATION

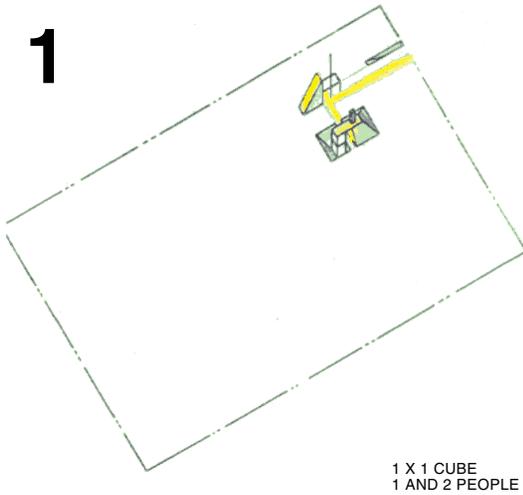




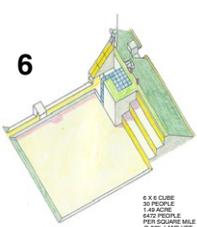
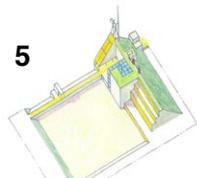
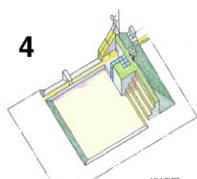
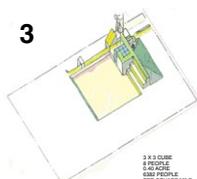
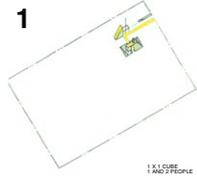
1



A HOUSING PIONEER



GROWTH AND DEVELOPMENT PHASES

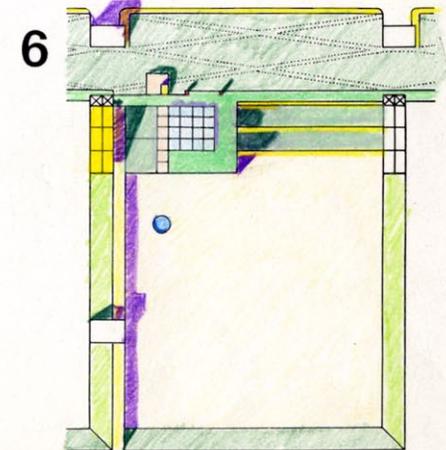
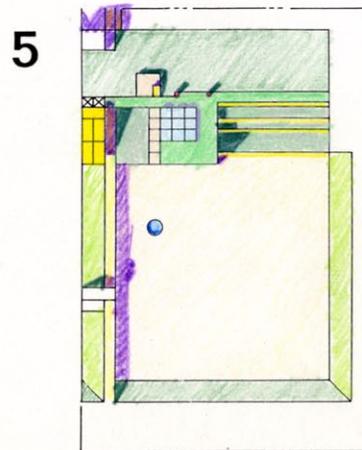
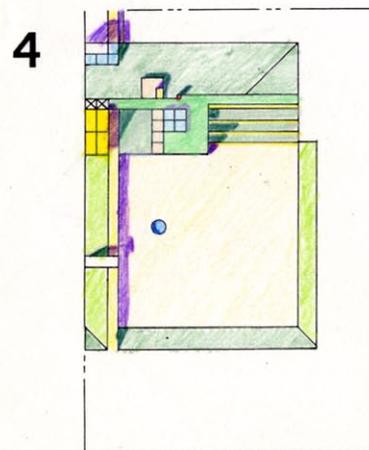
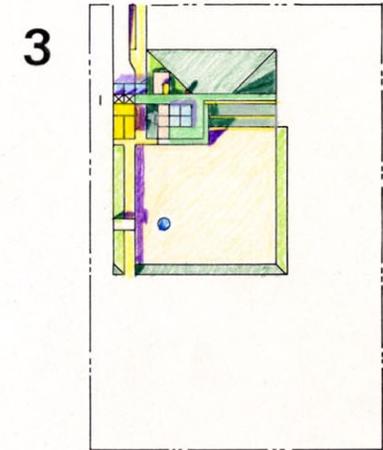
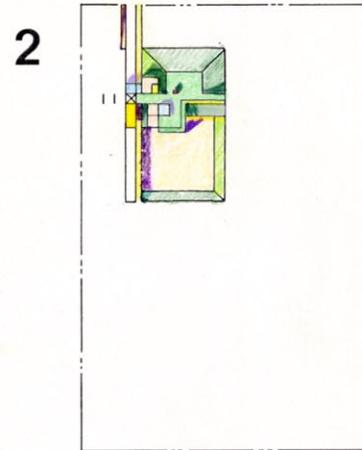


The 1x1x1 volume is the basic "starter home". It can grow seamlessly from no more than a single room studio apartment that sleeps one or two people into the next stage of a two story dwelling.

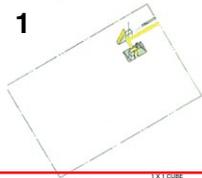
The 2x2x2 volume provides beds for 4-6 people, includes elevator, two showers and bathtub, kitchen and kitchenette, double height space fireplace, terraces and so on, all in only 1336 square feet!

The 3x3x3 volume includes all of the above plus a full laundry room, guest room, workshop, hot tub, sauna, and beds for 8-10 people. The total area is just 3000 square feet, which comes to an average of better than the typical 1500 square feet for a family of four.

Further growth, to 4x4x4 (16 people), 5x5x5 (24 people), and 6x6x6 (over 30 people) are shown in rough study form at smaller scale.



1

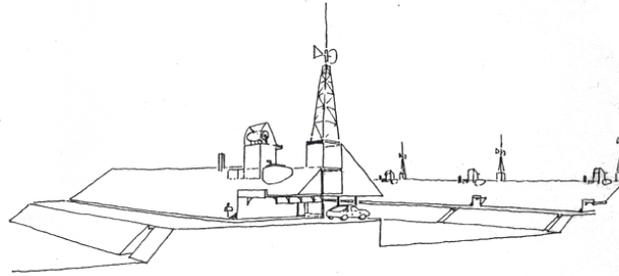
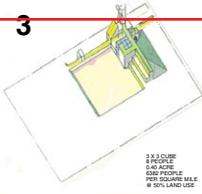


2

2



3



A GROWING FAMILY

DETAILED DEVELOPMENT

SHOWN HERE AND FOLLOWING ARE THE DETAILED PLANS AND FORMS A HOME FOR GENERATIONS COULD TAKE THROUGH THE 2ND AND 3RD PHASES OF ITS DEVELOPMENT. THE 2x2 CUBE WITH ITS ATTACHMENTS AND EXTENSIONS IS SUITABLE FOR UP TO 4 PERSONS. THE 3x3 CUBE IS SUITABLE FOR 8 TO 10 PEOPLE.

LEGEND

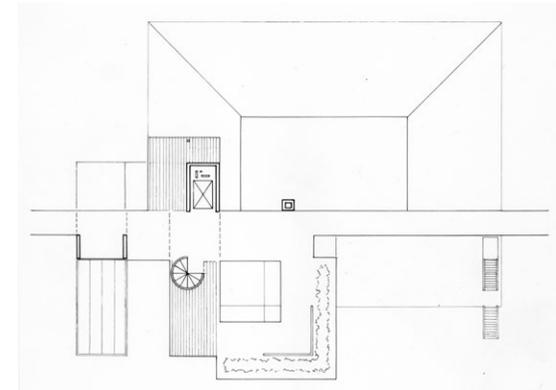
KITCHEN, BATHING, DINING, AND LIVING SPACES ARE INDICATED BY FURNITURE.. BATHROOM GRAB BARS, ELEVATOR, AND RAMPS PROVIDE FULL HANDICAP ACCESS.

DARK GRAY INDICATES EARTH.
LIGHT GRAY INDICATES VOID AT THE ATRIUM.
S = STORAGE

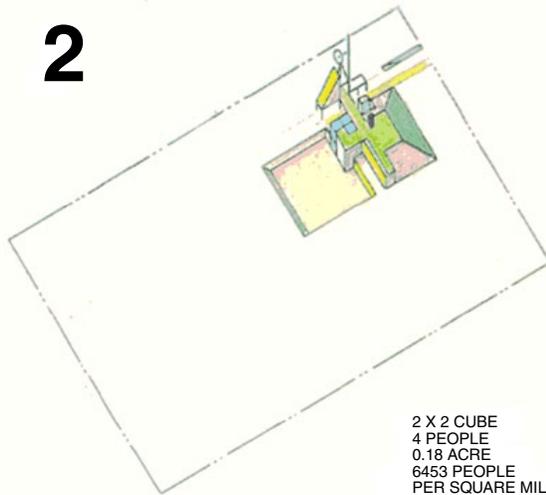
NUMBERS REFER TO ALL PLAN DRAWINGS IN THIS SECTION.

1. AIR LOCK ENTRY
2. HALLWAY
3. GALLERY
4. VOID
5. CHIMNEY/HEAT CIRCULATING FIREPLACE
6. HEAT EXCHANGER/FAN DUCT
7. BED ROOM
8. CAR PORT
9. TERRACE
10. POWDER ROOM WITH CHEMICAL PORTABLE TOILET
11. STUDY
12. RAMP FROM CULVERT BELOW GRADE.
13. CISTERN
14. WATER STORAGE AND HEATING
15. CLIVUS MULTRUM DIGESTING TOILET
16. LAUNDRY ROOM WITH LAUNDRY CHUTE ABOVE
17. CAISSON EARTH RETAINER
18. STORAGE BATTERIES FOR PHOTOVOLTAIC GARAGE
19. GUEST/WANDERER/TEENAGER ROOM
20. STUDY AND KITCHENETTE WITH WET BAR
21. WORKSHOP
22. SAUNA

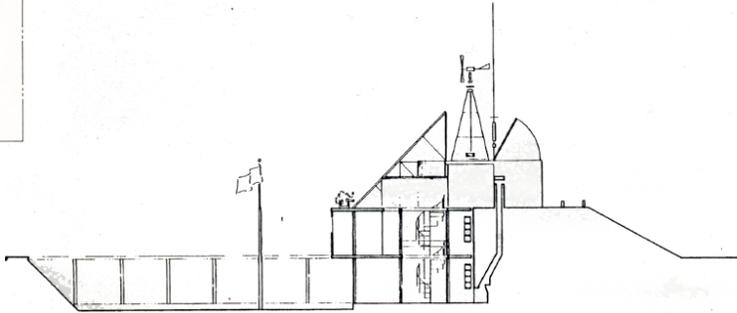
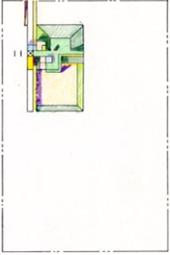
2 X 2 CUBE
4 PEOPLE
0.18 ACRE
6453 PEOPLE
PER SQUARE MILE
@ 50% LAND USE



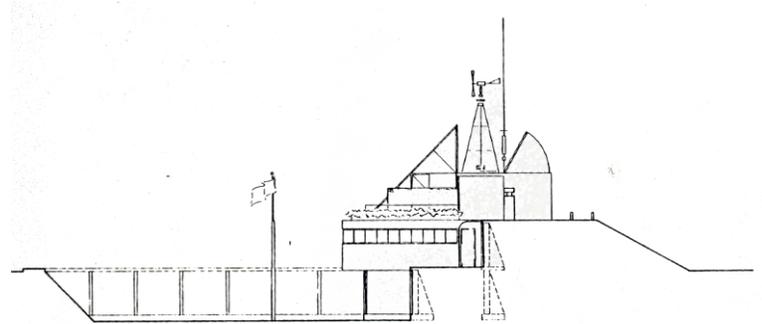
2



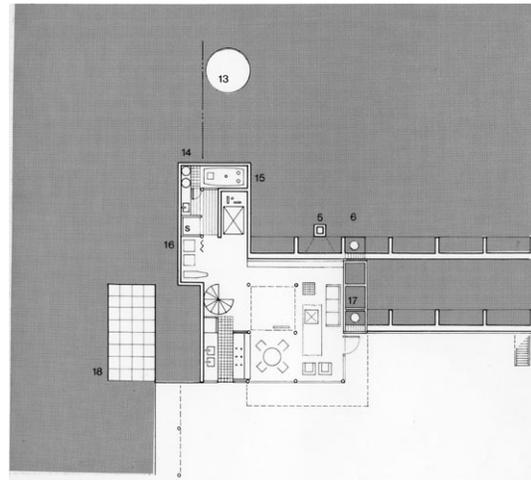
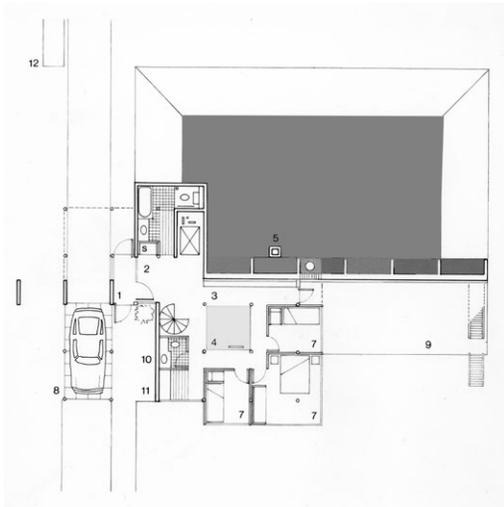
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2 SECTION THROUGH ATRIUM
LOOKING WEST

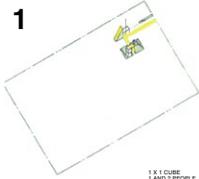


2 SECTION THROUGH TERRACES
LOOKING WEST



2

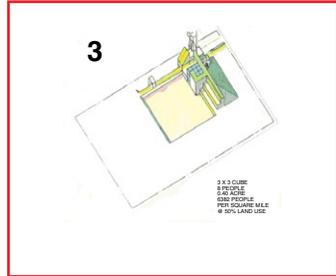
2 X 2 VOLUME
-1 LEVEL PLAN



1 X 1 CUBE
1 AND 2 PEOPLE

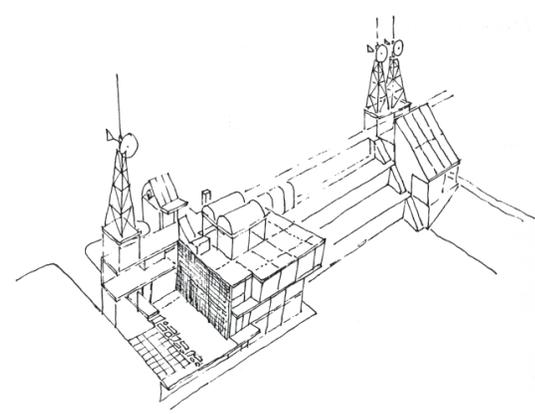


2 X 2 CUBE
4 PEOPLE
0.16 ACRE
6400 PEOPLE
PER SQUARE MILE
@ 50% LAND USE



3 X 3 CUBE
9 PEOPLE
0.40 ACRE
16000 PEOPLE
PER SQUARE MILE
@ 50% LAND USE

3



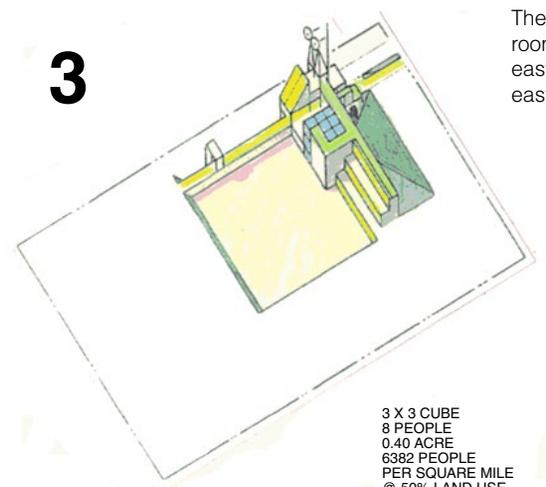
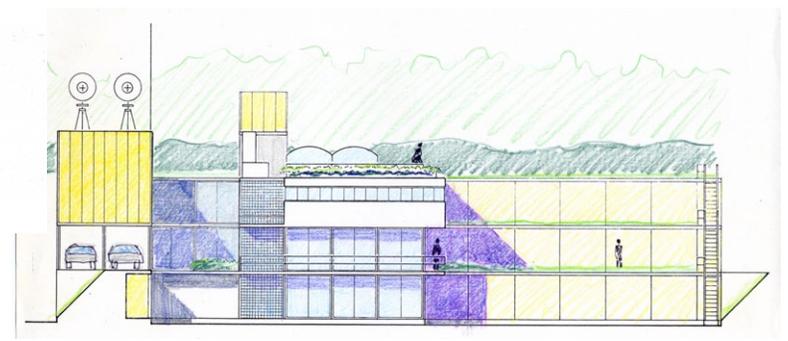
EXTENDED FAMILY

In this third stage not only does the floor area increase, but also the size of the void, the atrium, the hollow at the heart of the house, grows wider and expands upward.

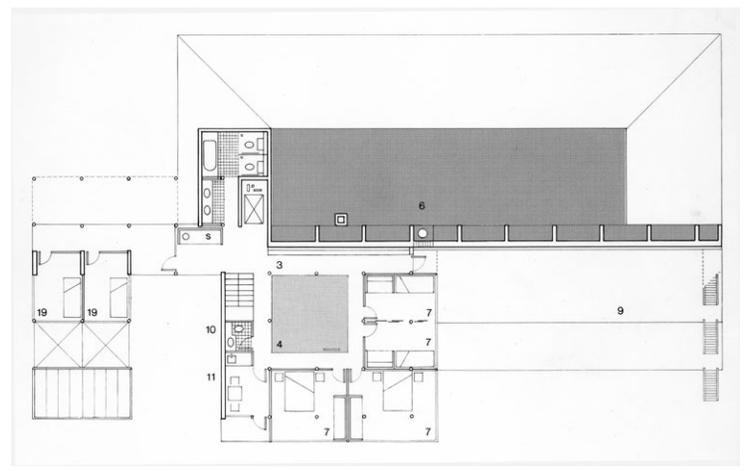
The two-car garage now includes room under the photovoltaic panels for two additional dormer bedrooms, for teenagers or guests.

Taller flagpoles and windmills find stiffer breezes.

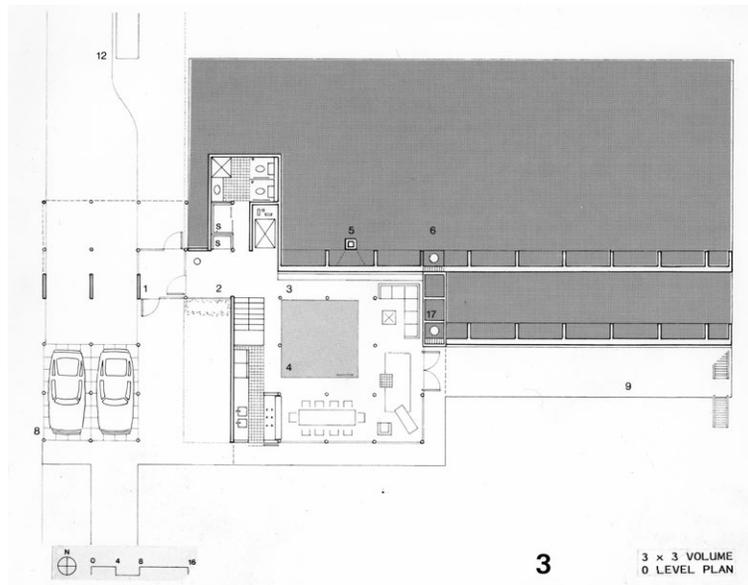
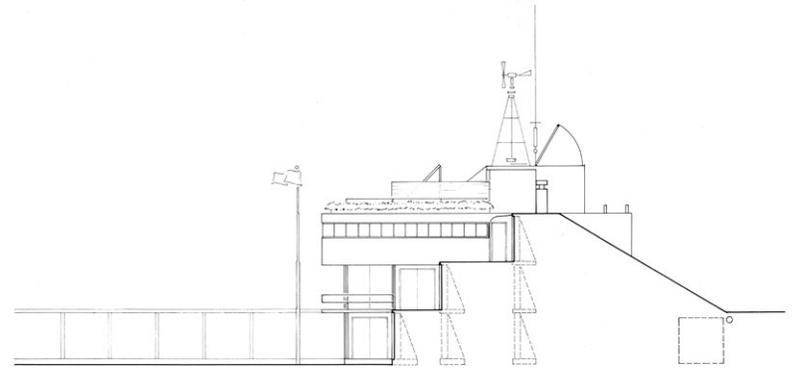
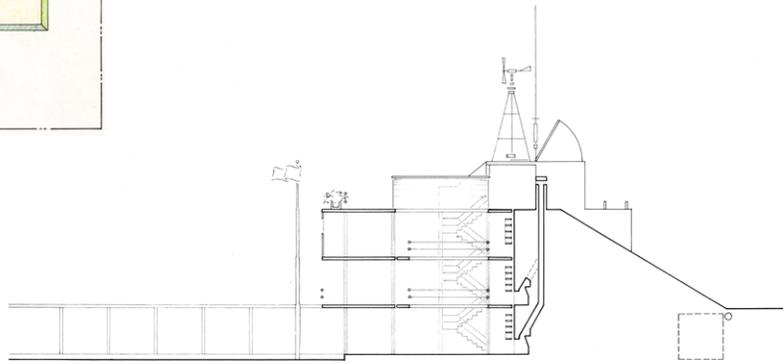
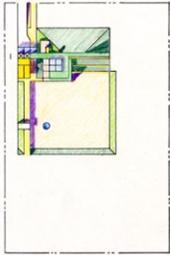
The lowest level opens to south field. Living room and bedroom levels open to terraces at east. Roof garden level provides access to east/west neighbors.



3 X 3 CUBE
8 PEOPLE
0.40 ACRE
6382 PEOPLE
PER SQUARE MILE
@ 50% LAND USE

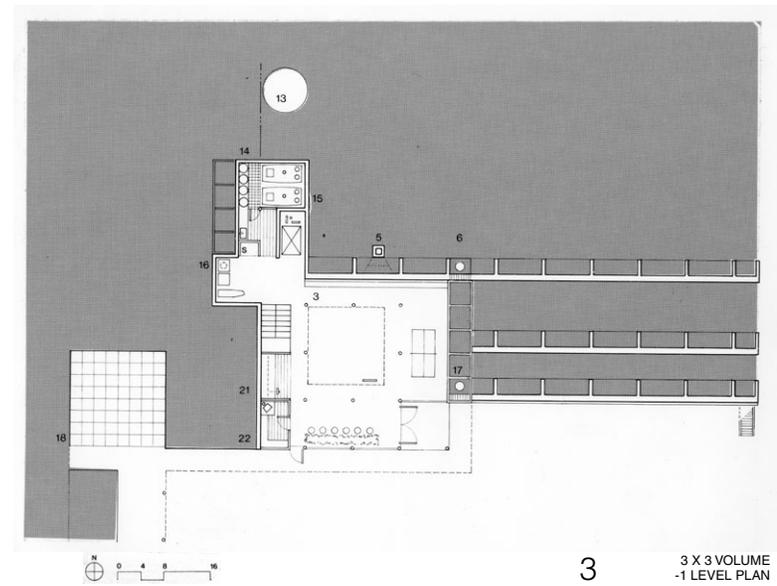


3



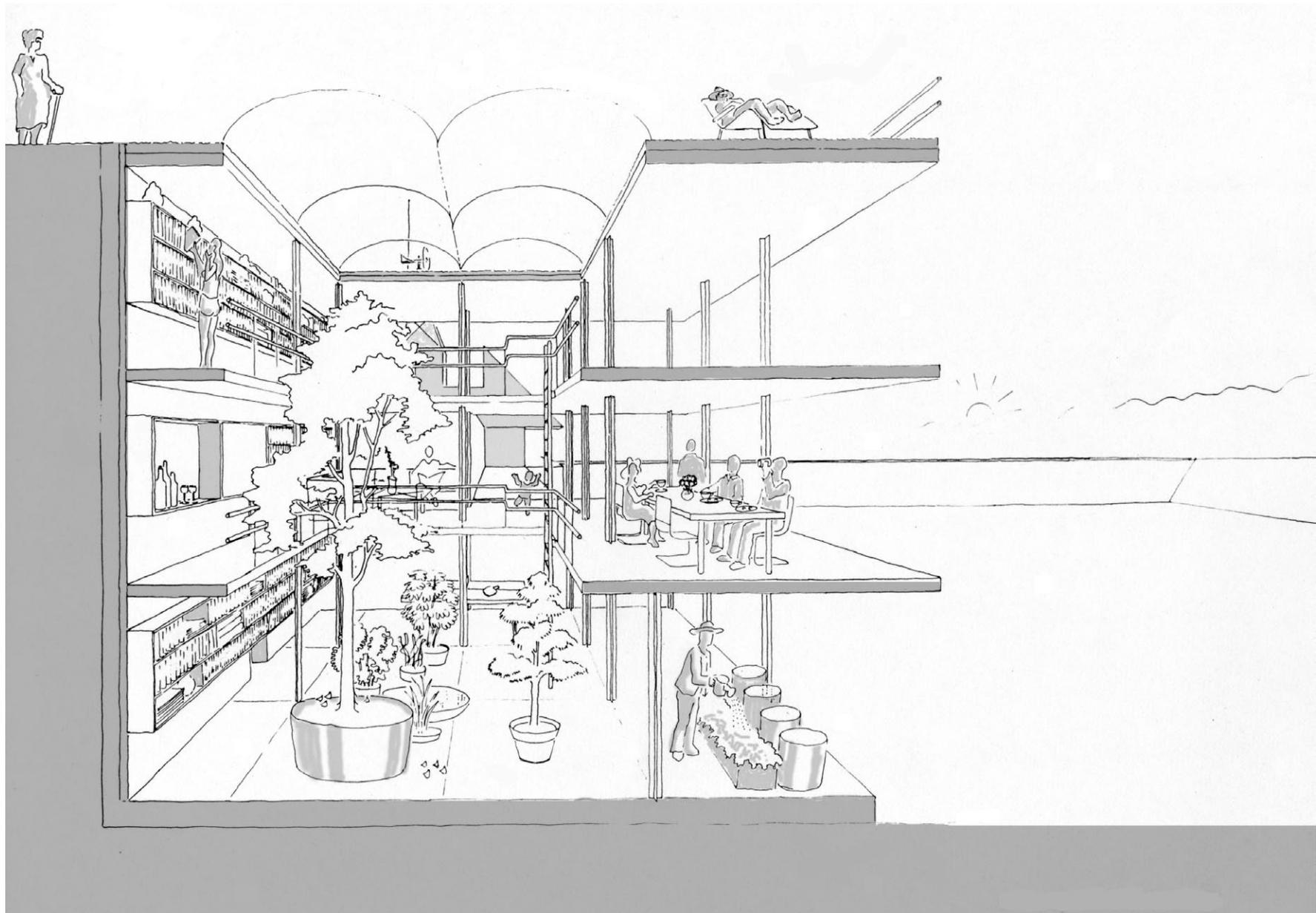
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3 X 3 VOLUME
0 LEVEL PLAN



3

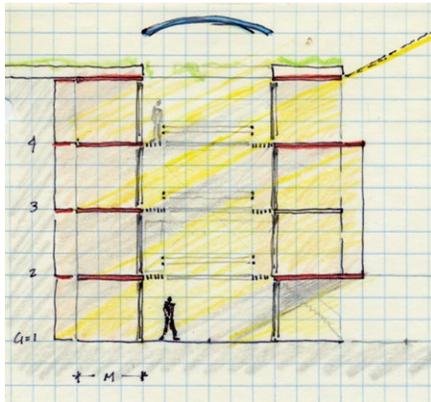
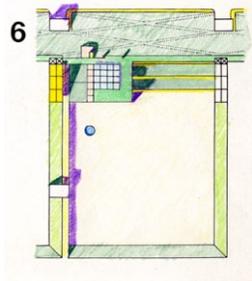
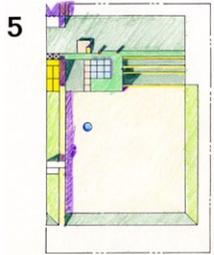
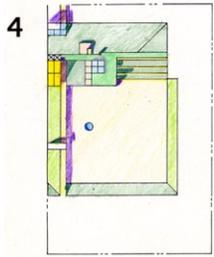
3 X 3 VOLUME
-1 LEVEL PLAN



What the word space, Raum, Rum, designates is said by its ancient meaning. Raum means a place cleared or freed for settlement and lodging. A space is something that is cleared and free, namely within a boundary, Greek Peras. A boundary is that from which something begins its presenting. That is why the concept is that of Horizmos, that is the horizon, the boundary. Space is in essence that for which room has been made, that which is let into its bounds.

A NEW DAY DAWNING

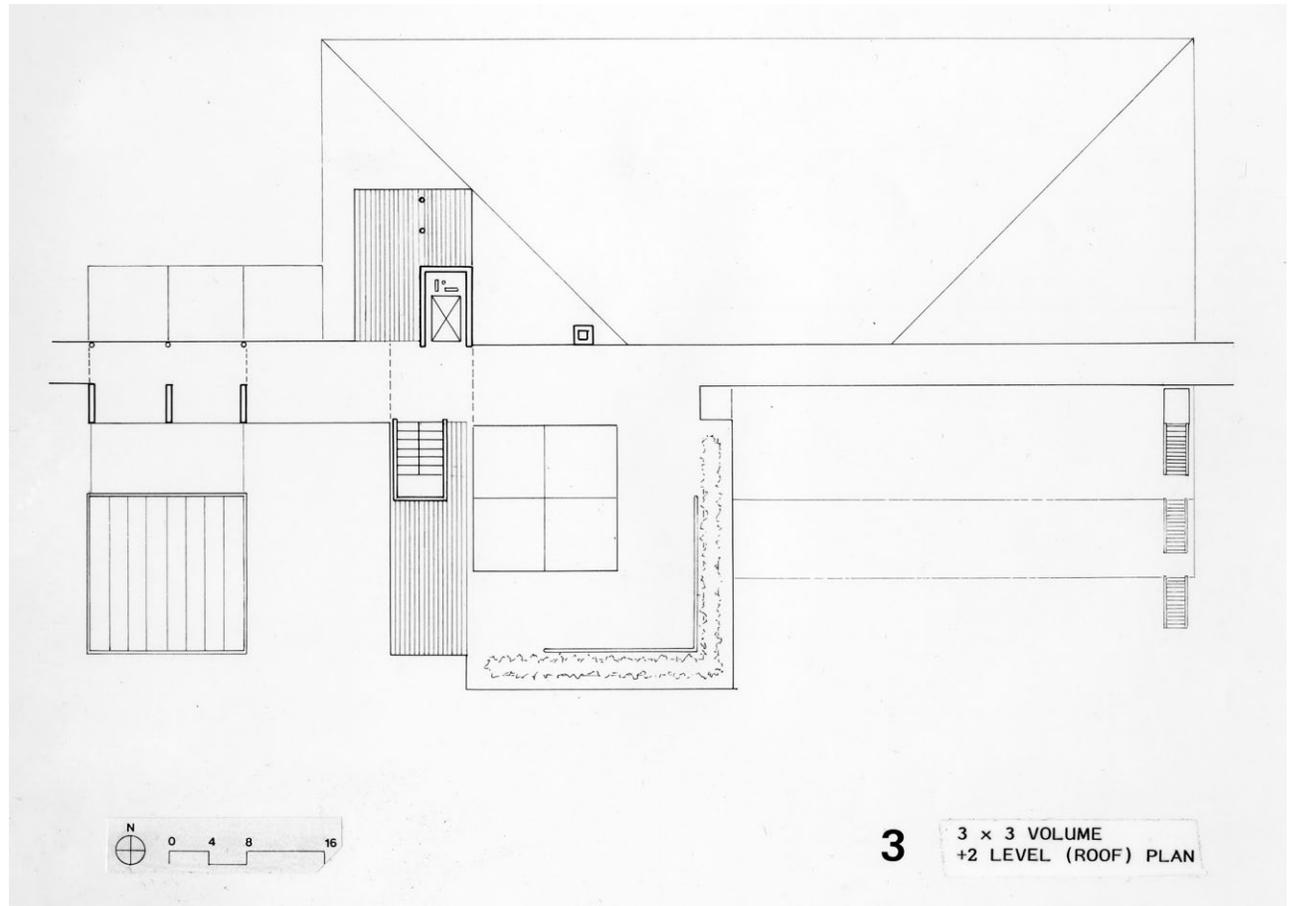
Martin Heidegger *Building Dwelling Thinking* 1954

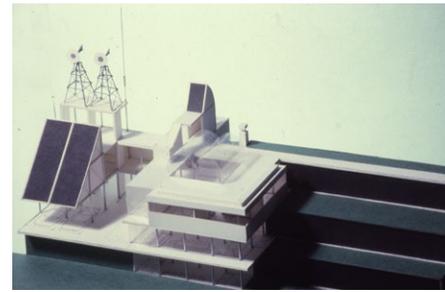
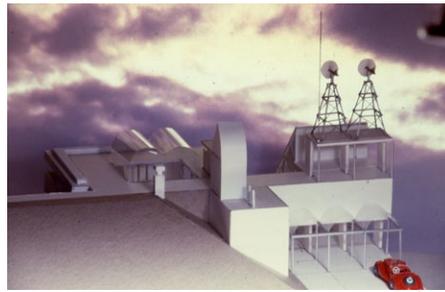
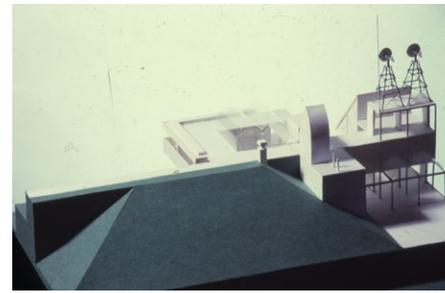
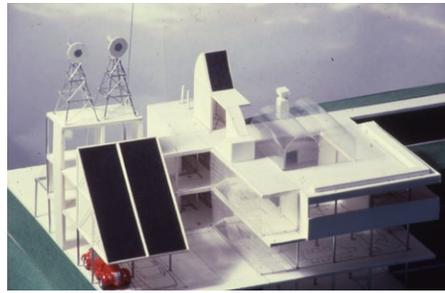
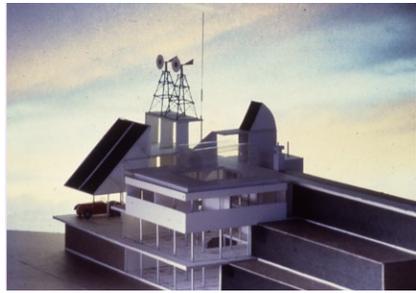
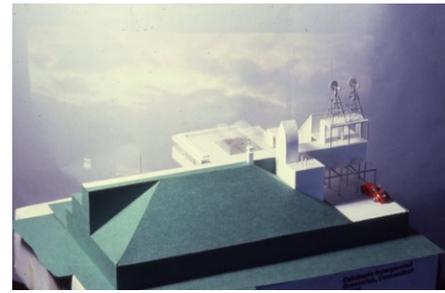
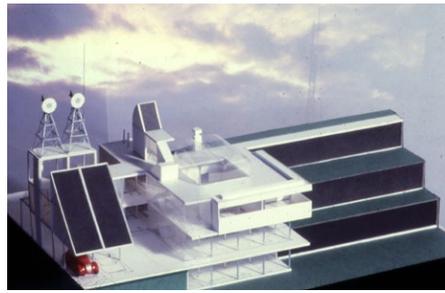
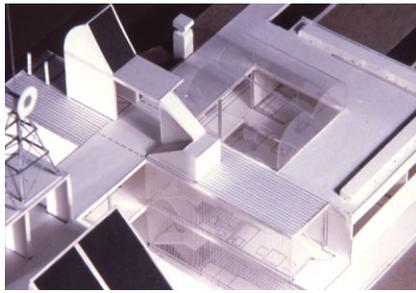
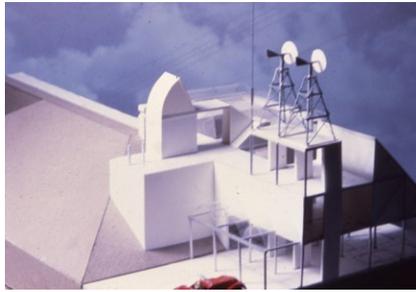


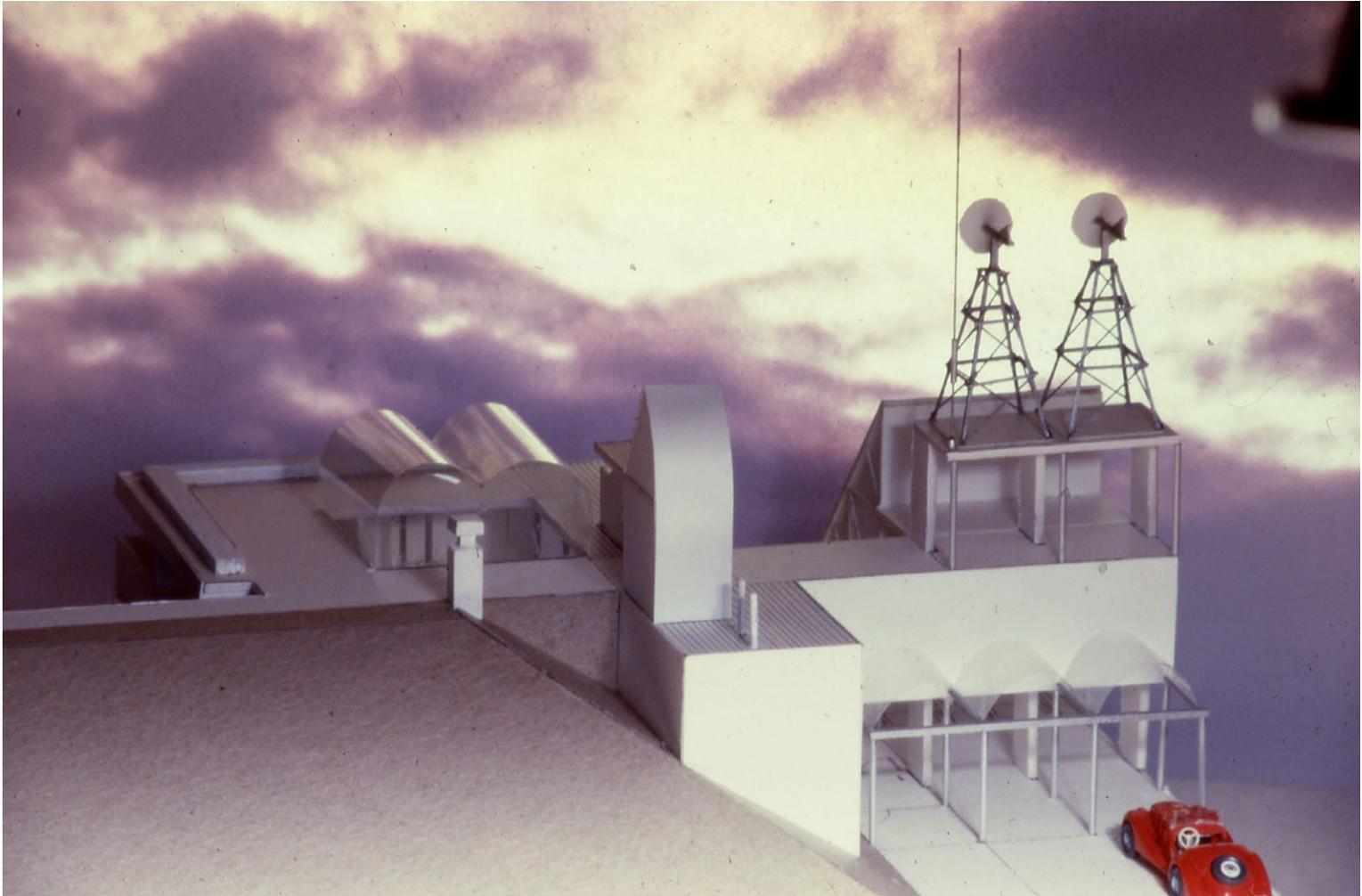
... 4 5 6 are easy

because room (volume) increases faster than material costs (surface area):
 the home gets cheaper to add to as it grows. Where L = length, A= area, V= volume:
 if L = 1, then $V/A = 1$; if L = 2, then $V/A = 8/4 = 2$; if L = 10, then $V/A = 1000/100 = 10$

It is uncanny how closely this sequence parallels in form the maturation of a human embryo, from zygote through blastula and gastrula, through later stages of tissue, organ and system development.







**PHASE 3 looking south
showing windmills, garages, hot water heater, and atrium roof.**

**This 3x3x3 volume adds to the 2x2x2 volume of PHASE 2 the following:
a full laundry room, guest room, workshop, hot tub, sauna, and beds for 8 to 10
people. The total area is just 3000 square feet, which comes to an average of bet-
ter than the typical 1500 square feet for a family of four. The space also includes
a triple height skylit all-year foliage-filled atrium in the center of the house.**

THE GREENING OF SUBURBIA

DEMONSTRATION

Nassau County New York concentrates the most critical problems for conditions of longevity, flexibility, and energy efficiency. Home of the original Levittown, it is one of the first car culture bedroom communities. A suburb of New York City within the confines of Long Island, its density pressure has increased disproportionately to the overall urban growth rate. Bounded by the Atlantic Ocean and Long Island Sound, its high water table limits excavation to about one story. The geologic product of a terminal moraine, it is extremely flat. The highest elevation across its 25 mile width is only 400 feet above sea level. Its water and air are polluted by industry and auto. Yet many people still wish to live there, because of its naturally beautiful beaches, climate, and the proximity to one of the capital cities of the world.

The 1981 US Census showed 1,321,582 people residing in Nassau County. The average density of the county is 4572 people per square mile.

The studies presented in this proposal are able to achieve a new order of landscape, with a degree of spaciousness and privacy rarely found in any but the most expensive house of Nassau County, and at the same time can develop a new order of social interaction, where parents can count on their parents to care for the children and make decisions about long term life issues. The forms such housing and neighborhoods may take will vary far more than the prototype diagrams shown here, but nonetheless they will create a new heart, a hollow for family life, for personal independence, and for community consciousness. A high degree of energy efficiency through the use of simple common materials carefully placed in terms of thermal orientation may introduce a new order of peace and repose as well into our dwellings. And ultimately, because we contemplate something more than the isolated nuclear family as the basic unit of life in human society, all these benefits can be achieved in such a manner to actually increase the number of people living in suburbia, without resorting to the typical high-rise separation of home from ground. (Every level of the HOME FOR GENERATIONS is a ground level.) The studies that follow suggest that overall population density can be increased (to 6472 persons per square mile, with housing covering only 50% of total land, as opposed to housing now covering about 56% of the total available land. The 6% bonus represents the equivalent of about 15 additional parks the size of New York City's Central Park. If these extra parks are not developed, and housing be allowed to cover 56% of total buildable land, as it does today in Nassau County, the total population could be increased by at least 37%. Including these additional parks, the population could still be as much as 1,607,105, representing a 22% overall increase in population density.



NEIGHBORHOOD

18 X 12 = 216 VILLAS
216 @ 30 = 6480 PEOPLE

.94 X .94 = .89 SQ. MILE

DENSITY:

7281 PEOPLE/SQ. MILE

56% OF LAND IS HOUSING
34% FOR OTHER USES:
INDUSTRY, SCHOOLS, CULTURE
PARKS, ROADS, RECREATION, ETC.

COMMUNITY

8 NEIGHBORHOODS
AROUND A 270 ACRE PARK
(= HALF CENTRAL PARK NYC)

8 X 6480 = 51840 PEOPLE
9 X .89 = 8.01 SQ. MILES

DENSITY:

6472 PEOPLE/SQ. MILE

8/9 X 56 = 50% IS HOUSING
THE LARGE PARK IS A BONUS

COMPARE URBAN DENSITIES:

SINGAPORE: 10,536 PEOPLE / MI²
WASHINGTON DC: 10,550 PEOPLE / MI²

COUNTY

31 COMMUNITIES OF 51,840 PEOPLE
COVER COUNTY BUILDING LAND.

HALF THE RESIDENTIAL LAND
IS RESERVED FOR MORE THAN
15 NEW "CENTRAL PARKS"

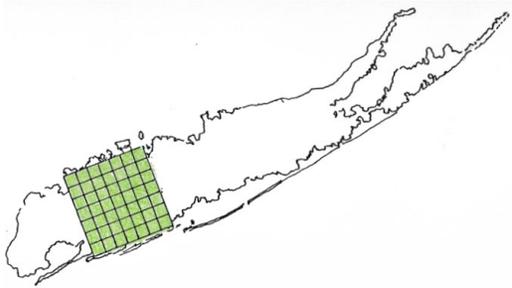
POPULATION:

EXISTING: 1,321,582 PEOPLE
PROJECTED: 1,607,105 PEOPLE

DENSITY INCREASE BY 22%.

The proportions of the lots of the six stages of this home for many generations appear to permit a variety of combinations of many different sizes of dwellings and groups of individuals. The houses need not be seen only as family habitats. Condominiums, cooperatives, collective apartment houses, senior homes, dormitories, and other forms of multiple unit housing can be adapted to the general configurations developed here.

Because all elements of land and building can grow at roughly proportional rates to each other, the density can remain relatively constant for whatever ultimate lot size a community adopts. Varied size dwelling settlements but stable density is sustainable! In all mixes of phases, density grows to ~6400 people per square mile and then it STOPS! as newborns replace 4th and 5th generation deaths. At this density, the land area of Earth could support 300 billion people. Plenty of room, and sustainable!



EXISTING PROBLEMS

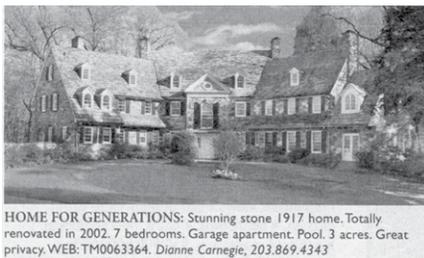
1,321,582 PEOPLE IN 289 SQUARE MILES;
 DENSITY = 4572 PEOPLE /SQ. MI.

FLAT SHALLOW LANDSCAPE. HIGH WATER TABLE LIM-
 ITS EXCAVATION TO ONE STORY. MASSIVE POLLUTION.
 INEFFICIENT ENERGY USE. OVER EXTENDED SERVICES.

PROPOSED SOLUTION

1,607,105 PEOPLE IN 289 SQUARE MILES
 DENSITY = 6472 PEOPLE /SQ. MI.

HOMES WHERE EVERY LEVEL IS BOTH IN THE AIR AND
 ON THE GROUND. LANDSCAPE AS SPACIOUS AND PRI-
 VATE AS ESTATES OF THE WEALTHY. SOCIETY, WHERE
 GENERATIONS SHARE INNOCENCE AND WISDOM. TAX
 REVENUES AND POPULATION INCREASE AT LEAST 22%.



HOME FOR GENERATIONS: Stunning stone 1917 home. Totally
 renovated in 2002. 7 bedrooms. Garage apartment. Pool. 3 acres. Great
 privacy. WEB: TM0063364. Dianne Carnegie, 203.869.4343

SOMEONE FINALLY GETS IT. VERY UPSCALE.
 GREENWICH CT. OFFERED BY SOTHEBY'S,
 IN THE MILLIONS. THE NEW YORK TIMES, JUNE 2006



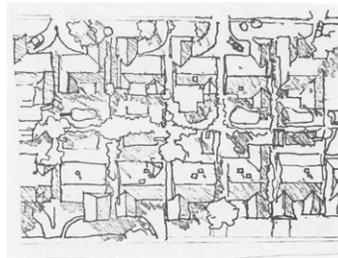
EARTH RADIUS = ~4000 MILES.

$$S_{\text{EARTH}} = 4 \pi R^2 \sim 12(16,000,000 \text{ MI}^2)$$

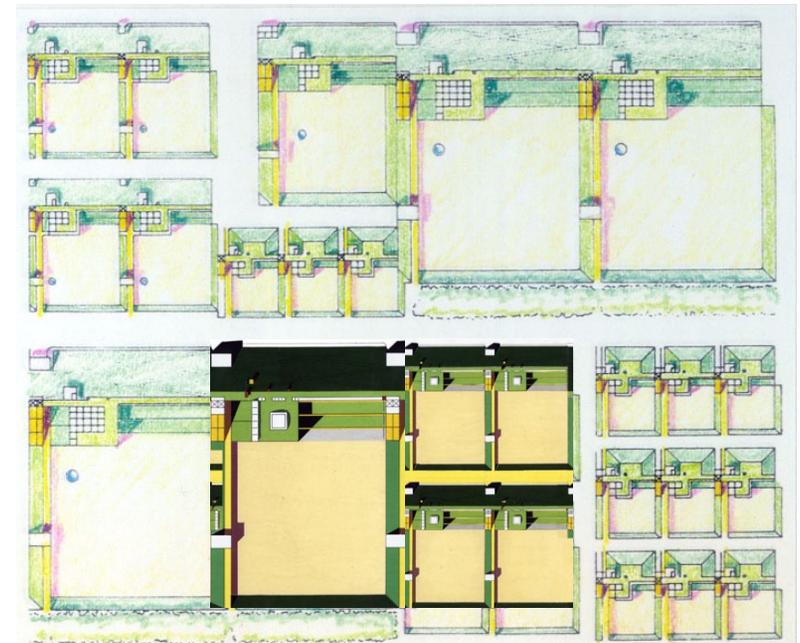
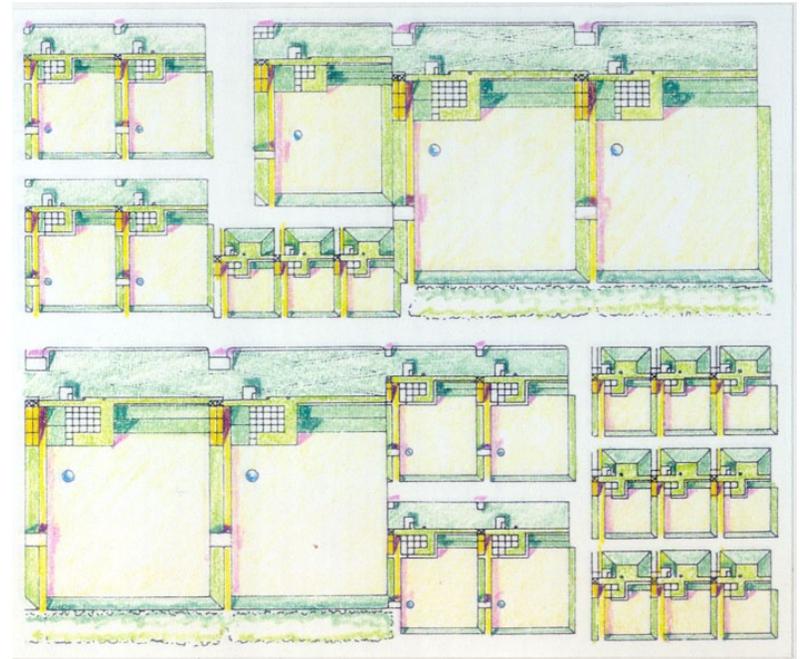
$$S_{\text{LAND}} = 1/4 12 (16,000,000 \text{ MI}^2) \sim 48 \text{ MILLION MI}^2$$

$$6000 \text{ PEOPLE/MI}^2 \times \sim 50 \text{ MILLION MI}^2 = 300 \text{ BILLION PEOPLE.}$$

PLENTY OF ROOM!



EXISTING AND PROPOSED COMMUNITIES
 AT THE SAME SCALE. THE EXISTING SINGLE
 FAMILY/QUARTER ACRE PLAN IS A **LOWER**
 DENSITY THAN THE PROPOSED.



GOOD NEIGHBORS

BUILDING INTO EXISTING CONTEXT



The flexibility of this housing approach allows for infill to existing developments, virtually anywhere. Directly to the right are shown before and after views of an actual site in Glen Cove, Nassau County, Long Island. A full 6 x 6 villa can be built on an existing unused industrial lot. A 3 x 3 3rd phase home can be built on a typical available quarter acre site.



The proposed Nassau County HUB project is also an ideal opportunity for demonstrating the Home for Generations. On the facing page are shown two Phase 6 Full Villa, each 1.5 acres, using only a small part of the vast existing Nassau Colosseum parking lot.

AN ACTUAL SITE IN GLEN COVE, NASSAU COUNTY, LONG ISLAND.
A FULL 6 X 6 VILLA CAN BE BUILT ON AN EXISTING UNUSED INDUSTRIAL LOT.
A 3 X 3 3RD PHASE HOME CAN BE BUILT ON A TYPICAL AVAILABLE QUARTER ACRE SITE.

WHAT ABOUT STYLE?



RANCH

FARMHOUSE

CURRENT

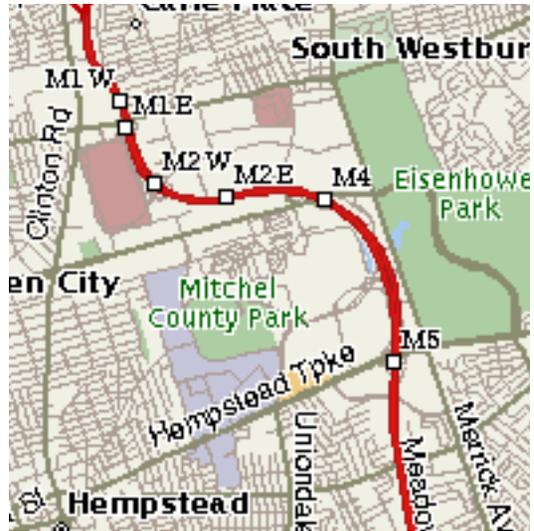
TUDOR

Since Home for Generations is a SYSTEM of land use and domestic habitation, whose dimensionally coordinated components may be combined and mixed in countless ways, the exterior cladding and stylistic detailing

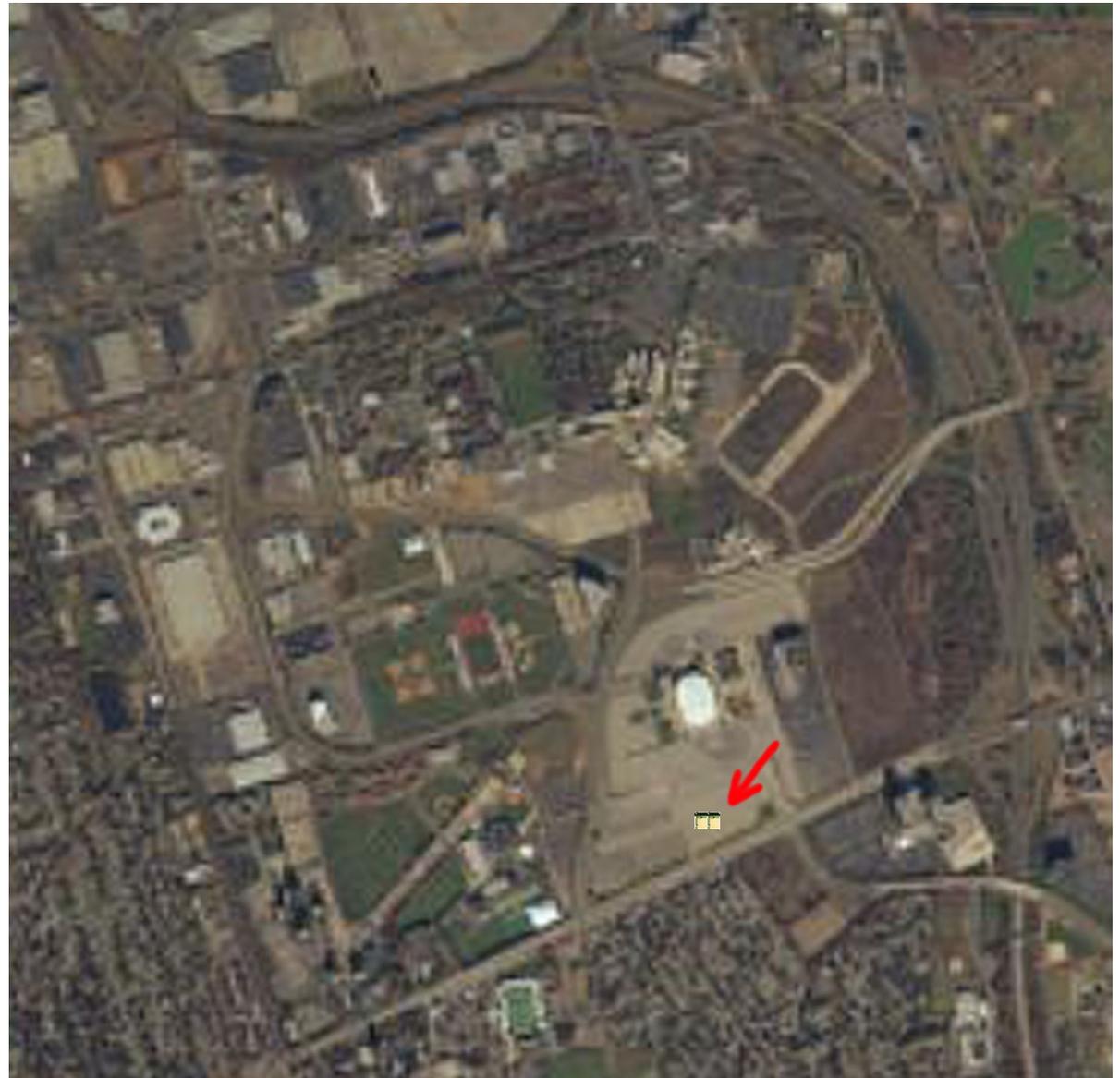
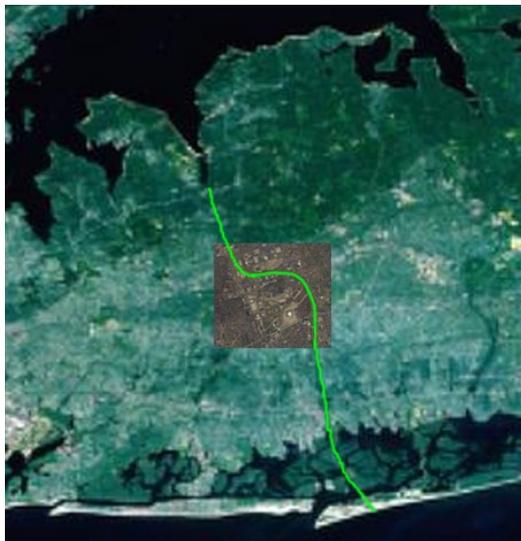
ing may be varied according to individual tastes. In fact, it is entirely possible to evolve the exterior styles of the Homes in much the same manner an interior decorator may alter the color scheme and furnishings of a single

room. One could visit the Home for Generations Component Supply Store, and trade in a Farmhouse Style Porch for a pair of Tudor Style Gables and re-clad the exterior of the Home with a simple set of wrenches.

NASSAU COUNTY HUB DEMONSTRATION

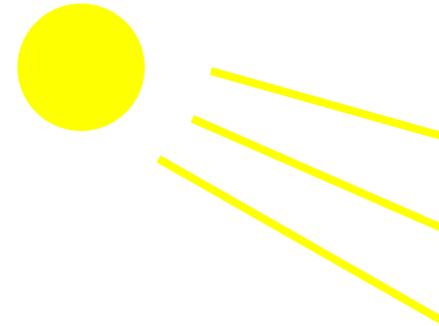


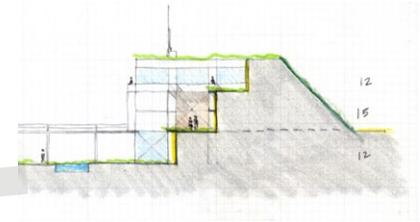
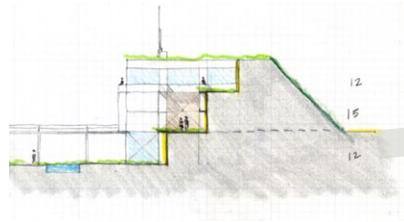
THE NASSAU COUNTY HUB PROVIDES AN IDEAL OPPORTUNITY TO DEMONSTRATE THE HOME FOR GENERATIONS. SHOWN AT THE RIGHT ARE TWO PHASE 6 FULL VILLAS, TOTAL 3 ACRES, IN A SMALL PART OF THE VAST EXISTING NASSAU COLOSSEUM PARKING LOT.



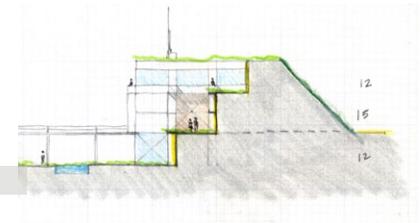
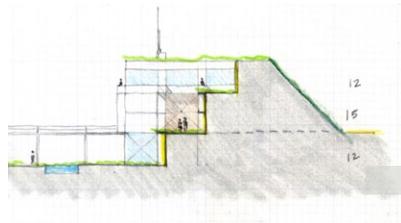
WHAT ABOUT THE HILLS OF THE NORTH SHORE?

A north slope will cast shadows of course, but at the scale of acres compared to six stories, the shadows of constructed volume are negligible compared to natural forested landscape. However, to assure full insolation of the ever-south-facing Trombe Wall heating and photovoltaic collecting systems, the north-south spacing between rows of villas can be adjusted. On average, if north and south faces are roughly equal, the density of the settlement pattern stays roughly constant. Where villas on the north-facing slope must be spaced further apart, villas on the south facing slopes can be terraced to overhang each of the dwelling zones below.

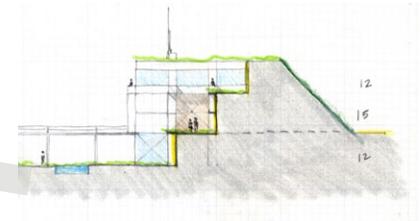
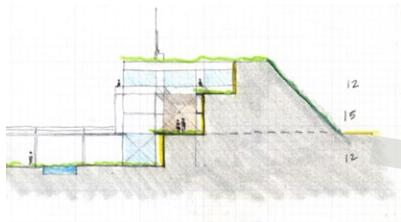




TERRACED VILLAS ON THE SOUTH-FACING SLOPE



STANDARD SPACING OF VILLAS ON LEVEL GRADE



WIDER SPACING FOR VILLAS ON NORTH-FACING SLOPE

HOUSING AND COMMUNITY

LEAVE IT TO BEAVER AND THE WALTONS

For over 300 years, from the 1640's until the 1970's, Nassau County's population doubled every decade. Since then it has actually declined. **WHY?**

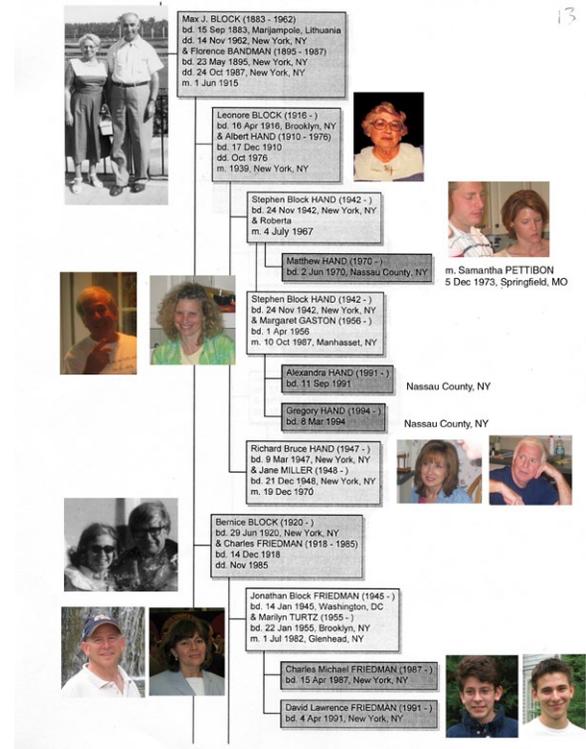
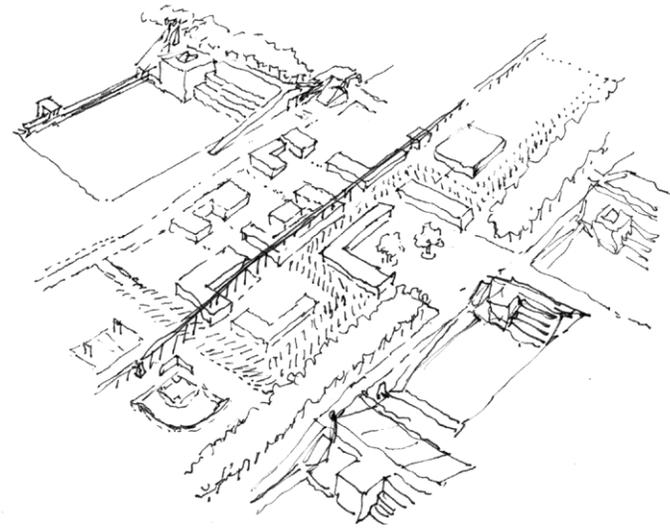
Nassau County is the home of Levittown, the first mass produced suburban landscape. Early American television created and supported two competing visions of domestic life in America. On the one hand, such shows as Ozzie and Harriet and Leave it to Beaver showed the happy nuclear family, Mom and Dad and The Kids, solving and resolving life's important issues within the hermetic and insular world of The American Dream, the single family suburban home. On the other hand, such shows as Lassie and The Waltons showed extended families, where Gramps and Grandma provided wisdom and continuity to the past and future.

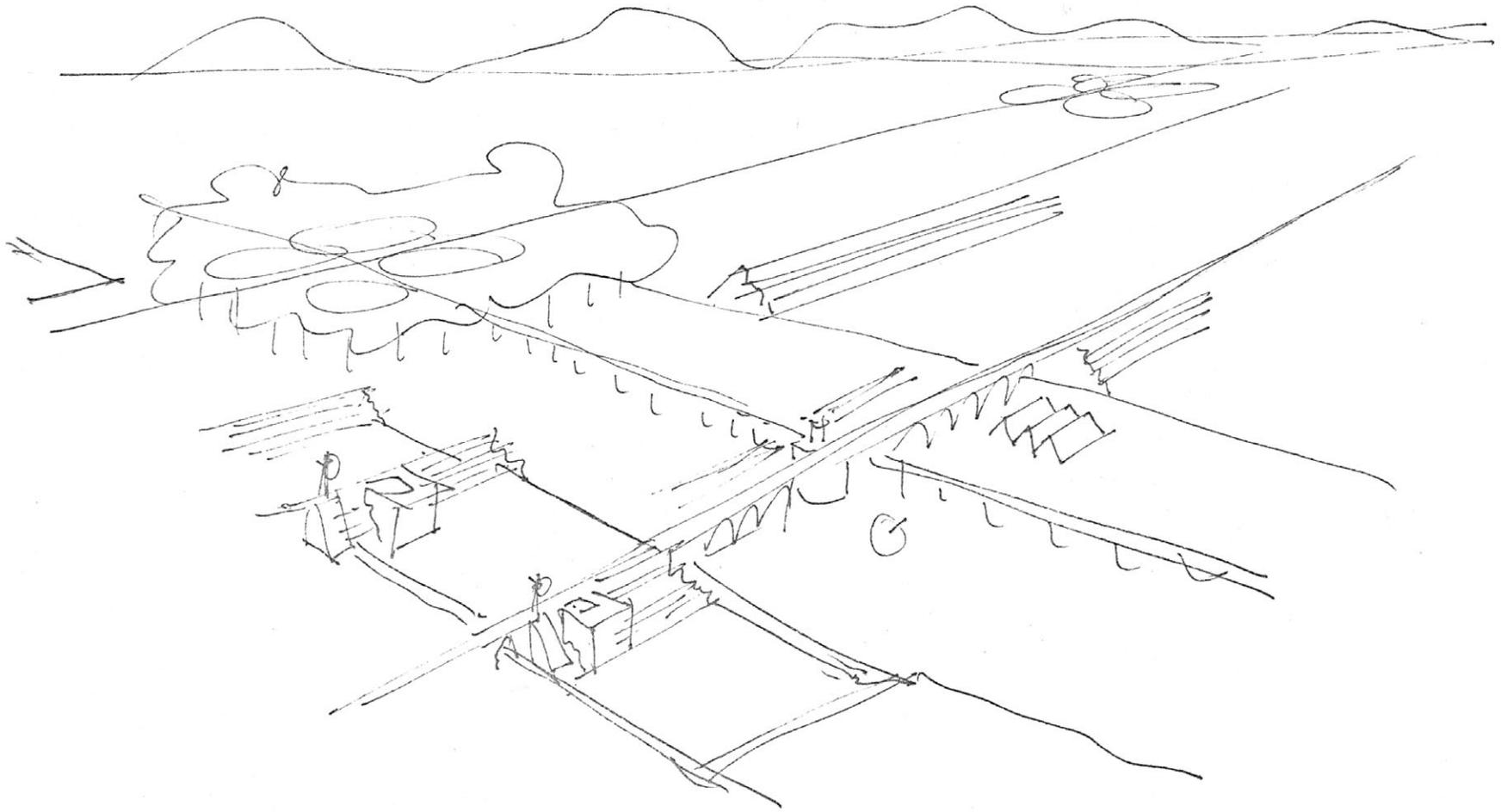
The long-standing experience of many human generations is closer to this second extended family experience than the tight world of the nuclear family suburb. As a result, Long Island suburbs like Levittown struggle to accommodate aging populations, working mothers, and emigrant children. These mass-built single family homes rarely provide adequate and appropriate space for more than one generation, rarely provide room for landscape experiments, and rarely encourage through built form social privacy or community gatherings. It may well be that we need the wisdom of every generation living within a family settlement, not too close nor too far away. Then the center of the home can become the origin and support for real local and extended community

CRAFT AND INDUSTRY: LOCAL AND GLOBAL

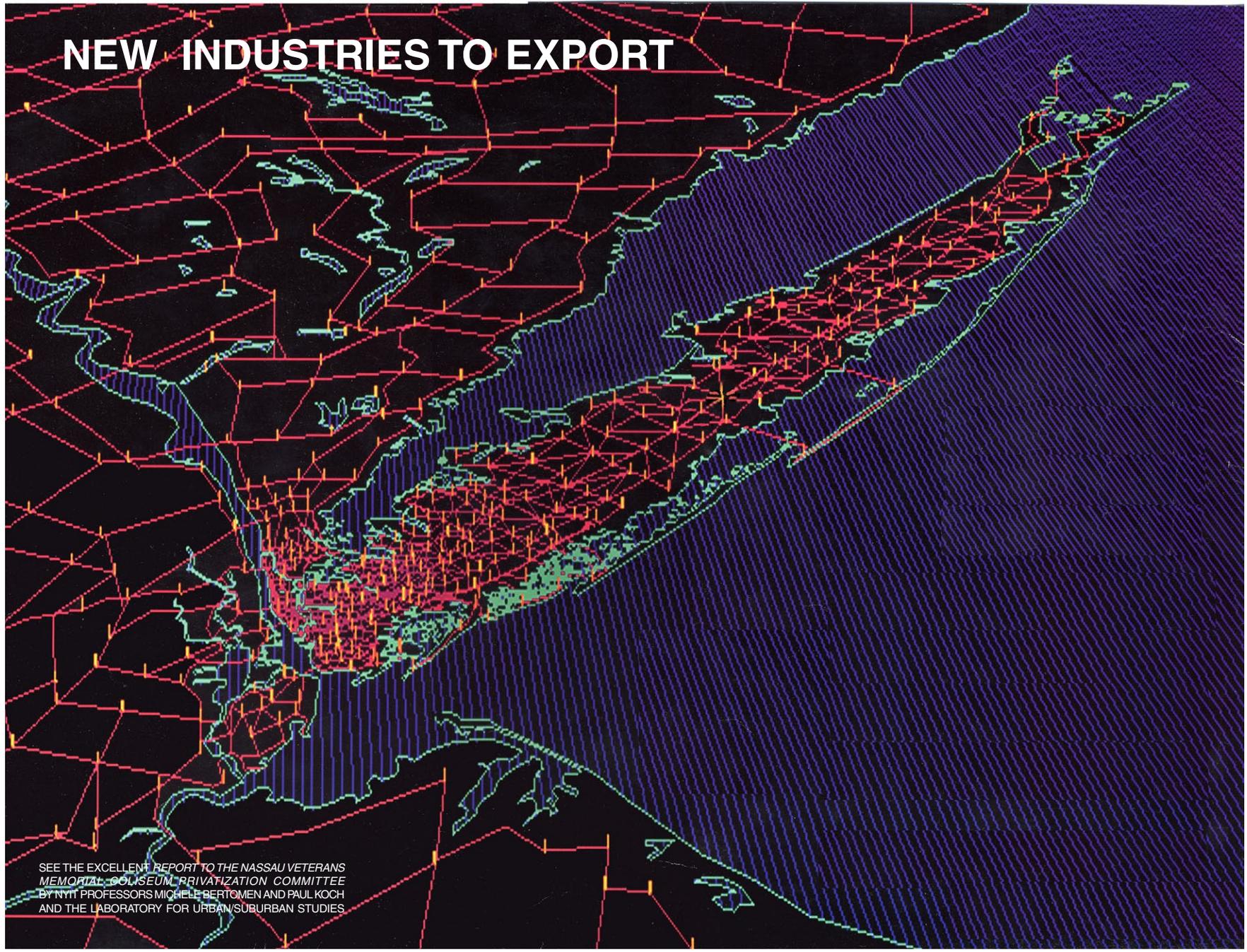
Buckminster Fuller, inventor of the geodesic dome, once observed that anyone who uses a factory-made chisel to make "hand-crafted" wooden bowls or an electric sewing machine to make clothes is already part of a global industry rather than simply pursuing a local craft. The mining smelting casting and forging of steel manufacture depends on a worldwide network of often imported products and services.

However, the virtues of local craftsmanship, and intimate knowledge of local materials and methods, is an ancient and important human heritage. The community designed by to go between the residences of home for generations is organized to enhance both economic realities/capabilities. At its most diagrammatic scale, one set of perpendicular spaces supports local "craft and community activities, a second perpendicular tartan set of spaces supports regional and broader connections. Local activities includes schools, daycare (if needed anymore!), ball fields, craft stores, perhaps libraries, garden clubs, senior centers and other community meeting groups all within easy walking distance. Here footpaths and small roads dominate. Regional activities include shopping centers, high schools, and high-speed auto expressways. Mass transit serves the intersections of these two systems.





NEW INDUSTRIES TO EXPORT



SEE THE EXCELLENT *REPORT TO THE NASSAU VETERANS
MEMORIAL COLISEUM PRIVATIZATION COMMITTEE*
BY NYIT PROFESSORS MICHELE BERTOMENI AND PAUL KOCH
AND THE LABORATORY FOR URBAN/SUBURBAN STUDIES

REGIONAL ECONOMY: INDUSTRY AND TRANSPORTATION

From World War 2 fighter aircraft to the Lunar Module, Long Island has an illustrious tradition of nationally vital design and production. We see an opportunity to revitalize resources in talent and facilities that created Grumman and Republic Aviation, Sperry Gyroscope and many other major industries here. There are two major interrelated industries that could be developed here, tested and demonstrated in our local field, and exported to the rest of the world, providing a major economic base for income and jobs for many years to come.

A. HOUSING SYSTEM AND COMPONENTS

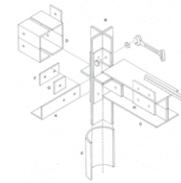
Home for Generations suggests a new interactive user-friendly do-it-yourself housing component industry. This could easily interface with existing standards throughout the world, including Japan and Europe, where IKEA already is an example of how interior home furnishings can be made locally and shipped globally. Long Island could lead the world in developing and exporting exterior home elements for an environmentally, ecologically, and economically friendly system of human settlement components.

B. MASS TRANSIT SYSTEM AND COMPONENTS

Similarly a system for personal computerized transport components could be designed, developed and produced for export here on Long Island, after testing and proving them as part of our own successful regional transport retrofit. Such work on cars, stations, and track linkages could be supported in part by LIRR, MTA, LIDC and RPA. This regional transport system is designed to go at a moderate speed of 60 MPH, but without traffic! Thus throughout the region mile-a-minute connections could vastly improve productivity and virtually eliminate rush hours. This system can also support light industrial shipments, like the components of the housing industry outlined above. Thus manufacture and assembly could occur throughout the region.



STRUCTURE



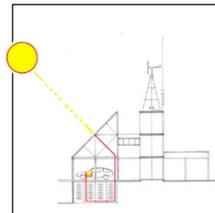
INCREMENTAL TRANSFORMABLE DOMESTIC STRUCTURAL SYSTEM

ELEMENTS



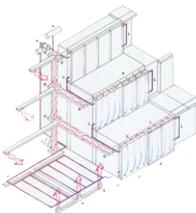
COMPONENT ASSEMBLY KIT OF PARTS

TRANSPORT



SOLAR AUTO AND PHOTOVOLTAIC GARAGE

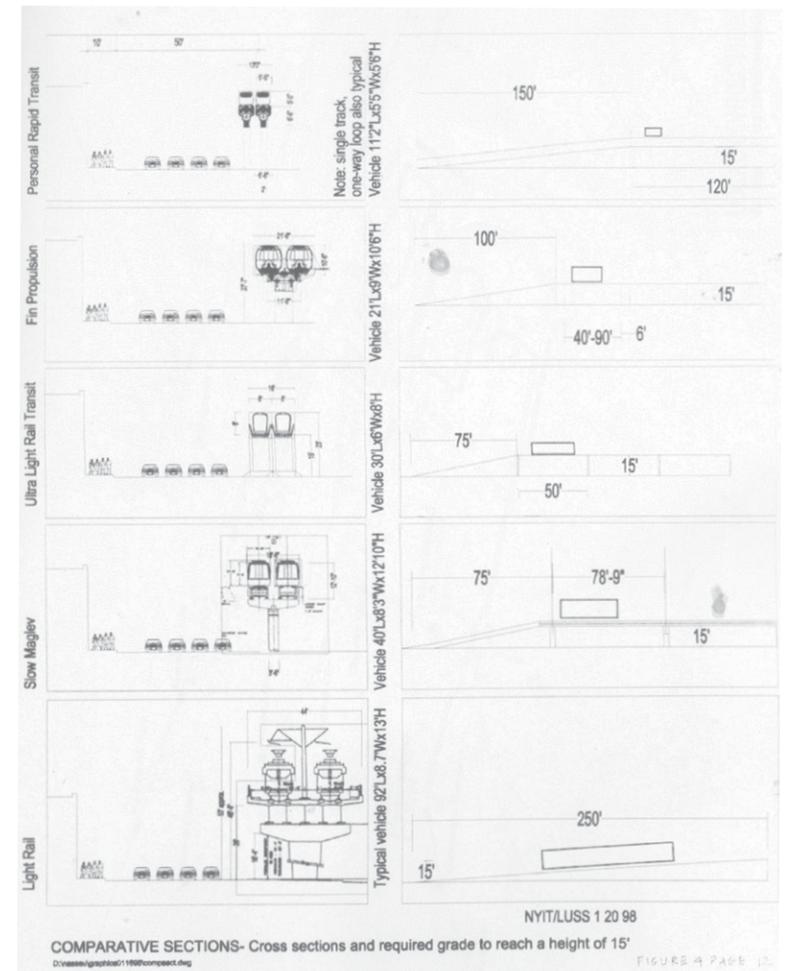
ENERGY



TROMBE WALL TERRACE SOLAR COLLECTOR



TRACK AND VEHICLE DESIGN AND ASSEMBLY

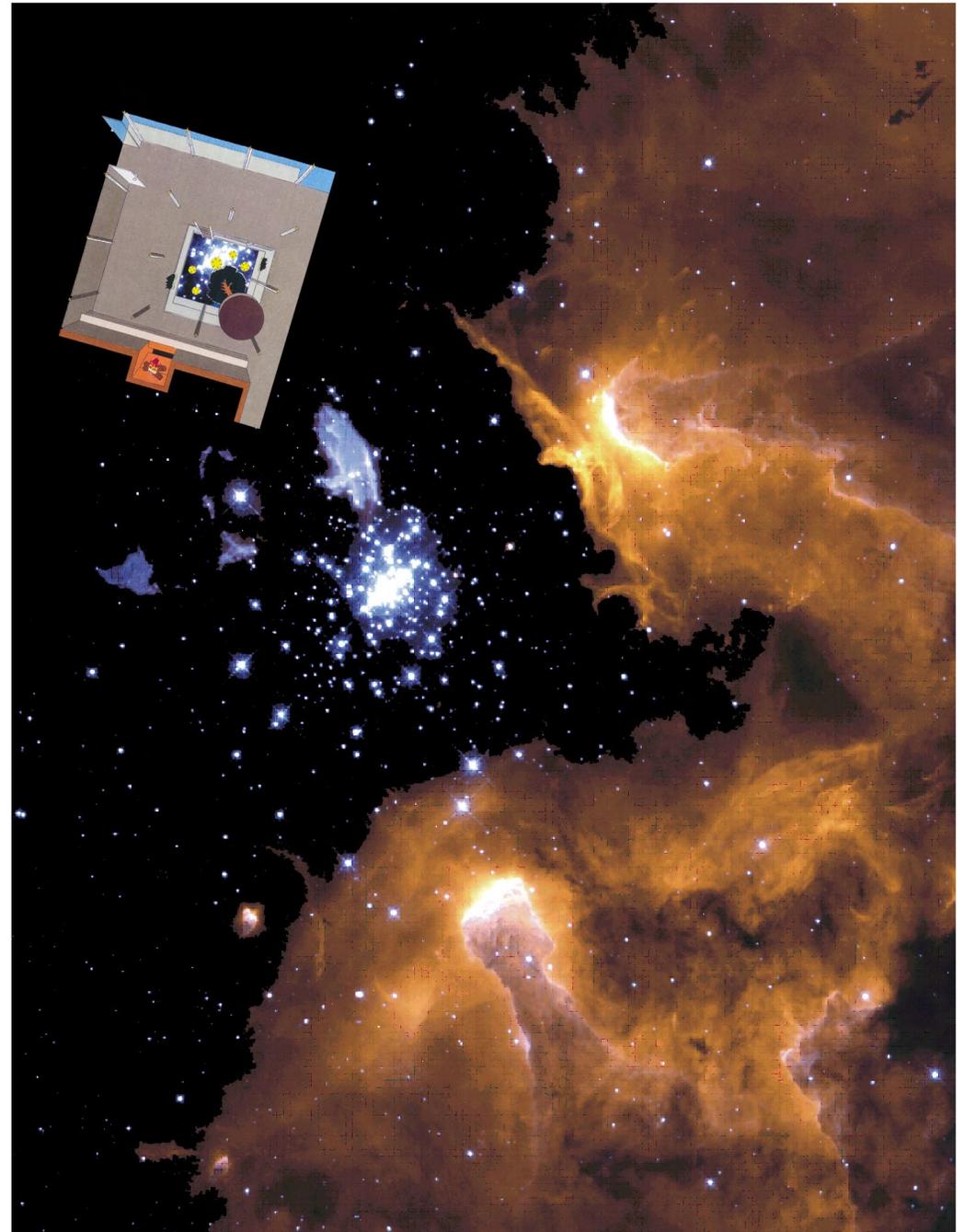
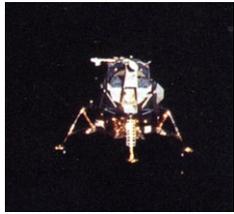




REACH FOR THE STARS

This prototype for housing appears to fit well in a variety of climates and locales. For instance, on the moon a Seedpod villa could generate its own oxygen under a bubble dome. The crops to the south and trees to the north will gain light through atmospheric scattering as well as by direct gain. The hill masses to the north will minimize black body radiation loss in the dwelling. Hills biomass and air grow for a new kind of Jeffersonian terra-forming.





THIS IS A FUNDAMENTAL FORM
AND GENERALIZABLE PRINCIPLE