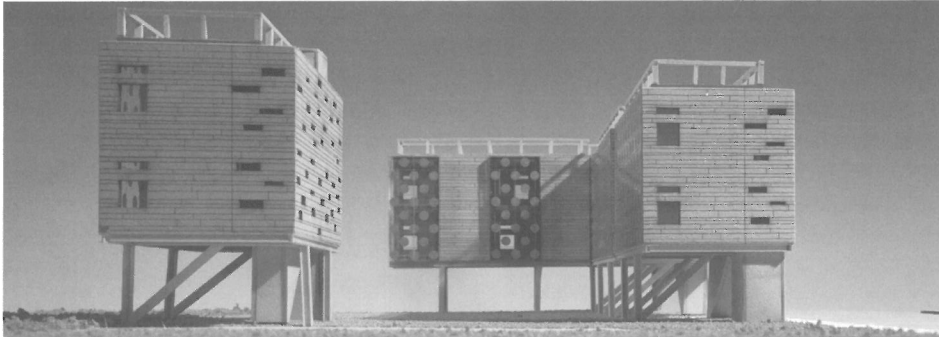
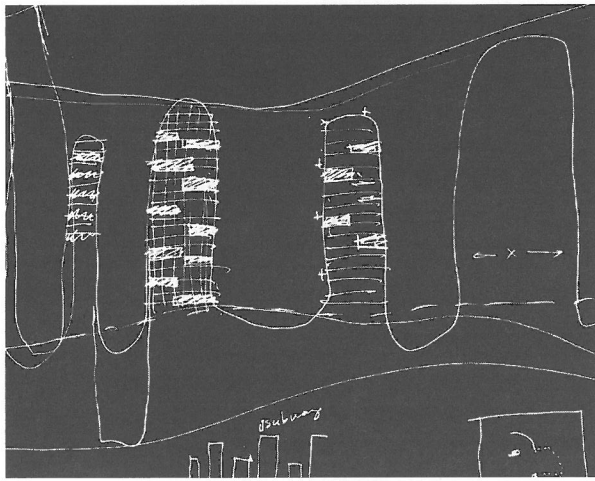


# YALE

PRINCIPALS  
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## STRATEGY

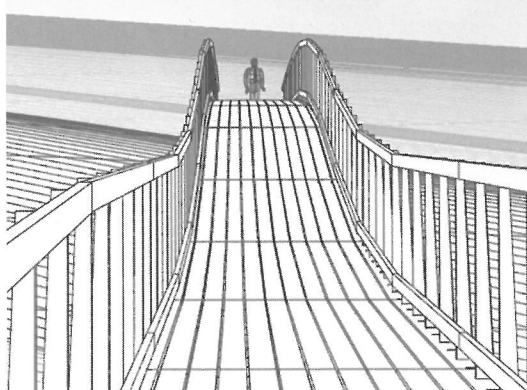
Housing has had many earnest reformers and aestheticians. The most intelligent subdivisions of property, however, establish no fixed plat or arrangement but rather express the organization as an interplay between simple functional relationships that become increasingly complex and robust when played. This project proposes no single plan but rather rehearses several different outcomes of a game played with new hybrids of some common production, infrastructure and financing envelopes.

A dual network infrastructure sandwiches linear landscapes within reticulating streets. These green lanes to the ocean, in turn, replace underground hydraulic infrastructure.

Stackable modular housing units are manufactured with new materials and positioned to be responsive to sunlight. Savings from modular housing offset the added costs of special infrastructure landscapes.

## STREET

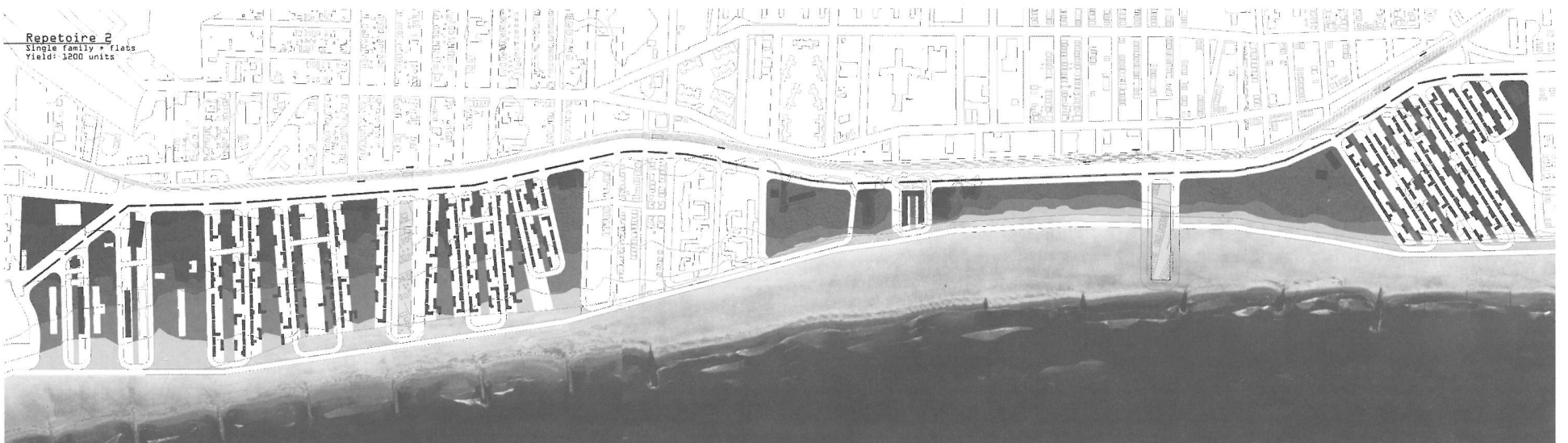
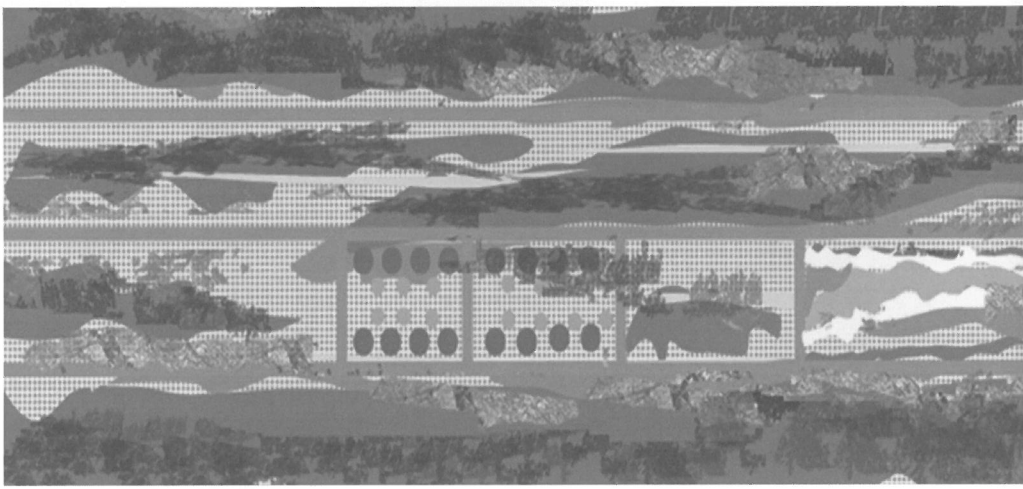
The street has no fixed position but rather rehearses several repertoires on the site that each yields different housing arrangements and densities. Like RNA, it organizes and sequences the housing and then reticulates through the site, bonding across open space that permits direct pedestrian access to the ocean.



Housing lots from both sides of the streets meet interior green lots held in common. This doubling line resembles not the cul-de-sac of 70 years ago or the giganticized cul-de-sac of the golf course suburb. It further giganticizes the cul-de-sac to form a hybrid of superblock and cul-de-sac. The street can alter its behavior to respond to the site and the sun. The reticulations may be of any length and may vary in width as a function of the height of the buildings. For instance, increasing the space between reticulations allows for taller multi-story housing spaced to receive sunlight. The reticulations also prevent the new development from completing itself within a single perimeter. Just as the landscape may enter from the south, the city may enter from the north and the street may also wind through and collect spaces from the adjacent housing projects. The street may assume any orientation, gathering sun from surfaces perpendicular to the street or organizing asymmetrical streets with south-facing surfaces on one side and north-facing surfaces on the other.

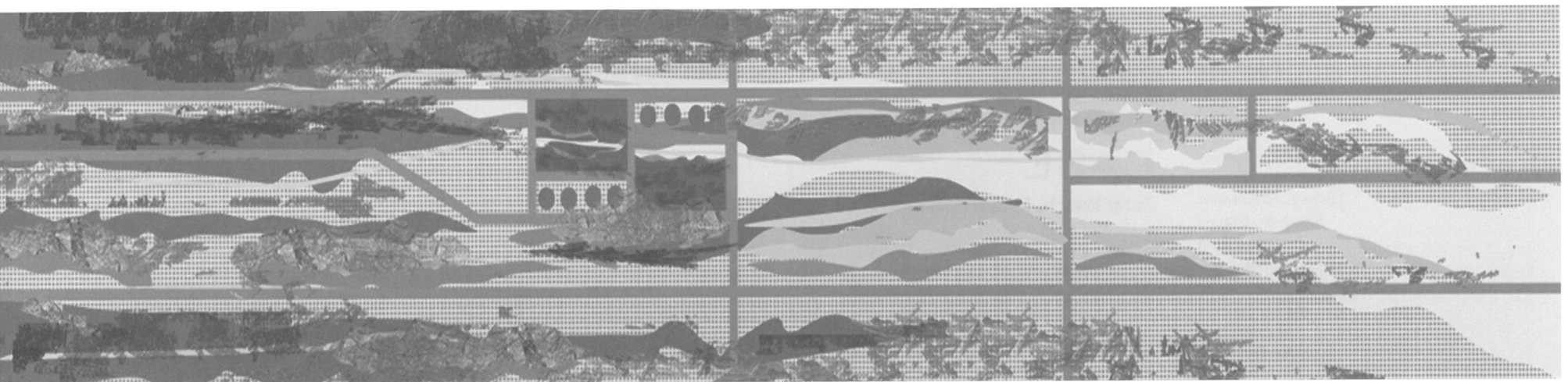
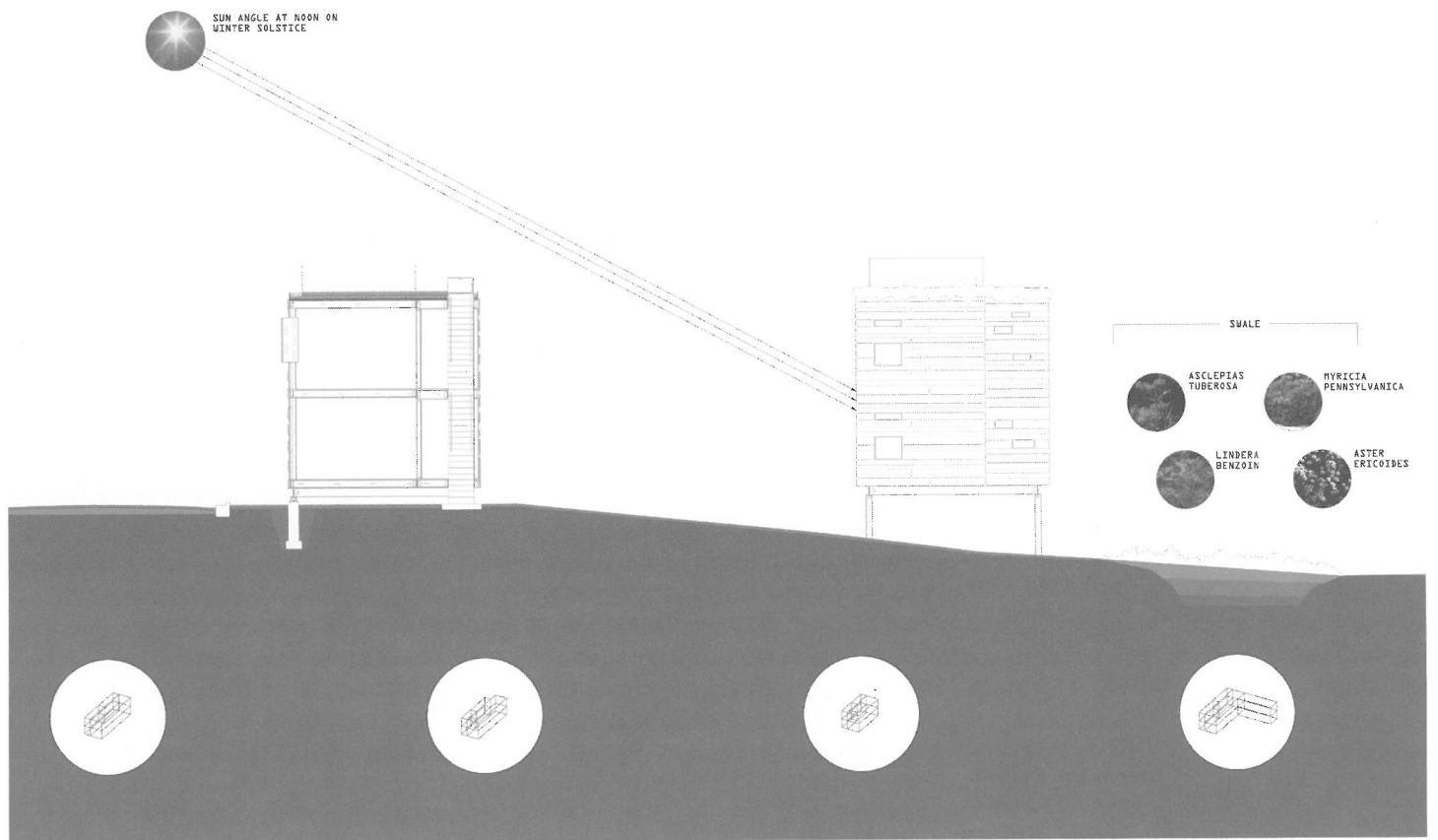
## HOUSING

Variable densities of housing can be sequenced along the street. Developed in double houses, the field comfortably yields approximately 600 units of housing or 6 units per acre. Arranged in flats, the modular units yield, for instance, 1000 two-story units in a scheme with equal amounts of housing coverage and landscape. The same arrangement can also yield 2000 four-story units. Mixtures of the flats and group houses yield approximately 1200 units or 12 units per acre. For the single-family house, homeowners may purchase larger lots or multiple lots within the general arrangement. All housing is raised above flood height providing most with parking underneath. For the most efficient shipping by truck or boat, units are of either 40 or 60 foot lengths and combine dense 7' wide stackable volumes holding circulation, kitchen, bath and storage together with 14' wide panel assembled construction holding the remainder of the program. The standard structure is the two story double house, the first story above the parking containing public rooms, the second floor containing bedrooms and the roof level providing the private garden. Units attach end to end, creating 80 foot long, 100 foot long, or 120 foot long structures. Modular units can be stacked in many configurations to create multi-story housing. Materials are energy efficient and/or recycled. On the north-facing walls, a recycled wood composite could generate, in facade, a field of small apertures. On the south-facing walls, a special glass curtain with operable windows can let light and air in but control heat gain and gather solar energy. One such wall could be made of integral louver sandwich glass panels that reflect summer sun but absorb energy through round photovoltaic patches that make a dot-screen of the facade. Differences in material options, differences in volume shape, and variations in site deployment provide a matrix of housing options.



**MONEY**

Modular housing is approximately 10 percent cheaper than site built construction due to the reduction of construction time. Retooling the industry to be responsive to new materials generates cost increases of 5-10 percent more than modular construction. Consequently, not only do the costs balance each other, but the ensuing fuel efficiencies generate additional dividends for the resident as well as the developer. Developers can conceivably charge more for an energy-efficient home. Prospective homeowners who achieve favorable energy ratings from independent groups like LEEDS are assured of reduced monthly bills and more easily qualify for mortgage loans. Municipal savings might also be passed on to both parties in the form of tax abatements. The project imagines that an economy generated from housing production might attract other public and private money, from the federal government, the city, commercial institutions, and non-profits to add more program variables to the area. The infrastructure



proposed in this project is radically different from typical urban infrastructure. The swales limit impervious pavement, and the living machine requires less initial construction expense; they can be expected to pay for themselves within 10 years. The publicity generated by a responsible and environmentally sensitive project such as this would sponsor invaluable marketing for the developer and important cultural significance for the city.



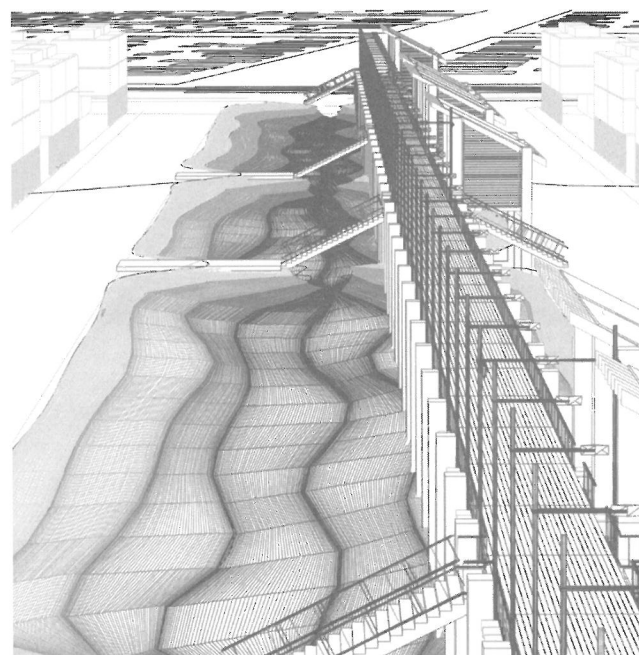
**LANDSCAPE**

At first blush our treatment of the Arverne site (drainage swales, porous paving, alternative sewage system) may suggest that our aim is simply to be ecological, sustainable and green. But these words are temporary monikers marking the emergence of a new paradigm. The ecological paradigm has produced rules to raise the biotic index, but has yet to produce any beautiful design. This is partly because the old forms don't quite fit the new paradigm and its new pieces. In Arverne, we have used the new elements such as swales, for designing new landscapes. The swales clean drainage water and create a landscape of private and public gardens. Their cleaning function has been combined with their aesthetic one by grafting onto them a system from large scale agriculture—rice terraces—to create water gardens.

Arverne's 100 acres sit on a sandbar, a fragile landscape, easily breached. Here is the ideal profile of a sandbar. Arverne has only one line of dunes today. Another line of them is recommended, if the site is to be developed, as well as boardwalk bridges across them to keep people from trampling the delicate dune grasses that keep the dunes in place. Other parts of the surrounding landscape affect Arverne's development: the rising levels of the water due to global warming, 9 inches over the 20th century, a projected 23.5 inches over the next 50 years. Arverne, on the edge of a flood plain today, will become a flood plain. So its buildings must be raised.

It wants a continuous green belt along its northern Jamaica Bay side—through which the floods flow into the site—which would help absorb, detain and store floodwaters. Arverne suffers too from the declining health of Jamaica Bay, whose marshes have one of the richest biota in the U.S., but are disappearing. One contributing cause is the amount of nitrogen entering the bay, mainly from sewage overflow from an old and overtaxed combined drainage and sewage system. Our design for Arverne's landscape responds to this context. First we have tried to make most of the surface porous,

using this graph as a guideline. Deterioration starts when the impervious surface of a watershed exceeds 25%. Our site has been designed to have only 14% of impervious surface. Second, the water that collects from drainage passes through vegetated swales, which clean it before it enters Jamaica Bay. Third, given the sewage outflows and the high costs of a new system of separate pipes we propose an alternate sewage system and have indicated one that uses plants, bacteria and sunlight to clean the sewage produced by the housing development. We have used the Living Machine but there are other systems. The point is that the sewage and drainage systems that were created for cities in the 19th century no longer work.



**ARVERNE**  
Arverne itself demonstrates the idea that cities do not derive their vitality from prescriptive planning. As the street reticulates further to the east in an area too narrow to support housing, it rehearses a new charter school dedicated to landscape studies and marine biology. The school would take advantage of the new sanctuary designation on the bay side of the island as well as the various landscape experiments within the housing area itself. It would provide recreation areas for the larger neighborhood. Another reticulation of the street, at the Beach 67 subway stop, creates the main public entry to the beach via a boardwalk which takes its cues from the boardwalk crossing the dunes. On stilts or on a slightly raised ridge, it conducts the larger public to the beach amidst informal commercial facilities (fish restaurant, concessions) that serve also as a spine for the development. Starting out as a boardwalk at first and adding units as demand grows, they are seen as a recycled wood architecture of "huts" which can hook onto each other and be continuous at full buildout. The subway stops serve also as a public entryway to the greenbelt on the bayside. The commercial recreation provides another audience for the school's corporate-sponsored landscape experiments, its fast-forward cultivation of rapidly rotating plants, and its almost cinematic outdoor lighting that varies with the speed of the wind.