

PORTABLE MOLECULAR HOUSING

The density of an Urban environment can be a positive factor in the development of a healthy city if we simultaneously provide relief that is integral to its conception.

The nature of Toronto, as a City within a Park, is reflected in this proposal by scattering hexagonal volumes within an expandable network of posts and hanging gardens. With a module that is capable of adapting to multiple property sizes and shapes, the proposed Portable Molecular Housing development will always be at once an object in its field while concurrently integrating itself with the idiosyncrasies of its site.

Laid on a conceptual isometric grid of 18" triangles, each module, consisting of either 4-, 5-, 6-, or 7-triangle long walls, is set within identically sized 7-triangle structural bays. This strategy allows for nearly endless potential configurations of both individual units and the collective assembly.

Wall assemblies consist of durable steel cladding over an air space, and bound to a prefabricated hexagonal structural steel frame. With fire resistant mineral wool insulation, the total R-value for the wall assemblies is R46, including a continuous R25 outside the frame of each module. Roof and floor assemblies are similar, providing for an R-value of R60 at the roofs, and an R55 at the floors. Windows are triple-glazed aluminum clad units with a U factor of U0.79SI.

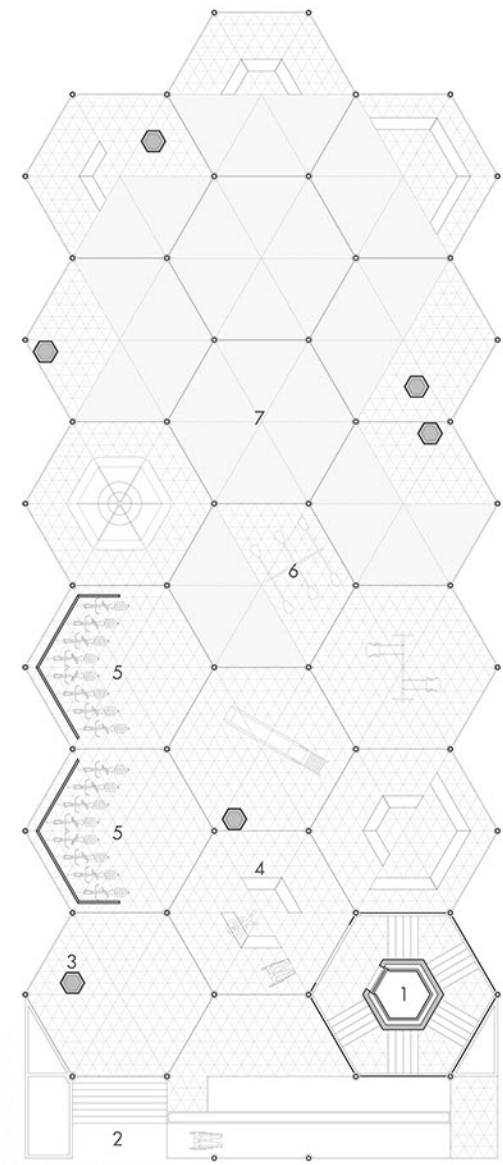
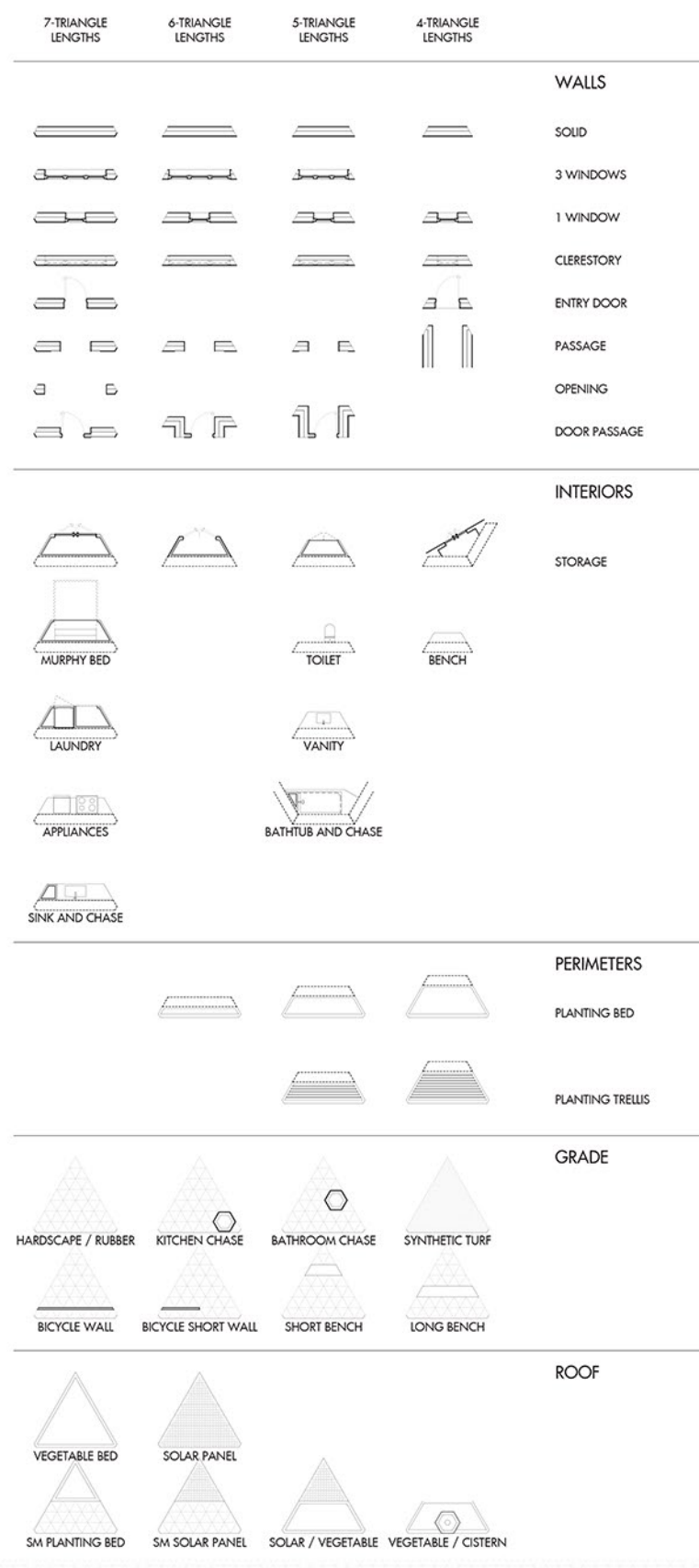
The Roof holds water cisterns, solar panels, and vegetable gardens, the number and configuration of which are all specified prior to installation. Water is collected at roof-mounted cisterns and by way of individual module roofs. The water collected at the cisterns is delivered to each unit through insulated pipe chases site-installed according to the chase locations and unit configurations. Each module roof is made of five triangular sections sloping towards the centre, with the sixth section directing collected water to planting beds at the perimeter of the modules.

Grade Level is deliberately open in the example iteration shown here. Grade Level components, such as rubber matting and synthetic turf, allow for the creation of play space beneath the structure, animating the level of entry. On larger sites, additional living units may be installed at Grade Level, as shown in the Alternate Site diagrams. Larger sites may also accommodate Grade Level components at Housing and Roof Level. The modular nature of each piece is interchangeable throughout the system.

The structural frame consists of both continuous and discontinuous posts, all mechanically bound by an assembly of beams that follow the isometric grid. With this triangular structural system, coupled with the inherent shear qualities of the modules and planting components, lateral forces are resisted in both tension and compression. The discontinuous posts allow for an offset of modules from one level to the next. This offset provides for a myriad of vertical spatial relief opportunities throughout the development, and invites light to permeate through what is an inherently porous resulting construction.

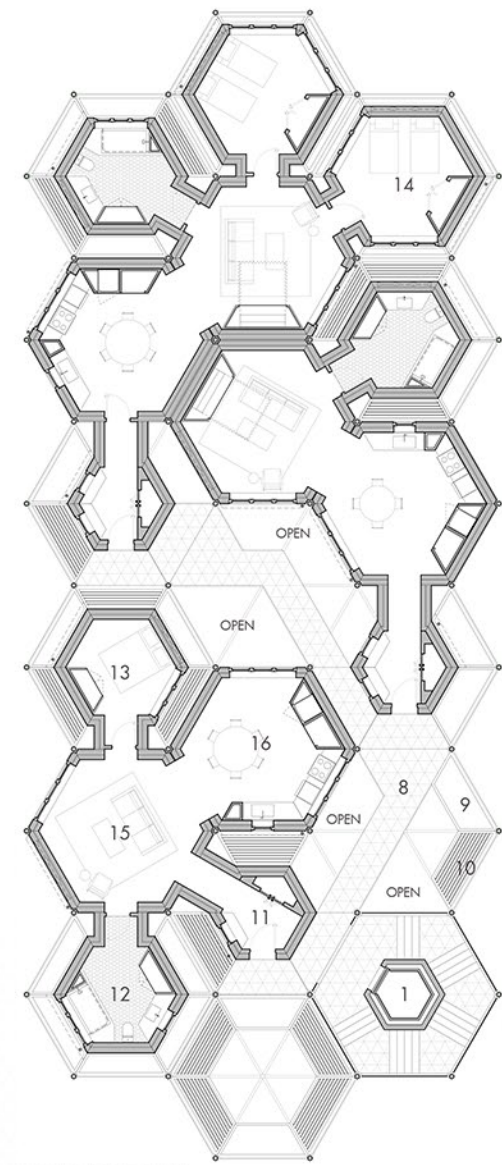
Because each component is autonomous, and is mechanically attached to the structural system, the disassembly of the whole results in parts that can be relocated and reconfigured to respond to the particular characteristics of an entirely different property.





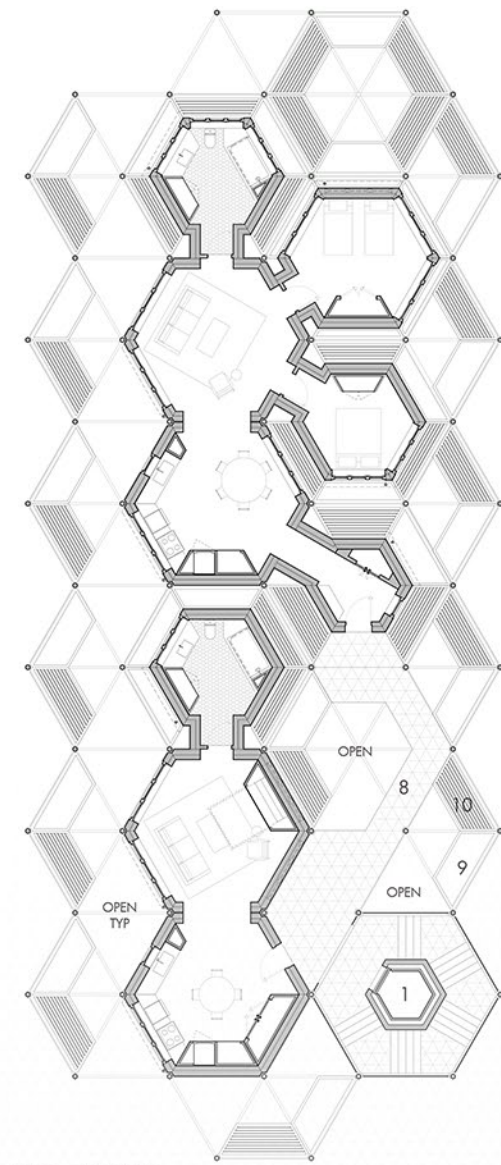
GRADE LEVEL PLAN

GRADE LEVEL SPACE DIAGRAM



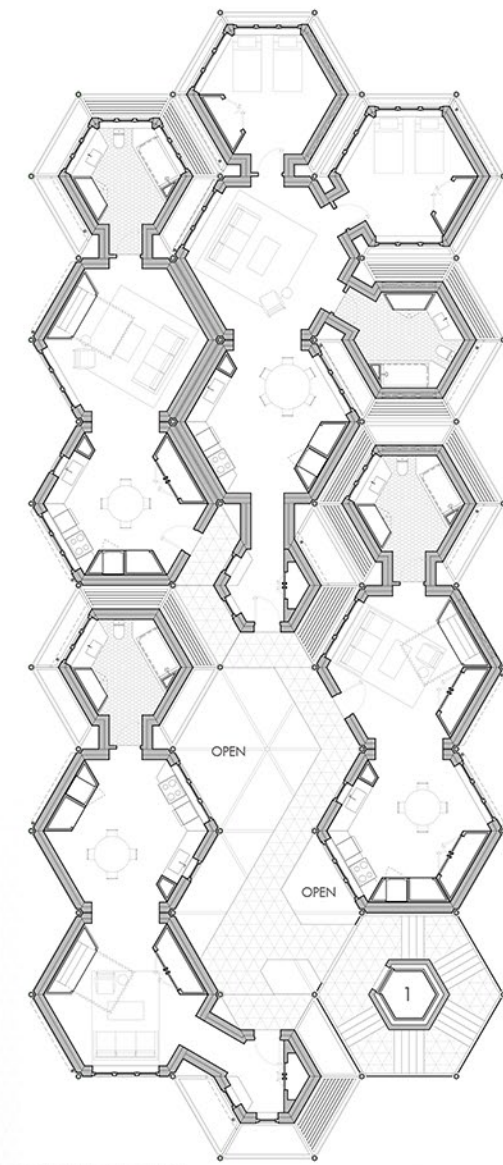
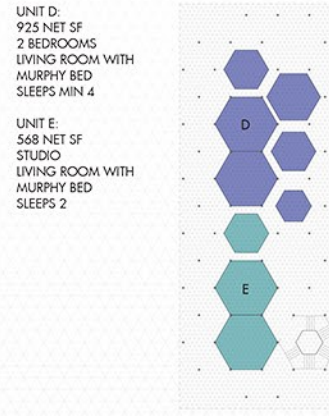
SECOND LEVEL PLAN

SECOND LEVEL HOUSING DIAGRAM



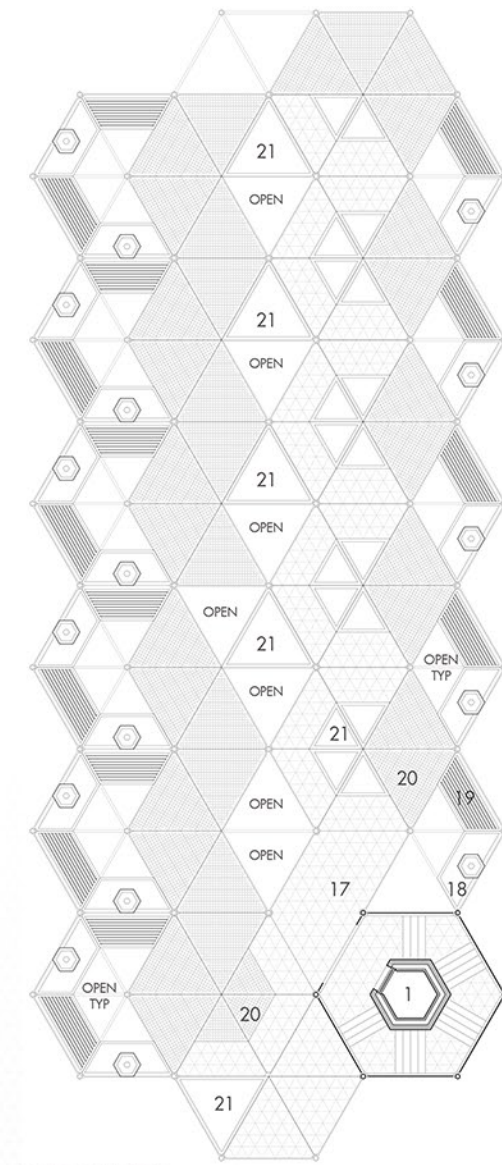
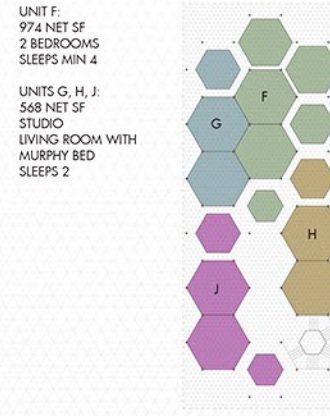
THIRD LEVEL PLAN

THIRD LEVEL HOUSING DIAGRAM



FOURTH LEVEL PLAN

FOURTH LEVEL HOUSING DIAGRAM

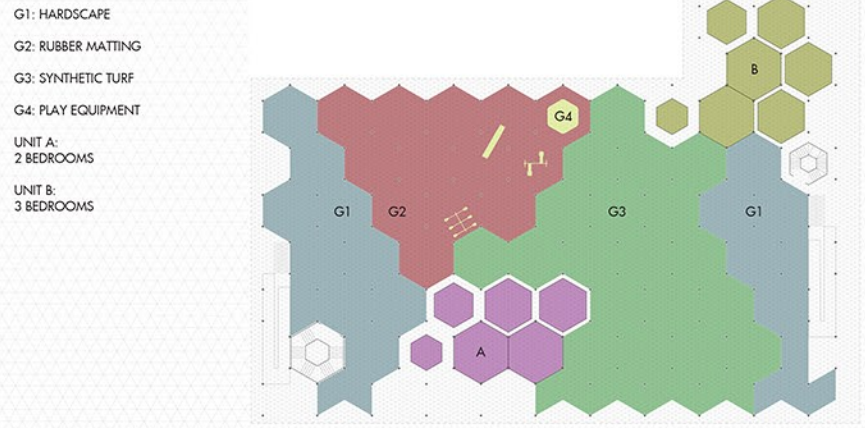


ROOF LEVEL PLAN

PLAN LEGEND

- GRADE COMPONENTS SHOWN IN THIS ITERATION:
- STAIR AND ELEVATOR
 - STAIR AND RAMP ENTRY
 - PLUMBING AND ELECTRICAL CHASE
 - SEATING ON HARDSCAPE COMPONENT
 - BICYCLE STORAGE
 - PLAY EQUIPMENT ON RUBBER MAT COMPONENT
 - SYNTHETIC TURF COMPONENT
- HOUSING COMPONENTS SHOWN IN THIS ITERATION:
- EXTERIOR WALKWAY
 - PLANTING BED
 - PLANTING TRELLIS
 - FOYER MODULE (4-TRIANGLE WALL LENGTH)
 - BATHROOM MODULE (5-TRIANGLE WALL LENGTH)
 - BEDROOM MODULE (6-TRIANGLE WALL LENGTH)
 - LIVING MODULE (7-TRIANGLE WALL LENGTH)
 - KITCHEN MODULE (7-TRIANGLE WALL LENGTH)
- ROOF COMPONENTS SHOWN IN THIS ITERATION:
- EXTERIOR WALKWAY
 - PLANTING BED AND WATER CISTERN
 - PLANTING TRELLIS
 - SOLAR PANEL
 - VEGETABLE GARDEN BED

ALTERNATE SITE GRADE LEVEL SPACE AND HOUSING DIAGRAM



ALTERNATE SITE ABOVE-GRADE LEVEL HOUSING DIAGRAM

