ARCH346 COMPETITIONS IN ARCHITECTURE
FALL 2014

RESEARCH ESSAY
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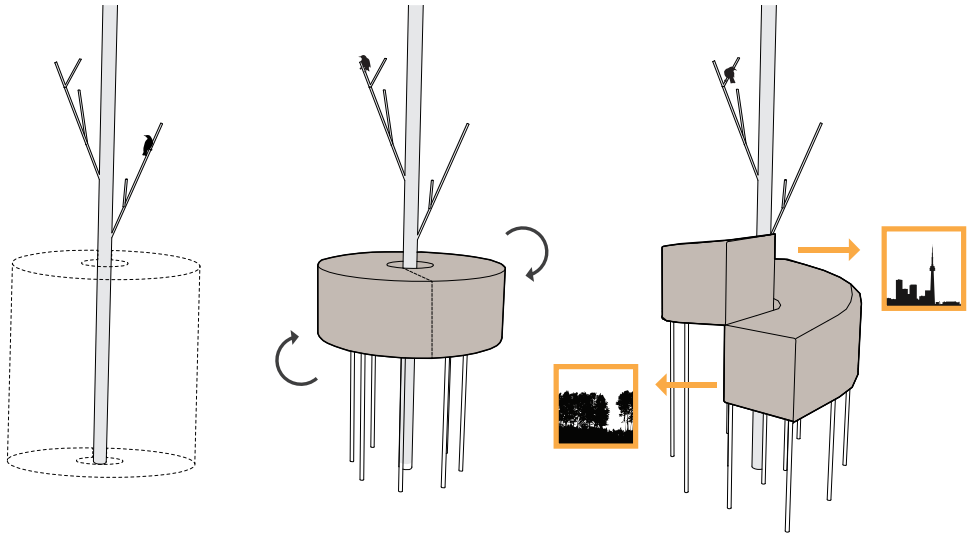
TREEHOUSE COMPETITION
Triumph Architectural Treehouse Award



1. site condition

2. mass is wrapped around the tree

3. mass is split to achieve varying views

site plan

The objective of the project was to create a retreat for a busy city couple, where they could find a place of isolation and comfort while maintaining their demanding lifestyles. The project is thus situated on Toronto Islands- a twenty minute commute from the bustling Downtown core, where one can find the atmosphere of seclusion, wilderness and tranquillity without leaving the city. While the south-western portion of the island contains various attractions such as beaches, amusement park, restaurants and bike paths, the eastern half is a quiet residential area in the midst of a forest and water canals. This allows the inhabitant to choose his own relaxing environment or conveniently alternate between the two.

Two main driving forces can be identified in the design process of this proposal- the dual nature of resident's experience and the necessity of a compact program organization.

In order to achieve the dual experience, building mass is wrapped around the tree, maintaining a sufficient offset from the trunk to allow for vertical circulation, and gets supported by metal stilts, avoiding any metal connections and thus damage to the tree. Wrapping the building mass 360° and splitting it in half forces each end to face perpendicular directions. Through careful selection of the building location, it was possible to obtain one end of the structure to face the downtown skyline and the opposite end to face the forest and calm waters.

The next major consideration was spatial organization. Competition brief set the maximum floor area to be 20m^2, which forced the design to be as compact as possible. By merging the circulation with main program (i.e. locating program within the circulation space), spatial efficiency could be achieved.

The competition brief posed a rather interesting design problem- how to achieve numerous unique experiences within a single compact space. In order to come to a successful solution, series of projects were looked at, each influencing the final outcome of the proposal.

Fig. 1

Fig. 2

Fig. 3

Fig. 1 through *Fig. 3.* 360 House by Subarquitectura. Adapted from "Casa 360° by SUBARQUITECTURA," by Yatzer.com, 2010, http://www.yatzer.com/Casa-360-by-SUBARQUITECTURA

360 House by Subarquitectura had a fundamental influence on the design of the treehouse. At the core of this residential project lies the idea of movement through the building, which simultaneously becomes the scenic journey, offering its residents a panoramic view of the distant mountains on the outskirts of Madrid. The architects made it a priority to slow down the inhabitant and emphasize the importance of the beauty of the chosen site.[1] By perforating the east facade with windows, a constantly changing scenic route is incorporated into the daily activities of the residents as they are moving from one end of the house to the other. In addition "the house is curved, generating the greatest quantity of linear meters towards the good views,"[2] as described by the architect. Another important design consideration was program arrangement. Spaces required for daily tasks were made into a "use diagram", and thus the shape of the building didn't just follow function, but became the function itself.[3] Program that required more privacy was positioned closer to the core, while open shared spaces were placed at ends to take advantage of the picturesque views. Design of the Duality Treehouse took a lot of inspiration from these concepts. Creating one continuous space which forces the inhabitant to appreciate the unique and carefully chosen location of the house was crucial. Due to the restriction on square footage, it was not possible to achieve an elaborate scenic journey from one end to the next, and thus the emphasis was placed not on the movement through the treehouse but rather on the end locations. By arriving at either end of the house, the inhabitant is presented with a carefully selected view, accentuating the stunning surroundings. While the entire façade of the building is pierced by windows to allow for natural sunlight, building ends is where most of the attention is drawn. "Static spaces," or areas where one would want to spend extended periods of time and not be used strictly for practical purposes, were placed at each end, ensuring that calm and relaxing activities can be enjoyed along with a fantastic scenic views. Such spaces are the living room at the upper level, facing the city skyline, and the bedroom on the lower level, facing the wilderness. Subsequently, and similarly to 360 House, service areas were placed at the core of the building, along the route of circulation.

[1] Tina Komninou, "Casa 360° by SUBARQUITECTURA," *Yatzer.com,* November 11, 2010, http://www.yatzer.com/Casa-360-by-SUBARQUITECTURA (accessed August 5, 2014).
[2] "360 House / Subarquitectura," *ArchDaily,* April 8, 2010, http://www.archdaily.com/55411/360-house-subarquitectura/ (accessed August 4, 2014).
[3] Ibid.

Fig. 1

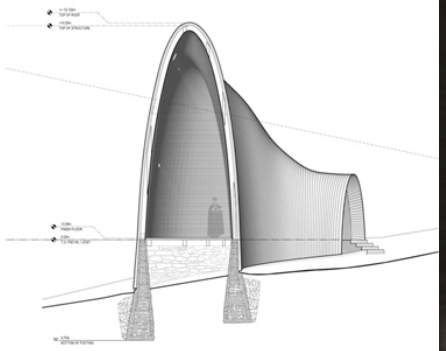


Fig. 2

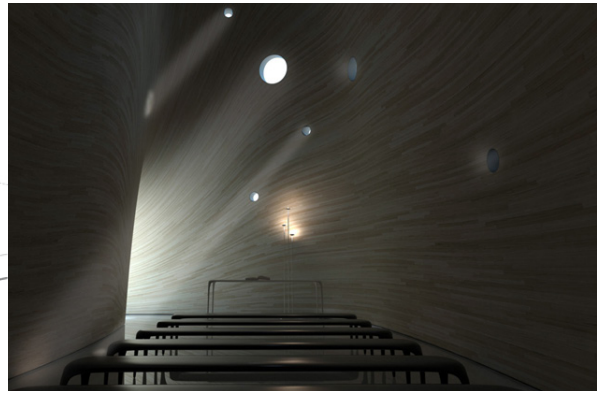


Fig. 3

Fig. 1 through *Fig. 3.* Kapolna Madaras by Christopher Johnson. Adapted from "Kapolna Madaras, A pilgrimage chapel," by Christopher Johnson Architects and Associates, http://aiany.aiany.org/Kapolna%20Madaras.pdf

Kapolna Madaras, a pilgrimage chapel in Madaras, Romania by Christopher Johnson, had a profound influence on the design of the treehouse as well. It was constructed as a site for annual pilgrimage taken for generations by Szekely Roman Catholics, to witness the blessing of local saints.[4] As the architect describes it, "the chapel is a proclamation of dualities … both natural and man-made; it is at once "the cathedral" and "the cave", temporary and permanent, cultured and primitive".[5] The location and façade openings were carefully designed to provide a certain light quality into the space at very specific times of the day and year.[6] Interior and exterior material finishes were also carefully considered to reinforce the idea of a simple continuous fabric making a primitive, light structure.[7] Construction technique was also a big driving force of the design, as all materials were locally sourced from the mountain forests and fields and only local carpenters, with century-old wood-working skills, worked on the construction. In regards to structure, a set of wooden frames (or ribs) make up the parabolic form and distribute the weight of the building, as well as withstand natural elements.

Duality Treehouse was designed with the same fundamental strategy in mind- to portray the strong sense of dual existence of the structure. In the semi-urban context of Toronto Islands, it was important to emphasize that the inhabitant can relate to the urban city skyline, but also have a choice to submerge himself into the surrounding wilderness. It was also important to accentuate the idea of natural vs man-made, similarly as in Kapolna Madaras. The immediate surroundings of the treehouse (wilderness and calm water canals), as well as careful selection of natural and recycled construction materials, suggest strong connection to nature. Treehouse construction techniques further reinforce the idea of respect for nature and tradition, as building structure is meant to avoid any direct connections and damage to the tree.

[4] Christopher Johnson, "Kapolna Madaras, A pilgrimage chapel," *Christopher Johnson Architects and Associates,* http://aiany.aiany.org/Kapolna%20Madaras.pdf (accessed August 7, 2014).
[5] Ibid.
[6] Ibid.
[7] Ibid.

Fig. 1

Fig. 2

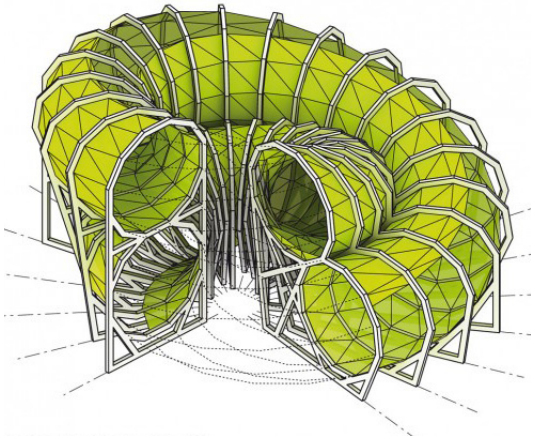


Fig. 3

Fig. 4

Fig. 1 through *Fig. 3.* EVOLVER by Alice Studio. Adapted from "alice studio: evolver," by designboom architecture design magazine, 2011, http://www.designboom.com/architecture/alice-studio-evolver/
Fig. 4. Allendale House by WIlliam O'Brien Jr. Adapted from "Allandale House / William O'Brien Jr.," by ArchDaily, 2010, www.archdaily.com/58210/allandale-house-william-obrien-jr/

EVOLVER by Alice Studio is a viewing platform located at the edge of Lake Stelli in Zermatt, Switzerland. Its design enables visitors to observe the spectacular landscape from a 720° route which cleverly spirals into itself. The design demonstrates how one can control the exploration route the visitor takes and frame the desired views to fully take advantage of the special site location. Construction technique of the pavilion influenced the structure and material choice of the treehouse. EVOLVER consists of 24 wooden frames arrayed 720°, which serve as the structural spine of the building. Open wooden slats were chosen as the exterior finish, creating a more holistic connection to the surrounding landscape.[8] Duality treehouse similarly incorporates rectangular wooden frames which are arrayed around the central tree trunk and provide a skeleton for the exterior wood cladding. Barn board was the interior and exterior material of choice to allow the structure to blend with natural forest environment. Sustainability was also a big design consideration when picking construction materials. Since reclaimed barn board can be salvaged from dismantled barns found in the suburban areas around Toronto, this design decision recycles a lot of material that would otherwise end up on landfill. In this way, by using natural materials whenever possible, a stronger connection to site and nature is established.

Allendale House by William O'Brien Jr. located in Mountain West, USA, served as an important precedent for studies of morphing the building form to achieve varying internal spaces as well as the overall building mass. Allendale house comprises three asymmetrical extruded A-frames, all linked together to create different programmatic areas of the house. Thin frame on the west side contains library, wine cellar and garage; broad frame in the centre is able to hold two floors of bedrooms and bathrooms while eastern side is designed for living, dining and kitchen areas. Severe interior angles, which resulted from connections between three varying structural A-frames, were resolved by the architect by allowing the internal ceiling/ wall line to deviate from the exterior roof line.[9] Spaces created between the external wall and internal one are used for open storage, saving space and eliminating unusable interior space due to low ceiling heights.[10]

[8] "alice studio: evolver," *designboom architecture design magazine,* February 9, 2011, http://www.designboom.com/architecture/alice-studio-evolver/ (accessed August 9, 2014).
[9] Nico Saieh, "Allandale House / William O'Brien Jr.," *ArchDaily,* April 30, 2010. http://www.archdaily.com/58210/allandale-house-william-obrien-jr/ (accessed August 5, 2014).
[10] Ibid.

Fig. 1

Fig. 2

The architect describes numerous iterations of the design, where possible configurations of structural frames were considered and the limitations of each one. This served as an important precedent for shaping the Duality Treehouse. Initially, morphing exterior frames were experimented with, where the square frames begin to twist around their axes with each progressive frame, rather than staying a simple square. This resulted in a similar problem of ceiling heights- several frames had more useless space rather than useful one, once they were turned. By going through multiple iterations of frame configurations, similarly to William O'Brien Jr, it was concluded that non-rotating frames provide the ultimate balance between usable interior space and flat exterior space for an outdoor terrace. If the upper floor of the treehouse was not resting upon itself, it would be feasible to rotate the frames all around, however it was more practical to keep the frame consistent all around in this specific case.

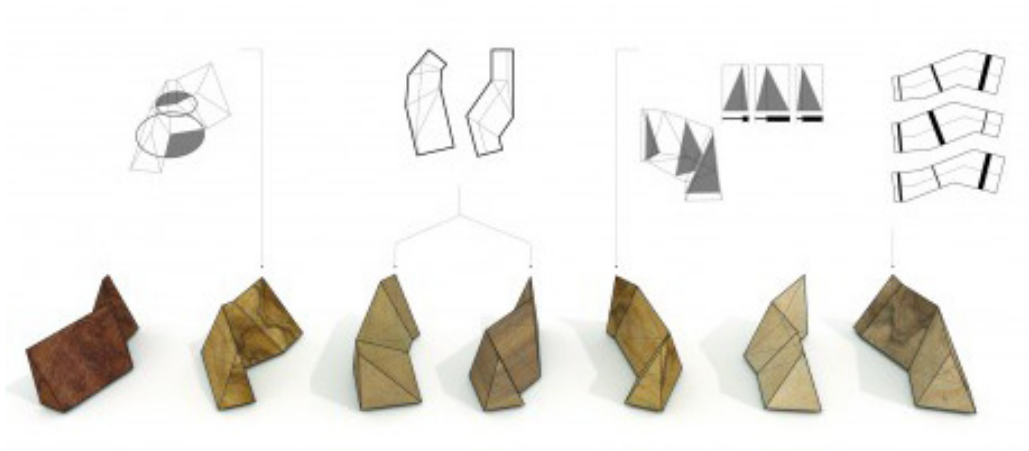


Fig. 3

The abovementioned precedent projects demonstrate their strong influence on the design development of the Treehouse. They faced similar issues of building site, structure, spatial and programmatic organization, suggesting possible solutions to these challenges. Duality Treehouse drew on these principles to combine them into its own unique, coherent proposal while drawing on the experience of these projects.

Fig. 1 through *Fig. 3.* Allendale House by WIliam O'Brien Jr. Adapted from "Allandale House / William O'Brien Jr.," by ArchDaily, 2010, www.archdaily.com/58210/allandale-house-william-obrien-jr/

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