KARIN DOM : WOODLAND SCHOOL

Budget Explanatory Note

Varna's proximity to the European timber industry is an asset, particularly to Germany where the vast timber engineering industry today allows for more competitive market pricing for prefabricated building components. As a strategy, the majority of the building utilized less expensive, repetitive prefabricated elements to minimize costs of on-site labor; while, the more complex construction is minimized and reserved for the most frequented public spaces that obtain the most traffic. Upfront costs for prefabrication may be greater; however, off-site prefabrication with integrated construction elements such as window units, electrical/av conduits, required structural penetrations, and insulation ultimately reduce the overall length of construction time and thus substantially reduces material and labor costs. The inherent finish of the wood allows these structural elements to remain exposed and eliminates the costs of expensive finishes and required framing. Additionally, the decrease dead load of a lightweight all-timber structural system significantly reduces the loads on the reinforced concrete building foundation, a substantial structural and excavation cost. With the more upfront cost for prefabrication offset by the cost savings in labor and material costs, we believe the budget will align with a conventional institutional building, approximately €600/sqm.

Introduction

Naturally wooded forests are often calming environments that children play in and escape to. The tangible surfaces, audible rustling and visual interest of forests make them a naturally sensory rich environment. This proposal references these qualities and the current forested site itself to create a warm and inviting new school for Karin Dom children. Through the sensitive use of wood material, an environmental site strategy, and efficient planning techniques this new school will welcome all into its doors.

The Warmth Of Wood

The primary material on both the interior and exterior of the project is wood, which provides many benefits from both an experiential and environmental point of view. Wood and timber

construction is known to have a significant de-stressing effect, as well as the ability to decrease blood pressure, heart rates, and anxiety, allowing children to feel more comfortable during day-to-day actives. Most of the interior surfaces are wood, which contributes to a warm calming environment with strategic splashes of light blue shades of color around the entry areas and larger window openings.

A Community Of Schools

The arrangement of the building on the site reflects the surrounding urban fabric and works to create a community, centrally-focused and welcoming environment with the adjacent buildings. Rather than position the new structure within the center of the lot this proposal shifts the building to the southern edge of the property allowing for a central public zone to be free of significant structure and used or visible by all inhabitants of the adjacent buildings. While this central zone will be secure and usable by Karin Dom alone, the openness of the site can be visually enjoyed by the students of the school dorms to the north and northwest. In a sense this produces a community of school buildings oriented towards the main green area and leaves the site much the same way that it exists today.

Connection To Nature

The siting of the project also keeps much of the existing landscape intact and preserves 34 of the existing trees. Karin Dom children can experience this natural environment from the decked portions of the landscape immediately adjacent to the project outside but also from the within the building itself. The primary façade of the new building overlooks the tree canopies in the courtyard, which filter light throughout warm seasons and provides direct visual connection to this soothing natural aspect of the site. The north facing orientation of this façade ensures harsh shadows and direct light will be minimized leaving the children with only soft natural indirect light. Still these floor-to-ceiling windows bring natural light deep into the interior of the building, minimizing the need for artificial lighting. More standardized operable windows are located on the remaining three facades, with shades to control individual lighting conditions in each room.

Planning

The simple bar form of the project contains a single linear corridor organization that produces a central public circulation system for easy wayfinding, efficient and functional room layouts, and access to natural light for nearly all spaces. The elevators and main public stair are located at the heart of the building and are immediately visible upon entry. From this point a central access corridor connects the spaces horizontally to the east and west, creating “wings” of

program on either end of the building. Great care was made to follow the essential adjacencies between the functional program as outlined in the brief and the size and shape of the project allows for sensible program groupings within the “wings” of the building. For instance, the first-floor contains all of Physiotherapy on the east and the entire Medical Center on the west, while the second floor holds all of the administration and Staff Areas on one side and The Training Center on the other. The rest of the floors continues to follow this logic of grouping as you move up the building with the Center for Diagnostics and for Family Mediated Intervention on the third Level and the Montessori Center and Hydrotherapy Unit on the fourth.

Materials & Construction

Health and Wellbeing

On a site which is dominated by trees, the new all timber building for Karin Dom is a welcome presence. The use of wood throughout the building and large openings toward the site create a strong relationship between the interior and exterior space, allowing children to feel connected with the lush green trees surrounding them. Inside, the warm wood finishes create a calm and inviting atmosphere for children and visitors, significantly improving the wellbeing of occupants. Timber and wood can also passively moderate humidity by absorbing air moisture when the humidity in a space is high, and releasing it when humidity is low. This natural moisture-buffering minimizes the impact of pathogens and chemical interactions on occupants, helping to prevent and improve illness in children and staff.

Sustainability

Timber is an environmentally sustainable material which is renewable, recyclable, and carbon-friendly. It also has a low embodied energy, which takes into account all of the processes associated with the production of the timber including harvesting, manufacturing, and transport, making timber construction both a sustainable and economical option. This construction method also allows for the potential to repurpose the few existing trees which would be removed for use in construction. Timber buildings can be disassembled and relocated at the end-of-life.

Construction and Economics

The natural warmth and timeless beauty of the timber structure provides a relatively inexpensive structural system and a decorative feature in one element. Wood and CLT construction allow prefabrication to happen off-site, drastically speeding up the construction process and reducing construction cost. Reduced weight of the overall building from using timber is around a fifth of the weight of concrete, allowing for timber buildings to weigh up to 50% less. This makes timber construction ideal for a restrained site with limited space.

Reduced building weight also decreases dead-load on the foundations, further lowering construction costs. CLT allows for superior dimensional stability with the lowest strength to weight ration compared to other common structural materials, allowing for long spans and reduced weights. CLT also performs exceptionally well to seismic loads, and is an impressive insulator on its own.

Assembly Method

The basic assembly method utilizes glulam posts along the perimeter and glulam beams which support the other wood elements. Traditional concrete floorplates are replaced by structural LVL floors which are laminated to hide conduit and electric, while lighting and air supply are left exposed. The façade is comprised on three sides of prefab insulated CLT panels with operable glazing units, allowing for ease of construction and decreased schedule and cost. The front façade also utilizes prefab CLT panels, but with repeated insulated glazing units structured with steel which make up the larger glass carves into the building. The building is clad in timber louvers which are an effective shading strategy and add to the overall appearance of the building.