Description of the proposed design for Karin dom's new home

Design mission:

Children with special educational needs in Bulgaria have never had a home specifically designed for them. Through a human-centered design approach and research, we have come to realize that a building simply catering to their special needs is not enough.

Instead, the design has to bring out the special strengths and hidden talents of Karin dom's children. We have i**nfused the proposed building with an enabling design strategy that empowers the abilities and skills, stimulates curiosity, self-confidence and independence.** What is more - the design develops social connections between the children, their parents and the wider community.

Key design goals:

1. Create a welcoming and spacious environment with more space for socialisation and development of skills, minimise closed corridor-type spaces, introduce niches and play nooks, as well as better accessibility for children and adults with disabilities. Corridors are wider than the minimal requirement so that stored mobility equipment does not block the passage, as required in the Building bulletin for design for children with SEN
2. Maximise yard area to the South and create visual and spatial connection to it starting at the main entrance. Increase children's psychological and physical wellbeing by greenery that welcomes them through the internal sunny and green "street". Preserve and show the biggest trees in the southeast corner of the plot.
3. Bring natural light in through roof skylights and open an atrium through the levels, that gives sky above the internal "street". Thus, enhance spatial awareness, wayfinding, natural ventilation and overall feeling for wellbeing.
4. Provide maximum opportunity for independent functioning and leasing of parts of the building to other organisations: use the building's resources during evenings and weekends to create a self-sustaining business model. Possibility to use floors and seperate units of the ground floor level independently of Karin dom's primary function through several entrances and access regimes.
5. Give back the green yard that will be destroyed during construction by bringing it to the roof terraces. Ensure social sustainability by giving possibility for access to the topmost roof (+11.10) for the community of high-school students from the adjacent dormitories, whose play yard and primary socialisation space have been taken away.

Underground floor area	956 square meters
Gross floor area above ground	2165 square meters
Total landscaped area within the plot	948 square meters
Number of parking spaces underground	21 parking spaces

1. Functionality and usefulness:

The design efficiently locates all the required functional units of the new building on 1 underground floor and 3 floors above ground. They are compactly situated close to the street access of the plot leaving maximum green yard to the south and southeast and preserving the biggest and oldest existing trees located there.

A primary goal of the design is to allow a visual and spatial connection between the main entrance and the yard. This is based on research of the therapeutic effect of seeing greenery and natural light immediately after entering a
building. The primary axis acts as an internal "street" that connects the spaces not only horizontally, but also vertically by providing natural lighting through the atrium and skylights above it. It facilitates spatial orientation and wayfinding a very important factor, especially for SEN children.

The ground floor (+0.00) contains:

	Area required **by brief** (without circulation space, without walls)	Area in **project** (**without circulation space,** without walls)	Area in **project** (**including circulation space** and wall thickness)
Reception	120 m^2	145 m^2	212 m^2
Montessori Center	170 m^2	181 m^2	216 m^2
Medical Center	56 m^2	53 m^2	56 m^2
Early Intervention Center	40 m^2	41 m^2	63 m^2
Physiotherapy	137 m^2	133 m^2	175 m^2
Vertical communication * and toilets	Not specified	-	48 m^2
Communication and terrace	Not specified	-	130 m^2

* Vertical communication: stairs and two lifts (one for Karin dom's visitors, the other for external guests). The position of the staircase allows it to service floors independently of each other

First floor (+4.05) contains:

	Area required **by brief** (without circulation space, without walls)	Area in **project** (**without circulation space,** without walls)	Area in **project** (**including circulation space** and wall thickness)
Center for diagnostics and therapy	231 m^2	254 m^2	424 m^2
Center for family-mediated intervention	100 m^2	106 m^2	135 m^2
Administration	95 m^2	97 m^2	141 m^2
Staff rest areas	50 m^2	52 m^2	66 m^2

Server room	6 m^2	4 m^2	-
Vertical communication and toilets	Not specified	-	49 m^2

Second floor (+7.20) contains:

	Area required **by brief** (without circulation space, without walls)	Area in **project** (**without circulation space,** without walls)	Area in **project** (**including circulation space** and wall thickness)
Training center	222 m^2	270 m^2	338 m^2
Vertical communication	Not specified	-	32 m^2
Green roof with play-ground and skylights	Not specified	-	596 m^2

Green roof (+11.10) contains:

	Area required **by brief** (without circulation space, without walls)	Area in **project** (**without circulation space,** without walls)	Area in **project** (**including circulation space** and wall thickness)
Street basket court	-	-	45 m^2
Open air cinema/ gathering space	-	-	265 m^2
Storage space for roof-top funriture	-	-	9 m^2
Vertical communication	-	-	54 m^2

All of these functions are accessible independently from the rest of the building.

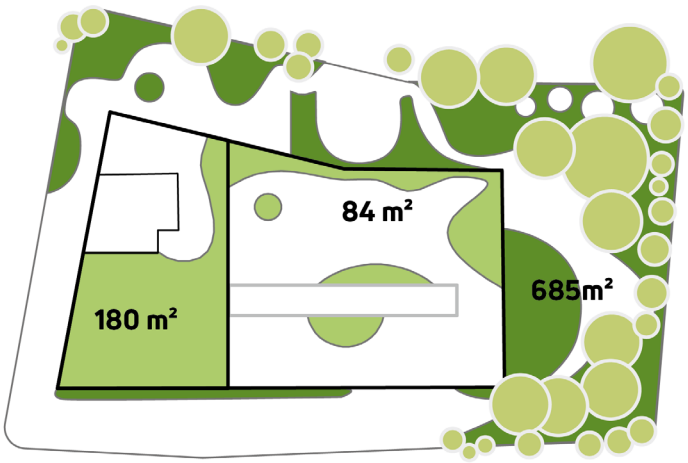
Underground floor (-3.00) contains:

	Area required **by brief** (without circulation space, without walls)	Area in **project** (**without circulation space,** without walls)	Area in **project** (**including circulation space** and wall thickness)
Parking for 21 cars	520 m^2	296 m^2	522 m^2
Hydrotherapy unit	150 m^2	153 m^2	223 m^2

Warehouse and installation room	80 m²	85 m²	9 m²
Vertical communication	Not specified	-	41 m²

Yard and landscaping - the yard is accessible from the building, as well as from the main plot entrance. It contains:

- Quick drop-off area in front of the building
- Car ramp with green pergola: to minimise the construction and building footprint, the design proposes a single-lane ramp (3.5-metre-wide), which is compliant with the building code for small parking lots as long as a traffic light signal is installed. The ramp has 15% inclination and is slip-resistant, which is allowed for small parking lots
- Parking for Karin dom's van and 8 bicycle parking spots
- Flower garden
- Veggie and fruit gardens
- Sensory garden with soil, water, pebbles, sand and wood chip
- Outdoor gazebo
- Fairytale corner
- Sensory path
- Green amphitheater with stage
- Chappel



total green area: **948 m²**
39% of the entire property

14 existing trees preserved
19 new local types of trees planted

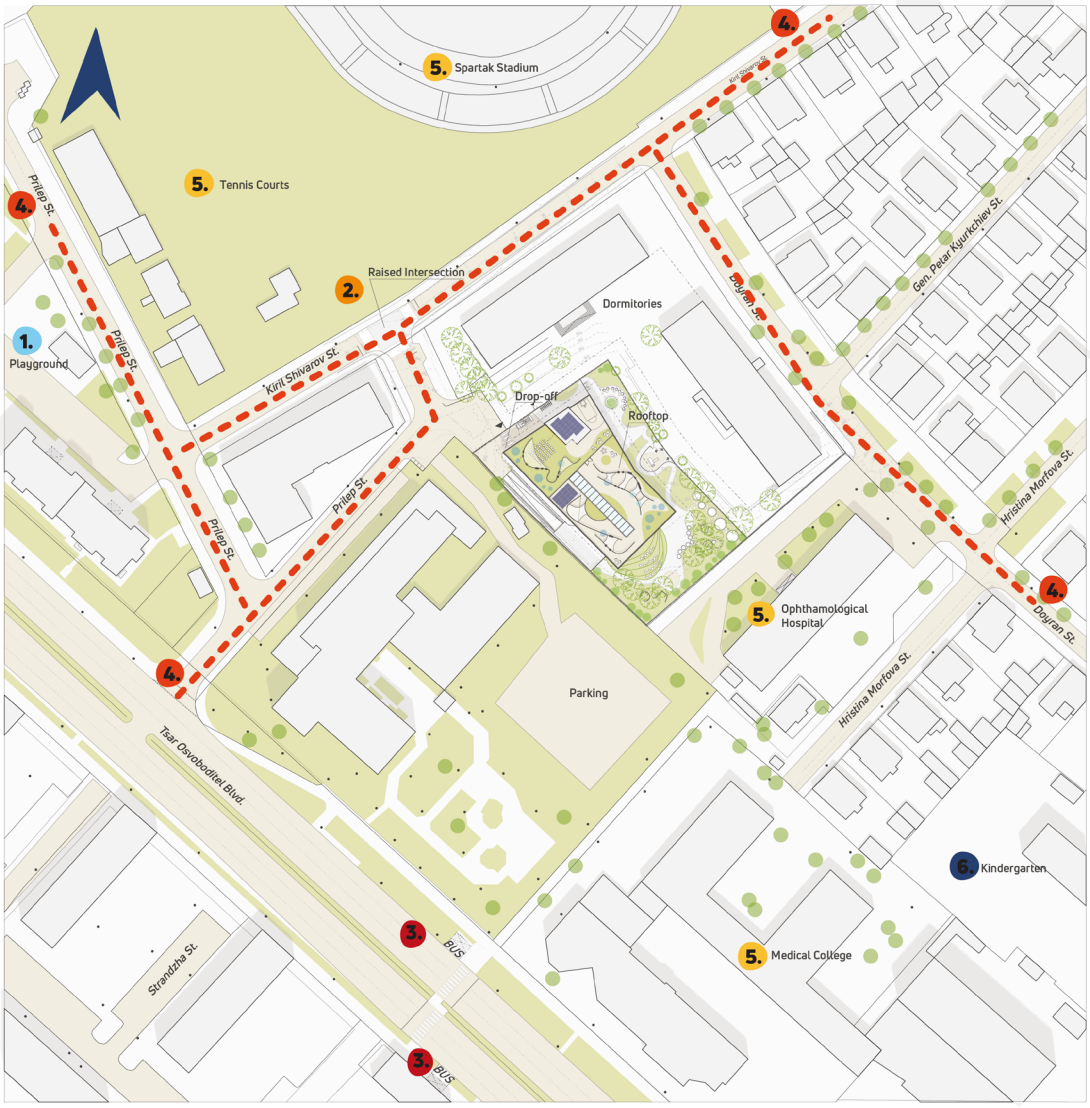
green areas on ground floor: 685 m²

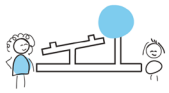
green areas on roof terraces: 246 m² *

*green roof layer is 40 cm: the total area is multiplied by a coefficient of 0,8

Street access

To improve the urban environment quality and the accessibility around Karin dom the competition project proposes a raised intersection on the corner of Kiril Shivarov St. and the extension of Prilep St. in front of the competition plot area for safe street crossing. It is recommended to include lowering the vehicle speed to 20 km/h as a traffic-calming measure in the area. For enhancing the walkability towards the nearby local services and public transit stops the project also suggests widening the western sidewalk from 2 m to 4 m and remaining two car lanes per 3.5 m. The area in front of the building is designed to function as shared space with the aim to provide accessibility for all ages and abilities.





1. Playground
Nearby publicly available play facilities

2. Proposal: raised intersection and a wider sidewalk
Safe, equitable and comfortable sidewalks and crossings.
Accessibility for all ages and abilities.

3. Bus stops
Access to public transit within 300 m.
Second bus stop within 400 m

4.Proposal: vehicle speed 20km/h
Traffic-calming measure for lower vehicle speed.

5. Access to a variety of services nearby
Close to various functions such as medical ca

6. 12th Kindergarten "Yan Bibiyan"
Opportunities for local community involvement, partnerships and social inclusior

Karin dom's requirements:

1.1. Accessibility

- The whole building is fully accessible by wheelchairs and people with limited mobility.
- Accessible broad circulation routes at least 2-meters wide to allow not only wheelchairs to maneuver freely, but also to temporarily store mobility equipment that would otherwise block passage.
- The layout is easy to grasp visually and allows easy orientation.

1.2. Safety and security

- Limited access for external users of the building by zones (ex. Training Center on separate floor and its user flow does not mix with Karin dom's other functions).
- Fences ensure no unauthorised access to the yard in the south of the plot
- Clear sight lines for passive supervision within the building - transparent segments of partition walls and railings

1.3. Sustainability

- **Social:** having a positive relationship with the wider community by restoring at least part of yard to the students from the adjacent dormitories - independent access to rooftop with open-air cinema and street basket court. Also, the building allows access to evening and weekend classes and workshops, water therapy and events for the wider community
- Economic: the higher cost of meeting the needs of children with SEN and disabilities are balanced by a new business model, where parts of the building are rented out and used by third parties in off-hours and on weekends, still without having access to Karin dom's primary premises
- Environmental: maximal use of daylight through skylights, natural ventilation through atrium and staircase (chimney effect), production of renewable energy, collection of rainwater for irrigation, minimise need for air-conditioning through window louvers, minimise north-exposed walls and windows

1.4. Flexibility and adaptability

- Service core and structure position is not central and allows spatial reorganisation
- Use of moveable partition walls that allow readjustment of layout in time;
- Locally-adjustable lighting and HVAC to allow for different needs

1.5. Health and comfort

- Access to outdoor fresh air because of quick yard connection
- Natural light to positively affect the psychological and physical wellbeing
- Greenery outside and in the interior (trees in pods) to provide fresh oxygen
- Sensory walls to calm the eyes and enable
- Ability to control temperature levels locally
- Use of building and finishing materials low in volatile organic compounds (VOC)

1.6. Sensory awareness

- Minimised need to use artificial lighting, because of atrium, skylights, terraces and large windows
- Minimised glare from outside by facade louvers
- Use of acoustic ceiling throughout the building to ensure appropriate sound level
- Sensory walls with greenery and other textures to help wayfinding
- Soft colors and neutral-color finishes to provide a calm environment, as well as more active zones
- Internal staircase to develop skills for climbing and descending

2. Sustainability:

The proposed design qualifies for **Silver LEED certificate**, as well as EDGE Green Building Certification System, which is a more recent and more flexible certification system, if the Principal chooses to go with that instead.

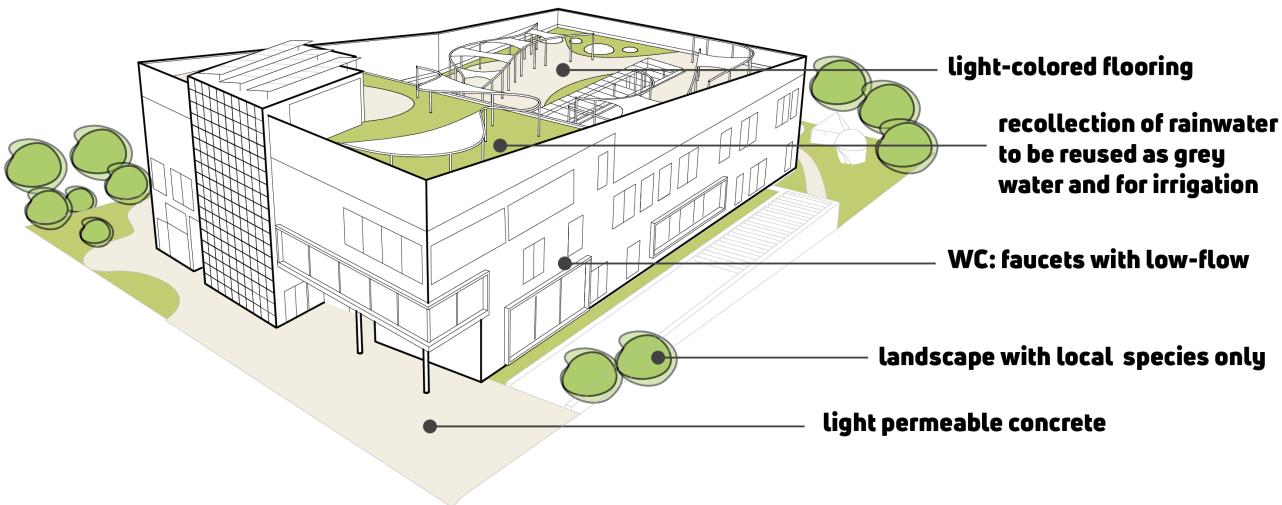
According to LEED standard, the building is in the category "New Construction" where it would be awarded the following credits:

- Use of **integrative process** in early design decisions to stimulate the Principal and achieve synergy between design goals and environmental impact

Location and transportation:

- The new building is close to various publicly available diverse uses and functions (ex. stadium)
- Accessible public transit stops are located within 400 m walkable distance from the main entrance of the building.
- 8 bike racks for all users within close distance from the main entry and bicycle facilities such as bicycle storage and shower room for the staff.
- 2 electric charging stations for green vehicles, 1 in front of the building and 1 in the underground
- 2 parking lots for people with disabilities in the underground

Water efficiency:



- collection of rainwater to be reused as grey water and irrigation
- use of low-flow WC faucets
- landscaping with local species only
- use of use of permeable concrete to allow water drainage
- use of light-colored outdoor flooring finishes around the building and on rooftops

Energy and atmosphere:

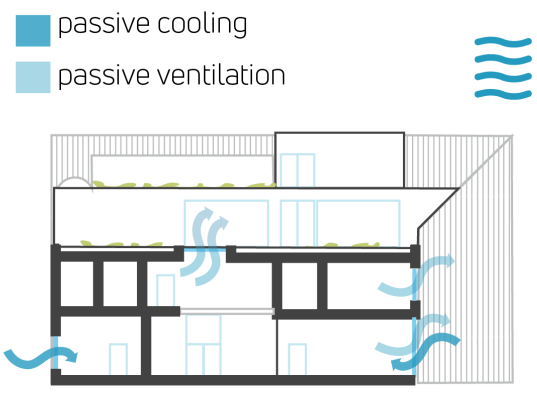
- commission a thorough energy model of the building by an expert consultant
- 5% of total energy consumption is from renewable sources (solar panels)
- LED lights on dimmer for minimal energy consumption
- use of electric meters with integrated BMS system

Materials and resources:

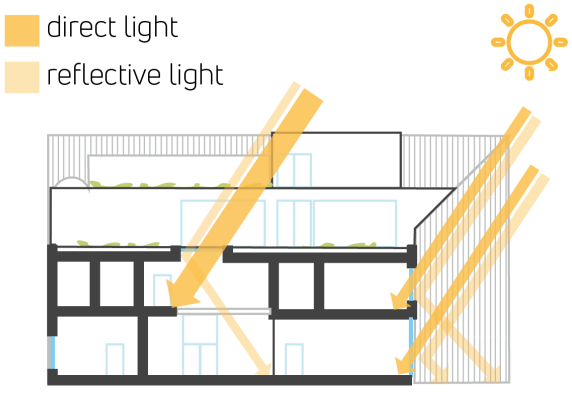
- BDP optimisation: materials with a stated low-carbon footprint integrated in the building
- Use of at least 20 building materials from 5 producers with an environmental product declaration
- Waste from building recycled in 5-way streams with bins on every floor
- Maximum use of locally produced materials

Indoor environmental quality:

- Use of low-VOC (volatile organic compounds) materials
- Combination of natural and mechanical ventilation
- Heat recuperation
- Model and strategy for indoor air quality management plan
- Installation of indoor-air-quality monitors
- Locally controllable HVAC system integrated with BMS for maximum efficiency
- Dimmable interior lighting with combination with movement detection
- Maximum daylight use through skylights, atrium, and louvered windows
- High acoustic performance of common spaces and rooms: acoustic ceilings



openable skylights and windows ensure natural ventilation
oak timber cladding that protects the facade from overheating, ensures facade ventilation and cooling



maximum daylight use through:

skylights, atrium, louvered windows

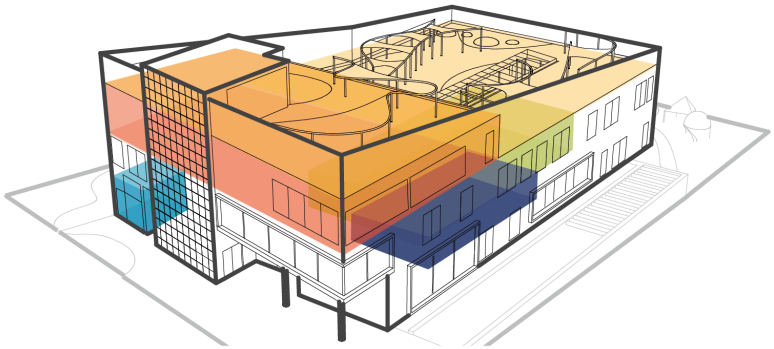
Innovation:

- Consultation with LEED-accredited professional throughout the design and construction process
- Establish sustainable practices in Karin dom: use of ecological cleaning products

Overall design:

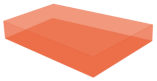
- facade timber cladding offers shield from the overheating during summer, and helps keep the temperature stable inside during winter
- maximal use of dayligh trough skylights
- natural ventilation through atrium and staircase (chimney effect)
- minimise need for air-conditioning through window louvers
- minimise north-exposed walls and windows
- building opens-up facade to the south

3. Feasibility:

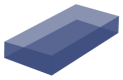


spaces with independent access to be rented out to third parties:

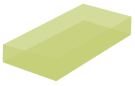
Rooftop playspaces, basketball playground and open-air cinema



Training center + cafe and coktail area



Hydrotherapy Center



Montessori Center

Medical Center

It is possible to have a layout that would manage to fit the whole functional program into 2400 square meters. We have tested this case and it resulted in a low-quality space with tight dark corridors, providing no invitation to feel welcome, socialise with others and give the building a higher added design and experience value.

The brief, by requiring only 406 sq.m. circulation area, has grossly underestimated the fact that people with disabilities and particularly SEN children require more than the usual percentage of circulation and socialisation space for public buildings, as mentioned in the Building bulletin for design for children with SEN. The requirement for several separate entrances places additional weight on the need for circulation area.

Therefore, despite the fact that the proposed building design exceeds the required area of 2400 square meters, it offers higher-quality space to its occupants, but mostly - it allows for a sustainable business model that will ensure the long-term financial stability of Karin dom, by independently renting-out parts of the building (the Training Center, the Medical Center, the Montessori center, the Hydrotherapy unit, the rooftop terrace).

Approximate value for implementation of the competition project:
1 872 600 euro (excl. VAT)

The approximate value is based on the rough estimate of 600 euro per square meter (excl. VAT). The price can be adjusted based on the selection of materials and building systems.

Also, some of the gross floor area can be reduced further by eliminating access to topmost rooftop and tightening corridors, both of which the authors of the design do not recommend.

The extra budget will be compensated by renting out spaces and/or entire floors.

4. Exterior and fit in with the surroundings:

- The design deliberately proposes a **lower building** to fit better with the scale and distance to existing buildings around it. This plot is currently the yard of the adjacent high-school dormitories and was never intended as a building site, so the new design needs **to respect that legacy.**
- The building's architectural style is harmonious with the existing silhouette line but at the same time invokes a modern image of a brand new building artefact.
- The feeling of the exterior reminds of **childrens' building blocks** through the use of diversely-sized volumes that break away from the main volume, or have been taken out and have left a colorful dent inside. The timber cladding is at times transparent (near the roof and windows), creating curiosity about what happens in these places.
- Orientation with **maximum opening to the south** of green yard, green amphitheater and terraces.
- The **careful use of colors** in the exterior communicates visually that the primary users are

children, without using overly simplistic childlike forms.

- **Preservation of the biggest existing trees** at the southeast corner and their integration as shade for outdoor activities (ex. The storytelling corner under the trees).
- **Use of natural materials** - oak timber cladding that protects the facade from overheating, ensures facade ventilation, and does not require maintenance because of its specific weathering properties and resistance to microorganisms. The colorful dents are finished with mineral facade paint.
- Balances out the green area that it destroys by **offering it back on its roof,** in combination with urban furniture for socialisation, rest, active play.

5. Design

The interior design is characterised by the internal sunny green "street" that cuts through the building horizontally and vertically. It aims to create a spacious, naturally lit environment, which at the same time offers child-friendly spaces for hiding, playing and observation.

- Sensory tactile walls and niches are placed throughout the layout to stimulate curiosity as well as learning, sharing and socialising through sensory play.
- Children-scaled invitations: the wooden houses with colorful windows are perceived from the very entrance through the atrium void; their function is to attract the children to explore.
- The building offers several "hidden" play corners with soft surfaces and appropriate toys/ stimuli.
- The interior staircase stimulates children to try and climb or descend it, even if it is very difficult for them. Underneath, a hidden gem awaits the children - a hiding place with toys which is still visible to adults.
- Greenery is celebrated throughout the interior, especially by introducing trees planted in pots, close to the terrace on the ground floor. Also some of the sensory walls contain

plants to emphasize even more the connection with nature.

Aim of interior materials's choice is to bring more natural texture and feeling, as well as light palette without strong colors, only small colorful accents.

- Timber partition walls and doors, as well as flooring for interior staircase
- Extensive use of glass walls to provide visual connection to interior spaces as well as natural light
- Use of interior curtains to control visibility inside rooms; they also give a homelike feeling to the spaces
- Floor carpeting (public-space grade) to minimise noise and enhance tactile feeling
- Acoustic ceiling with irregular patterns in light natural color
- Dispersed lighting fixtures integrated in ceiling
- Hanging lighting fixtures inside atrium void to emphasize vertical space and fairytale-like feeling
- Small colorful surfaces to emphasize childlike feeling and spaces
- Moveable timber furniture with soft surfaces in natural colors.

Karin dom's new visual identity is a light and spacious space, harmoniously lit, with great acoustics throughout the building, that also offers small colorful treats for the children and their parents.

"More Able Not Less Disabled"

Christopher N. Henry