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# Architectural Design Guidelines for Early Childhood Education

## Acknowledgements

These guidelines were prepared by Jure Kotnik, (Architect, CEB Consultant) under the supervision of Yael Duthilleul, Technical Advisor at the Directorate for Technical Assessment and Monitoring (TAM) at the Council of Europe Development Bank (CEB).

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# Foreword

Ensuring inclusive and quality education is one of the 17 Sustainable Development Goals (SDGs) that countries have agreed to achieve by 2030. Among the targets identified to monitor the achievement of this goal, the need to build and upgrade education facilities that are *child, disability and gender sensitive and provide safe, nonviolent, inclusive and effective learning environments for all* is specifically mentioned.

The challenge facing countries today is not just to build more schools, but to ensure that the physical space contributes to better student learning outcomes and well-being and at the same time supports a more efficient use of education resources. With learning outcomes at the focus of the international policy debate on education today, new research addressing what makes a learning environment effective is developing.

These *Architectural Design Guidelines for Early Childhood Education* provide a tool for education officials, architects and engineers involved in the design and construction of education facilities to imagine new learning environments for young children. They were developed to support the implementation of one of the projects financed by the Council of Europe Development Bank (CEB). With around €7 billion of investments in education since its establishment over sixty years ago, the CEB has accompanied many of its member countries in their efforts to improve and expand education facilities by strengthening local capacity and fostering the exchange of knowledge and experiences.

We hope these guidelines can help other countries create learning environments that meet the needs of young children in an effective and sustainable manner.

**Monica Brezzi**
Director
Technical Assessment and Monitoring Department

# Introduction

These *Architectural Design Guidelines for Early Childhood Education* aim at supporting education officials, architects and engineers involved in the plan, design, construction and evaluation of early childhood education facilities to create high quality educational spaces. The principles and examples presented apply a flexible and open approach to design, support a more efficient use of the space and promote a learning environment that encourages young children's cognitive, social and physical development while ensuring their health and safety.

Originally these guidelines were developed as a technical input to support the preparation and implementation of a CEB financed project in one of our member countries. The project aimed at improving access to quality preschool infrastructure by financing the construction of new education facilities throughout the country. The Government saw the loan as an opportunity to develop a new way to conceive and make use of the space to promote children's well-being and development and better reflect international trends. Existing kindergartens tended to have complex geometrical forms, were a succession of closed rooms without proper lighting along wide corridors without direct access to playgrounds and with toilets closed and separated from the classroom, usually not adapted to children's age and size. There were single rooms for sports, arts and drama separated from the classroom, playgrounds usually lacked shaded areas and were equipped with basic plastic slides, metal structures and swings. The existing normative framework guiding the construction of kindergartens and the existing urban plans imposed certain constraints in terms of surface requirements. The challenge was to work within the existing normative but with a different approach.

After several exchanges with officials and local architects and training sessions delivered, the guidelines evolved into its present form. They have proved to be a valuable tool to discuss architectural principles, develop local capacity and inspire new constructions. We believe they can be of use to other countries facing similar challenges and be a starting block in the process to develop a new vision for early childhood education infrastructure. These guidelines reflect a vision of learning that sees children as active actors of their own development and growth. In order for the new spaces to be useful contributors to learning, teachers should be equipped with the necessary environmental competencies to make an effective use of the new learning environment.

We are very happy to make this tool available today to the wider public.

**Yael Duthilleul**
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Architect

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# ARCHITECTURAL DESIGN GUIDELINESS FOR EARLY CHILDHOOD EDUCATION

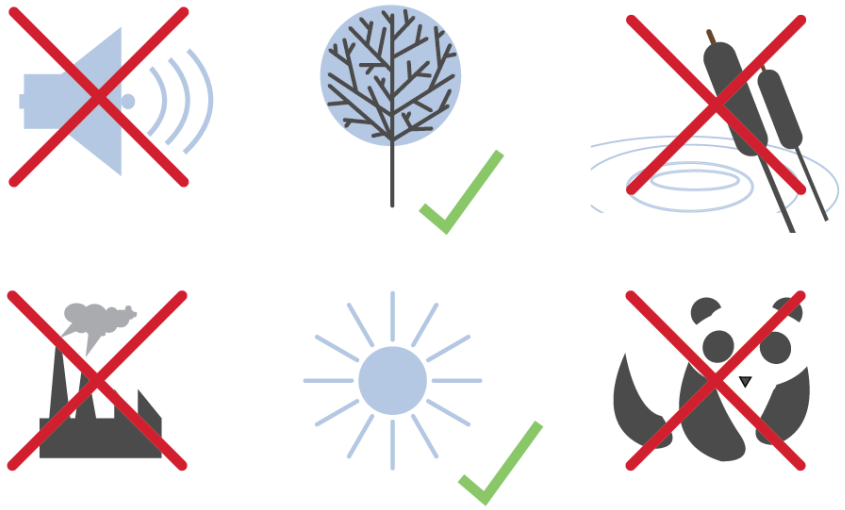
Increasingly, around the world, early childhood education programs are based on a view of the child as a key actor of its own development through his and her interactions with other children, adults, objects and events and of teachers and caretakers as playing a key role in the process by fostering interactions and structuring activities. The characteristics of the physical space where these interactions and explorations take place are also fundamental to facilitate experiences. Research is beginning to share light on the critical aspects that make a difference in learning outcomes.

These guidelines propose a new approach for the design and construction of early childhood education spaces. They encourage the flexibility of the interior design to benefit children's creativity, cognitive and socioemotional development, foster interactions among children and facilitate the arrangement of the space to serve multiple objectives. They conceive the outdoor space as an integral part of the learning space that also needs to be adequately conceived to foster quality outdoor play and provide a stimulating environment. They promote innovation and efficiency in the design and construction while at the same time supporting children's well-being and development, health and safety. Innovation is promoted by the creation of new and diverse spaces to play and learn while efficiency is supported by a better and more flexible use of the space.

The guidelines are organised as follows: Section 1 presents a set of building design principles to keep in mind when designing early childhood education areas. Section 2 provides guidance on how to organise the interior space most effectively. Section 3 presents common design misconceptions that impact costs and functionality. Section 4 focuses on the design of outdoor playgrounds and Section 5 provides some general recommendations on the choice of playground materials and on ensuring safety. The Annex includes an analysis of strength and weaknesses observed in nine different shape and size early childhood education facilities, which can be used for training purposes.

# 1. BUILDING DESIGN PRINCIPLES

## 1.1. Location Selection Criteria



A plot is suitable to build an education facility for the early years if it meets the following criteria:

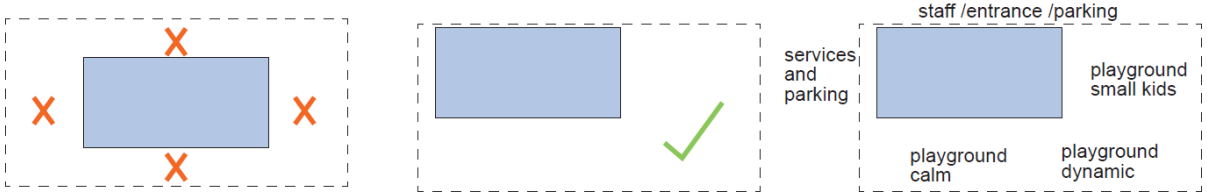
- It is in a quiet zone, away from noise, dust, smoke, industries or major roads
- It is preferably in a green spot, allowing for the use of green spaces as much as possible
- It offers plenty of sunshine, is sheltered from high winds but ventilated at the same time
- Is not foggy or moist and is not situated in wetlands or floodplains
- It is not the natural habitat of endangered animal species or protected vegetation
- It is within easy access to transportation and services to avoid unreasonable costs
- It is a flat terrain or with a minimal southward slope

## 1.2. Plot Organisation Principle

The shape of the plot and its surrounding area have an impact on the choice of the building typology which will then impact the organisation of all other elements (interior design, playground, staff and parking areas). It is most likely that new plots, unless in dense urban areas, will offer sufficient space to conceive various building typologies (linear, compact, round, orthogonal).

In most cases it is advised to build the early childhood education centre closer to the edge of the plot in order to make a more efficient use of the land available. Central positioning of the building on the plot is not advisable as it takes away an important share of the area that can be used for playground.

Building positioning scheme




The education building should be placed in a way that all its functional areas (playground, entrance and services areas) can function properly without collisions.

Playrooms should be positioned to profit from a maximum amount of daylight, while at the same time the building has to foresee the need for proper shading. Playrooms should not face northward unless such an orientation offers special value, such as a nice view, peacefulness or similar.

## 1.3. Construction Principles

Frame construction systems are the most flexible types of construction as they can form big open spaces (that can later be closed if needed) at low cost. The materials used can vary from concrete, timber to steel. Spaces can be closed freely. Pillars can later be used as didactical elements.



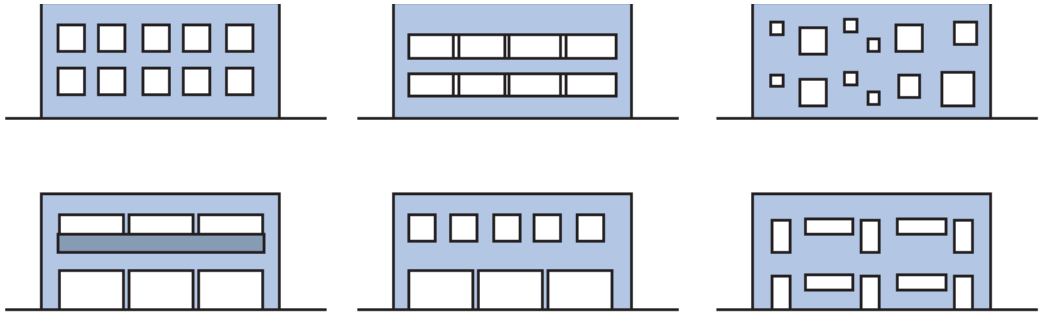
Construction system can affect the functionality of the building
© Elzendaalarchitectuur



## 1.4. Façade / Windows Design Principle

Window design should enable children to have a good visual connection with the surrounding environment (e.g. nature, playground). This means that the windows should preferably have no parapet wall. In case they do, it can be used as a bench for sitting. Also a dispersed window concept is possible, with some windows at the children's level and some above their height level. Within the same plan, several façade concepts are possible such as symmetric composition, linear, dispersed or combined. Rational use of window elements does not need to translate into monotony of design.

Same building - different façade variations creating visual diversity



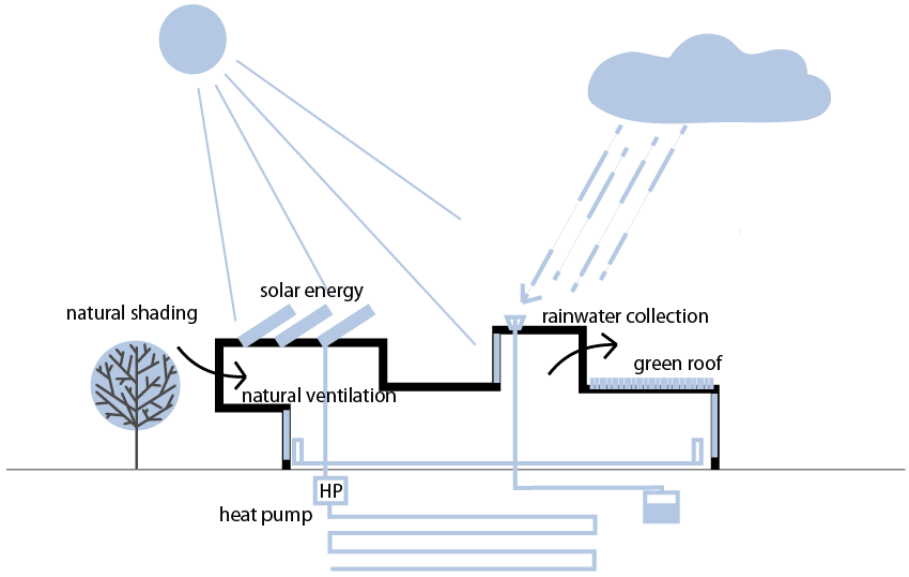


Solar panels on the roof © Cebra

## 1.5. Sustainable Energy Concept Principle

Designs should promote quality materials and elements that reduce energy loss. This means that the building itself should be designed in a sustainable way by using good isolation, quality multi-layer windows, heat pumps, and solar energy features.

Elements of sustainable energy can also have educational value and introduce children to ecological processes such as recycling, principles of solar energy, the importance of careful use of resources (electricity, water) and similar.



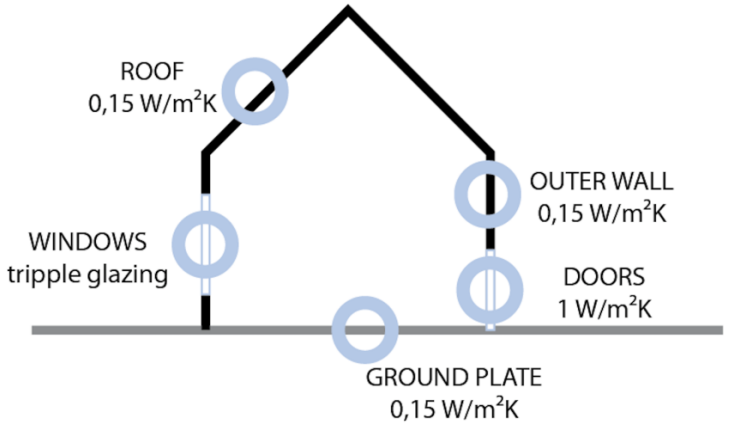

Elements of sustainable design

The construction of education buildings is becoming increasingly sustainable and eco-friendly by promoting:

- the use of natural and eco-friendly materials, especially wood (timber);
- access to green surfaces and trees, as they filter the summer sunlight when in bloom and reduce the need for air conditioning as well as allowing the sun's rays through in the winter;
- clever window openings to provide ample daylight, reducing the need for artificial lighting and thus saving energy and ensuring proper ventilation;
- the use of solar energy and heat pumps in connection with the earth's warmth, and similar alternative energy sources to keep the building warm and to heat water;
- the collection and use of rainwater for toilets, irrigation, etc.

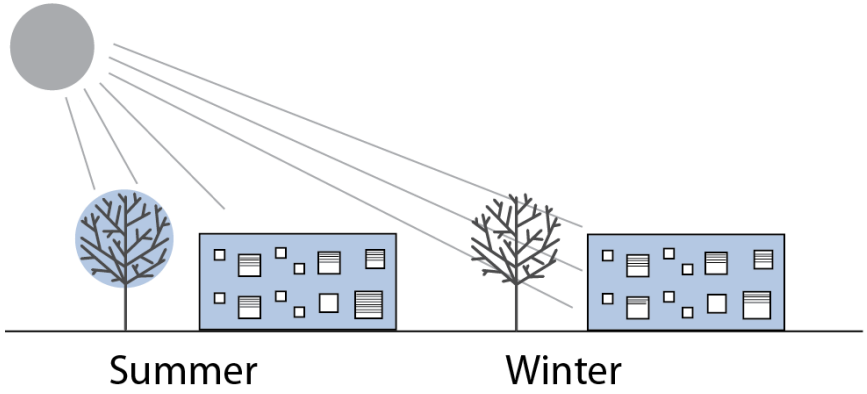
Simple design details can prevent heat losses and, if the building is well isolated, result in lower energy consumption. Different countries prescribe different values for passive or low-energy buildings.

Minimum required standards based on class B2 EU standards are presented below.




Orientation values for the building that would lead to target consumption of 35 kWh/m² in Central Europe (B2 EU standards)

Proper shading can regulate the temperature inside the building and help with natural ventilation. Shading can be mechanical or natural, relying on the use of trees according to the seasons.




External shades are the most efficient heat and light regulators.
Trees can also reduce the heat in the summer and allow sun in the winter

## 1.6. Active Learning Environment Principles

Promoting children's interaction and active transformation of certain aspects of the physical space and learning environment can be achieved by integrating certain building elements such as black boards and magnets to its design. These interactions that promote a transformation of the physical space contribute to promoting children's sense of ownership of the space, leaving a trace of their individuality and foster their capacity to impact the environment while at the same time developing their physical, social and cognitive skills.



Besides drawing, playing, climbing etc., active façades allow for direct interaction of children with the building

## 1.7. Accessibility for Children with Disabilities Principle

The design of new education facilities should take into consideration children with disabilities. This applies especially to dimensioning elements such as doors and distances among various elements of furniture and equipment. The building needs to be designed to be handicapped friendly, with the access/entrance suitable for a wheelchair. If the building is two stores-high, an elevator needs to be included.






Inclusive playground games and access ramps
Up: © Courtesy DM - Right: © Bloom blog

## 1.8. Minimal Material Selection Principle

Reducing the number of materials to be used means less subcontractors. Buildings designed with fewer materials overall tend to be more rational in their design, yet do not necessarily lack architectural expression, as architects can use different colours or shapes within the same material to create variations of the façade. The same element in different positions, orientation or colour can contribute to the architectural design of the building and its attractiveness.



Kindergarten using one type of window openings and one material in different colours to create colourful identity of the building © Cebra

Full printed version can be obtained by contacting:
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# Bibliography


- Kotnik, Jure (2011), *New Kindergarten Architecture*, Links International, Barcelona
- Kotnik, Jure (2014), *Preschool Interior Design Guide for Architects and Educators*, World Bank Document, Washington DC
- Kotnik, Jure (2018), *Designing Spaces for Early Childhood Development: Sparking Learning & Creativity*, Images, Melbourne.
- Shmis, Tigran, Kotnik, Jure, Ustinova, Maria (August 25, 2014), *Creating New Learning Environments: Challenges for Early Childhood Development Architecture and Pedagogy in Russia*, Early Childhood Care and Education International Conference, Volume 146, pp 40–46, http://www.sciencedirect.com/science/article/pii/S1877042814047387?np
- http://maker.good.is/myla2050/projects/KidsPlayatPS.html
- http://www.wehrfritz.de
- http://www.lappset.fi


# Photos and schemes

All schemes and photos by Jure Kotnik unless stated otherwise.
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