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Diplomarbeit

# KinderGarten(ING)

ausgeführt zum Zwecke der Erlangung des akademischen Grades einer Diplom-Ingenieurin

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Wien, am .....



CONTENTS; OI :: PREAMBLE O2 :: AIM O3 :: METHODOLOGY O4 :: ANALYSIS O5 :: DESIGN AND STRUCTURE O6 :: VISUALIZATIONS O7 :: CONCLUSION 08 :: ANNEX







## 1.1 INTRODUCTION / ABSTRACT

Diese Diplomarbeit beschäftigt sich mit dem Entwurf eines neuen Kindergartens in London, basierend auf dem Raumprogramm des im November 2015 von AWR-Award ausgelobten internationalen Ideenwettbewerbs als Grundlage für die weitere Entwurfsausarbeitung.

Inspiriert durch freie Formen und Strukturen und das Kind als Träger der Energie und Kreativität, soll durch die entwickelte organische Form ein unverwechselbarer Kindergarten entstehen, der dem Kind ein freies Spielen und Erforschung des Gebäudes ermöglicht.

Ein architektonischer Schwerpunkt ist die Fassade, die aus mehreren Schichten besteht. Äußeren Jalousien, die Fassade selbst und ein Sicherheitsnetz im Innenraum bilden die Fassadenschichten. Zwischen diese Schichten befinden sich Spielflächen, die unterschiedlichen Aktivitäten und Bewegungen anbieten. Die Flexibilität der Glasfassade ermöglicht einen leichten Zugriff zum geschützten Grünbereich im Freien. Das Entwurfsgrundstück befindet sich in Greenwich, im Osten der Stadt London, in unmittelbarer Nähe des bekannten Trinity Laban Conservatoire of Music and Dance, das Royal Observatory Greenwich und Greenwich Park - also ein optimaler Ausgangspunkt um Natur, Wissen und Bewegung, funktional und thematisch miteinander zu verknüpfen. Die Bahnstation "Greenwich" verbindet das Grundstück mit dem naheliegenden Stadtzentrum und bietet somit einen leichten Zugang nicht nur mit Auto, sondern auch mit den öffentlichen Verkehrsmitteln.

Bei meinem Projekt "Kindergarten(ing)" war es mir wichtig einen lebendigen, interessanten und vielfältigen Kindergarten zu entwerfen, der eine Bewegung und Spielplatz trotz der Wetterbedingungen den Kindern anbietet. Ein Kindergarten soll Kreativität und Wissbegierde fördern, aber auch einen qualitativen Raum zum Forschen und Experimentieren zur Verfügung stellen. So wird ein nettes Erlebnis nicht nur für die Kinder, sondern auch für die Lehrer sichergestellt. This diploma thesis investigates the design of a new kindergarten in London, using the international ideas competition, runed by AWR-Award in November 2015 and the functional brief as a basis for further development.

Inspired by free geometries and the child as a source of energy and creativity, the building's design results in an organic shape and enables the children to play and explore the building, while learning.

Architectural priority is given to the facade, which consists of several layers, distinguished through sun shades, the facade itself and a secured net surface. In between those layers, play scape structures are positioned, offering different type of physical activity and movement. The flexibility of the glass facade enables easy access to a secured open green area. The proposed site is located in a London Greenwich district area, east of the city center, which is bordering on the grounds of the well-known London Trinity Laban Conservatoire of Music and Dance, the Royal Observatory Greenwich and the Greenwich Park, suggesting itself to become a focus point to interlink nature, knowledge and movement spatially, functionally and thematically. The Greenwich rail station connects the site with the close-by city center, making the new kindergarten campus easily accessible, not only by car, but also with a public transportation. 9

The "Kindergarten(ing)" project focuses on creating a vivid and diverse place of interest and play, a nursery school that does not restrict a child's movement depending on a meteorological conditions, but encourages exploring and curiosity, that offers a high quality space to study and experiment, and makes spending time in a kindergarten facility a nice and fun experience not only for toddlers, but for their teachers as well.

## AWR Competitions

Architectural Workshop in Rome

LONDON NURSERY SCHOOL INTERNATIONAL IDEAS COMPETITION

http://www.awrcompetitions.com/competition/31/ london-nursery-school

## COMPETITION BRIEF

## "London Nursery School"

... is an international ideas competition for a new nursery school in London announced in november 2015 by AWR-Award. Architecture, engineering and design students or neo-graduates and professionals from all over the world have been invited to design a new kind of kindergarten design encourages kids to be their silly selves, to provide a grounding for the child to start school, offering a range of structured educational experiences based on learning through play.

"Each child in England at the first school term after their third birthday, is entitled to 15 hours per week free childcare funding. Nursery schools and classes staffed by teachers and assistants, provide a non-compulsory phase of education suitable for children in the year before they immediately go to primary schools. They are sometimes attached to a primary school. Both types intend to provide a grounding for the child to start school, offering a range of structured educational experiences based on learning through play. A new kind of kindergarten design encourages kids to be their silly selves. What does a school do with 4- and 5-year-old kids? How should be the nursery of the future? How children should spend their days in these structures?"



## HARDF

SITE AREA: 6.840 m2 BULDING FOOTPRINT: max. 1.500 m2 Building must have only one level FOILETS + CIRCULATION = 30% of Building GFA STAFF PARKING: 15 car park BUILDING MAX HEIGHT: 5 m



2.1 :: AIM OF THE MASTER THESIS 2.2 :: HOW TO MAKE A CHILD HEALTHY? 2.3 :: HOW TO MAKE A CHILD HAPPY? 2.4 :: WHAT SHOULD A CHILD LEARN?

KinderGarten(ING)

2.1 AIM OF THE MASTER THESIS

## IDEA OF THE AUTHOR

The main aim of this master thesis is to create a safe, creative and inspiring space for children, allowing them to grow happy and healthy. While learning through play, the child will be able to memorize more information, without getting bored. Learning experience will be percieved in a more positive way, without causing stress or frustration.

In addition to the spatial program, provided for the competition, a space for pets was added. Taking care of animals will teach the child to take responsibility, improve social skills and build confidence. Having a private fruit and vegetable garden will create a perfect opportunity for the little ones to learn the process of growing own food and value it. Last but not least, fruits and vegetables grown on site will be more healthy.



## 2,2 HOW TO MAKE A CHILD HEALTHY?



#### Good food

Mind and body of a child are developing and growing very fast. In order to boost child's immune system and allow their body and mind to develop properly, a healthy and well balanced diet is necessary. Teaching a child from early age about nutrition is crucial for establishing a healthy habits in their adulthood.

#### Fresh air

Not only nutrition, but also fresh air and outdoor activities improve child's health. Impurities such as dust, exhaust gases, etc., are part of each city, therefore spending time outdoors helps to clear the lungs. Activities in nature will also teach children to appreciate the environment.

### Having fun

Participating in activities, which are fun for the child, develop their imagination, improve their mood and create a sense of security and acceptance. This is also crucial for a good mental health. In a friendly and creative atmosphere children will grow friendly, open and curious about the surrounding world.



Image 2.3



Image 2.4





## 2.3 HOW TO MAKE A CHILD HAPPY?

## Playing

Playing with toys and other kids, helps for developing a good imagination and boosts the creativity. In this process a child learns to develop a good relationship with others and improves their emotional and social intelligence.

#### Pets

Having and taking care of pets teaches the children to take responsibility of other living creatures. It also helps for creating a good social and communication skills. Having a pet improves child's self-esteem and minimizes stress levels.

### Creativity

Showing creativity in everyday tasks, improves child's imagination and self image. It also teaches the child that many different options and solutions are possible in a task and it enhances the "outside the box" way of thinking.







Image 2.8



## 2.3 WHAT SHOULD A CHILD LEARN?

#### HEALTHY CHILDHOOD = RESPONSIBLE AND SELF AWARE ADULTS

In kindergarten a child experiences and learns about the world mostly through play. Therefore a kindergarten is not only a building, but a place where the kid develops for a very first time an attitude towards the learning process and the environment outside the safe family circle. Since this is the first "foreign" place a child experiences and this separation from the mother figure could cause stress, it is important to create a safe, friendly and creative atmosphere, where the child will feel accepted and motivated to express and improve it's talents and ideas.

At the age of 3 to 5 years, a child should learn how to be more independent, to communicate and create healthy relationships with other children and adults and to respect them. Social and communication skills achieved at this age will create a solid basis for a healthy and responsible adulthood. In this case playing activities are crucial for developing those skills. Playscapes and other structures should be safe, should offer not only creative and logical thinking, but also movement and excercise possibilities for strenght and flexibility.

For all children is also very important to develop healthy habbits, related to nutrition, physical activity and mental development. Physical development is achieved through play and excercises. Very important are open green spaces and fresh air, which stimulate also the brain activity. Good mental development is stimulated through logical games, which also encourage creativity and team work. Reading books, telling stories, engaging children to explore their talents and achieving new skills will help them to build a healthy self-esteem and positive self-image. Another crucial point for healthy childhood is nutrition. Teaching a child to select, to choose their food, to destinguish between healthy and unhealthy food from early age will build a habit, which the child will follow also in the future. Self production of fruits, vegetables and herbs within the kindergarten premises will provide healthy, rich in vitamins and minerals food for the little ones and will also show them the all way of the food from a little seed to the table. In this way the child will learn not only about nature, but also to charish the food and the effort put in preparing it.

Another important thing to learn is taking care and responsibility for other living beings. Having pets, feeding them, nurturing and loving them will help boosting a childs emotional and social intelligence. It will also teach them compassion, tolerance and appreciation of life.







## 3.2 MATERIALS

#### **Building materials**

\*Wood Wood is used as floor and ground covering material.

## \*Cloth the hammock area.





\*Sand Sand is used as floor covering in the pet area.

\*Steel Steel is used for the construction and the outdoor and indoor playstructures.





\*Rope:

Rope is used for the outdoor and indoor playstructures as a safety net and for the hammocks.



## 3.1 IDEA DESCRIPTION

#### How was created the concept?

- \* Learning more about the site area
- \* Learning more about other existing kindergartens what are they offering and what is lacking
- \* Reading and learning more about child development psychology
- \* Involving psychology in architectural design
- \* Identifying and satisfying child's needs, parent's expectations and teacher's necessities
- \* Establishing important points, which should be considered in the design process for this diplomthesis were importaant aspects, such as indoor and outdoor playstructures, creative furnishing elements to encourage child's creativity, fruits, vegetables and herbs garden, pet area,
- \* Integrating those important points and aspects into the design

#### During the design process

- \* Analysis of the development area
- \* Research about similar projects and designs in internet and architectural books about educational spaces
- \* Form finding through 3D models in Rhino and hand drawings
- \* Creating graphs in Photoshop
- \* Creating 2D plans, sections and elevations in AutoCad
- \* Creating 3D models in Rhino
- \* Creating visualizations in Rhino, using V-ray and Photoshop
- \* Creating and experimenting with furnishing elements, using Rhino
- \* Editing photos, graphs and maps in Photoshop
- \* Creating physical models

Cloth is used for the shading in

\*Plastic Plastic is used for the outdoor and indoor playstructures.



\*Rubber Rubber is used for outdoor playarea coverings.







4.1 :: URBAN AREA 4.2 :: SITE AREA 4.3 :: FUNCTIONAL PROGRAM

4 :: ANALY515

Fig. 4.2

## 4,1 URBAN AREA \*LONDON, UNITED KINGDOM

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### General data:

#### . 1 rea - 8382 km2

Population - 1624 people/km2 Climate - oceanic; mild generally warm summers; cool, claudy and dump winters

#### \*GREENWICH DISTRICT

GREENWICH

### General data:

Area - 47.35 km2 Population - 165,413 Added to list for World heritage sites

#### \*LOCATION AND MAIN ATTRACTIONS



\*NURSERIES AND KINDERGARTENS NEARBY



Fig. 4.3





4 :: ANALY515

KinderGarten(ING)

Suggested spatial distribution from

the author of this thesis:

## 4.3 FUNCTIONAL PROGRAM

Suggested spatial distribution in the competition brief:





entrance, cloakroom, waiting area, office,

play structures, green roof, indoor garden, vegetable garden, outdoor sleep/play area, pets area, public green area, 15 parking lots 39





Really important aspect for creating the spatial relationships was the easy access to the common and nursery area from the teachers' spaces. Another important aspect is easy access to open areas. Almost all spaces have access to green areas. Spatial relationships are strongly influencing the building's shape





## 5,1 CONCEPT / FORM FIDING

#### 1. Learn how to take care of plants; self production within the kindergarten premises









5. Creating indoor and outdoor play areas will allow children to play and have fun despite the weather



## Concept

After clarifying the spatial relationships, another thing that influenced the design of the building was child's perception of shapes and forms. Curved and more organic shapes are percieved like more natural and calming from toddlers' mind. Free form shapes are considered funnier and awaken the imagination.

The shape was firstly created by organizing basic circles according to the spatial relationships, afterwards the shapes were connected, building the shape of a flower.







KinderGarten(ING)

5 .: DESIGN AND STRUCTURE

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5.2 SITE PLAN

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#### Legend:

1. Foyer - 35 m²

2. WC adults - 9.5 m<sup>2</sup>

3. Principal's office - 23 m²

4. WC children - 37 m<sup>2</sup>

5. Changing room staff - 15.5 m<sup>2</sup>

6. Common area staff - 30 m²

7. Utility room - 16 m²

8. Doctor's office - 29.5 m<sup>2</sup>

9. Laundry room - 18 m²

10. Changing room children - 21.5 m²

11. Garbage room - 13.5 m<sup>2</sup>

12. Storage room - 10.5 m<sup>2</sup>

13. Kitchen - 36 m²

14. Eating/Study area - 280 m²

15. Nap/Play area - 353 m²

16. Baby nursery - 103 m<sup>2</sup>

17. Hygiene room - 47 m<sup>2</sup>

18. Day care - kitchen - 12 m²

19. Day care - WC - 9m<sup>2</sup>

20. Day care - storage - 5 m<sup>2</sup>

21. Day care - 96 m<sup>2</sup>

22a. Play area - climbing net - 8.5 m<sup>2</sup> 22b. Play area - climbing net - 16.5 m<sup>2</sup>

23a. Play area - rope bridge - 10 m2

23b. Play area - rope bridge - 30 m2

23c. Play area - rope bridge - 10 m<sup>2</sup>

23d. Play area - rope bridge - 9 m²/

24. Play area - babies - 32 m²

25a. Play area - herbs garden - 35.5 m²

25b. Play area - herbs garden - 24.5 m<sup>2</sup>

26a. Play area - climb and slide - 10.5 m<sup>2</sup>/

26b. Play area - climb and slide - 22.5  $m^2$ 

27. Farm animals - 140 m²

10

28. Hammock area - 240 m²

29. Vegetable garden - 524 m²

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KinderGarten(ING)

5.5 FLOOR PLAN - FURNISHING














#### 5 :: DESIGN AND STRUCTURE



5.6 SECTIONS \*SECTION A-A





#### 5 :: DESIGN AND STRUCTURE



\*SECTION B-B





5.7 ELEVATIONS \*SOUTH-EAST VIEW

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\*NORTH-WEST VIEW

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Concrete ceiling with openings for the skylight



Detail B -Indoor green area

#### \*DETAILS CROSS-SECTION I

#### Detail A - Roof/Facade



#### Detail B - Indoor green area



#### 5 :: DESIGN AND STRUCTURE



	Begrünung
100 - 500 mm	Vegetationstragschicht
	Filtervlies
80 mm :	Dränschicht
	Trännlage
10 mm	Filtervlies
150 mm	Bitumenbahnabdichtung wurzelfest
	Wärmedämmung XPS
120 mm	Dampfsperre
250 mm	Trapezblech Aufbeton
	Konstruktion
	abgehängte Decke

Detail D - Steps/Sitting area

Sitzmöglichkeiten aus Holz an der Wärmedämmung mittels Stahlschiene befestigt.



Detail E - Floor/Facade



Detail 5.6

30 mm Bodenbelag Holz 40 mm Stahlkonstruktion 100 mm Beton ..... Schotter

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Detail 5.5
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30 mm 🗄	Bodenbelag
80 mm	Estrich + PE Folie
120 mm :	60 mm WD XPS + 60 mm TSD
	Dampfbremse
50 mm :	Niveauausgleich Styroporbeton
300 mm :	Beton
•	Schotter

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### \*CROSS-SECTION ||



# \*DETAILS CROSS-SECTION II

### Detail F - Floor/Baby area



Detail G - Roof



: zwischen Kindergarten und Tierbereich

#### Detail H - Stairs/roof

Detail I - Floor/Pet area







Metalprofil, mit Dämmung befüllt, trägt das Fensterprofil

: Schotter

KinderGarten(ING)

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5.10 FACADE DESIGN







Play B - Hanging Garden





Play C - Wintergarden

Detail 5.14

Play D - Playscape



Play E - Baby



Detail 5.15

Detail 5.16

Inner yard slide

# \*OUTDOOR PLAY AREAS

#### Outdoor sleeping/resting area

Image 5.11

Image 5.12

Sitting area next to the skylights

Pets area





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Image 5.13



Image 5.14

# 5.11 LANDSCAPE \*WINTERGARDEN







Spider plant (Chlorophytum)

#### Flowers and herbs

Flowers and herbs are suitable for this area, because they don't have very big roots. Herbs are very rich in vitamins. They can be used not only in meals, but also for tee during winter. Flowers will create better indoor atmosphere. Suitable non-toxic flowers for indoor spaces are spider plant, daffodil and african violet. Children will be able to learn about different plants, how to take care of them and which benefits they have for their health. The indoor gardens are very suitable for bad weather and will provide production also during winter time.





Cilantro

Basil



Daffodil (Narcissus)



African violet (Saintpaulia)



Rosemary

Mint

\*INNERYARD







Garlic

#### Vegetables and greens

For the inner yard area are suitable vegetables and greens, which grow underground., or do not need a lot of light. These could be potatoes, beet root, scallions, carrots, spinach, tur-nips, garlic and lettuce. They are also a base for almost every meal. Produced localy, within the kindergarten premises, they will be very high quality and rich in vitamins and minerals.



Scallions

Carrots





Turnips

Spinach



Potatoes



Beet root



#### Vegetables and greens

For the green roof area are possible vegetables and greens, which have deeper roots. These could be onions, chard, kale, cabbage, broccoli, cucumbers, zucchini and cherry tomatoes. They could be used for almost every meal. Produced localy, within the kindergarten premises, they will be very high quality and rich in vitamins and minerals.



Broccoli

Cucumbers









Kale

Cabbage



Zucchini



Cherry tomatoes



Apple tree

Cherry tree

#### Trees and bushes

For the outer green area are suitable thornless bushes as vineyards, black-, logan- and blue-berry bushes. Children can have healthy snack time during outdoor activities. Apple, cherry, pear and plum trees will bloom nicely during spring time, while in autumn the fruits will be gathered. Children will be able to see in how many different ways the fruits can be prepared and will learn to grow, prepare and cherish the food.







\*OUTER GREEN SPACE



Pear tree

Plum tree



Loganberry



Blueberry

# 5,12 SURFACE VERIFICATION



Site Area = 6840 m<sup>2</sup>



Free Area = 5340 m<sup>2</sup> 78% of the site area

Built Area = 1712 m²; 23% of the site area Kindergarten = 1558 m²; 91% of the built area Pets Area = 154 m²; 9% of the built area







1.2% of the built area



6.1 EXTERIOR VIEWS \*BIRDEYE PERSPECTIVE - EAST SIDE

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S BOOMES



\*EAST SIDE VIEW





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### \*ROOFTOP GARDEN



# 6,2 INTERIOR VIEWS \*OPEN AREA







# 6.3 MODEL PHOTOS





Image 6.8

# SIDE VIEW FROM THE EAST COAST OF DEPTFORD CREEK





Image 6.10

SIDE VIEW FROM THE EAST COAST OF DEPTFOR CREEK

Image 6.11





# 7.1 FINAL WORDS

#### Outcome

After completion of the design process, it is clear that all crucial aspects in child's development were taken into account. A safe and creative atmosphere is created. Children have the possibility to create the space according to their needs thanks to the variety of furnishing elements. Opportunities for creative way of thinking and expressing talents and ideas turns the kindergarten from a boring place into a imagination friendly space.

Self-production of vegetabes and fruits is not very common idea for a kindergarten, but it will definately win all parents with bio and organic production. Having animals within the building's premises will turn every kindergarten into a child's favourite place.

All these aspects together with the curved form of the building, which is percieved better by the kids, are turning the kindergarden into the best educational building for the child's immagination and expectations.

HAPPY CHILD = H

# IAPPY PARENTS




# 8,1 THANK YOU!





ОГРОМНО БЛАГОДАРЯ НА РОДИТЕЛИТЕ И СЕМЕЙСТВОТО СИ ЗА БЕЗУСЛОВНАТА ЛЮБОВ И ПОДКРЕПА, ЗА ТЪРПЕНИЕТО И ОПОРАТА, КОИТО МИ ДАВАТ!

НА ПРОФ. БЕРТОЛД ЗА НЕВЕРОЯТНИТЕ ИДЕИ, СЪВЕТИ И МОТИВАЦИЯ!

НА ЖАН, МИЛЕНА, СНЕЖИ, КАЛИ, АНЕЛИЯ, ЕВА И ЯСЕН ЗА ВЕСЕЛИТЕ СТУДЕНТСКИ ГОДИНИ, ВЪПРЕКИ ТУ ВИЕНА!

MANY THANKS TO MY FAMILY FOR THE UNCONDITIONAL LOVE AND SUPPORT, FOR THEIR PATIENCE AND UNDER-STANDING!

TO PROF. BERTHOLD FOR THE AMAZING IDEAS, SUPPORT AND MOTIVATION!

TO JAN, MILENA, SNEJI, KALI, ANE-LIA, EVA AND IASEN FOR THE FUN AND JOYFUL YEARS, DESPITE TUV!

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\*DETAILS

Rhino,V-ray and Photoshop

### Photoshop

Rhino,V-ray and Photoshop

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### **RESEARCH FELLOW**

🖪 AIT - Austrian Institutof Technology 📋 01 Jan 2016-31 July 2017

KPI calculation and analysis, preparation of monthly and annual reports for the European Commision, various administrative and organizational tasks, graphic design of diagrams, schemes, graphs and social media articles.

### INTERN

#### 🖪 Permanent mission of Republic Bulgaria in Vienna 🗰 3 months

Various administrative and organizational tasks, preparation of reports, memos, analyses, materials, translations from german in bulgarian language, work with documents from and for UN and IAEA, participation in the 58th IAEA general conference.

### INTERN

#### 🖪 Hansen Architekten 🗰 1 month

Work focused on passive housing design and construction. Preparation of plans and 3D models in Archicad, visualizations and photo manipulations in Photoshop.

# **EDUCATION**

### DIPL.-ING.

🏚 Vienna Technical University 📋 03 March 2015 - 19 Oct 2017

#### Master in Architecture and Design

Main modules in digital architecture and digital design and production; Design studios covering topics, such as green building design, bridge design with focus on the construction, architectural competition design and preparation.

### BACHELOR OF SCIENCE

🚓 Vienna Technical University 📋 01 Oct 2010 - 31 Jan 2015

# Bachelor of Science in Architecture and Design

GERMAN

\*\*\*\*

Main modules and design studios with focus on residential and commercial buildings, urban design and development; Additional skills in sketching, graphic design, layouting, 3D modelling in various scales, working with laser cutter and 3D printer.



BULGARIAN \*\*\*\*

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