Kaunas University of Technology

Faculty of Civil Engineering and Architecture

Transformation of Brownfield Sites and Buildings and Sustainable Integration into the Urban Fabric (Britanika Hotel Case)

Master's Final Degree Project

Tautvydas Zykevičius

Project author

Assoc. Prof. Vidmantas Minkevičius

Supervisor

Kaunas, 2024

Kaunas University of Technology

Faculty of Civil Engineering and Architecture

Transformation of Brownfield Sites and Buildings and Sustainable Integration into the Urban Fabric (Britanika Hotel Case)

Master's Final Degree Project

Architecture (6011PX003)

Tautvydas Zykevičius

Project author

Assoc. Prof. Vidmantas Minkevičius

Supervisor

Assoc. Prof. Ingrida Povilaitienė

Reviewer

Kaunas, 2024

Kaunas University of Technology
Faculty of civil engineer and architecture
Tautvydas Zykevičius

Transformation of Brownfield Sites and Buildings and Sustainable Integration into the Urban Fabric (Britanika Hotel Case)

Declaration of Academic Integrity

I confirm the following:

1. I have prepared the final degree project independently and honestly without any violations of the copyrights or other rights of others, following the provisions of the Law on Copyrights and Related Rights of the Republic of Lithuania, the Regulations on the Management and Transfer of Intellectual Property of Kaunas University of Technology (hereinafter – University) and the ethical requirements stipulated by the Code of Academic Ethics of the University;

2. All the data and research results provided in the final degree project are correct and obtained legally; none of the parts of this project are plagiarised from any printed or electronic sources; all the quotations and references provided in the text of the final degree project are indicated in the list of references;

3. I have not paid anyone any monetary funds for the final degree project or the parts thereof unless required by the law;

4. I understand that in the case of any discovery of the fact of dishonesty or violation of any rights of others, the academic penalties will be imposed on me under the procedure applied at the University; I will be expelled from the University and my final degree project can be submitted to the Office of the Ombudsperson for Academic Ethics and Procedures in the examination of a possible violation of academic ethics.

Tautvydas Zykevičius

Confirmed electronically

KAUNAS UNIVERSITY OF TECHNOLOGY
Faculty of Civil Engineering and Architecture

Topic (theme) of the Master Final Degree Project: Transformation of Brownfield Sites and Buildings and Sustainble Integration into the Urban Fabric (Britanika Hotel Case).

Theme of the Master Final Degree Project approved by the Dean's Order_____

Master studies **Final Degree Project** (study module M000M100)

T A S K

1. Aim of work:

To verify the concept (conceptual model) established during the previous stage of the work (empiricalresearch) in the solutions of the experimental project., and to prepare the Master's final degree project integrating research and experimental design stages.

2. Tasks of the work:

To collect the necessary data for the project preparation, to prepare the architectural design of the selected object, to highlight the solutions determined by the concept formulated in the conclusions of the research project, to present the evaluation of the results of the experimental project.

3. Structure of the work:

Text. Title page, heading page, declaration of academic integrity, task of the final degree project (FDP)(if needed), summary, santrauka, content, list of figures (if needed), list of tables (if needed), list ofabbreviations and terms (if needed). Main part: introduction (relevance and novelty of the topic, research problem and its level of investigation, object, objective, tasks, and methodology of the FDP); summarized dataof theoretical research, empirical research and experimental design; conclusions of chapters, and the whole work conclusions. List of references, list of information sources (if needed), appendices, copies of graphical part (reduced in size).

The volume of the text (main part) is 2 – 3 author's sheets (1 author's sheet is 40 000 press characterswith spaces), i.e. around **60 – 80 pages** of computer text (recommended font Times New Roman, size 12, linespacing multiple 1,15 (Methodological Guidelines for the Preparation of Written Works)).

Graphic part.

The graphical part of the work is presented in posters (70x100 cm). It should reflect the most important results of theoretical material analysis, empirical research (*hypothetical model, conceptual model highlighting the statements implemented in the experimental projec*t), and experimental design (*the scheme of the situation of the designed object, the scheme of the analysis of the current condition; project idea / strategy; detailed solutions:* ***building*** *- site arrangement proposals, plans, facades / elevations, specific sections, fragments of interior / exterior spaces, construction details, etc. (if necessary);* ***urban complex*** *- communication system, building typology, public spaces, green infrastructure (natural framework), social infrastructure, proposals for the formation of cityscape identity, master plan of a quarter / city part, etc .;* ***public spaces (or their systems)*** *- functional diagram and spatial formation zones, connections between them, path system, landscaping system, water bodies, pavements, small architectural elements, lighting, etc.; general visualization of the designed object with the contextual environment, visualizations of separate visual spaces, etc.*) as well as changes of conceptual model (if needed).

The graphic part of the work should be arranged and exhibited in a way to form a visually unified whole and reflect the content of the work. It should be attractive aesthetically. When preparing the graphical part of the work, it is necessary to exclude the non-essential information, highlight the most important researchresults and ideas, and unify notes, graphical expression, and colours.

The volume of the graphic part is **10 – 16 posters** of 70 x 100 cm size (vertically oriented) that integratethe results of research project and experimental design. The posters must be printed on the 2-3 mm thick cardboard.

The description of the results of theoretical and empirical research must consist of **up to 1/2** of the main text, and in the graphic part they should be represented in **1 - 2 posters**.

Model or photorealistic visualisations of the planned area / object.

Printed copy of the final work text and graphical part.

4. Timetable of tasks performance:

1. Discussion of the task and the principles of experimental design	2024 02 05
2. Selection of the location of the designed object according to the criteria established on the basis of the conceptual model, analysis of the location based on secondary sources, creation of the design program	2024 02 12
3. Field survey, identification of the problems and potential of the designed object, development of the first alternative of the project idea	2024 02 19
4. Review and evaluation of the results of the analytical work and the conceptual sketches of the project (Alternative I)	**2024 02 26**
5. Search for a solution strategy / idea and evaluation of alternative options according to the established criteria	2024 02 26 – 2024 03 18
6. Review and evaluation of the solution ideas (Alternative II)	**2024 03 18**
7. Development of the chosen alternative: detailing of the solutions	2024 03 25 – 2024 05 06
8. Consultative review	2024 04 08
9. Consultative review	2024 04 22
10. Review of the detailed solutions	**2024 04 29**
11. Completion of the text	2024 05 13
12. Defending the final project in the commission of supervisors	**2024 05 20**
13. Public defence of the Final Degree Project	**2024 06 04 - 2024 06 05**

Consultation time with supervisor

Week day	**Faculty of Civil Engineering and Architecture, Room 307, Zoom or other distance learning platform**	**Workplace**
	Time and duration *	**Time and duration ***
Monday	**12.00; 2h**	
Tuesday		
Wednesday		
Thursday		
Friday		

* - 2 hours per week

Supervisor of the final degree project Vidmantas Minkevičius *Confirmed electronically*

(name, surname, signature)

Student Tautvydas Zykevičius *Confirmed electronically*

(name, surname, signature)

February 2024

Zykevičius, Tautvydas. Transformation of Brownfield Sites and Buildings and Sustainable Integration into the Urban Fabric: (Britanika Hotel Case). Master's Final Degree Project /supervisor assoc. prof. Vidmantas Minkevičius; Faculty of Cicil Engineer and Architecture, Kaunas University of Technology.

Study field and area (study field group): Architecture (Arts).

Keywords: regeneration, transformation, abandoned buildings and territories, sustainability, greenary, vieswhed analysis.

Kaunas, 2024. 97 pages.

Summary

The paper research very important and revelant topic of abandoned buildings and territories transformation and integration into urban frame. The research tries to understand what makes structures officialy vacant, how they can be classified. What abandoned buildings are worth transforming, what method should be used. Each transformation method is analysed using various analogs from all around the world. Analogs are compared and evaluated with each other which is the most sustainable. Algorithm is created which helps to evaluate and get first design guidelines for any abandoned building. Hyphotetical model and algorithm is tested in empiric research section using “Britanica “hotel as an example. Public and expert surveys are conducted, case study object (“Britanica“hotel) potential is analysed. Finally, ideas of higher volume ,after transformation, in order to save as much trapped CO2 as possible, are tested. Every conclusion is put into a solid conceptual model which clearly defines what design decisions has to be made. Finaly paper suggests an experimental design solution to prove that research part conclusions.

Zykevičius, Tautvydas. Apleistų teritorijų ir pastatų transformavimas ir tvarus integravimas į urbanistinį audinį: “Britanikos“ viešbučio atvejis. Magistro baigiamasis projektas / vadovas doc. Vidmantas Minkevičius; Kauno technologijos universitetas, Statybos ir architektūros fakultetas.

Studijų kryptis ir sritis (studijų krypčių grupė): Architektūra (Menai).

Reikšminiai žodžiai: regeneracija, transformacija, apleisti pastatai ir teritorijos, tvarumas, žalumas, matomumo analizė

Kaunas, 2024. 97 puslapiai.

Santrauka

Mokslinis darbas nagrinėja labai svarbią ir aktualią temą apie apleistų pastatų ir teritorijų tvarų transformavimą ir integravimą į urbanistinį kontekstą. Darbas bando surasti savybes, kurios oficialiai nustato kada pastatas yra laikomas apleistu, bei kaip apleisti pastatai gali būti klasifikuojami. Kurie iš apleistų pastatų yra verti transformavimo, bei koks rekonstrukcijos metodas turėtų būti naudojamas. Kiekvienas renovacijos metodas yra išanalizuojamas naudojant įvairius pasauio pavyzdžius. Analogai lyginami tarpusavyje stengiantis rasti, kuris transformavimo metodas yra tvariausias. Sukuriamas algoritmas, kuris padės įvertinti esamą būklę bei duos pirmines dizaino gaires apleistų pastatų rekonstrukcijai. Hypotetinis modelis ir algoritmas yra testuojami empirinių tyrimų dalyje naudojant „Britanikos“ viešbutį kaip eksperimento objektą. Apklausiama visuomenė ir ekspertai, įvertinimas esamas viešbučio būklės potencialas, tiriama hipotezė dėl galimybės statybi netgi aukštenį tūrį negu yra dabar, stengiantis išsaugoti kiek įmanoma daugiau jau sunaudoto statyboms co2. Visos tyrimų išvados sukuria koncepsinį modelį, kuris aiškiai nurodo kokie tikslūs dizaino sprendiniai turi būti priimami. Galiausiai šis mokslinis darbas pateikia dizaino pasiūlymą esamai „Britanikos“ viešbučio situacijai stengamasis įrodyti, kad tyriamojo darbo išvados yra teisingos.

Table of contents

List of figures

List of abbreviations and terms

Abbreviations:

Assoc. prof. – associate professor;
Lect. – lecturer;
Prof. – professor.
NS – not special building
S – special building
PEG – positive energy building
Zeitz MOCAA - The Zeitz museum of Contemporary art Africa
CLT – cross laminated timber
GIS – geographic information system
UAB – uždara akcinė bendrovė (translated from lithuanian – closed stock company)

Introduction

"Old ideas can sometimes use new buildings. New ideas must use old buildings."
(Jane Jacobs, 2016)

Relevancy of the topic:

Rapid climate change and global temperature increase over the years always encourage city residents and researchers think about our energy consumption and C02 emissions: "According to the International Energy Agency, the construction sector is responsible for one-third of the global energy consumption and nearly 40% of CO2 emissions."(Sibilla et al., 2023) Because of this building sector's large influence to global warming governments all over the world started to fund new research how to solve or minimise the footprint of building sector to the environment. For the past several years new high efficiency buildings, their certification and new innovative technology implementation became the most promising factors solving this issue but that is not enough, especially when Europe wants to reach their goal of net Zero continent by the year 2030. In order "…to meet climate change targets and promote new approaches to urban regeneration plans, taking into account that many abandoned buildings exist across Europe…" (Sibilla et al., 2023) "The Greenest Building is the One That's Already Built" (Schutte, 2021) One of the best quotes made by former architect and director of sustainability Carl Elefante. His words were rethought and used in practice multiple times. The best example would be 2021-year Pritzker Architecture Prize winners Anna Lacaton and Jean-Philippe Vassal's, the French architect's duo's project the FRAC (Fond Regional d'Art Contemporain) Nord-pas de Calais, Dunkerque. "…they chose to keep the original hall and attach the second one of similar dimensions to the existing building. Absent is nostalgia for the past. Rather, they seek transparency, openness, and luminosity with a respect for the inherited and a quest to act responsibly in the present. Today, a building that previously went unnoticed becomes an iconic element in a renewed cultural and natural landscape." (*Anne Lacaton and Jean-Philippe Vassal Receive the 2021 Pritzker Architecture Prize*, 2021). By keeping existing building architects not only created energy efficient solutions, but they also saved history. Brought back to life old forgotten warehouse. In additional greatly reduced demolition and material costs.

Secondly, to add up to climate change abandoned houses and territories, as it was the situation in mentioned example, usually are gathering places for unlawful activities, they also lower the values of surrounding structures. 2015 study (Cui & Walsh, 2015) shows that crime increases by 20% in areas which have abandoned buildings. Another study (Han, 2014) shows that buildings which neighbour abandoned structure tend to lose their value. Therefore, the worth of the buildings is directly connected to the distance from the vacant building and the time spam of that building presents in the area. Mr. Han even provides us with a clear calculation method to find neighbouring building values and their changes depending on mentioned properties. Some studies (Kruger et al., 2007) even shows mental health deterioration of neighbouring residents and physical dangers their oppose by living near abandoned buildings or territories. It is clear that abandoned building issues must be solved not only because of sustainability goals but more importantly because they create dangerous and unpleasant living areas in the city.

Lastly, abandoned buildings are the place for opportunity and new thinking ground. Solving this problem needs creative, innovative, and critical thinking. Transforming these shadow monsters can even slow down or even stop urban sprawl phenomena which is very often seen in modern cities when all young families move out to suburbs because of cheap housing and urge to have private plots. Methods of rehabilitation of old buildings could create cheap social housing available for everyone

in the city center which could even solve traffic jams. People living in the city center can reach their jobs and other necessities more easily using public transport or simply walking instead of using their cars. It all comes down to changing mentality and people's views of abandoned buildings as a place for change and creative adaptation instead of demolishment and anger which first comes to mind thinking about vacant and forgotten places. This paper tries to show endless possibilities for transformation and adaptive re-use and rethinking of these monstrous structures. It encourages to forget building forms which have connection with bad past times or encourage saving memories if structures need just a bit of rehabilitation or remodeling. Abandoned buildings are an opportunity for new beginnings despite what kind of history they hold. The best paper which writes about this change of mind in aesthetics of old and new buildings and overall moral codes and needs for reconstruction is written by Aalto university professor (Capdevila-Werning & Lehtinen, 2021). It provides new thinking about old, present, and future aesthetics. What is classical and what makes classical-classical. It emphasizes the importance of future generations and their looks and understanding of aesthetics.
In short, abandoned buildings are not a new topic, and there are a lot of research done in this field. The topic was, is and is going to be relevant throughout the upcoming years because structures and territories live in cycles. We must always think how we can transform outdated old buildings to today's standards. This paper will try to find systematical methodology how to easily find the design approach and technical solutions for any abandoned building, taking into consideration different transformation methods of abandoned structures, sustainable and harmonious integration methods which are known by today.

Problem

This paper focuses on "Britanica" case situation. Which has one of the few "impossible" starting grounds for sustainable transformation of the structure and integration into urban frame. Most of the residents and city council are against sustainable ways of reconstructing the building because of its crucially important location in historic city center which recently was announced as a UNESCO heritage site. (*Savivaldybė,* 2023). Demolishing at the first glance seems like the only option. The easiest option is not always the right one, especially considering sustainability and its goals. There has to be another solution and this research not only tries to find that option but also emphasizes the importance of solving local residents and municipality's unsupportive views for reconstruction of the structure.

Aim

Create systematical step by step design guideline program which could be adapted to any situation. System is tested experimenting with the hardest situation of "Britanica "hotel case.
Using theoretical research find a hypothetical solution for "Britanica" hotel case, which when could be tested in empyrical research. Second research phase aim is to create more solid conceptual model which would define clear design decisions for the experimental phase. Last phase purpose is to try and prove first two phases' conclusions by adapting elements which have been found in the research.

Tasks

Find definition of „abandoned building and territories ", classify vacant structures,
Analyse different abandoned buildings transformation methods using already built architectural examples all around the world, which are one way, or another related to the "britanica" hotel case,

Explain and understand sustainability in building sector from urbanism perspective. analyse principles of harmonious integration of modern building into existing urban context.
Analyse “britanica” situation, reconstruction proposals, workshops, and research.
Make conclusions, find connections between different typologies, transformation methods and sustainable / harmonious integration principles to create systematical approach to the problem which could be easily used by everyone using new algorithm.
Create and test several hyphotesis using empiric research.
Create solid conceptual model which will show clear design guidelines.
Make experimental architectural proposals by adapting already found conclusions.

Methods

Analysis – interpretation of the statements or phenomena found in literature by dividing them into the individual parts according to the chosen structure, identifying the hierarchy of the structure (more important and less important parts of the structure)

Integrated analysis (synthesis) - when the researcher summarises the broad topics discussed in the literature, formulating a new and distinctive approach to the topic.

Referential - describing different approaches of authors; this paper uses different articles, research papers, web pages, laws, examples, and other theoretical material.

Comparison analysis. The paper uses different transformation approaches and compares them with each other trying to see which of them favor what sustainable integration category. The research also tries to compare opinions of different people (residents, experts, government institutions). Article tries to acknowledge each party’s stand and position to the problem, trying to provide positive and negative effects each side would have to overall environment.

Structure

The paper consists of three parts.
First is theoretical research, which researches various papers on the topic, analyses analogs and situation to come up with new algorithm and hyphotetical model for the next phase.
Second part mostly tests hyphotesis which have been raised in the first part and analyses additional raised hyphoteses using surveys, interviews, regulation documents, statistical and GIS data.
This section creates conceptual model for next experimental design phase.
Last, third part tries to create experimental design for “Britanica” hotel by adapting made conclusions in first two parts of the research. Number of pages – 134; number of images – 87; number of appendices – 25.

1. Theoretical research

1.1. Typology of abandoned buildings and territories

1.1.1 Abandoned buildings and territories definition

According to different sources, officially abandoned structure has different meanings. More philosophical approach from (Dixon, 2023) says it could be empty – not having anything in it, derelict – voluntarily abandoned. Legal documents like (*Code of Laws - Title 12 - Chapter 67 - South Carolina Abandoned Buildings Revitalization Act*, 2020) defines "abandoned" as a structure which two thirds of it (sixty six percent) has been closed for at least five years. If we would compare south carolina's regulations to Lithuania's legal documents clear difference can be seen. (*T-387 Dėl Apleisto Ar Neprižiūrimo Nekilnojamojo Turto Nustatymo Tvarkos Aprašo Patvirtinimo*, 2020) (angl.: Regarding the approval of the description of the procedure for determination of abandoned or neglected real estate) defines vacant structures as neglected real estate that endangers the health, life or environment of people living, working, or staying in or near it. It also includes not registered structures, which means empthy construction sites would be also defined as abandoned. Other articles like (Hoff, 2016) and (*Abandoned Buildings and Lots*, 2012) clearly defines that officily vacant territories should at least be left unoccupied for six consecutive months, despite that some papers (Gassett, 2022) suggest the minimum requirements of several years. All in all, there is no universal answer to the question what is officially considered abandoned. It is completely left for each municipality to decide.

For this research we will define "abandoned building" to lose confusion. We decided to put a middle ground and define "abandoned building" as follows:

- building or territory that has been vacant for six months or longer.
- building or territory that has no official owner or owner is missing.
- building or territory that is not registered as a completed structure (building is not build to 100%)
- building or territory that creates various dangers to its surroundings. (psychological, psychical, value).

1.1.2 Classification of abandoned buildings

Classification is important to evaluate abandoned buildings and make decisions which territory should be transformed first. (Li et al., 2023) "The research explores the use of a deep learning method for segmentation known as Mask R-CNN(*FORTAI | Kauno tvirtovė parkas*, 2023) (He et al., 2017), for identifying abandoned buildings. It suggests four categories: industrial heritage, commercial heritage, residential heritage, and construction sites. From the research category of "function" can be created. (Tara Struyk, 2023) article suggest second class of "location". Every building, abandoned or not, gains their biggest value because of location. Buildings themselves are one part of the equation and second part is infrastructure, accessibility, and their surroundings. Despite that, author of web article "The factors of "good" location" talks mostly about not abandoned buildings, despite that things mentioned fit our topic as well. "The house currently standing on that land can be renovated or remodeled, but you can't change where the home is situated. […] This means that location is often the single most important driving force behind the value of a property. It's a simple case of supply and demand: Housing supply in great locations is limited by the number of homes in that location.".

Usually vacant and unpleasant structures in the city center have more potential and need to be renovated compared to structures outside the city.

Our research suggests creating four location defining factors:

- In the center - Building in historic center or city center
- Around the center - Building in close proximity to city center (from three to ten kilometers)
- In the outskirts - Building in the outskirts of the city (ten to fifty kilometers from city center)
- Far from city – (fifty and more kilometers from city center)

Note that approximate numbers can vary depending on which city are we talking about. We think that the suggested numbers are close to average and can fit a majority of bigger city's which suffer from abandonment problem the most.

Third class would be "size". Lithuanian building code (*D1-713 Dėl Statybos Techninio Reglamento STR 1.01.03:2017 „Statinių Klasifikavimas" Patvirtinimo*, 2023). Angl.: (D1-713 Regarding the Approval of Construction Technical Regulation STR 1.01.03:2017 "Classification of Structures", 2023). Suggest defining characteristics:

- NS - Small (up to 200m2; up to 8m height) – family houses, patrol stations, garages etc.
- NS/S - Medium (200-1000m2; 8 - 20m height) – big houses, motels, small shops, offices, hotels, apartment blocks, churches, etc.
- S - Large (1000-10000m2; 20 - 50m height) – warehouses, supermarkets, religious buildings, office buildings, hotels, small spa centers, stadiums, opera houses, etc.
- S - Extra Large (from 10000m2; from 50m height) – skyscrapers, huge hotels, national level stadiums, expo centers, industrial manufactories, etc.

Note that approximate numbers can vary depending on which city are we talking about. We think that the suggested numbers are close to average and can fit a majority of bigger city's which suffer from abandonment problem the most.

Forth class would be "age". It has a direct influence on the risks and possibilities to bring building back to today's standards. (Brooke Penman, 2021) "an obsolete building" must go through various tests to ensure its structural soundness, material quality, condition of mechanical and electrical services, safety and a comfortable environment for future occupants. The author also talks about interviews which have been done in which some developers noted that older buildings in sectors like healthcare, codes and regulations are outdated and it would be too expensive to frequently upgrade older systems. In summary, Older the building is, the greater risk it gives danger not only for workers but also neighbors. Despite that, the building could also have been built using already outdated laws: not enough height in rooms, wrong dimensions of fire staircases and other.

Our research suggests creating four location defining factors:

- Young (1-10 years) – building sometimes could seem even to be too young for renovation if it does not hold enough valuable history in it.
- Middle-age (10-50 years) – Final years where construction of the building could still be strong enough to withstand construction and renovation works. 50 years is also the age limit after which building can start being evaluated to become an official cultural heritage (*T-387 Dėl Apleisto Ar Neprižiūrimo Nekilnojamojo Turto Nustatymo Tvarkos Aprašo Patvirtinimo*, 2020) 2 section 10.3 point.
- Old (50 – 200 years) – Mostly cultural heritage buildings which reconstruction would mostly mean for educational or symbolic purposes, not for intensive use. Sometimes those kinds of structures are demolished.

- Very old (200+ years) – buildings which are closer to be considered archaeological sites. Could even be called an environmental heritage or examples of rewilding.

Note that approximate numbers can vary depending on which city are we talking about. We think that the suggested numbers are close to average and can fit a majority of bigger city's which suffer from abandonment problem the most.

Abandoned building category				
Location	City center 0-3 km	Around center 3-10 km	City outskirts 10+ km	far from city 50+ km
Age	Young 0-10y	Middle 10-50y	old 50-200y	very old 200+y
Used function	commertial	industrial	residental	hard to define
Size	Extra large 10k+m2; h=50+m	Large 1k -10k m2; h=20-50m	Medium 200-1k m2; h=8-20m	Small 0-200 m2; h=0-8m
Note: Note that approximate numbers can vary depending on which city we are talking about. We think that the suggested numbers are close to average and can fit a majority of bigger cities, which suffer from abandonment problem the most. = MARKED				

Fig 1.: Abandoned building's classification scheme. Made by the author.

Subsection conclusion.
Suggested classificiation system should help to quickly evaluate existing situation and decide if certain abandoned building has potential to be transformed. Ex – function, location, age and size of the structure play a big role in determining if it is worth the effort of reconstruction.

1.2. Different abandoned building's transformation methods

(*Building Adaptation in Construction -Objectives, Importance*, 2017) describes range of different building adaptation options very well using a simple diagram (figure 2):

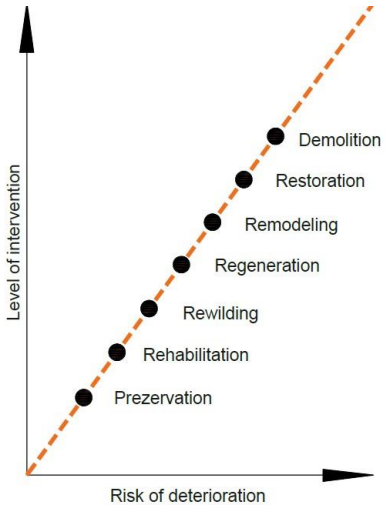


Fig 2.: Diagram shows transformation method's influence on existing structure. Made by the author.

(*Building Adaptation in Construction -Objectives, Importance*, 2017) also defines the different scales of transformation:

- small – improvement of surfaces in some areas, re-roofing, new coverings for the floors, re-painting or painting, replacement of doors and windows, replacement of kitchen appliances or toilets, minor structural works like small new openings.
- medium – upgrades of surfaces and elements in a major scale, retrofitting of different services in the building, enlarged capacity of the building, change of function, new engineering systems like air conditioning, complete roof change, extensions in lateral or vertical direction in major area, insertion, or removal of walls or even the floors.
- large – drastic changes to the building, extensive remodeling, spatial and structural alterations which drastically reduces or increases the overall capacity of the building.

(*Building Adaptation in Construction -Objectives, Importance*, 2017) raises main objectives of any transformation:

1. compliance with the standard code – Accessible for disabled people, fire safety, sound insulation and noise prevention, stability for the structure, Thermal efficiency.
2. Enhancement of the environment – focusing on efficiency, sustainability goals, comfortability of the interior spaces, landscaping around the building
3. Spatial modification – sizes are adjusted (ceiling heights, rooms), Accommodation should be increased and improved, alterations done for elderly and disabled, buildings planning change according based on the convenience.
4. Upgrading the structure and fabric - improved water resistance, load bearing capacity ,by inserting a new columns or beams as a part of strengthening, underpinning operation for foundations of the building.

1.2.1 Preservation / conservation method

This method would be classified as a small transformation. Usually, this method is used for culture heritage buildings. Public love cultural buildings, their rarely approve of any modifications of old buildings after they are repaired. Talking on the topic of abandoned buildings, public usually do not know how it could have looked like before it was damaged or abandoned. What gives some freedom for designers to create something new. One of the most interesting examples is architect's Edita Stankevičiūtė (Righetto studio) project (Edita Stankevičiūtė, 2022) (figure 3). Old, abandoned church in suburbs of Kaunas city Lithuania. Main design concept is to build inner disconnected two floor structure. Transformation of this abandoned structure meant that all valuable artefacts and objects have been beautifully preserved for future generations to admire. All in all, preservation methods are rarely seen for abandoned buildings, because depending on their age sometimes where are nothing which could be preserved in an abandoned building.

Fig 3.: Photos of tranformed church in Kaunas suburbs by architect Edita Stankevičiūtė

1.2.2 Refurbishment (adaptive re-use) / rehabilitation

This method would be classified as a small transformation. This method usually includes minor changes which help to update buildings to newer regulations and standards. For example: ramps for disabled, better insulation and thermal efficiency or better planning of existing volume. According to (*Rehabilitation Guidelines*, 2016.). This method usually is used for historic buildings, but the same principles can be easily adapted for abandoned buildings. Main goals of transformation are really similar to preservation but in this case, buildings are also refurbished in a way that they could be properly used and not only admired as an object of tourist attraction. One of the best examples for rehabilitation is recently held competition for transformation of world's oldest museum for the ancient Egyptian vulture in Turin, which was won by well-known OMA architect's group. Web articles was written by (Christele Harrouk, 2023) (figure 4). The proposal really changes how building is going to be used, despite that no historically valuable elements will not be changed. All things considered, rehabilitation is not that different from preservation, although preservation follows a lot stricter regulations and usually is for buildings which are for tourist attraction purposes only. On the other hand, refurbishment is a lot more than that. This method of transformation very often includes changes in planning or volume inside the building. It also makes buildings more accessible and usable according to newest standards.

Fig 4.: Visualizations by OMA architect's showing their proposal for transformation of the existing museum.

1.2.3 Remodeling

This method would be classified as a large transformation. the main difference from the other methods is that building form and volume are changed. Usually remodeling/ renovation comes with upgrades for materials and overall building conditions, new planning, lighting, function, and others. The most often change in remodeled buildings is the increase in volume. One of the best examples of remodeling is a transformation of creative hub in Wroclaw, Poland by (MVRDV, 2020). (figure 5). the building gained 3 times its previous capacity. From architectural conceptual perspective building transforms from old strict and formal to modern, free, cozy and as author's describes designed for "unformal" meetings. Structure was changed, form and volume were increased, function changed from formal to informal, inside planning changed from ground zero. Only things which were left are Proportions and materials. All things considered, remodeling usually means quite a huge change for building's volume, planning, materials, or function. Often only some structural or esthetical elements are left of the old building.

Fig 5.: Creative hub in Wroclaw, Poland desifned by MDRDV architects. Photo by Juliusz Sokolowski.

1.2.4 Regenerative method

This method would be classified as a large transformation. According to (*Regenerative Design*, 2022) "Regenerative design is based on the idea of creating a building that mimics the restorative aspects found in nature to bring about a positive impact on the overall environment. This method is about thinking about the future. Compared to sustainable approach this method does not seek stability or net zero, it seeks to regenerated already done damage to the environment. This method encourages designers and architects think how to not only use less materials but also how to restore or even increase the resources after the construction. In short, sustainability limits material use and regeneration demands to replenish used materials. In this case sustainability is only a subset of larger model (figure 6):

Fig 6.: Scheme from web page (*Regenerative Futures*, 2023).

One of the better more known example would be (*Bosco Verticale / Boeri Studio*, 2015) new apartment building in Milan, Italy (figure 7). This project consists of two towers: 80 and 112 meters tall. Both combined host 480 large or medium trees, 300 smaller tress and more than 11000 various plants. This vertical garden is equivalent to 15.000 – 20.000 m2 forest and underground. Regeneration is also about restoring trees or vegetation which were cut down for the construction. In this example constructed building greatly influenced regeneration process by providing an environment for different ecosystems to live in. Slowly, but surely, regenerating the damage done by Milan's urban development. In a way, regeneration should not be only about restoring, what was destroyed during construction, it also can bear the burden, and help to restore ecosystems in the highly urbanized areas. In summary, regenerative design method is still quite new, but its proposed approaches are very innovative and helpful for the environment. In a way, this method is better than sustainable approach, because it demands not only to save resources or energy but also to think about restoring everything which was used or destroyed during construction. This method not only focuses on remaining at ground zero, but it also encourages to restore the damages which are already done.

Fig 7.: Photo of the Bosco verticalle building from bird's eye view. Photo by Paolo Rosselli

1.2.5. Rewilding (biofilic) method

This method would be classified as a medium transformation. (Claire Brodka, 2023) in her web article called "Rewilding in architecture: concepts, applications and examples" describes rewilding as a powerful approach to ecological restoration. This method follows the idea of removing human intervention from our surroundings. It needs low effort and budget. Main goals are to help nature to rebuild itself: destroy invasive species, recover local ones, filtrate contaminated soil or water, etc. Rewilded territories or structures can provide neighboring residents with high quality fresh air, nature parks, cozy atmosphere and other. The rewilding method is most often used for large, abandoned

territories but it could also be experimented with high abandoned buildings, of course firstly ensuring their structural properties.

On the other hand, we could achieve similar goals of providing local residents with human-nature connection using biophilic methods. According to article (Grazuleviciute-Vileniske et al., 2022) "Classification of biophilic buildings as sustainable environments" - biophilic design is all about creating good conditions for humans in various man-made environments while at the same time trying to restore connection with nature. The paper states that connection to nature is very important to every human-being, this need came from evolution. Despite that, our human-nature connection continues to decline. We spend our days in closed sterile environments. Authors says that in order to restore the connection designers and research have to think about "how architectural form can engender biophilic qualities or/and how biophilic features can be integrated into architectural form.". Compared to rewilding, biophilic design does not suggest leaving nature by itself for restoration. This method focuses more on what forms, colors, compositions or even smells make human feel connected with nature. Paper also provides us with good examples of biophilic design principles used in practice. One of them is: "Example B—Vilnius University Kairenai Botanical Garden's Green Building-Plant [18] (Figure 3); Type of biophilic design: applied; Design: Paleko "ARCH studija" (R. Palekas, B. Puzonas, D. Zakaite, A. Palekiene, V. Linge); Location: Kairenu ˛st. 43, Vilnius; Year of completion: 2016. This object was selected due to its direct correspondence to the trend of applied biophilic design as this is reconstructed building, the biophilic character of which is created with vegetated columns—an unusual and experimental solution in Lithuanian climate conditions." (figure 8)

Fig 8.: Vilnius university botanical garden in Kairenai. screenshot from (Grazuleviciute-Vileniske et al., 2022) article.

In conclusion, rewilding and biophilic design methods both have a close relationship with nature. Rewilding goal is to restore destroyed nature mainly leaving majority of the work for natural processes, but in a way this approach is quite dangerous for big, abandoned structures to use, because it would be really hard to ensure structural safety to its surroundings. On the other hand, biophilic design is closer to sustainability ideas by trying to provide residents with a lost human-nature connection using inspiration from nature and vernacular architecture. This approach is easier adaptable for abandoned buildings transformation strategies.

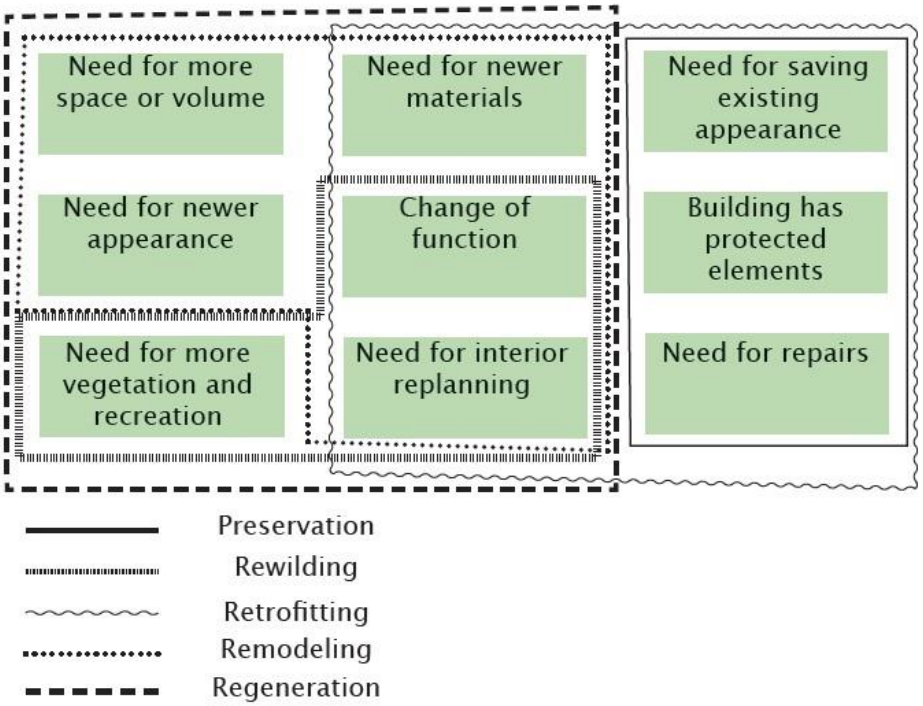


Fig 9.: Scheme which shows how transformation method can be chosen evaluating clients and public's needs. Scheme made by the author.

Subsection conclusion

Each method has it defining features, existing situation and client needs has be analysed in order to choose most suitable transformation method.

1.3. Sustainable integration principles

(Cordero, 2001) describes sustainability by quotes from other researches: "…American Institute of Architects In its broadest sense, sustainability refers to the ability of a society, ecosystem, or other ongoing system to continue functioning into the indefinite future, without being forced into decline through exhaustion or overloading of the key resources on which that system.". In short, sustainability is about the continuous development of humankind and nature with respect to each other.

This movement usually is divided into three and sometimes four categories:

1. Environment – thinking about saving vegetation, animals.
   (13,14,15)
2. Economy – thinking about using less, recycling already taken materials more.
   (1,2,6,7,8,9,11,12)
3. Society – thinking about saving traditions, creating strong and active communities.
   (3,4,5,10,11,17,16)
   3.1 Culture (usually is counted as smaller subsection of society)
   3.2 Politics (usually is counted as smaller subsection of society)

Numbers represent sustainability goals presented in picture (figure 21).

(Thatcher, 2015) in his article "Defining Human Factors for Sustainable Development" suggest that hierarchy should be introduced in sustainability. First – environment, second – society, third – economy. "The development of the economy is constrained by the society in which it is found which

is constrained by the ecological limitations of energy and other natural resources available to the society".

1.3.1 Integration focusing on social needs

architecture cannot solve or address all sustainability goals. It most often can influence one or another. Most commonly talked social categories in architecture field are sustainable communities, health, poverty, culture and politics. They can be squeezed down to only three distinct groups which architecture may influence. These groups are as follows:

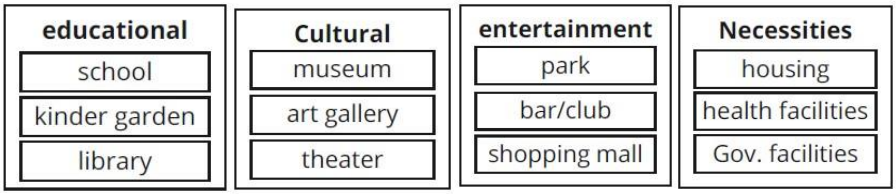


Fig 10.: Scheme shows social integration groups. Scheme made by the author.

Socially integrating any building, abandoned or not, is not that straightforward as it seems. Social integration can touch a variety of different subjects and opinions. Several different approaches have been seen though out history (Professor Verdelli, Laura, 2016). Top-down (politics based), Bottom-up(society-based) and hybrid (where politics, communities, urban planners, and architects gather and discuss). One of the best Lithuanian examples of abandoned structures social integrations "Radio City" in Kaunas, Lithuania. Architects thought that the building has to be demolished because it represented soviet times and it did not match urban structure in any way. The worst thing was, that it blocked the view to the most important church in the city. Despite that developers "Citus" bought the property and suggested the transformation project where people could live, work, create, develop, relax, and entertain in one place. A large rooftop space was created for various leisure activities, with different areas, such as a green lounge, children's activity spaces, relaxation zones, and a city observation deck. In a sensitive part of the city, the conversion of a contested industrial legacy has transformed the complex into something non dissonant with the symbolically meaningful Christ's Resurrection Church." (Tranavičiūtė, 2023) (figure 11).

Fig 11.: Picture of "Radio City" in the middle of reconstruction. Photo by Citus.

All in all, the social integration method is not that straightforward as it seems. We presented 3 distinct classes which each have an influence on what should transformed building look or function like. Those categories are: politics, culture, society. It is also known that any integration has 3 different categories: top-down, bottom-up, hybrid. Buildings social integration principles also should address sustainability goals such as: Poverty, hunger, health, education, gender equality and sustainable communities.

1.3.2 Integration focusing on economical needs

Integration include sustainability goals such as affordable and clean energy, clean water and sanitation, decent work and economic growth, sustainable communities, industry, innovation, infrastructure, and production. Everything can be simplified into three classes:

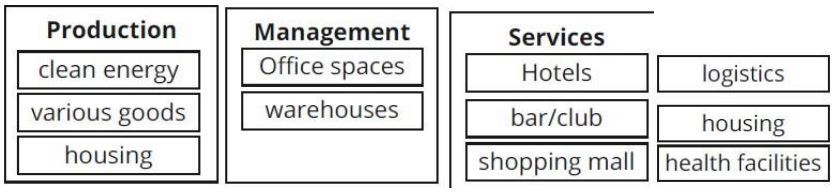


Fig 12.: Scheme shows economical integration groups. Scheme made by the author.

Most often abandoned buildings are reconstructed for business purposes. A great location in the city center or vast heigh ceiling volume creates perfect conditions for businesses to flourish. One of the best Lithuanian examples of abandoned structures economical integrations "Drobės"factory which was an old building which was built in 1920 (designed by engineer V.Klimavičius), it produced wool clothes. It was working until 2008. After that a lot of owners changed the keys of the building. It was partially abandoned for one decade. In 2022 reconstruction project was finished, which was financed by "Baltic railway investments". 22.000 square meters of area was retrofitted to various size rooms, which were designed for different businesses and artists to work or live in. The project was a success and now more than 40 companies work in this place. Overall, the project utilized the most important aspects of sustainable transformation in integration and the result is stunning (Figure 13).
All things considered, sustainable integration based on economical needs usually is mostly based on money and economic growth. Two main categories would be focused on clean energy production and energy efficiency to the buildings, which would make positive impact in the long run. Another, more direct approach, is to transform existing abandoned buildings to quickly meet business demand for spaces.

Fig 13.: Photos of "Drobės"Factory. Photos by "Drobės" factory.

1.3.3 Integration focusing on ecological needs

Final integration method based on sustainable categories is focused on the environment. How abandoned places can be retrofitted and adjusted to comply with environmental needs. This approach

may include and follow these sustainability goals: clean water, recycling, climate action, life below water, life on land. Everything can be categorized into three classes:

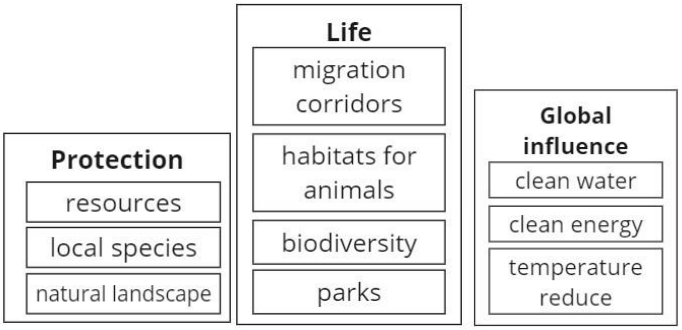


Fig 14.: Scheme which shows different aspects of environmental integration subcategories. Made by the author.

According to (Thatcher, 2015) everything starts from the environment. If climate conditions and surrounding life is at the stable conditions only when we can start focusing on society and finally profits or economic growth. The environment is the place where everything begins. One of the best Lithuanian examples of abandoned structures ecological integrations is "Kaunas's fortress park", located in Kaunas, Lithuania. It contains huge complex fortresses around the city of Kaunas which were constructed in XIX century by Russian Empire to protect its western flank from Germany (figure 15). All places were left for nature to do its work (rewilding method). Only some of fortresses out of huge network were reconstructed and maintained for the tourists attraction as a museums. A lot of rewilded fortresses are still used for excursions and various events. Artists, musicians, tourists and even people who just want to help with cleaning works are always welcome in these places. Kaunas fortress is a very sustainable integration solution for abandoned buildings which are rich in history. Leaving them for nature and animals is a very environmentally friendly decision, while also creating various interesting cultural events, which keeps the history of the place alive and brings small but some economic benefits.

Fig 15.: Various events in Kaunas fortresses. Photo from (*FORTAI | Kauno tvirtovė parkas*, 2023)

All things considered; abandoned buildings have a huge potential to be integrated according to environmental needs. We can fully reconstruct and provide the city with high quality parks or if structural safety and risks there calculated positively building can even be left for nature to absorb and create, while at the same time organizing various cultural events to ensure that history of the place does not die out.

1.3.4 Harmonious integration principles

Harmonious integration is as important as sustainable integration in the existing urban framework. This subsection can be classified as a part of social integration principles because it is mostly related to cultural heritage and a sense of place. (LLC, 2016) in his web article "Contextual doesn't mean copying" states that harmonious integration to buildings surroundings does not mean that it should lose its identity and time stamp (which year it was built) (examples in appendix 1). (appendix 2). To achieve this modernity while being respectful, building needs to follow these design guidelines: Form, materials, size, proportions, composition (figure 17), contrast, sense of place (genius loci) (Vogler & Vittori, 2006), research of historic environment, point of view to the building (figure 16)

Fig 16.: Example of importance of point of view for contextual/harmonious architecture. Townshouse, Landscrona (Sweden). (*Townhouse in Sweden by Elding Oscarson*, 2016)

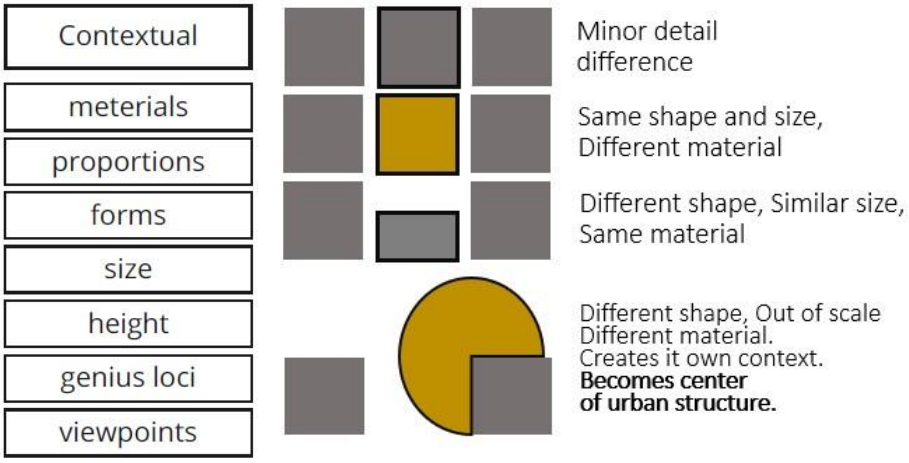


Fig 17.: Different types of contextuality simplified scheme(top). What makes object contextual (constituents) – on the left. Made by author.

In conclusion, any sustainable integration of abandoned buildings has to comes with understanding of contextuality, mainly speaking from buildings appearance perspective. Deep research of the project place has to be done to determine not only local aesthetic rules but also genius loci of the place.

Subsection conclusion

It is quite easy to integrate transformed building focusing to one or two sustainability categories. Some properties overlap (for example: housing – social and economical) only some can be considered

as good examples for sustainable integration in to urban frame. Transformation and integration analogs were compared with each other in order to find the most sustainably integrated example. Only one analog got the closest to perfect score. It was creative hub in Wroclaw, Poland by (MVRDV, 2020).

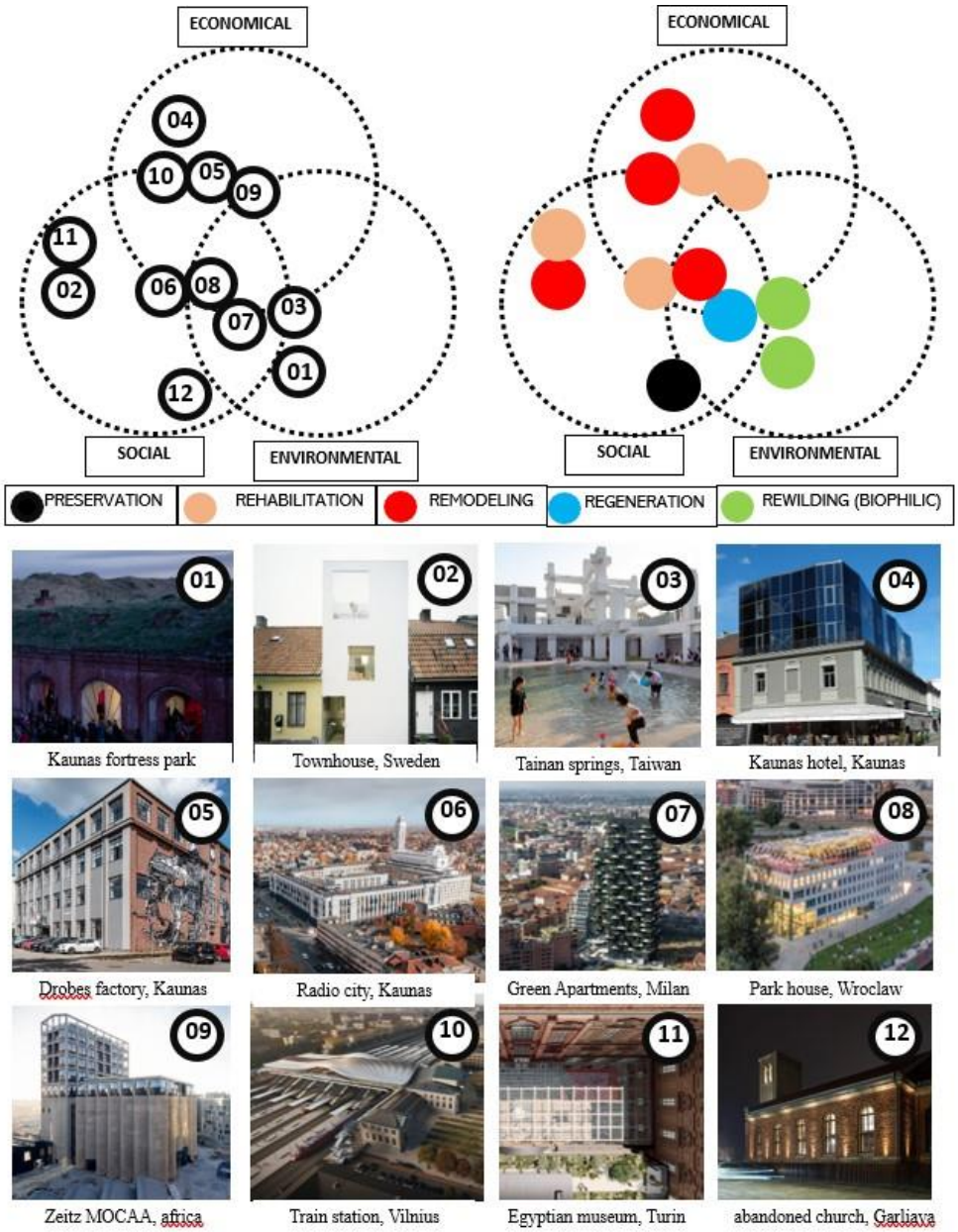


Fig 18.: Scheme which shows different aspects of environmental integration subcategories. Made by the author.

1.4 “Britanica” hotel case

1.4.1 Situation

History

the most difficult and controversial locations. You could say if you solve this problem, you can solve anything. This study case is located in Kaunas, Lithuania, in old heritage part of the city, where our study subject is located. Abandoned construction site almost two times higher than surrounding

buildings. Structure which should have been one of the most luxurious hotel complexes in soviet times left unfinished because of the collapse of the CCCR. (figure 19).

According to ("Viešbutis 'Britanika,'" 2013)The building was designed by architect A.Steponavičius. The plan was to build to enormous hotels which would represent the glory of Soviet Union. Both were 14 floors high and had up to 500 available rooms. These two twin towers are "Britanica" and "Respublika". . Hotel's "Britanica" construction started in 1986 (according to architect's Alfredas Paulauskas plans), sadly after 4 years construction was stopped. The building was abandoned till this day. The municipality tried to encourage UAB "Britanica" to finish their hotel, but company did nothing. Project till this day is going through various courts. This is almost the only reason why the hotel is standing to this day. It became the most famous and hated abandoned building in the city.

Fig 19.: How hotel should have looked like after the construction (left), how it looks now (right). Photos from (*Architektūros Objektas*, 2023)

1.4.2 Initiatives

Today hotel is owned by company UAB 'K26" (from 2018) which often tries find solution for the situation asking different architects of the city to solve the problem (company is prepared to invest up to thirty million euros for the reconstruction) (several proposals are shown in appendix 3). Some suggested student housing, but most suggestions propose leaving hotel function as it is, because it would be profitable for investors. Despite of various interesting proposals company decided to work with one of the most famous architects in Lithuania G. Nadkevicius and officially hired his office for full proposal project for this object. Architect proposed several proposals but to no avail (appendix 4). Not a single suggestion received a construction permit from the municipality, mainly because of strict laws regarding the place. In 2023 06 22 company K26 finally completely lost court cases against municipality – city's ghost will remain standing. (BNS inf., 2023). Main arguments were that suggested proposals by architects does not apply to detailed plan of the area, but some critics and journalist say that major of the city order the blockade of hotels reconstruction because when finished it would compete with other two hotels in the city which are surprisingly owned by the major itself. (BNS inf., 2023).

Worskshops and research

Different initiatives from architectural community there also made for the abandoned buildings. For examples one of the most famous Lithuanian architects Gintaras Balčytis with his college Martynas Marozas organized international workshop including Lithuanian and Japanese students who tried to solve Brittanica's problem using 4 different sustainability approaches: social, cultural, economic and ecological. Various interesting ideas were proposed, and a good amount of research has been done

which will be later used in our research. (You can see different solutions from students in appendix 5). Besides all the workshops, even 3 master thesis were written directly focusing on Britanica problem: (Liaučius, 2015) proposed using this space for economic needs, proposed greatly reducing the size but keeping some structural elements, he also proposed a revolutionary solution for hotels parking problem (appendix 6) ; (Yegin, 2022) did wonderful analysis of surrounding plot and building values, did a public survey addressing the problem, analysed various distances from the hotel to city places, analysed public transport accessibility, asked the public what function they would want in the abandoned building, analysed sun paths and shadow influence to the surroundings (all of analytical visuals can be seen in apendix 7).
Research and workshop critic**:** (Liaučius, 2015) have not considered saving all volume of the building and have not used full potential of available space, therefore proposal would not be met positively around investors, proposed parking is radical but also too expensive. (Yegin, 2022) focused too much in parts which does not affect the situation (like distances to other buildings), he also focused to much on creating new landmark instead of creating sustainable development. Finally, despite all done research and workshops done, only architect Nadkevičius tried to analyse important viewpoints using primitive methods of picture capturing and photoshop. Papers one of the main goals is to solve visual problems made by abandoned building using complex software to determine exactly which parts of the building block important city views.

1.4.3 Regulations

. This viewpoint document of Kaunas city is only one of many. Case is influenced by other documents like (*I-1240 Lietuvos Respublikos Statybos Įstatymas*, 2023); (*Kauno miesto savivaldybė Planavimo dokumentai*, 2023); (*Kauno Miesto Istorinė Dalis, Vad. Naujamiesčiu*, 1999); (*Nr. 886 Patvirtintais Teritorijų Planavimo Sprendiniais (Detalusis Planas)*, 1999), (Aukštybinių Pastatų Išdėstymo Kauno Miesto Savivaldybės Teritorijoje Specialusis Planas, 2007). Each of them faces its own challenges and regulations. Our case will have a lot of problems with fire safety, car parking, height of the building and others.

Conclusion of subsection
"Britanica" hotel was chosen for case study because of it's very hard starting situation: contrasting, most famous hated building in the city, strict regulations and a lot of failed attempts. Our research compared these innitiatives using our sustainable integration diagrams. The most sustainable proposal actually were student proposal (Akiha Shimizu, Adelė Astrauskaitė, Gabrielė Ibėnaitė, Motoki Susa) which created a mix-use complex which used rewilding / rehabilitation transformation method. (figure 20).

Fig 20.: student proposal. Screenshot from East east 5 workshop presentation.

1.5 Hyphotetical model

1.5.1 Algorithm

Using all gathered and analysed data we created quite simple algorithm which if followed correctly could give a good direction in which design decisions should go. (algorithm presented in appendix 8). We tried and applied algorithm to our case study situation. Here is the result:

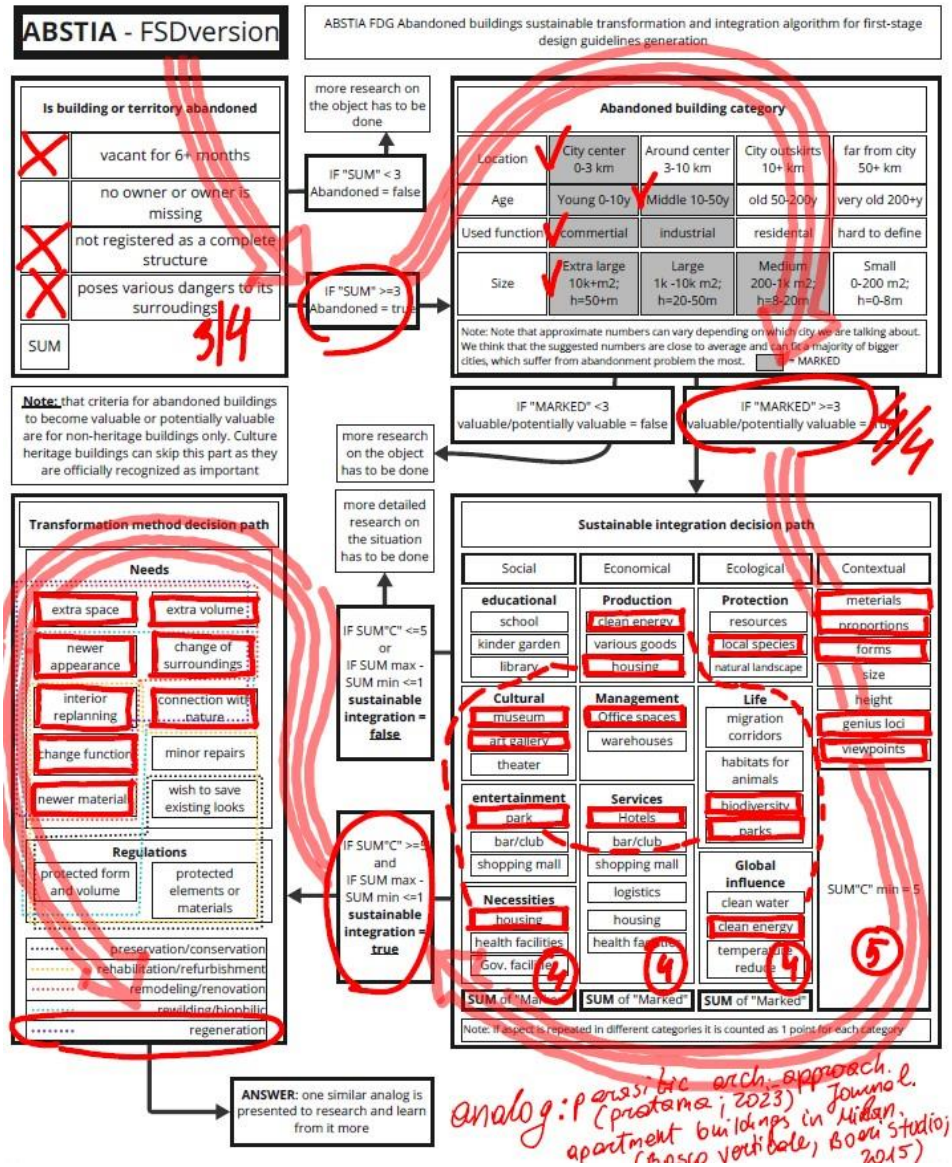


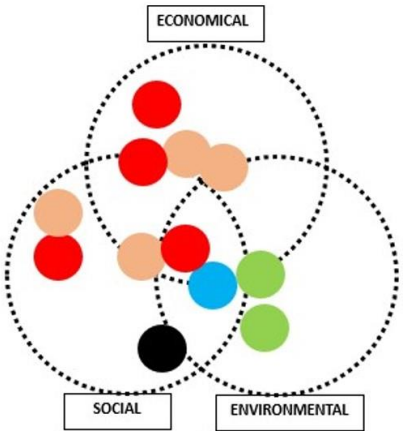
Fig 21.: Show how Abandoned building sustainable transformation and integration algorithm for the first design stage guidelines works for Britanica's case. Made by author.

1.5.2 Research by design

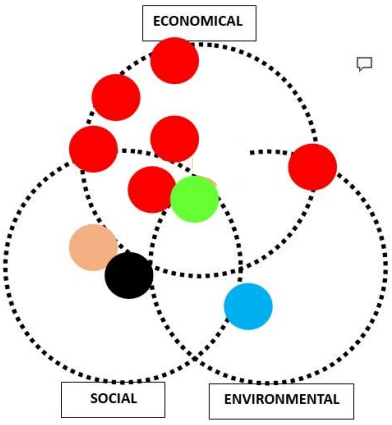
In case we do not trust algorithm answer we also tried to apply already analysed transformation and integration principles for the case study by quickly sketching different outcomes influenced by methods used. (visuals can be seen in appendix 9). We compared different transformation methods to sustainable integration principles and got that regeneration method where vertical park was suggested scored the highest scoro in sustainable integration graph. (appendix 10)

Findings and conclusions of theoretical research

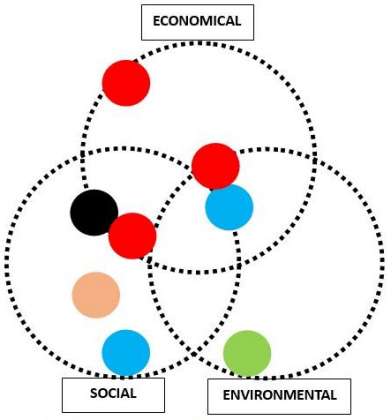
Comparison of transformation methods influence to sustainable integration



Comparison of worldwide examples of abandoned building transformations



Comparison of architects' proposals for the hotel



Comparison of research by design proposals

Fig 22.: Combined scheme of analysed comparisons and their transformation methods. Made by author.

First, we analysed different outcomes of different transformation methods in different contexts. When we compare them, we can see the following correlations:

1. Integration focused on economical benefit often uses remodeling transformation method
2. Integration focused on environmental benefit often uses regeneration or biophilic design methods.
3. Integration focused on social benefits often uses rehabilitation or preservation methods.
4. Only rewilding/biophilic, remodeling and regeneration method examples made the most sustainable integration (in the center of the scheme)
5. We ranked transformation methods by amount they were used:
   - 1st – remodeling -12/30 (40%)
   - 2nd – rehabilitation – 7/30 (23%)
   - 3rd – regeneration 4/30 (13%)
   - 3rd – rewilding/biophilic 4/30 (13%)
   - 4th – preservation 3/30 (10%)
6. Most stable method (best scoring to the center)
   - 1st – regeneration 3/4 (75% success rate)
   - 2nd - rewilding/biophilic 2/4 (50% success rate)
   - 3rd – rehabilitation 2/7 (28% success rate)
   - 4th – remodeling 3/12 (25% success rate)
   - 5th – preservation 0/3 (0 success rate)

Winning solution for Britanica's hotel

Based on our algorithm and comparison on transformation method success rate through different examples we suggest using: Regenerative design for Britanica's hotel transformation and sustainable integration into existing urban frame.
Technologies – In addition re-used deconstructed concrete for cement and wooden constructions for reinforcing the existing concrete frame.

2. 1 Empirical research

2.1.1 research program

Hypothesis	Objects	Methods	Tasks
1. "Britanica" hotel transformation or partly demolition is better solution compared to complete demolition	1. Kaunas city residents 2. experts 3. "Britanica" hotel 4. sustainability ideas	1. Public survey 2. Interview 3. Article and situation analysis	1. Create survey 2. Publish survey 3. Analyse data 4. contact and interview experts
2. Existing hotel can become even higher at the same time more contextual than it is now	1. Kaunas city residents 2. opinion of experts 3. Kaunas 3D 4. Kaunas important viewpoints document 5. Turner contextuality principles 7. City's history	1. Public survey 2. Interview 3. Document analysis 4. Analysis how high-volume effect important viewpoints of Kaunas city 5. ArcGIS Viewshed analysis	1. Get data from geoportal 2. Distinguish the most important viewpoints of Kaunas city 3. Insert proposed building volumes into existing important viewpoint of the city 4. Create survey 5. Public survey 6. Analyse data 7. contact and interview experts 8. Try to find connections and explanations for other higher buildings in Kaunas city center.
3. Method of regeneration is the best solution for "Britanica" hotel transformation.	1. Kaunas city residents 2. opinion of experts 3. Bosco verticale as example 4. Articles about local Lithuanian plants and their properties 5. Dendrologist's consultation	1. Public survey 2. Interview 3. Research and analysis 4. Analysis how vegetation in the city can reduce and filter C02	1. Create survey 2. Public survey 3. Analyze history and find arguments for this method of transformation. 4. contact and interview experts 5. Analyze what needs of plants are in Lithuania to grow and thrive in high altitudes

4. Transformed "Britanica" hotel can and should become a mix-used building	1. Kaunas city residents 2. Kemal Yegin 2021 work 3. opinion of experts 4. "Britanica" hotel	1. Public survey 2. Interview 3. Analysis of research work 4. Existing structure's functional potential	1. Create survey 2. Public survey 3. Analyze Kemal Yegin research work and find his arguments for what functions is the most needed in central part of Kaunas city. 4. contact and interview experts 5. Analyze existing hotel's structure and find what functions is possible according to Lithuanian building code.

2.1.2 "Britanica" hotel complete demolition vs partly demolition

Hypothesis is very important for overall research work as it presents the main idea of the research. Main goal of empiric research was to determine if "Britanica"case study is really worth keeping the building and transforming it using less invasive methods or reconstruction.

As it was already determined in theoretical research algorithm – building has potential to be transformed. This section analyses how adaptive to changing the building is today. We could not visit building because it the entry is strictly prohibited, mostly because in the past several suicidal events have happened. Because of that we analysed various videos uploaded to platforms like YouTube, where some people sneak inside the structure illegally and filmed everything. Screenshots below from videos of (EL PAÍS, 2021; Paulius Samoška, 2020) . Screenshots show how many steps there are in one stair flight – 8 steps + 2 for islands (First steps at the start and finish match the heigh of floor level) . Overall, it makes 1+8+1+8+1 from one floor to another. 19 steps to be exact.

When we also analysed data of East East 5 workshop which was given to the participants.

As we can see from the pictures below (Figure 23) plans given by workshop organizers match video footage, so we can confirm that plans are correct. For this research we accept everage calculation errors up to 20cemtimeters, as it is accepted in Lithuanian building code.

Fig 23.: Screenshots of videos taken by YouTube creators (EL PAÍS, 2021; Paulius Samoška, 2020) of "Britanika" hotel inside. Shows width of corridors and how many steps are in staircases.

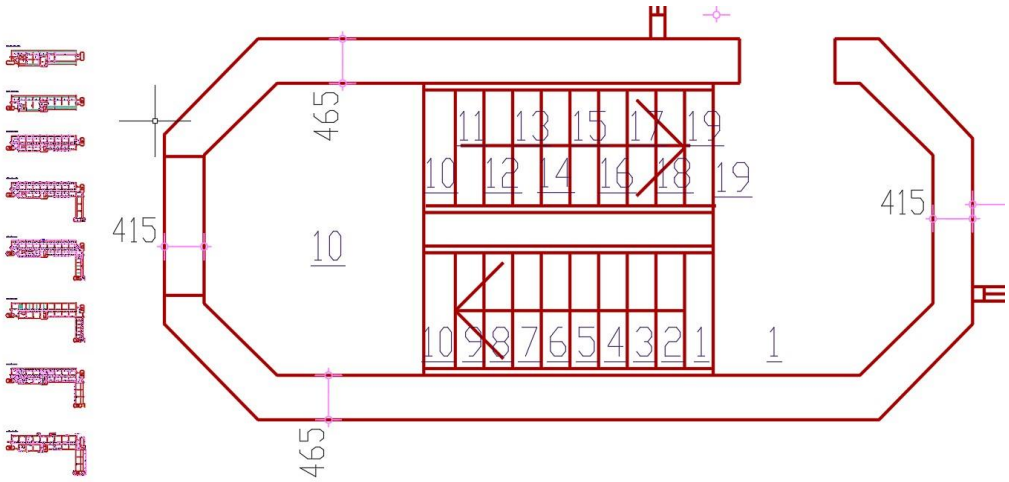


Fig 24.: On the left, plans .dwg format provided by East East 2022 organizers, on the right: zoomed in staircase with step numbers on it.

Fig 25.: Screenshot made by author from SketchUp model of "Britanica"hotel which was given to East East 5 participants. We can see measured step in two blue dots and exact measurement result in bottom left corner.

Using gathered data using Kaunas 3D map available online (*3D Kaunas (Lidar)*, 2023) and Kaunas digital twin model created by KTU team (*OpenCities Planner (Digital Twin)*, 2023) we measured heights of different floors: ground floor and other residential floors. As you can see in the picture (Figure 3) First two floors of the building has a height of 3.4meters and all other residential floors has 2.8 meters from ground to ground between floors. We estimated that at that time minimal construction thickness between floors would be around 200-250mm.

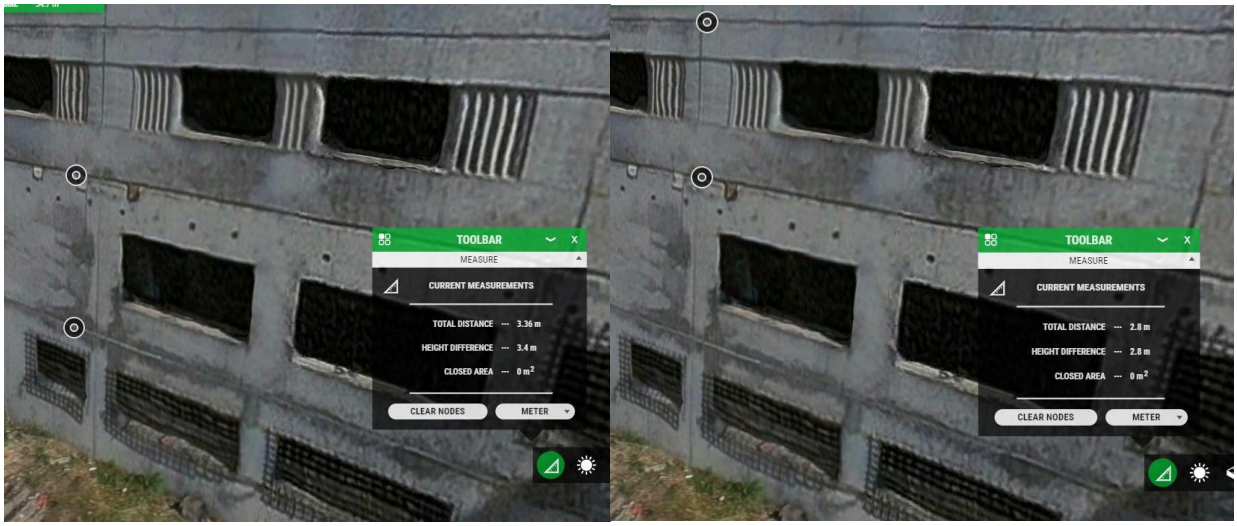


Fig 26.: Screenshot made by author from website "Kaunas digital twin"on the top we measured first two ground floors and on the bottom we measured typical residential floor height. Measurement result can be seen on the right at "height difference"section.

After confirming all gathered data to be true we analysed existing building 's functional potential for transformation.

According to (*1-338 Dėl Gaisrinės Saugos Pagrindinių Reikalavimų Patvirtinimo*, 2024)

Fire staircases in Lithuania must have platforms 1.5m or wider + 0.85x1.2 space for disabled people. 1.2m width flight, 20cm or wider empty shaft between flights and 1.2m wide double sided or one-sided entrance to the staircase.

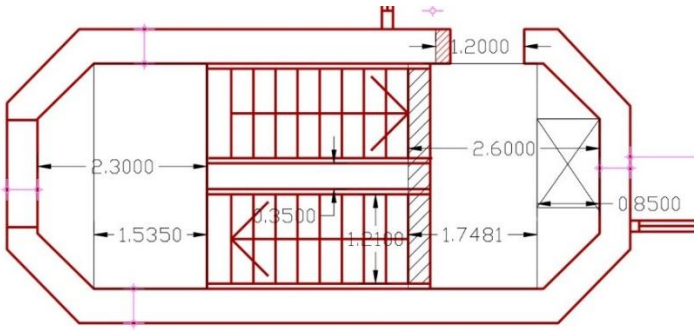


Fig 27.: Scheme shows how existing staircase can be modified to apply with Lithuanian building code. Scheme made by the author.

In conclusion, existing fire starcases can be used for the tranformation purposes, beacause existing stairs can be easily modified and upgraded to today's building code standards.

Second we analysed what functions can be created in these very small residental floors. According to (*D1-91 Dėl Statybos Techninio Reglamento STR 2.02.02:2004 "Visuomeninės Paskirties Statiniai" Patvirtinimo*, 2022) main rooms in public buildings have to be 3meters or higher, only technical rooms or corridors can be with lower ceilings. Meanwhile in residential buildings according to (*705 Dėl Statybos Techninio Reglamento STR 2.02.01:2004 "Gyvenamieji Pastatai" Patvirtinimo*, 2022) 2.5 meters of clean ceiling height is enough. Because of these regulations only economical residential apartments can be designed in these floors of existing building. (Figure 7) We suggest using 60mm of leveling layer, then 40 for floor paneling and construction. Create ventilation shafts in the corners of the rooms leaving a bigger portion of the room with higher ceilings. Raising floors only at specific parts where water drainage will be put.

Fig 28.: Section cut shows how low ceilings still can meet the minimal requirements of Lithuanian building code. Section cut made by the author.

In conclusion, existing planning structure would allow designing only economical residental apartments which beraly meet minimal standarts of today ‘s lithuanian building codes. There is a possibility to deconstruct every second constructional overlay and create apartment or other public functions with lofts and big windows, but this approach would be very costly.

All things considered, existing hotels structural conditions and planning is not perfect, but it is also not impossible to adapt to today ‘s standarts. In that case it is suggested to leave existing structure as much as possible and adapting it to economical bugdet options for social housing, dormitories, or other public functions in need.

Public and expert opinion

Our survey was mostly directed to Kaunas city residents or city visitors who know existing situation well enough to express their opinion on it. We gathered opinion of 165 people. Majority of them were well knew the existing situation. We attached all respondents age, gender, location information in the appendix of this research (appendix 11).

Participants were asked:

What do you think should be done with "Britanika Hotel"? - you can choose several options.

1. To completely tear it down and do nothing in its place
2. Demolish and design the parking lot
3. Demolish and build something new
4. Partially demolished and the remaining places transformed into something new
5. Do not destroy anything and renovate as the first authors of the project thought
6. Do not touch anything at all and leave it as it is

7. To transform the entire building without destroying anything, but to modernize it so that no features of Soviet architecture remain
8. Demolish and establish a park or square in that place
9. Transform the building into a vertical park with an observation deck on top
10. – write your opinion –
Answers were (appendix 12):
1st – Transform building into a vertical park with observation deck on the top – 67/165 (40.6%)
2nd – Transform the entire building without destroying anything but modernize it so that no features of Soviet architecture remain. – 66/165 (40%)
3rd – Completely demolish and create something new – 53/165 (32.1%)
Majority of partisipants express that their want to transform existing structure not to demoish it completely. Although we purposly added one option which suggests tranforming while hidding all soviet era elements, still a lot of people (one third) chose to demolish this abandoend building. That means that not only soviet architecture is the main reason for hate for this ghost structure but also its size and appearance.
If we would compare public survey to expert's survey, we can see quite similar results. (appendix 12) We can see that experts had devided opinions. Two almost equal camps of destroyers and tranformers were formed. It could be said that experts understand that it is very hard and economically unreasonable to use existing structure because of its low ceiling heigts and too wide corridor spaces.

Main thoughts gathered from expert's interviews:
G.Natkevičius - main architect for this project, who already suggested several different proposals.
1. Thought about transformation but threw out the idea because of low ceilings.
2. He calculated that interior works for existing corridors would cost the same price as demolition of the building, so why invest in area which you cannot sell?
3. He would demolish the structure in riny days in order to avoid dust
R.Adomaitis - practicing architect who has worked with Natkevičius earlier. Does a lot of cultural heritage transformation and is used to complicated adaptation processes for existing buildings.
1.Thinks that a lot of people started to kind of live on with this abandoned structure.
2.Would not demolish it because the location is too valuable from economical standpoint.
Š.Kiaunė ir A.Kiaunienė – practicing architects who had a lot of experience working with city planners in the past. Lives in Kaunas for a long time and knows the situation very well.
Demolition is the easiest path. It would be boring to choose it.
Existing building structure would surely handle any additional transformations - functionally, structurally building can be transformed.
P.Vaitiekūnas – practicing architects who helped organize Kafe 2019 (architectural festival). Created an installation where visitors could climb up to the roof and experience this abandoned ghost from inside.
Only transformation and nothing else.
Thinks this building has already created its own genius loci for the place.
Stand for complete remodeling from esthetical stand, but form should still be monumental and strong.

All things considered, we can see that in both public and expert surveys small majority (around 65-70%) are leaning to transformation of existing structure, but still we can see that around combined of 30-35% of participants would choose demolition and creation of something completely new in this space. Still, we would count it as a deciding factor that public and experts have similar opinion, and it is to sustainably transform existing building and try to integrate it into existing urban frame.

Conclusion of section

The hypothesis that "Britanica" hotel transformation or partly demolition is a better solution compared to complete demolition" can be partially confirmed. Nevertheless, that in theory existing structure can quite easily achieve today 's building code regulations and standards, it would not attract a lot of investments because of it's low selling area efficiency (large corridors, low ceilings). Our suggestion would be to partially demolish the existing structure with the intention of still leaving it's monumentality and genius loci and in addition building new more efficient and modernized area on top the existing structure or beside it. In that case abandoned ghost buildings would be transformed still using it's existing structure for a part of new building and reusing deconstructed reinforced concrete for different building tasks in the site.

2.1.3 Regenerative transformation methdos is the best solution for "Britanica" hotel.

Analysed data in analitical research raised a hyphotesis that regeneration method is the best tranformation methods for „Britanica "hotel case, that was also backed by preliminary answers from our created algorithm.

First analysis subject – public and expert survey.
Our survey was mostly directed to Kaunas city residents or city visitors who know existing situation well enough to express their opinion on it. We gathered opinion of 165 people. Majority of them were well knew the existing situation. We attached all respondents age, gender, location information in the appendix of this research (appendix 11).

Our question was not straight forward. We ask what functions in public opinion is the city center lacking. (appendix 13). Top 3 answers were: 1. parks / green spaces, 2. squares and places to sit, 3 nothing is missing in the city center. Experts answered quite similarly: 1 nothing is missing, 2. Squares / places to sit. In interviews experts mostly agreed with an idea to create vertical park which could reduce CO2 level and increase livability in the place.
Conclusion - Public and experts support the idea of regeneration method.

Regeneratative transformation method influence to the environment.

Regeneration by itself mainly means building something which not only makes construction reach net zero or sustainable ground but, on the opposite, encourages to influence its surroundings in a good way. Main idea is that any insertion into existing status quo should improve overall wellbeing not only for humans but also for the environment.

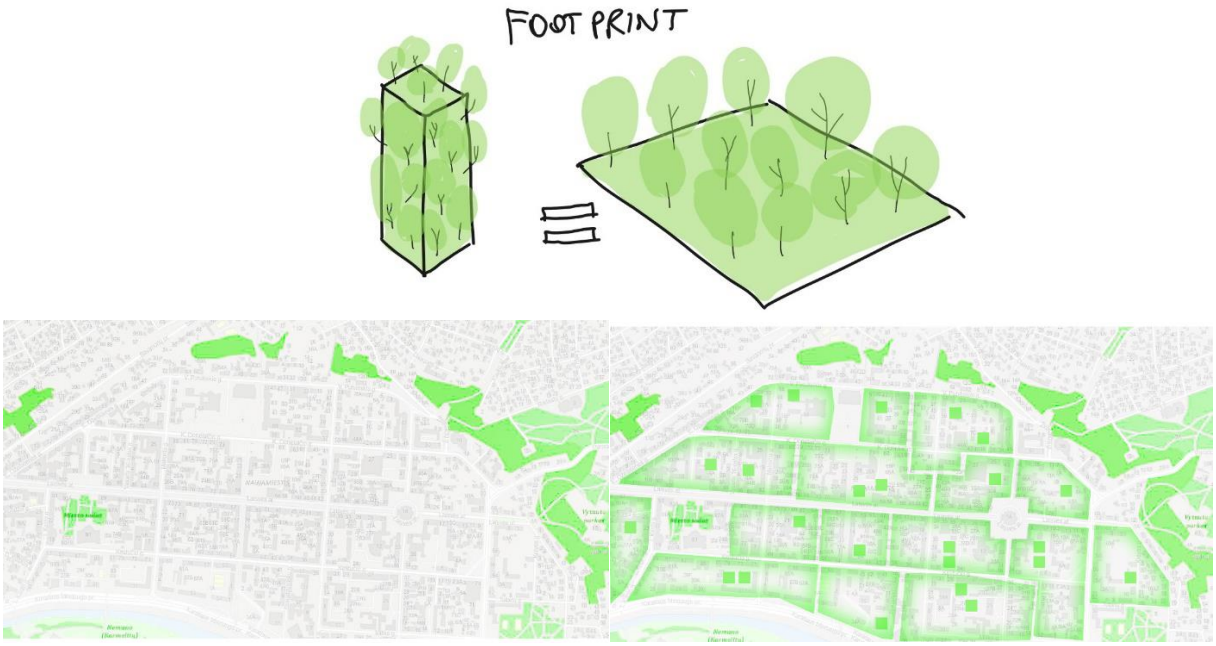


Fig 29.: Scheme above shows how vertical parks regenerate urbanized areas. Scheme made by author.

For example, Bosco vertical residential skyscraper (figure 7) built in Milan Italy, designed by Boeri studio analysed how influential their building is. . ("Vertical Forest | Milan," 2014) says that building footprint area is equivalent to 5 to 10 times bigger forest area. Other independent researcher (Par Rose Barfield, 2019) says is closer to 3-5 times. Nevertheless, this is perfect for highly urbanized dense cities like Milan, matter that the size was miscalculated this building still has an enormous impact on the city, by reducing pollutants in the air and reducing urban heat island effect.

Kaunas is the perfect place for this type of building, because it has a relatively small number of public parks in center area. The only solution for this dense district is vertical parks.

Overall, regeneration is a perfect way to house desired functions for humans while at the same time creating space for small animals, reducing CO2 emissions, and filtering polluted city air. The vertical forest's used footprint has a minimal of 1:5 efficiency rating. Where 1000m2 of built area can be equal to 5000m2 of forest. We must understand that this number may vary by building height, plant sizes and number. Regeneration methods can be costly and economically unsustainable, but it is necessary to stop global warming or even bring it back to the pre-industrial era.

Local Lithuanian plants perfect for vertical forests

According to web article (Lina, 2020) "Sodas ant namo stogo: "Live squere" terasos kūrimas". Landscape architect Linas Ūsas says that minimum of 15cm soil is needed for small grass and around 70-100cm for average trees like American *Amelanchier lamarckii, Euonymus alatus, pinus mugo* empthy areas near the ground can be filled with various smaller plants like: *Juniperus, pinus mugo, carex caryophyllea, asteraceae, pulsatulla, allium.* According to another web article (Genute, 2016) „Raimonda Šimėnaitė: VU botanikos sodo eksperimentai neturi analogų" created new façade landscaping techniques (figure 30). They created a façade column for plants. 3 segments each 1.2m height and 0.4x0.4m width cover one floor of the building. One segment with plants weighs around 1 tone. There is a pipe with small holes inside which waters plants using melted snow or rainwater

collected from the roof. The left space is filled with compressed soil which is held together by a small metal grid outside. Research uses simple cut outs from nearby growing wild grass. They add that all roofs or façade plants must resist various winds, heats, and colds. They suggest using plants which does not require "perfect" conditions like: *potentilla fruticosa, forsythia, physocarpus opulifolius, aurea, hydrangea, nepota x faassenii, Lavandula angustifolia, berberi thunbergia* and others.

Fig 30.: Façade of VU botanic garden laboratory. Photo by L.Liubertaitė

Lastly we analysed web article (*Įspūdingas sodas ant stogo*, 2022) where landscape architect M. Marozienė suggested using large vazes to fill them with soil and protection from heat or cold (metal cading, marine playwood and foam insolation), it not only gives enough space for plants to grow and expand but also create some kind of boundaries and seperates roof into different zones. She also notes that drainage of water is very important for plants not to rot. She suggest using:*acer, hippophae, viburnum opulus, spirea x cinerea, calamagrostis x acutiflora, betula.* She also notes that the bigger the vaze the bigger the plant would be, there is no rule how much wide or tall the vaze must be. Smaller vazes around – 40x40x40cm, average 70x70x70cm, larger 100x100x100cm.

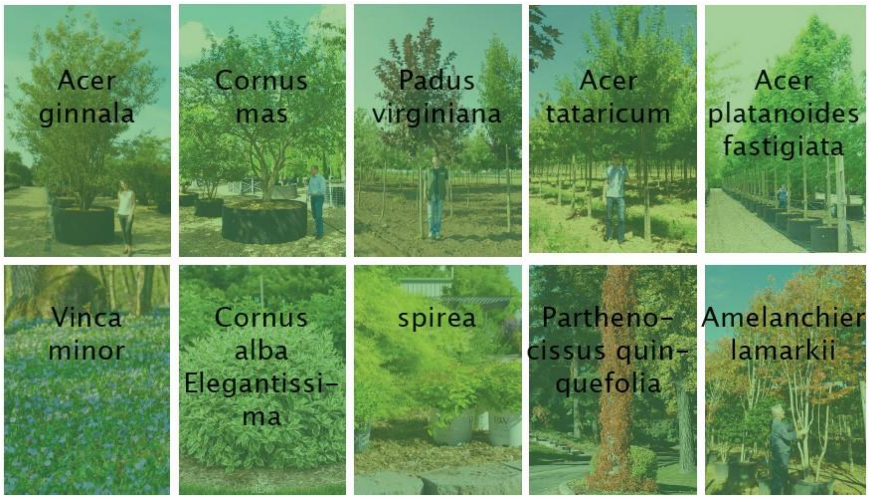


Fig 31.: Suggested plant species for green facades. Scheme made by author.

Lithuania has plenty of plants which can withstand extreme wind, heat or colds which usually occur in Lithuania especially if living high above ground. We can use insolated vases or vertical columns for the facades. We also need to understand that larger plants need larger vases and soils in order to grow bigger. Lastly, a very important aspect of green buildings is not only watering systems but also drainage which prevents plants from rotting.

Conclusion of section

Transformation method of regeneration is not only the best solution for “Britanica” hotel is also a must. It will help to revive and regenerate the degraded central part of Kaunas city. Examples in Milan show that a small footprint of a vertical forest structure can accumulate to from 5 to 10 time more area of forest. This type of regeneration in urbanized areas is the most efficient and environmentally friendly method of building. Finally, we found out that there is plenty of various different plants of Lithuania which can withstand different extreme conditions living high above ground, so this method is completely possible in quite harsh conditions of Lithuania.

2.1.4 The transformed “Britanica” hotel can and should become a mix-used building.

“britanica” hotel owner wants to build a luxurious “Hilton” class hotel in the site. However, it would not be very sustainable from a sociological and ecological standpoint. We analysed what functions can also be integrated into mixed-used building.

Analysis of publics and expert’s opinions on what functions should be included in newly transformed hotel.

Our survey was mostly directed at Kaunas city residents or city visitors who know the existing situation well enough to express their opinion on it. We gathered the opinions of 165 people. Most of them were well knew the existing situation. We attached all respondents age, gender, location information in the appendix of this research (appendix 11).

Participants were asked what functions should be included in the newly transformed “Britanica” hotel.
People could choose several proposals they liked. (appendix 14)
Top 5 answers were: Park (83/165), place for events (80/165), observation deck (70/165), museum, exposition place (61/165), restaurant (58/165) and even “skyscraper which represents Kaunas city” (55/165). The hotel as a function was also mentioned, but it scored one of the lowest points, finishing in 10th place (27/165).

Experts for comparison (appendix 14) unanimously (9/9) said that place for event is a must function for this place. In addition, majority also suggested: restaurant (6/9), park, green spaces (6/9), offices (5/9), bars / pubs (5/9)

To make answers more solid control question was asked before asking about functions for “Britanica”. It was: What are you usually doing in the Kaunas city center and what are you missing in it. (appendix 15). Answers matched the ones which were suggested for abandoned building. People generally are missing Parks, green spaces (69/165), squares, places to sit (57/165).
Question what you are usually doing in the city center showed functions which center has plenty of, like: shops (111/165), museums (69/165), bars (77/165), restaurants (120/165), cinema, theatre (94/165), live events (49/165)

Conclusion
The public and experts agree on most functions like parks, green spaces, places for events and restaurants. There is a big desire by the public to still use this structure as an observation deck or even

as a museum of old soviet architecture, they even see a possibility of having a representative skyscraper. On the other hand, experts still think that a safer approach with offices is needed.

Main thoughts gathered from expert's interviews.
G.Natkevičius - main architect for this project, who already suggested several different proposals.
building is in very good location; you just cannot forget to efficiently use the space and catch investors eye. I would suggest doing all addition functions as extra, but mainly focus on trying to at least keep the same amount of volume and area.
R.Adomaitis - practicing architect who has worked with Natkevičius earlier. Does a lot of cultural heritage transformation and is used to complicated adaptation processes for existing buildings.
Thinks that you can only build hotel in this area, realistically speaking. Because if plot is now owned but rather rented owner cannot decide what functions he can built. According to Kaunas master plan area can be completely become a mix-used territory.
Š.Kiaunė ir A.Kiaunienė – practicing architects who had a lot of experience working with city planners in the past. Lives in Kaunas for a long time and knows the situation very well.
Completely agrees with vertical park idea, a very interesting idea and decision. They also said that you must save the existing inner yard of the site, it has a perfect orientation to the south, could function as a cozy square. Give an area for artists, let them create a new atmosphere of the place. This place can become a new culture hub for young people.
P.Vaitiekūnas – practicing architects who helped organize Kafe 2019 (architectural festival). Created an installation where visitors could climb up to the roof and experience this abandoned ghost from inside.
Thinks it should radically remodeled. Agrees with vertical park idea and notes that less but more valuable square meters is the way to go for this wonderful location which is near to everything. You should fully restore the old hotel function and add a lot of different mix-used function to attract public.

Conclusion.
Experts suggest creating valuable luxurious and expensive area which at least should match or be close to existing structure's area (around 12.000m2). The majority agreed that vertical park for this site is a wonderful and interesting idea. Finally, the area has well situated area and properties to become a mix-used plot and it should be accomplished.

Analysis of depth map research by Kemal Yegin, 2021

Kemal Yegin wrote exact same research work for "Britanica" hotel (Yegin, 2022) and in one of his empiric research sections he used depth map to try to find which function is mostly needed in Kaunas city center.
Scheme 1.
With this scheme the author explains that where is not enough hotels in the city center and "Britanica" hotel has almost perfect location to fill the void. (Figure 32). Despite that his marked hotels in the scheme almost do not match the real locations and numbers of hotels in city center. According to web article ("Bundanti viešbučių rinka Kaune," 2023) says that Kaunas already done wonderful job by upgrading its infrastructure which is a first step for bigger development in the tourist industry. Today Kaunas is not too far away from a critical position for the lack of hotel spaces for visitors, especially when a bigger event is held in the national Zalgiris stadium. The author also says that the city

experiences unprecedented growth of 55% over the period of 10 years. In addition, 2018 done study shows that Kaunas had the biggest number of occupied rooms on average in the country (around 65%). In 2022, the highest occupation of rooms where recorded – 77.6%. The author also adds that because Kaunas lacks very high-class luxurious rooms a lot of national or foreign stars after concerts or sports games go to sleep in nearby cities.

Fig 32.: scheme by (Yegin, 2022). Shows distances from the abandoned building to the closest hotels in 1500m distance.

Scheme 2.

The author states that city central has a" slight necessity in terms of parks in the city center although the situation is not causing such discomfort" (Yegin, 2022). Despite that not all things were put into consideration when analysing this very important function for the city center. As we can see in the scheme (figure 33). We modified and added some important details such as Savanoriu street on the left which would block a lot of passing towards western parts of the city. In addition, slope to the east would also filter how many people would choose to walk up to walk in the park. Finally, we would argue that some selected areas (marked "x") would be classified as parks, in addition some areas like Ramybes park were not even selected. We marked "real" areas of parks in the city center (circles with lines). We can clearly see that "Britanica" hotel sits completely in the middle of void – place which has no parks at least 500m around. This would clearly suggest that creating a park as an integrated function is very needed in this area.

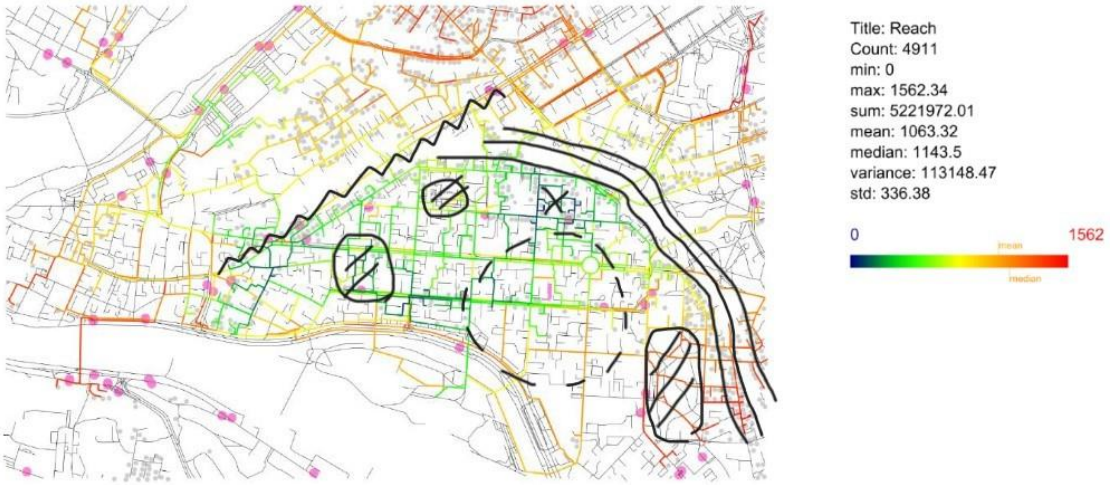


Fig 33.: scheme by (Yegin, 2022). Shows distances from the residential apartments or hotels to the closest parks in 1500m distance.

Scheme 3.

Here the author states that you can reach most university buildings in 1500m from dormitories. He says that even though the central part of Kaunas mostly lacks dormitories it would be "advantageous to propose student housing for the transformation project". In addition, we can also see that his scheme does not match reality (see figure 34). It is clearly visible that the number of universities (marked in red) in the city center is a lot bigger than number of dormitories (marked in green). Big problem with dormitories as they are not always cooperating between different universities. It is suggested to create very affordable small apartments with all minimal necessities which can be on the student's budget. These apartments can also be used by other individuals who need small affordable housing in the city center.

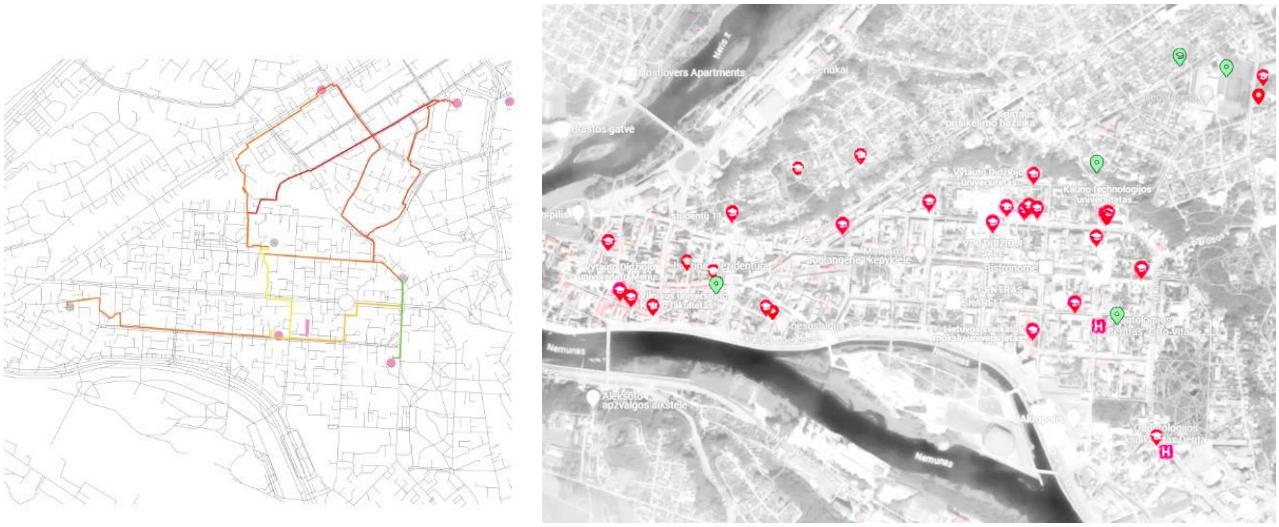


Fig 34.: scheme by (Yegin, 2022). Shows distances from the dormitories to the closest universities in 1500m distance. Scheme in the right made by author shows real locations of universities (marked in red) and places of dormitories (marked in green)

Conclusion.
After analysing and correcting some research mistakes we can see that the city center mostly lacks functions like hotels, dormitories or affordable housing and parks.

Conclusion of the section

Public and experts survey results and analysis of Kemal Yegin work shows that that Kaunas central part has some functional voids and „Britanica "hotel well situated position brings well needed help. New tranformation should introduce functions like reconstructed and improved high-end luxurious hotel, affordable housing for students or other people, squares, vertical parks, observation decks, places for various cultural events, extra office spaces are also always needed. To achieve this mix-used development we suggest deviding functions by blocks instead then by floors.

2.1.5. Existing hotel can become even higher at the same time more contextual than it is now.

This research raises the suggestion for higher existing volume based on these arguments:
1. Theoretical research provided some conclusions of large building genius loci appearance which has been seen in public and expert opinions.
G.Nadkevičius raised the importance of possible profit from created building area.
R. Adomaitis marked the importance of the location and untapped potential of the place which can be matched or even exeded today‘s building area. He also thinks that enough years have passed that the structure created its own denius loci for city residents and tourists.
Š.Kiaunė suggest that unordinary situation has to have creative and unique proposals and bravery. He really supports the idea of vertical parks which would help and regenerate degradated city centers.
P. Vaitiekūnas Supports genius loci phenomena and thinks that transformation should create something monumental and brave, something that is up to date and modern but carries old monumentalistic feeling of „Britanica“ hotel.
2. Research based on genius loci idea tries to provocate suggesting higher building in order to raise further discussions on similar topic when higher contrasting building is suggested in highly protected historical city centers. Why should we not avoid this thenomena and how it can be controlled?

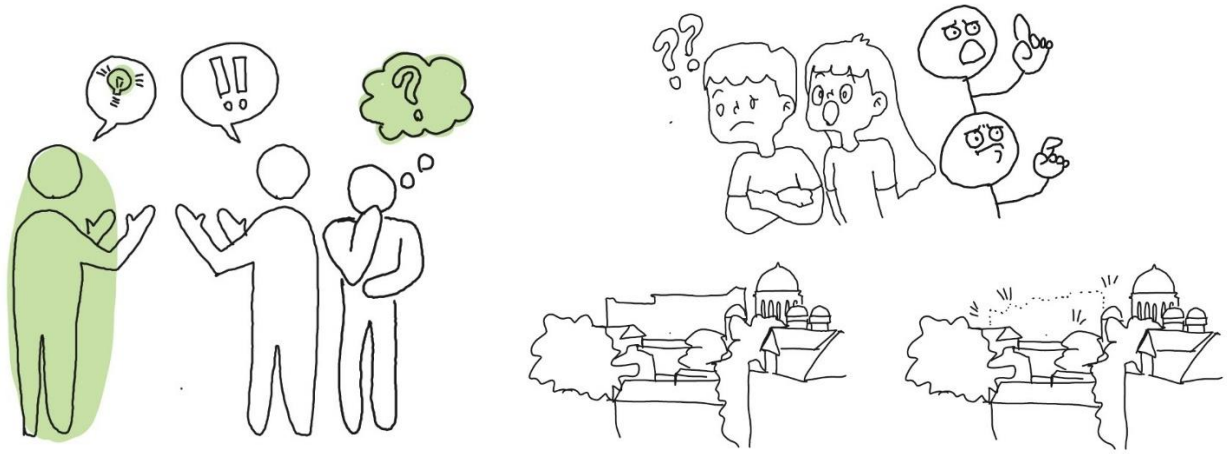


Fig 35.: Schemes visualizes reasons for higher volume. Made by author.
3. The more existing building can be left untouched, the more already used CO2 will remain trapped insane the structure.

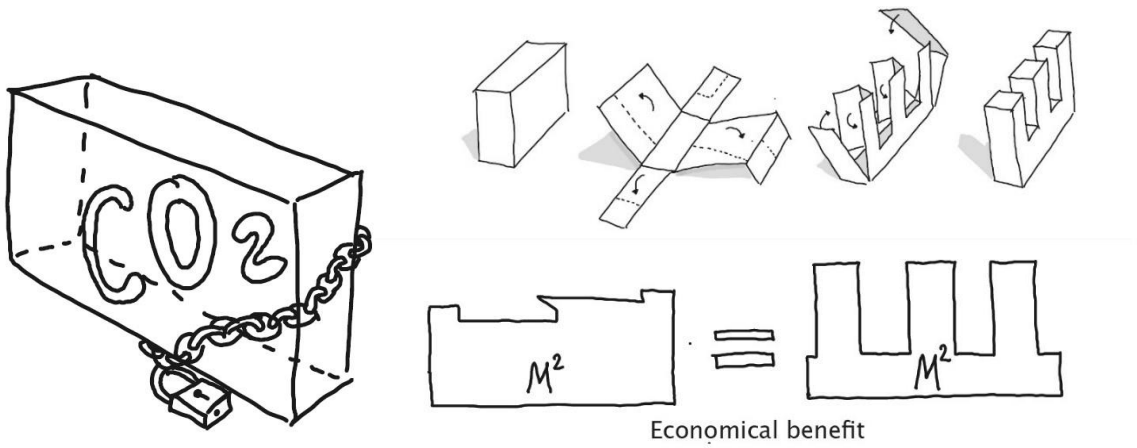


Fig 36.: Schemes visualizes reasons for higher volume. Made by author.

4. Economical benefit and untapped potential (backed by G.Natkevičius and R.Adomaitis) different volume similar building area. You should not waste the location which is as good as this.

Fig 37.: Schemes visualizes reasons for higher volume. Made by author.

5. Philosofical standpoint – Old soviet-era building transformed into new larger and modern structure which represents Lithuania and its values. It would be not only a metamorphosis but also new contrasting higher volume standing near Soboras which was built by Russians in XIX century as a monument of power over Lithuania.

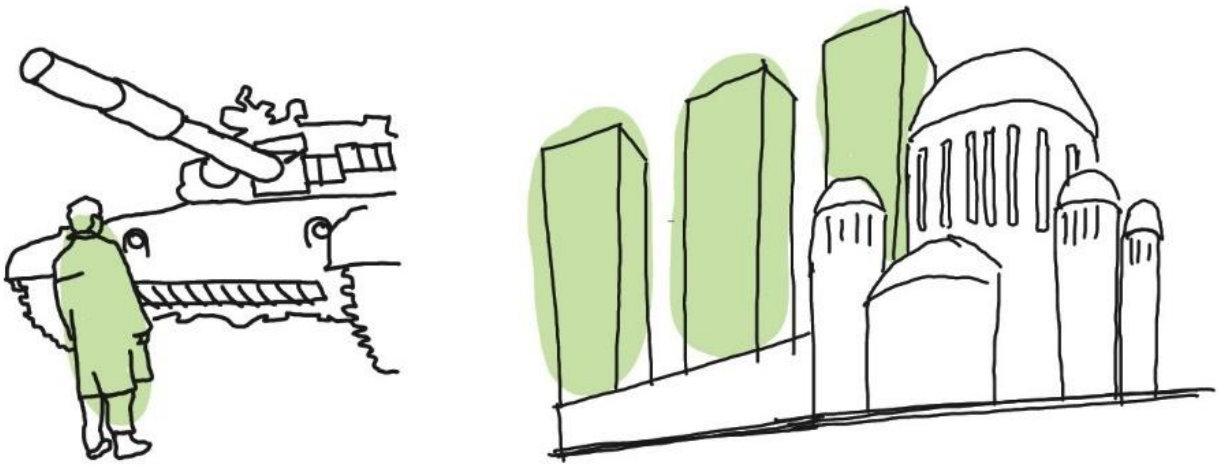


Fig 38.: Schemes visualizes reasons for higher volume. Made by author.

2.1.5.1 Important and protected viewpoints and documents

The paper analysed most common views seen by everyday resident in Kaunas city. Two distint distinct city centers can be seen (Figure 39). One on the left and another one on the right. It is very interesting that our case study object is quite well seen in different parts of the city. That makes this site very important for overall city views.

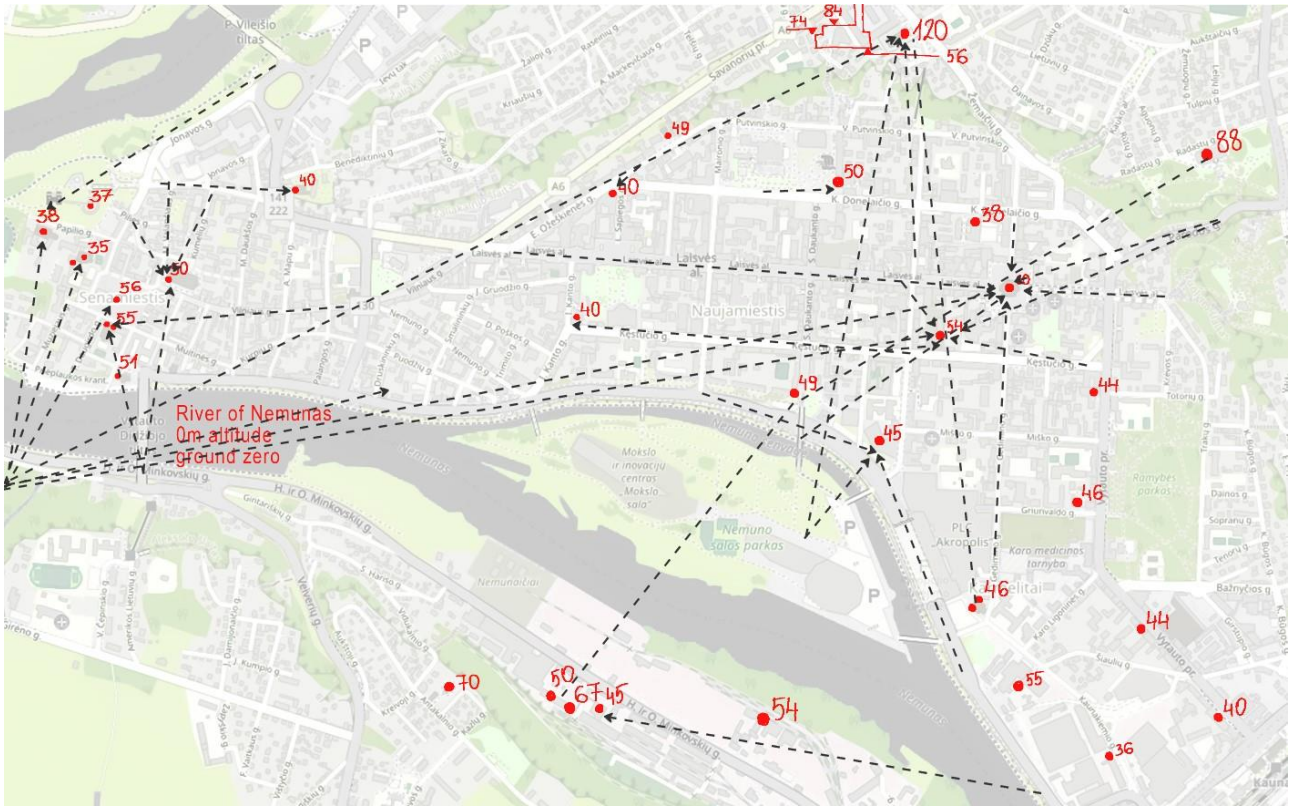


Fig 39.: Scheme made by author. Most common viewpoints by everyday Kaunas city resident.

In addition, the research analysed official document of Kaunas city, in which all protected city views are listed. (appendix 16). In the picture below you can see viewpoints marked in numbers with specific view direction. “Britanica” hotel falls under 7 out of 18 protected viewpoints.

5– view from Aleksotas bridge

6 – view from Aleksotas observation deck

1 – view from “Prisikėlimo” church’s observation deck

3 – view from Simono Daukanto bridge

8 – view from Čiurlionio brigde

9 – view from Freda hill

4 – view from Laisvės avenue to Soboras

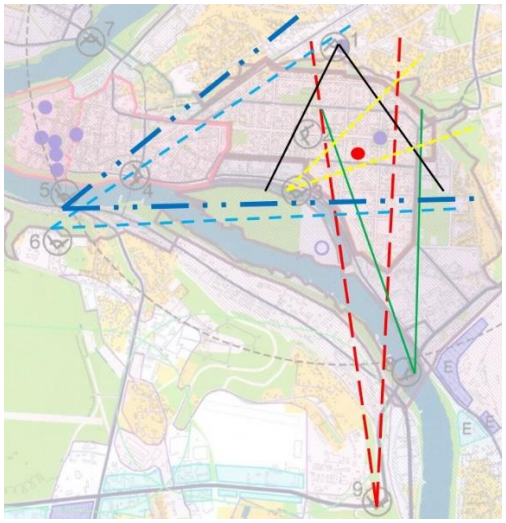


Fig 40.: Screenshot from official city document: “special plan for high-rise buildings in the territory of Kaunas city municipality” with marked relevant viewpoints for this case study.

In conclusion, “Britanica” hotel falls in the mix of different protected viewpoints in which different important landmarks are protected: Prisikelimo church and Soboras. They are the main dominating objects in the city skyline on purpose.

2.1.5.2 Past, present and future of Kaunas cityscape.

The research analyses how these dominating buildings change throughout the ages in Kaunas city. (appendix 17) Interesting phenomena can be seen. In the early stages of city’s existence, the main castle tower was the main building of the city, later around XV century when Lithuania become Christian first church was built near the banks of river Nemunas (Vytauto Didžiojo church). It overnight became the new most important building in the city. In following years more similar size churches and city hall were built. Clear dominating building disappear – now we can see a distinct city silhouette. This phenomenon continued until XVIII century when a big expansion of the city organized by Russian czar was started. A completely new city grid was planned and at the end of it an orthodox church (Soboras) which presented itself as a dominating building. It showed power and greatness of Russian overlords. Because of that till this day there are some discussions and proposals how we could deconstruct this building which represents dark times of Lithuania’s history. Nevertheless, we can see that the XVIII century gave a change in dominating objects in the city – from a silhouetted old town to dominating a new district. This wasn’t for long. After Lithuania gained its independence in the start of XX century and after short war with Poland Lithuanian when parliament and capital had been moved to Kaunas (temporary capital of inner-war period) new investments came. One of the most important developments was a new catholic church on the highest hill in the city, funded and built completely by Lithuanian money and hands. It quickly became a symbol of free democratic and catholic Lithuania. The building was shortly used as a radio factory by atheistic soviet occupants, but after regaining independence in 1990 the building was quickly restored and stands until this day as the most important symbolic and dominant structure of Kaunas city.

of XX century and after short war with Poland Lithuanian when parliament and capital had been moved to Kaunas (temporary capital of inner-war period) new investments came. One of the most important developments was a new catholic church on the highest hill in the city, funded and built completely by Lithuanian money and hands. It quickly became a symbol of free democratic and catholic Lithuania. The building was shortly used as a radio factory by atheistic soviet occupants, but after regaining independence in 1990 the building was quickly restored and stands to this day as the most important symbolic and dominant structure of Kaunas city.

We can see from this city’s history that each age had its own transformations. From new district with one distinct dominating body to a cluster of complex structure filled with different high city skyline dominating structure which are complimentary to each other. We can also see from (Algimantas Miškinis, 2009) research that new modernist center of Kaunas through out the years slowly but surely became denser and higher (figure 41). That could indicate that this area of the city is transforming from one centered, one building dominated district into complex cluster of various height buildings which complement each other in beautiful cityscape.
Only height in this area should be limited by the height of Žaliakalnis hill (which would allow to build up to 55m height – about 30m taller than avarage building in the area) and all the specific

locations where these higher buildings could be built should be closely analysed and testes using GIS softwares. This would help to ensure the senergy between higher buildings making sure that important elements or structures will not be blocked by new volumes.
Another important aspect of multi-dominat cityscape is clear seperation between average and higher heights. As we can see from Kaunas Oldtown example (figure 42) higher towers are similar height but significantly higher than “background“buildings. We suggest that height difference should be at least 2 times. Bad and good examples are showed in figure 43.

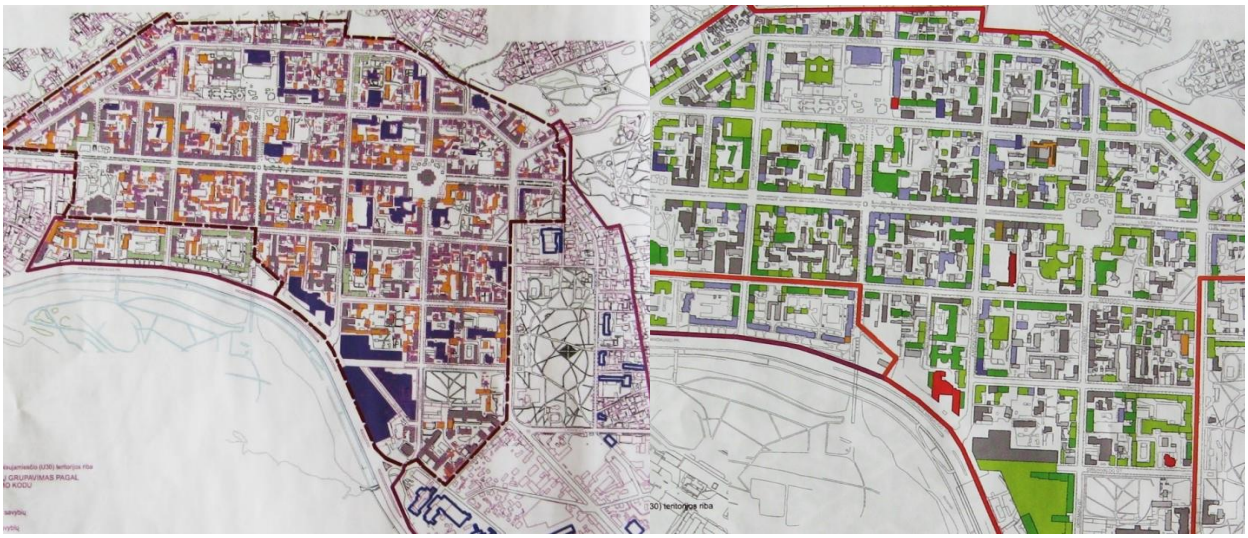


Fig 41.: Screenshot from (Algimantas Miškinis, 2009) research. It shows buildings built in different times in history. In gray buildings built until XX a. In yellow buildings built after 1945 which does not have valuable properties. In Green yellow buildings built after 1945 which do have valuable properties. In dark blue buildings built from 1990 which change pre-existed urban structure with their proportions, height, size, or materials.

The right scheme shows buildings height in central part of Kaunas in the year 2009. In grey – buildings up to 2 stories, in green – buildings up to 4 stories, in purple – buildings up to 6 stories. In darker grey – buildings up to 8 stories, in orange – buildings up to 9 stories, in bright red – buildings up to 10 stories and dark red – building of 15 stories (“Britanica” hotel).

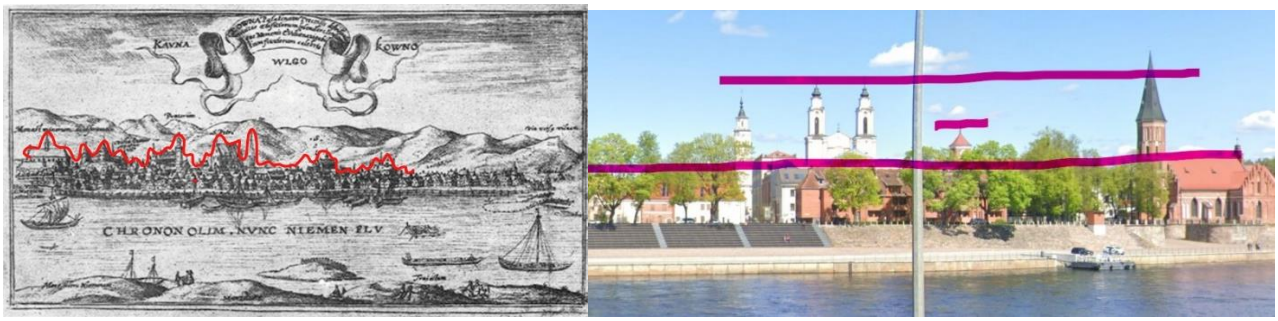


Fig 42.: Old painting of Kaunas city in XVI century and screenshot from google maps from today (view from Ukmerges street). We can see a clear devide between average buildings and dominant ones. Both create a beutiful city siluet.

Fig 43.: Schemes of cityscape of new town of Kaunas. Made by author. In the top, bad examples when a bit higher and hifher buildings just cluster together and form chaos. On the bottom, a good example, how well positioned significantly higher buildings can create that multi-dominant cityscape in which buildings compliment each other and work as very practical landmarks for guidance. Screenshot by author from google maps. View from Aleksotas observation deck.

In conclusion, we can say that Kaunas modernist center is rapidly changing and slowly but surely is transforming itself into a complex multi-dominant cityscape. We suggest several future development guidelines that justifying that “Britanica” hotel can remain the same height or higher.

2.1.5.3 Research by design.

This subtopic analyses images generated using AI powered tools, which helped quickly create and see how new high vertical form would look like in Kaunas city center context. First, we gathered screenshots from google maps which are in exact spots from which city skyline is protected. (appendix 18). When we used (*DALL·E 2*, 2024) engine. We can see the results in appendix 18.

Conclusion

From these images we can clearly see that vertical volume is way to high.
In a way it helps to open some lost views and makes site a lot ligher than existing large squere form “Britanica“hotel which size mostly comes from it‘s wide and monumental facades and not from it‘s overall volume.
We noticed that making vertical volume full of vegetation helps him blind in with Zaliakalnis hill which is too steep for building and will remain the same for long in the future.
Observations helped us come up with first integration method. – Camouflage or chameleon technique. Height still would have to be reduced to match Zaliakalnis hill skyline.

2.1.5.4 Analysis of publics and expert’s opinions to proposal to make hotel even higher.

Public survey used AI generated images of hyphotetical situation of new high vertical volume in Kaunas city center. *The survey was mostly directed at Kaunas city residents or city visitors who know the existing situation well enough to express their opinion on it. 185 participated in the survey. Most of them were well knew the existing situation. We attached all respondents age, gender, location information in the appendix of this research (appendix 11).*

Survey first introduces and explaines partisipants with protected and important city viewpoints, when presented these viewpoints using screenshots from google maps. Finally, asked two questions:
1. How would you assess the value of this building as part of the history of Kaunas?
From 1 - harms the history of Kaunas (to) 10 - Very important for the history of Kaunas.

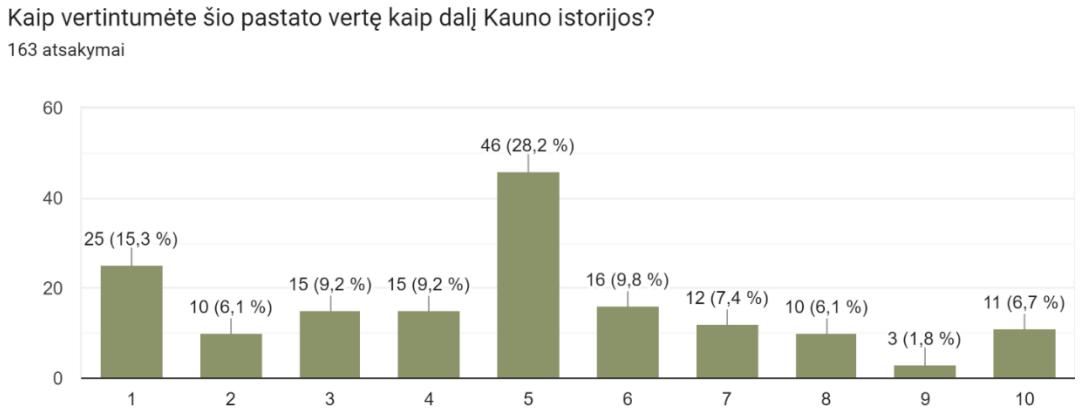


Fig 44.: Screenshot by the author from his public survey answers tab. Partisipant answers to question number 1.

2. How would you assess the influence of the building on the Kaunas cityscape? Note: the building is not specifically marked in the photographs. If it takes time to see it, the visual impact is low.
From 1 – very bad (to) 10 - It does not harm at all; it even complements the Kaunas cityscape.

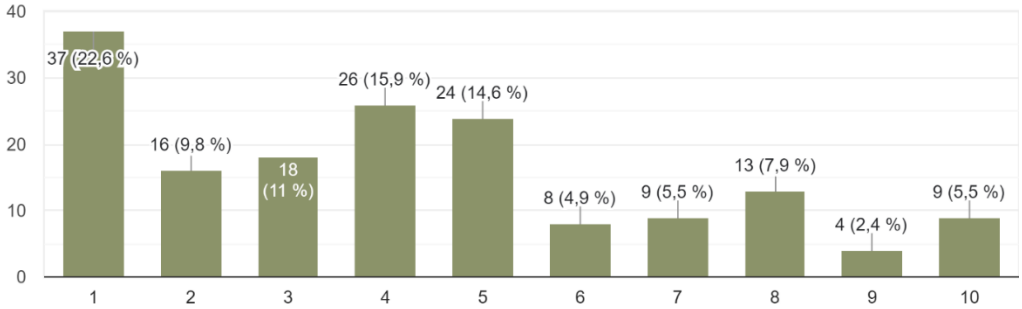


Fig 45.: Screenshot by the author from his public survey answers tab. Partisipant answers to question number 2.

It is quite suprinsing that some people evaluate existing situation possitively. Of course, majority, as espected, chose negavitve answers about the situation. Final suprise was that a lot of people could not decide or pick a deciding opinion if this building has any influence to city ‘s history.

3. „In your opinion, raising the "Britanika" hotel during the transformation is a good decision? “
The answers were:

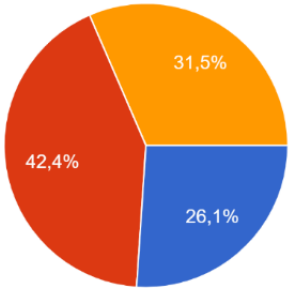


Fig 46.: Screenshot by the author from his public survey answers tab. Partisipant answers to question number 3.

Question was asked before showing AI generated images on purpose, to test partisipants with final question to see if vizualizations helped to change their mind. From these answers there is a majority who are against any additional height to existing buildings. But suprinsingly it was not a huge majority (not even above 50%). More people think raising volume up is better than leaving britanika as it is (from question 2 – figure 46).

In forth question partisipants were presented with several quick 3D models for them to decide which of them they like the most. (appendix 19). They had also the option to choose „I don ‘t like any proposal“or to choose several proposals. Answers were:

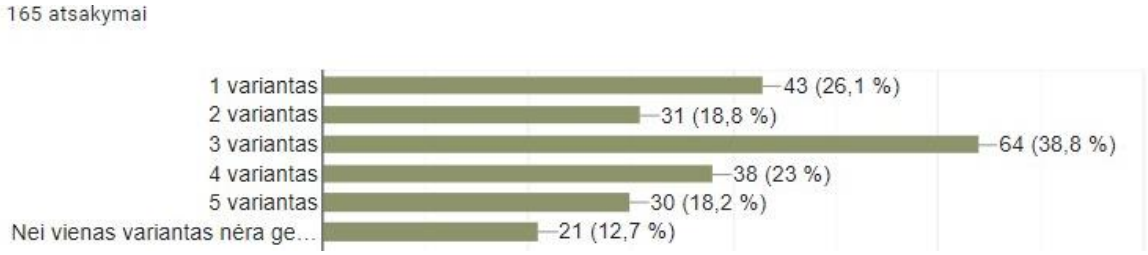


Fig 47.: Screenshot by the author from his public survey answers tab. Partisipant answers to question number 4.

Results show that majority of participants likes 3rd proposal with a cut-out circle. Interestingly a lot of people selected proposal to do nothing and leave it as it is. Only minority did not like any of the proposals. Later AI generated vizualizations were showed (appendix 18) and asked one last question: What is your opinion after seeing the photos? Please rate.

Partisipants could choose from:

1 - I completely disagree with the idea of promotion

3 - Still, I'm leaning towards the humiliation option

5 - After seeing the photos, I was undecided

7 - The height is interesting, but maybe not so much

10 - you opened your eyes, this is a great decision

Answers were:

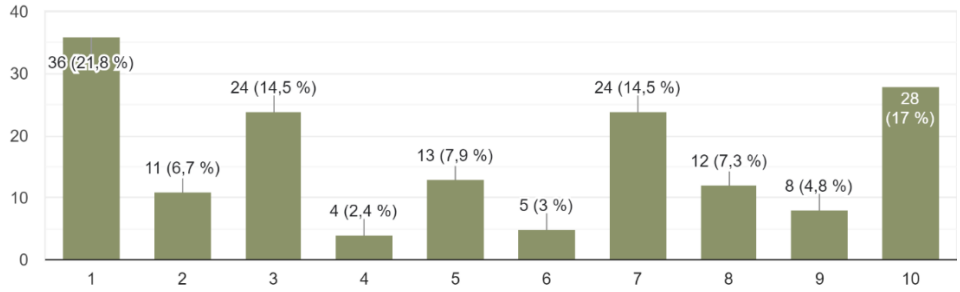


Fig 48.: Screenshot by the author from his public survey answers tab. Partisipant answers to question number 5 (final).

Majority answered that they still do not agree with idea to make building even taller. Neverthelles, a lot of people completely changed their minds after seeing the pictures. If we would compare answers from question 3 (figure 46) we can clearly see the improvments:
Completely disagrees (Q3) 42% ---------- (Q4) 43%
Do not have a strong opionion (Q3) 32% ---------- (Q4) 20%
Completely agrees (Q3) 26% ---------- (Q4) 36%

It could be said that people who are decisively against remained the same, but people who did not have an opinion before changed their mind after seeing vizual examples of how higher "Britanica"hotel could look like.

Conclusion.
Public opinion with a slight majority (around 40%) are against suggestion of making the hotel even higher. In comparison, a close amount of around 35% quite strongly agree that hotel can be higher. Finally, we can see that around 25% of people still does not have a strong opinion on the situation. From analysed answers we can say we should focus on convincing undecided to change their mind, because only minimal change of opinion can be seen in the group who is strongly against higher building.

If we would compare public survey to expert's survey, we can see very different results.
Overall, nine out of 25 sent letters to practising urban and architectural offices were replied. More detailed data about the (partisipants can be found in this research appendix 20).
Main difference is that experts had almost one-sided opinion that „Britanica" hotel should not be higher than it already is. (appendix 21).
A complete majority expressed their opinions that.

- „Britanica" hotel has negative impact for Kaunas history
- Has very bad impact for Kaunas cityscape
- Building cannot be higher or even like this height.
- Selected only dense and low height proposal.
- Still remained drastically against any additional height fot the hotel even after seeing the vizualizations.

Conclusion.
Experts still see hotel as a complete parasit inside Kaunas central part. They want to keep existing low height perimetric urban structure. On the other hand, answers still were not unanimously agreed. There were one or two experts who supported new ways of thinking.

All things considered
We can see that public opinion is on the edge of deciding if higher building in „Britanica" hotel plot can be accepted (40% dissagress, 25% does not have a strong opinion, 35% agrees with a higher volume proposal). On the other hand, experts almost unanimously agree that no futher height extensions for the building will be accepted. Building should be lowered, and plot has to be densified.

2.1.5.4 Analysis of publics and expert's opinions to proposal to make hotel even higher.

G.Natkevičius - main architect for this project, who already suggested several different proposals.
Thinks building can be higher than thirty meters if presented with construct arguments.
R.Adomaitis - practicing architect who has worked with Natkevičius earlier. Does a lot of cultural heritage transformation and is used to complicated adaptation processes for existing buildings.
Thinks there is no way to overcome and convince commission to agree with any kind of higher building proposal.
Š.Kiaunė ir A.Kiaunienė – practicing architects who had a lot of experience working with city planners in the past. I have lived in Kaunas for a long time and know the situation very well.
Realisticaly you cannot overcome regulations. You need very clear concrete arguments, smart ideas. More important is function.
P.Vaitiekūnas – practicing architects who helped organize Kafe 2019 (architectural festival). Created an installation where visitors could climb up to the roof and experience this abandoned ghost from inside.
He thinks there are no boundaries. The site and situation are too important to look at from a regulation standpoint. It needs a lot of new and brave ideas, workshops, competitions with no boundaries. Boundaries will change as society changes.

Conclusion
We can see two camps of different opinions forming after analysing expert's opinions after interviews. Half thinks that realistically radical ideas are impossible, but worth a try. Another half either believes that it is possible to convince public and commission with radical proposals or understand that realistically now it would not be possible but feels the importance of the situation and encourages to think radical, creative and out of the box.

2.1.5.5 Viewshed analysis

Idea of camouflage technique (figure 49) will be tested using various programs and harmonizing indexes.

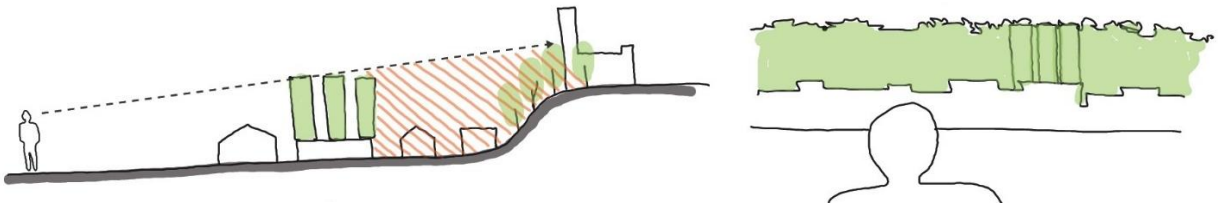


Fig 49.: scheme which explain how "camouglage" technique works. Made by the author.

2.1.5.5.1 Section cuts

Section cuts we created using publicaly available data in geoportal.lt. (geoportal, 2024)We analysed four relevant and protected viewpoints which can be seen in figure 40. In scheme (figure 50). Each viewpoint is analysed. Starting from the top:
According to forest expert Adrijus Skučas (director of comapany IĮ „Adrida", has 20+ years of foresting and vegetation experience and knowledge), most common tree growing on Zaliakalnis hill – oak (lot. *Quercus robur)* or lime (lot. Tilia), according to ("Paprastasis ąžuolas," 2023) and ("Liepa

(augalas),” 2023) these trees grow on average around 25meters in wild and around 20 meters in city. The research uses minimal height of 20m as a additional height from Zaliakalnis hill‘s top to determine exact height which is possible to achieve using Camouflage technique. *Note that urbanisation and tree height can vary from 10 to 30 meters above hill, because of that we took avarage of 20m.*

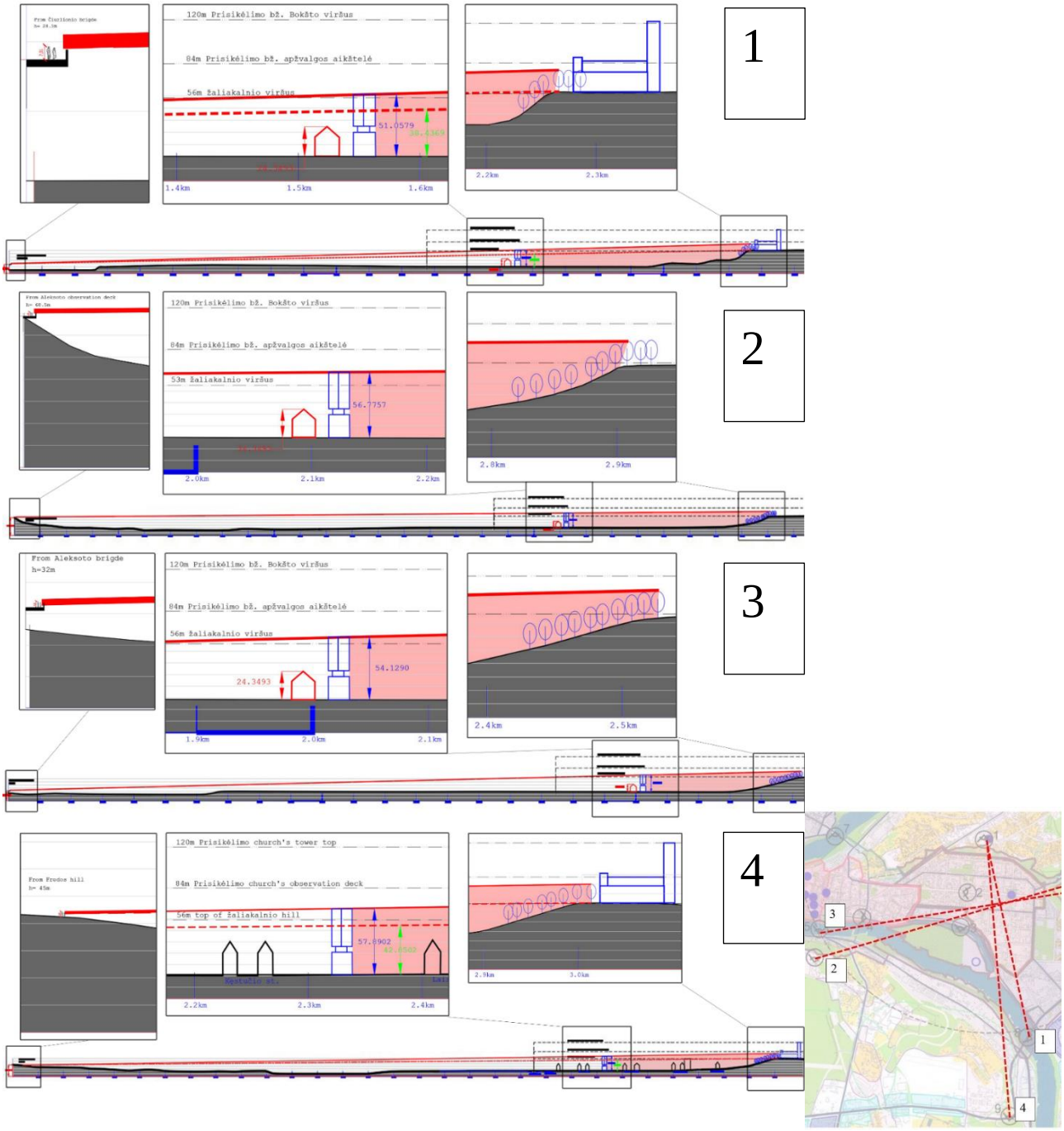


Fig 50.: Section analysis schemes made by author. In red blocked view. Red line shows observers point of view. Small map on the right shows exact cut locations in Kaunas city.

Conclusion.

The section cut analsysis shows that it is possible to hide a volume around 50-58m height which is filled with various vegeration.

2.1.5.5.2 Viewshed analysis using ArcGIS.

This analysis used ArcGIS viewshed function. All important and relevant viewpoints were analysed which were showed in figure 40 plus two additional ones: 1. From Parodos hill 2. From Laisves avenue (appendix 22). Settings: Viewshed analysis tool, distance: 200-5000m.

1. View from Aleksotas observation deck.
Main thing which could be blocked is Soboras church. As we can see from the figure 45 any part of the church is blocked. So this view allows make any adjustments in volume which does not surpass 50m altitude.

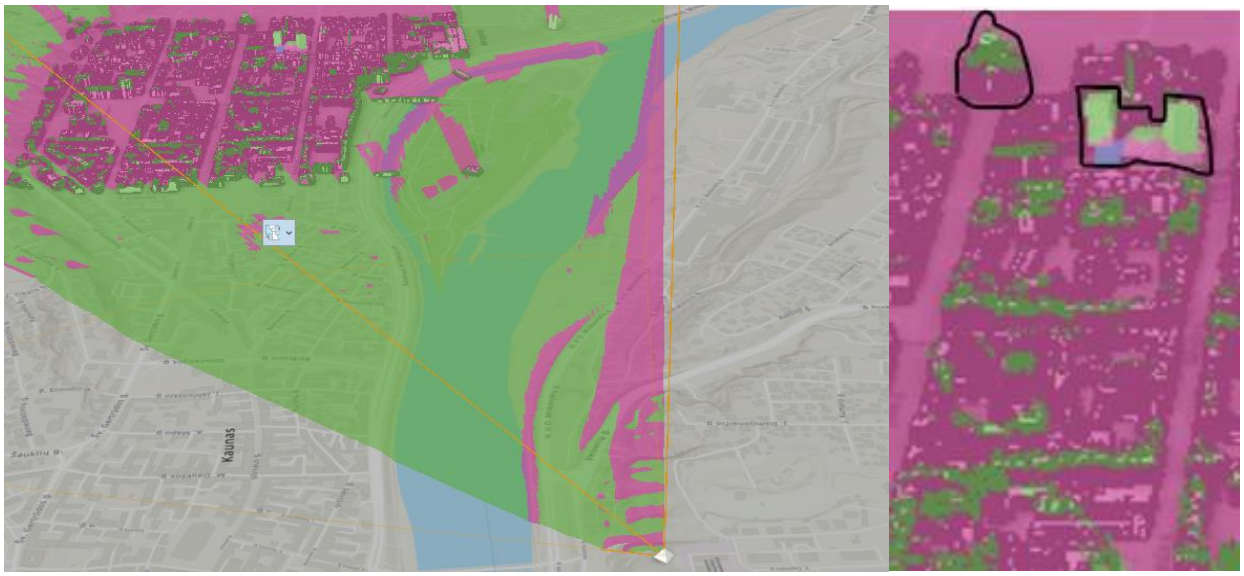


Fig 51.: screenshot from google maps made by author. View towards “Britanica” hotel from Aleksotas bridge.

2. View from Aleksotas bridge.
As we can see from figure 46, soboras is not even visible, so volume height restrictions only apply to conclusions made in subsection 2.5.1.

Fig 52.: screenshot from google maps made by author. View towards “britanica’ hotel from Aleksotas bridge.

3. View from Laisves Avenue.

As we can see from figure 47.: protected view of the fountain in laisves avenue has no disruption by the new volume of the building. We also analysed which parts of Laisves avenue will be able to see new proposed higher volume (figure 53). As we can see, only a small portion of padestrians will notice this high building. (marked in green, circled in black)

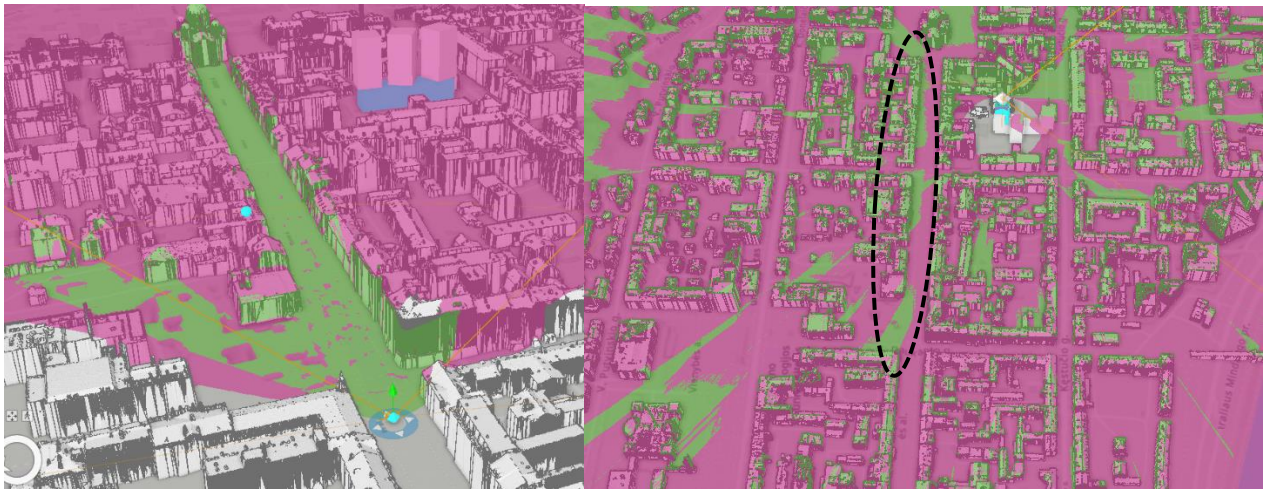


Fig 53.: (left)screenshot made by author from ArcGIS program. View from Laisves avenue, near the fountain. (right)screenshot made by author from ArcGIS program. View from highest roof of the hotel. Green colors show places from which new volume will be visible.

4. View from Prisikelimo church observation deck.

As we can see from Figure 48. Leaving the whole building at 55m height would block important views to Kermelitu church towers. To fix that, majority of the site's height has to be reduced to maximum of 40 meters height.

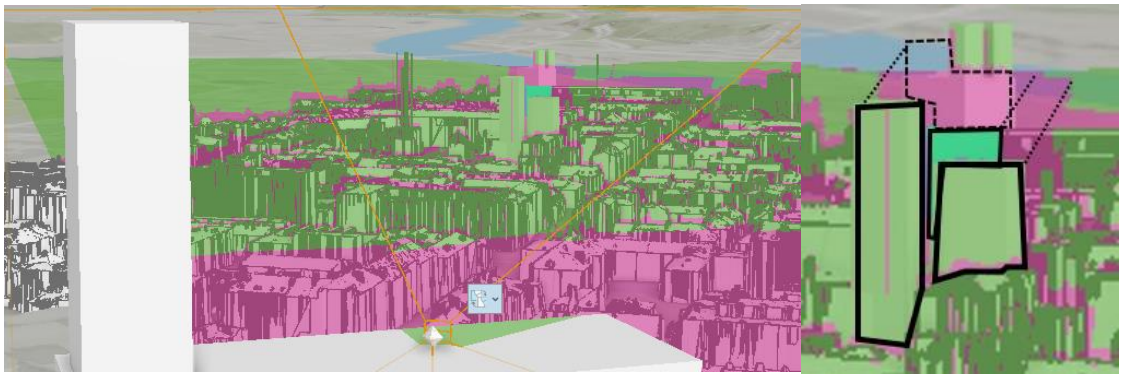


Fig 54.: screenshot made by author from ArcGIS program. View from Prisikelimo church observation deck.

5. View from Parodos hill

As we can see from Figure 49. A gap between volumes must left which would open very important views from Parodos hill to a culture-heritage object called "tower" (picture in top right). This "gap" part must be lowered to 25m.

7. View from Simono Daukanto bridge.

As we can see from Figure 51. Opening also allows to see the top of Soboras church when walking on S. Daukanto bridge. In gap part recommended height would be 25m.

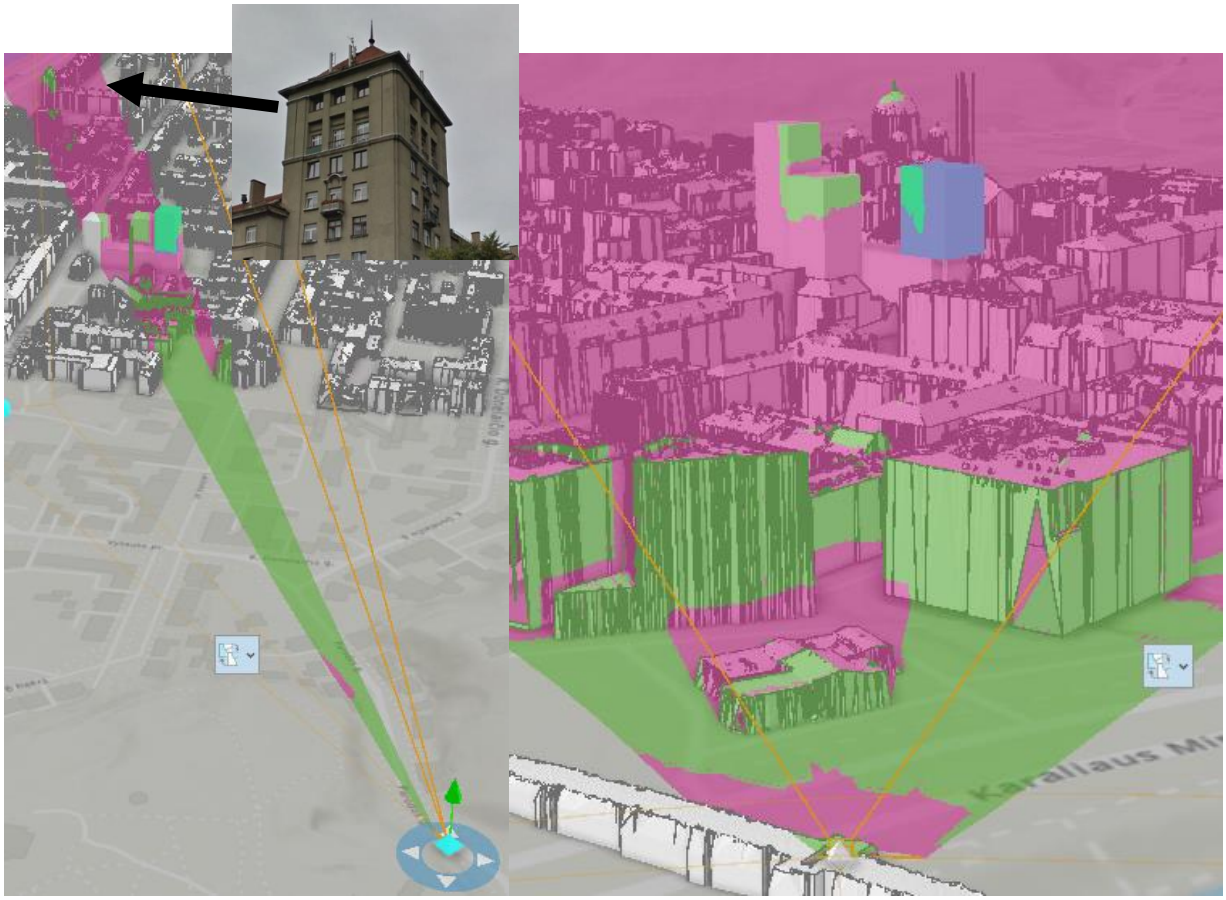


Fig 55.: (left) screenshot made by author from ArcGIS program. View from Parodos hill (right)screenshot made by author from ArcGIS program. View from S.Daukanto bridge.

6. View from Fredos hill.

As we can see from Figure 56. On the bottom zoomed in situation of how volume has influence on the Prisikelimo church. Example on the right is higher and positioned badly, focusing only at opening views from parodos hill. Example on the left still has the opening but also has smaller and more compact volumes which does not block views to the main church.

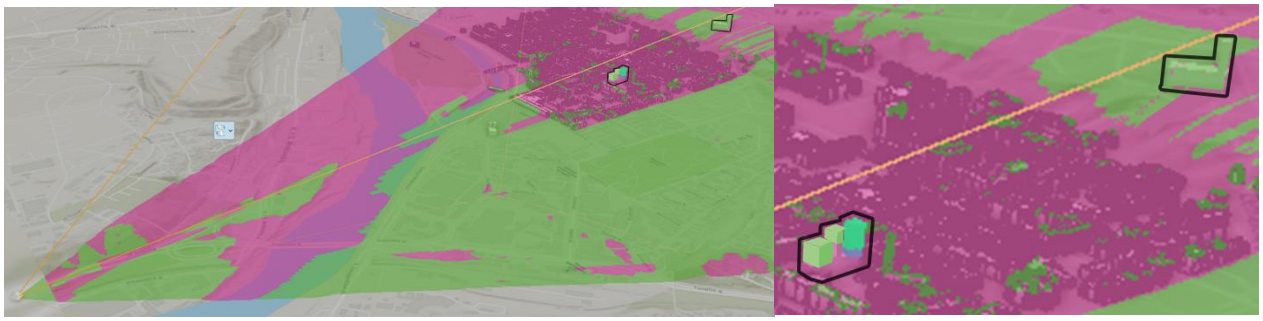


Fig 56.: screenshot made by author from ArcGIS program. View from Fredos hill.

8. View from Ciurlionis brigde.

As we can see in appendix 23. New proposed volume does not in any way effect Prisikelimo church and it's visibility from Ciurlionis brigde.

Finally, research analysed how new volume would influence other common locations in Kaunas city. Note that these locations and views from them are not protected. (appendix 24)

Conclusion.

We can see that it is completely possible to insert high volume buildings without damaging any important or protected viewpoints of the city. This confirms hypothesis that existing building can be made even higher (approximately by 10-15m higher) using camouflage technique.

2.1.5.5.3 Uncontextual size can be contextualized using other methods.

According to (Turner, 2004) building size makes only a fraction of it‘s contextuality. You can have bigger building around smaller ones using some compensating methods in order to make it contextual for the place. He developed building identity index which by measuring different aspects of the building can determine how well integrated the building will be. For example picture below (figure 57-58) Several times higher volume which got identity idnex of 40%.

Fig 57.: Tower Blocks UK: Rotherham Clifton House Site Redevelopment. Rotherham, UK, 1985. (Glendinning, 2023) Beeversleigh – multi-unit residential building.

Fig 58.: screenshot from google maps by author. Shows street perspective.

Identity index comes from addresing different properties (as you can see in figure 65). We marked how our situation and higher volume proposal would score.
Using it we can calculate how new higher „Britanica“hotel‘s volume can influence it‘s surroundings. Explanation for each marking is explained after the figure.

Landscpae components	Topografy/ relief, **R**				Water bodies, **W**				Vegetation. **V**				Buildings **B**			
Degree of visual contrast	Large	Average	small	insignifica	Large	Average	small	insignificant	Large	Average	small	insignificant	Large	Average	small	insignificant
Scale	10	8	6	4	8	6	4	2	8	6	4	2	12	10	8	6
Forms	5	4	3	2	4	3	2	1	4	3	2	1	6	5	4	3
Lines	5	4	3	2	4	3	2	1	4	3	2	1	6	5	4	3
Colors	10	8	6	4	8	6	4	2	8	6	4	2	12	10	8	6
Texture	5	4	3	2	4	3	2	1	4	3	2	1	6	5	4	3
Materials	5	4	3	2					4	3	2	1	6	5	4	3
Style									4	3	2	1	6	5	4	3
Function									8	6	4	2	12	10	8	6
Level of protection	15	12	9	6	12	9	6	3	12	9	6	3	18	15	12	9
Level of contrast	Large				Average				small				insignificant			
Sum of points	186-234				137-185 (144)				88-136				0-87			
% of blocked view	>12%				5-12% -b				4.9-1%				<1%			

Fig 59.: compressed SID index by (Turner, 2004). Colored by the author.

Large = 0-25%; Average = 25-50%; Small = 50-75%; Insignificant = 75-100%

Figure 65.: Identity index table according to T.Turner , 2004. Modified by author.

Explanations.:

Topografy. Site is almost flat with the highest difference of 2m. Plot is the same as its surrounding plots. Site has quite unique form which disrupts existing perametric urban structure. Zaliakalnis hill relief is considered a valuable piece of topografy what ‘s why it falls under larger protection degree.

Water bodies. Nemunas river is the closest water body to the site, and it plays a very small role for contrast of the new building.

Vegetation. Proposal suggests making higher volume facades full of various vegetation. These plants can vary in size compared to already exsiting ones. It would also create completely new green vertical lines and forms instead of common horizontal ones. Materials will not be seen from the distance. In this case, vegetation affects building style, which from certain altitude would become completely out of context. Besides that, Zaliakalnis hill and it ‘s greenery is protected this suggestion of greenifying facades will completely help to blend in new building with the silhouette of the hill, contrast would be minimal.

Buildings. Size of the building would be twice as big. It would feel out of place looking from the street perspective. Its forms (proportions) and lines (height between stories, cornizes) (figure 60) copy surrounding buildings in that way blending it in. Only half of the building could fully copy surrounding colors, because the higher portion of it must be full of plants which will stand out with lush green color out of context. New contemporary style would feel a bit out of context because the area which site is in is mostly build at the start of raw modernism era. Mix-used function is quite common in this part of the city. Still new observation decks would be a bigger driver for attention. This higher cluster of people would slightly disrupt existing functions.

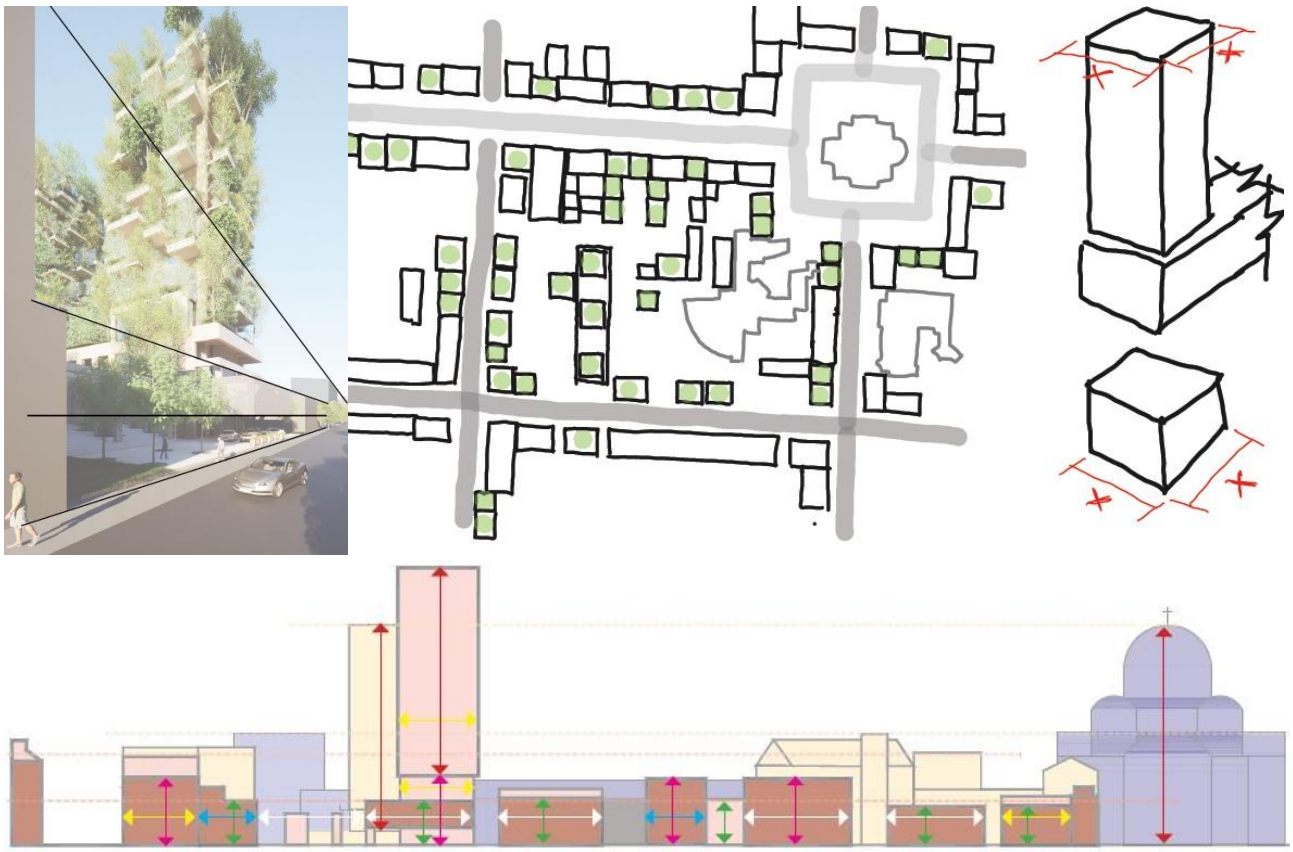


Fig 60.: Left corner – visualization shows matching street perspective lines, center and right corner – scheme shows how higher volume proportions copies surrounding buildings' perimeter. Below – scheme show how new proposed volume copies neighbouring buildings' sizes and proportions. All schemes are made by the author.

Conclusion

The score for higher volume proposal (in addition with green facades – comouflage technique) would be classified as average contrast – exact score around 46% (silimar to example in figure 57. Which scored 40%). With some extra changes contrast levels can be reduced to small. Nevertheless, we can confirm that even a higher-than-average building can become contextual using other methods and techniques.

Conclusions of section

We can confidentely say that slightly higher "Britanica "hotel building is completely possible proposal to this situation. At first, we raised a new hyphotesis that Kaunas central area is slowly but surely swifting towards multi-dominatn cityscape region which must quickly create document where higher slim vertical volumes could appear in order to avoid different height chaos. Secondly, after looking closely to viewpoint protection documents we analysed all possible blocking points using ArcGIS and specific section cuts to find out that the"camouflage" method, in which new volume matches the top of Zaliakalnis hill while using green facades and masking tool allows to raise existing structure up to 55 meters (+5 meters for vegetation). Finally, it would not seem completely out of place looking from the street view. (using T.Turners SID index new proposal scored – 46%).

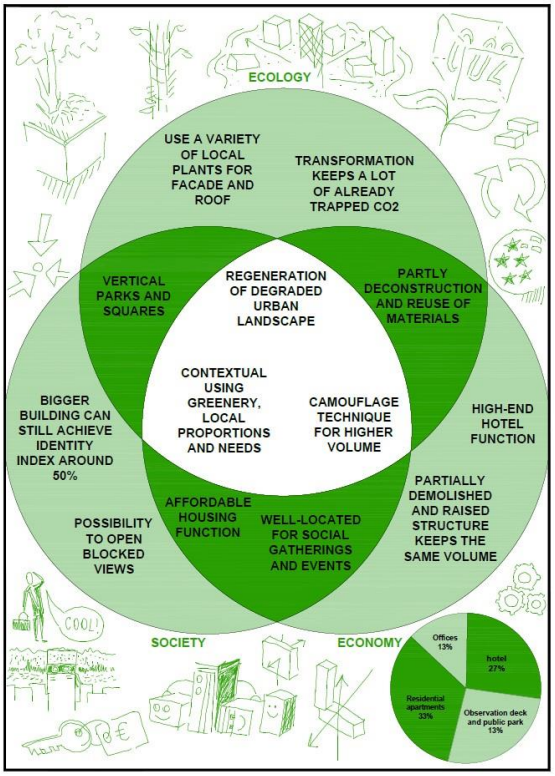
2.1.6 Conceptual model – design guidelines for “Britanica “hotel case

Empiric research conclusions

All hypotheses have been confirmed and that creates a solid guideline for further practical testing.
Research conclusions suggest:

1. “Britanica “hotel has to be transformed to achieve that more efficiently it can be partially deconstructed with conditions that materials will be reused as cement or concrete in the site. The majority of public and experts agree with transformation idea.
2. “Britanica” hotel should and can be transformed using regeneration method, which not only keeps stability in the environment but also revives it. A new hotel’s footprint can be equal to up to 10 times more area worth of wild forests. Lithuania has a plenty of local plants which can withstand extreme conditions in higher altitudes.
3. “Britanica” hotel should and can become mix-used building after the transformation. The public and experts are very supportive of this idea. Research shows that Kaunas center mostly lacks: high-end hotels, affordable housing for students or other individuals, parks, green spaces, cozy squares, places for events, museums. All these functions can be fit into new hotel’s volume with a block separation between functions instead of horizontal which as research shows creates inefficient central vertical connections.
4. “Britanica “hotel can and should change it‘s volume.

Research showed that volume can become higher (from 48 to 60m) if camouflage technique of greenifying the facades will be used to hide in the background of Žaliakalnis hill.
Research also tested new volume’s ability to become contextual to the surroundings despite its size. It is achievable by using local materials and proportions for the volumes and aesthetics.



Conceptual model

All general conclusions were vizualized into a conceptual model, which stands as a guidelines or tasks which we will do in practisal testing phase of the research. (figure 80)

Fig 61.: conceptual model scheme. Made by author.

2. Experimental design of a multi-functional complex of “Britanica” hotel in Kaunas, Kęstučio street 23

Thesis is purposely covering “Britanica” hotel case, because this situation is one ofthe worst possible starting points for any transformation or regeneration project. It is well known to the public and the issue of this abandoned structure has not been solved formore than 30 years even by the greatest architects in Lithuania. The research tries to solve this “unsolvable” problem using created algorithms and design guidelines. The situation has a well known owner and everybody knows his wishes and where he wants to invest his money (economical benefit). Even one of the greatest architects in Lithuania (G.Natkevičius) is proposing a demolition project over a transformation. Only legal institutions (culture heritage department) are holding the start of demolition. In other words, there is not a lot of time to analyse, experiment and publish research findings in order for them to be relevant and maybe even decision changing.

2.1 General analysis

2.1.1 Analysis of teritory’s block

Functionality. Block is mix-used. Dominated mostly by residential and commercial functions. It also has othersmaller abandoned buildings and small technical structures. (Figure 62)

Public and private places. Most of inner yards of residential houses are closed from public. We think that some of residents closed public areas illegally (marked with black dot). There is one small inner (marked with red dot) yard which has a small restaurant, which seems is close to bankruptcy. That inner yard canbe transformed into a passage from Laisvės avenue to the hotel complex in this way bringing the coziness back into inneryard. (Figure 62)

Fig 62.: (left)Functions of the buildings in the block scheme. Made by author. (right)Accessibility in the block scheme. Made by author.

Block’s problems. A lot of abandoned (hatched in black), randomly placed barriers (red lines), trashcans, messy unorganized parking (pink hatch). (Fig 63)

Block’s Weaknesses. Complex pipe system underground Zilinskas inner yard (orange lines), gaps in perimetrically built up city center (orange waves), angry neighbors who critic any minor changes in the blocks inside(angry faces), a lot of closed or privatized bromes. (Fig 63).

Fig 63.: (left)Problems in the block scheme. Made by author. (right). Weaknesses in the block scheme. Made by author.

Block's strengths. A lot of culture heritage facades and buildings(green lines), Zilinskas gallery iconic back wall,angel technical structure, quite a lot of valuable trees (green circles), good accessibility by vehicles inside the block. (Fig 64)

Block's opportunities. Possibilities to build new apartments in order to close perimetrical street layout. Possibilities to create organized parking underground or in the ground floors of new buildings.Possibilities to create two new connections to hotel complex from Laives avenue. Possibilities to revive and create popular and lively inner yard, full of culture and art. Possibilities to create 5 different entry points to hotel complex (technical, residental, parking,hotel, public) Thoughts to create a popular Zilinskas inner yard by moving parking to different locations Thoughts on creating a climbing ramp near a new proposed hotel complex structure which would gradually rise above surrounding buildings opening a nice panoramic view of the city. (Fig 64).

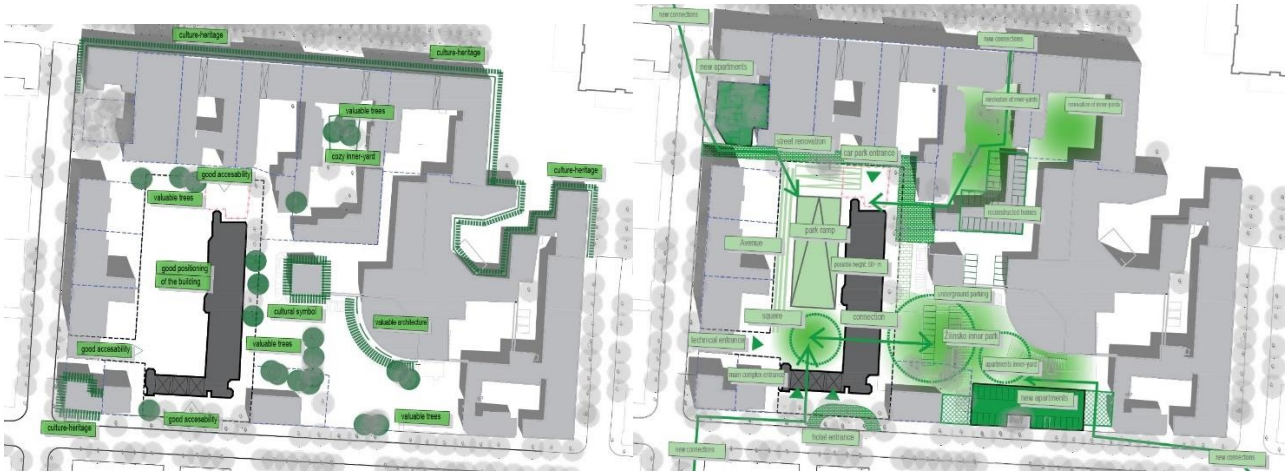


Fig 64.: (left) Strenghts in the block scheme. Made by author. (right) Opportunities in the block drawing. Made by author.

2.1.1 Site analysis

Topografy. There is up to 2–3-meter altitude change which climbs from west to east side. This can be cleverly used to design half-underground parking thus saving money on expensive excavation works for two story underground parking. (Fig 65).

Technical pipes protection areas. The biggest setback is that there is a huge heat pipe in from of the existing façade which faces Kestucio street. This greatly reduces our abilities to create a continuous perimetric layout of the street. Our proposal would be to use cantilevered façade from second or third floor which wouldextend 10+ meters out and reach the street build-up line. Other then that Site is quite empty and has few restrictions for building volumes. (Fig 65)

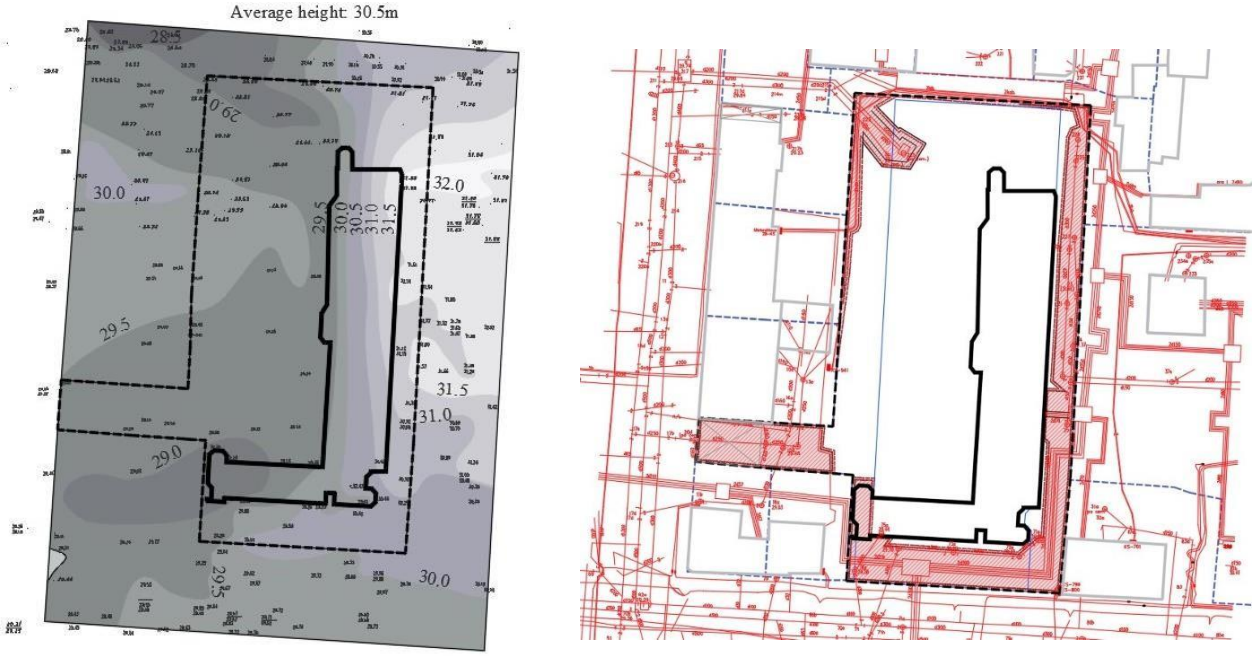


Fig 65.: (left) Site height. Ligher – higher. Darker – lower. Made by author. (right) Communication protected areas are marked in red. Made by author.

Existing detailed plan. This plan was created in 1999. A lot of experts say that we shouldn't count it as legal, and we should propose a better newer version of detailed plan. Still our goal would be to be as close as possible to existing detailed plan. In its legal building area is marked in striped, blue color). Otherhatches mark legal servitudes. (fig 66)

Heights of the site. Scheme on the left – heights of the existing abandoned structure (blacker the higher). Schemeon the right – possible legal heights using 3+0.5m counting rule. Existing structure would have to be demolished from 48 to 15m in order to comply with regulations. If it has been built in the center of the plot it could stand at 40m tall 14m wide and 40m long. We should also notice that the city will start a separate commission if any proposal surpasses 30m height.

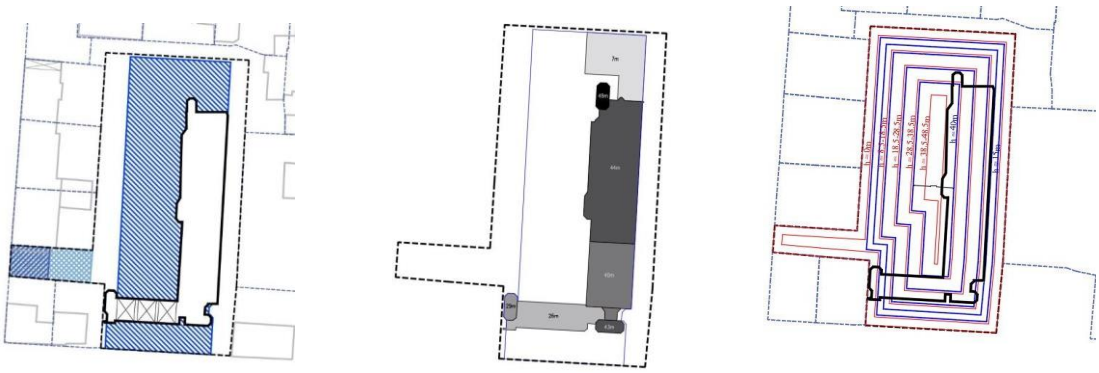


Fig 66.: (left) Detailed plan drawing. Areas in blue around the building, places where new structures can be built. (center) existing structure's hrights (right) Existing building heights and possible building heights in the site. Made by author.

Conclusion. Territory is very interesting because of its complicated problems but also of its very promising opportunities. It should mostly be focused on connectivity, parking problems and regeneration of forgotten once cozy inner yards.

The plot itself has quite good starting ground and not a lot of restrictions of protected zones, in comparison to other sites. It should mostly be focused on creating inner square or event space with a connection with Zilinskas art gallery's inner yard.

2.2 Design program. The program is created taking into account client's wishes, economical and sociological integration principles. The measured area of each function is compared with original architect of existing building (A.Paulauskas) and proposal of G.Nadkevičius with idea to try and outperform both previous proposals from economical and socialogical stand point. (Fig 67)

Architects / Functions	**1986 m** A.Paulauskas Program (existing, not planed)	**2019 m** G.Natkevičius program	**2024 m** T.Zykevičius program
Hotel (room sizes, number) + additional functions (lobby, restaurants, kitchen, spa, gyms, massages, offices, conferences, technical, others.) Room ceiling height	7010m2 (30-42m2 / 201 vnt) +1210.85 m2	5085m2 (22-234m2 /213 vnt.) + 2705 m2 (1005;0;220; 0;70;0;0;529;481; 400;1337.5)	Min 4000m2 (22-160m2) Min 150 vnt Good 200 vnt Perfect 250+ vnt +1000 m2 (150; 500; 150; 0; 30; 500; 500;.)
offices	0 m2	1503.06 m2	Min 1000 m2 Good 1500 m2 Perfect 2000 m2
Apartments (sizes)	0 m2	0 m2	Min 2000 m2 Good: 2500m2 Perfect: 3000 m2 (20-160m2)
Commercial (coffee shops, markets, bars)	0 m2	0 m2	Min 500 m2 Good: 1000 m2 Perfect: 1500 m2
Event spaces (conferences, museums, exhibitions, galleries)	0m2	0 m2	Min 500 m2 Good: 1000 m2 Perfect: 2000 m2
Parking (number of spaces)	n.d.	4614.51 m2 (200 vt)	Max 4000 m2 Min 150 vt Good 250 vt Perfect 400 vt
Fire staircases	3	6	Max 6 Good 4 Perfect 3 or less
Corridors (%)	4440m2 (35%)	2030m2 (16%)	Max 15% Good 12% Perfect 10% or less
Height	48.77m	38.35m	50+ m
Total area (with area underground)	12660.85 m2	12660.54 m2 (17275.05 m2)	Min 10.000 m2 Good 12.000 m2 Perfect 15.000 m2 (14.000 m2)

Fig 67.: Design program table. Made by author.

2.3 Concept alternatives. First of all, it has to be mentioned that both ideas has same ground principles of partly demolishing existing structure from 40m to 15m with eception of leaving staircases and lift sachts untouched which will be used later in transformation. Disasambled reinforced concrete is grinded on the site and used as cement for underground parking and first three floors of transformed building for new reinforced concrete mixing. Escavated soil for underground parking will be used for plants on the facades. (Fig 68)

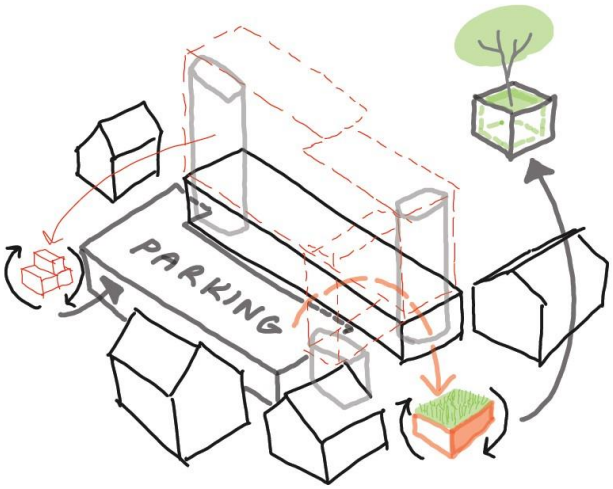


Fig 68.: Scheme shows general technical solutions for proposed volume. Made by author.

Both concept's volume creation starts from making sure that new discovered views will not be blocked. First concept, after creating a hole in the volume continues with the rithm and follows exact distance to create three tower symbol. Second concept takes into consideration site's building height limits and creates a slope from small cubes which are the size and proportions of surrounding buildings. This concept uses terraces for larger vegetation and balconies for smaller. (fig 69).

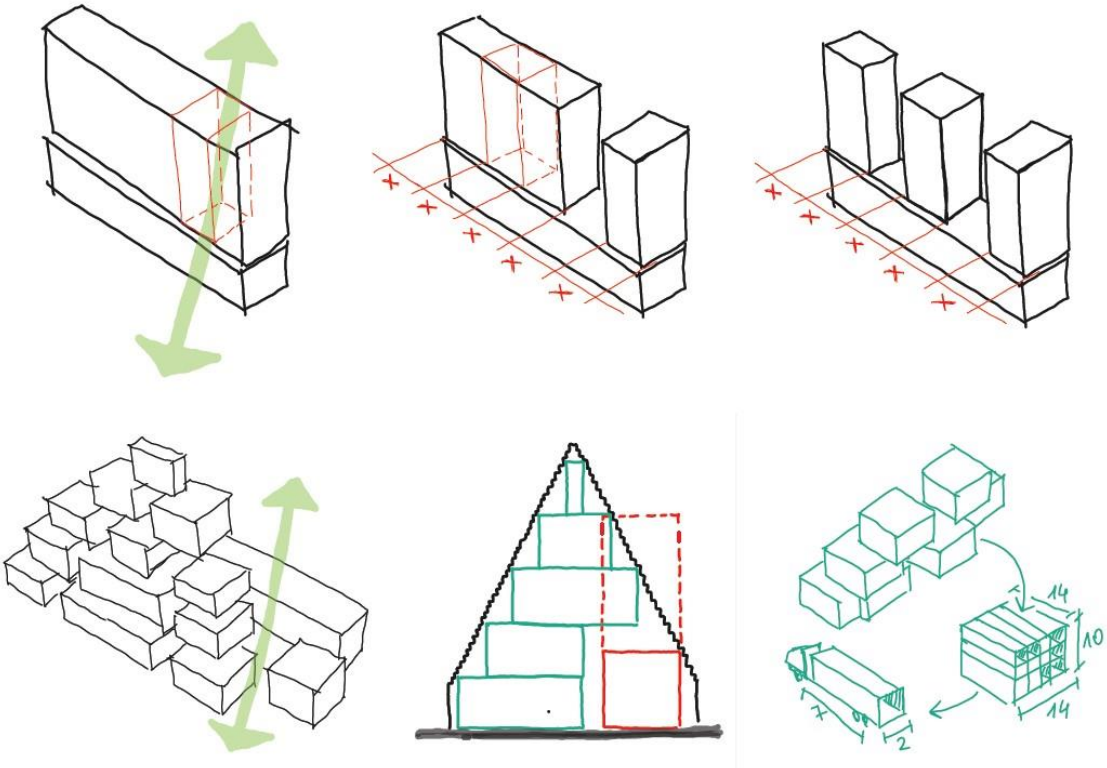


Fig 69.: Schemes show different conceptual approaches to proposed volumes and their proportions. Schemes made by the author.

2.4 Elaboration of the conceptual idea.

Three tower concept has been chosen not only because of its braver approach and idea but also because number three has a very deep meaning in Lithuania's history and values. (fig 70). Starting from Baltic resemblance of three main tribes which united under one banner to create Lithuania's nation (Aukštaičiai, Žemaičiai, Lietuviai), Three greatest old Lithuania's rulers (King Mindaugas, Grand duke Algirdas, Grand duke Vytautas), Three greatest local lithuanian trees: Oak which represents nations strenght, Birtch which represents lithuanian's tolerance and Aspen which shows people's sensitivity. Main symbol of greatest lithuanian dynasty "Gediminaičių stulpai" symbol has three distinct columns. It also represents peaceful protest of three Baltic countries in 1989, Lithuanian values for traditional family of father, mother and child. Finally, number three represents nations believes in chirtianity with clear recemblance of Father, Son and Holy spirit figures and connection with similar monument in Lithuania's capital Vilnius, where Three croosses sculpture stands on top of the hill where one of the grand dukes of Lithuania is buried – it was a symbol of change from paganism to Chirtianity. All in all, number three is clear representation of Lithuania's history and values, especially when three volumes are covered in old Baltic trees which only strengthens the affect.

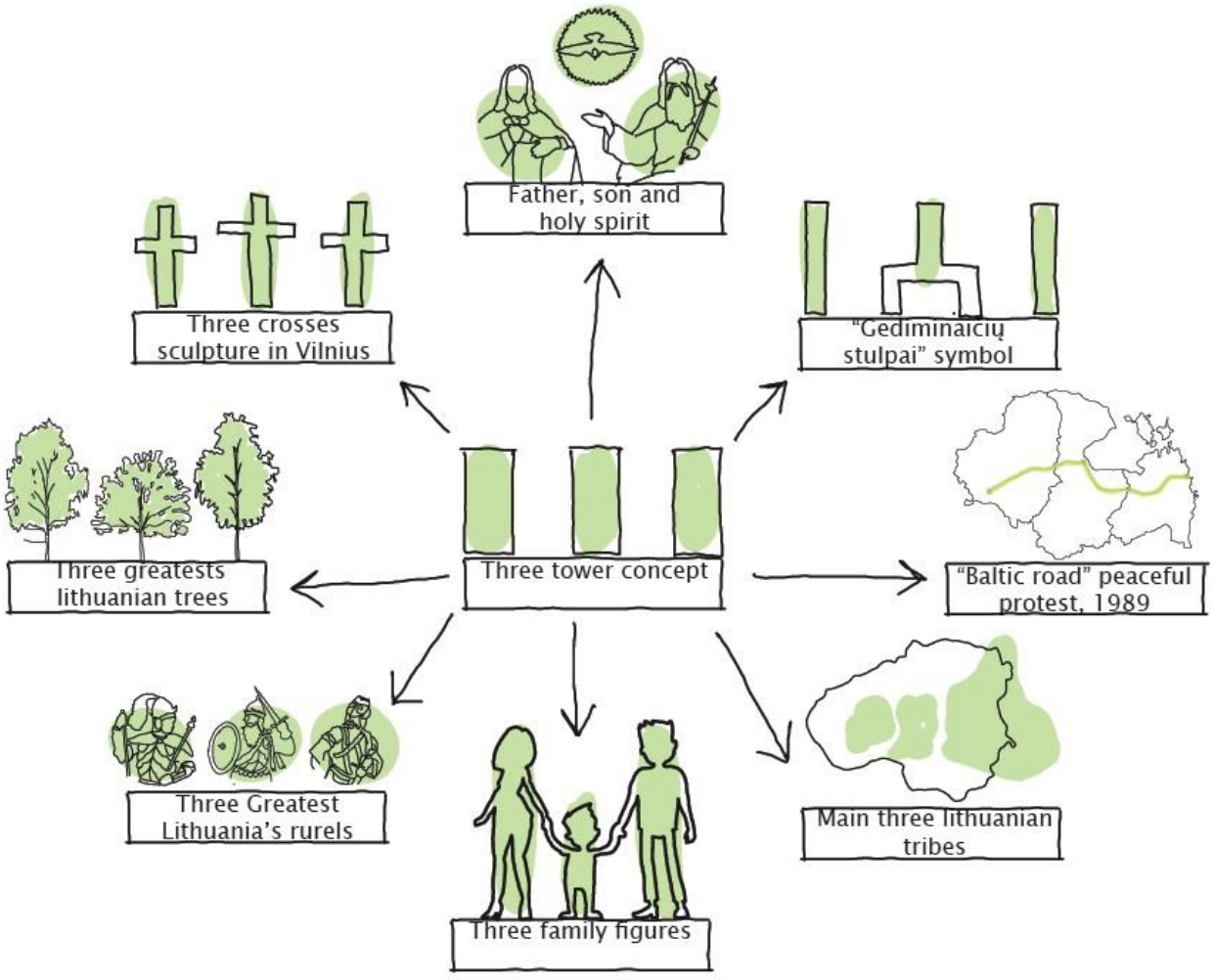


Fig 70.: Scheme shows how this unique three towers' volume represent Lithuanian values and history. Scheme made by the author.

2.5 Technical solutions.

2.5.1 Construction and engineering. First four floors are made out of reinforced concrete in order to strengthen the foundation. Next floor are made using CLT wooden construction. All columns of the building are 600x1400mm, maximum dintance between them is up to eight meters. Research suggest using large columns in order to sustain enormous weight of large trees and especially soil and water in the vazes. (Fig 71). Overlay is made out of 600m height CLT wood beams and 300mm CLT wood assembled panels. (Fig 72).

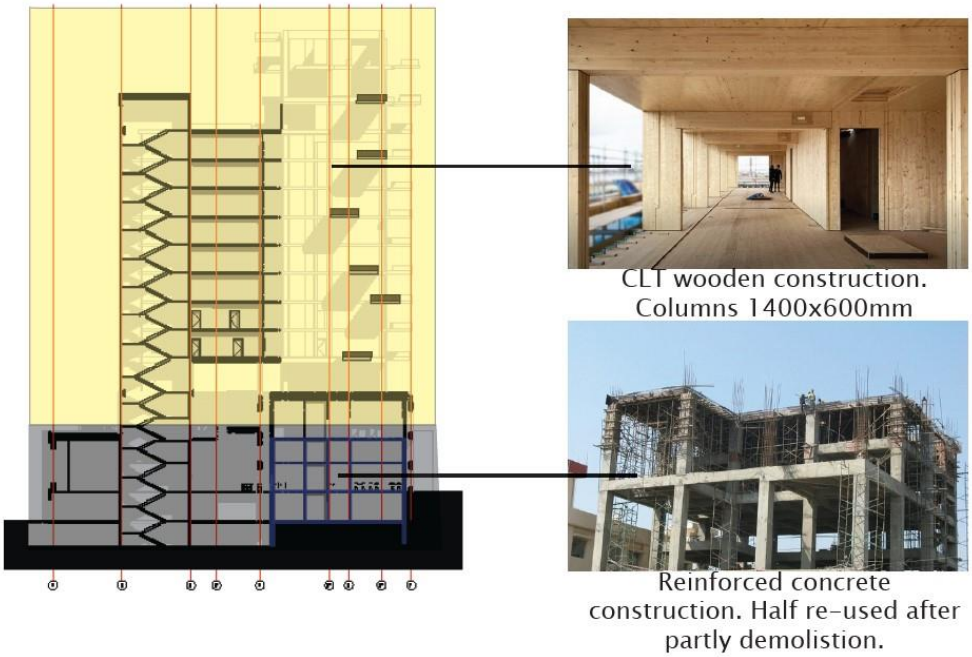


Fig 71.: Scheme shows which parts of structure is made from reinforced concrete and which are made from CLT wooden constructions. Scheme made by the author. (*Hotel Buildings Constructions Service*, 2022.) – photo below. Photo above – by Heutink Broep.

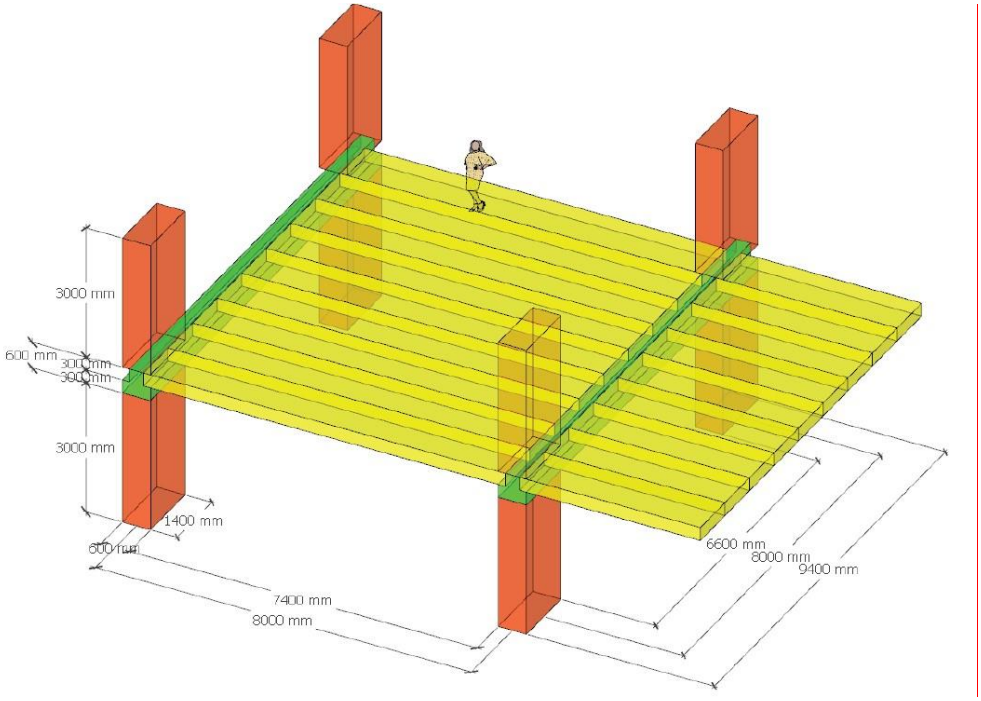


Fig 72.: Scheme shows how construction elements are put together. Scheme made by the author.

2.5.2 Green facades. It is suggested to use vegetation with special properties like tolerance to harsh climate, winds, and shadows. Trees which have relatively small root system, big height and medium crown diameter. In addition, use trees which could be replanted at a relatively old age in order to make sure that visualizations would match reality as soon as possible. (More detailed vegetation table can be found in appendix 34).

In addition, green facades could become a new movement path for small local species which live in city centers like birds, insects, and squirrels. (fig 73). In order to minimize insect influence to residents life we suggest moving vazes where plants are planted at a minimum distance of 2 meters from the doors which connect balconies with apartments. (fig 74).

Fig 73.: Scheme shows how proposed vertical park would integrate various species in Kaunas city center into united ecosystem. Scheme made by the author.

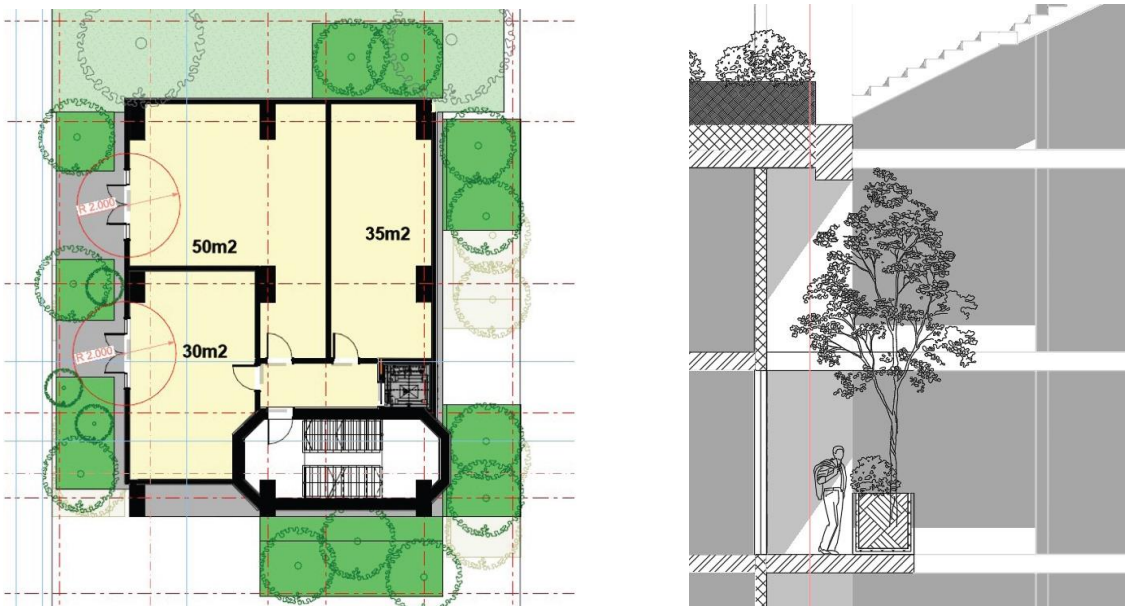


Fig 74.: Drawing show how façade greenery is placed on balconies. Drawings made by the author.

Visualizations how building would look like in different seaons throughout the year. (fig 75).

Fig 75.: Visualizations made by the author which shows how complex will look like in different seasons of the year from different viewpoints.

Finally, building will have special watering, water storing, water drainage and water filtration systems. Main idea is that complex could use and later re-use rainwater, especially when Lithuania has relatively a lot of rainy days throught out the year. Of course, complex should be connected to the grid in case of emergencies and for additional safety have a water reservour. Only for these functions we suggest leaving at least close to a thousand squeare meters of area for technical rooms. (Fig 76)

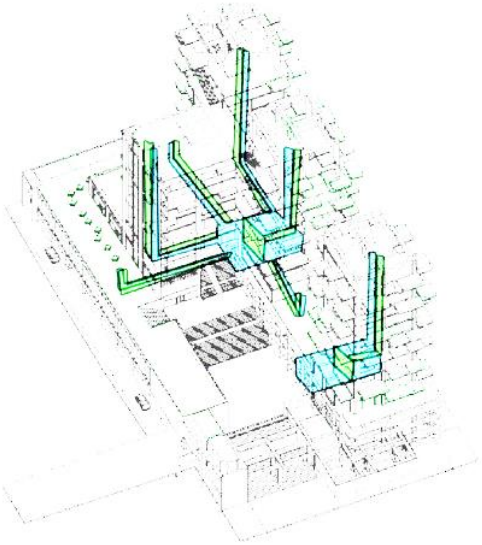


Fig 76.: Scheme shows how plant's waterring system would be connected between green facades, reservours and filtration systems in the complex. Made by author.

Conclusion.

Green facades often are criticized as “greenwashing”, but in this case green façade is not only beautiful visualizations. It is used for regeneration purposes of dense city center by creating public parks and infrastructure. Finally, greenery helps to blend the building with the Zaliakalnis hill and make it even more contextual looking from protected viewpoints.

2.5.3 Functional zoning.

2.5.1 General

The complex has a lot of challenges for planning stage to make it mix-used building. Almost every design program’s goal was met at minimal requirements. (fig 77) Functions distribution a bit differs from preliminary assumptions after a public survey, but final decisions are surely not very far from it. Largest function remained hotel, focusing not only on client’s needs, but also on the need of hotels according to previously made conclusions in the research. Parking spaces would exceed minimul requirements if coficient of 0.5 would be used because the complex is in city center territory.

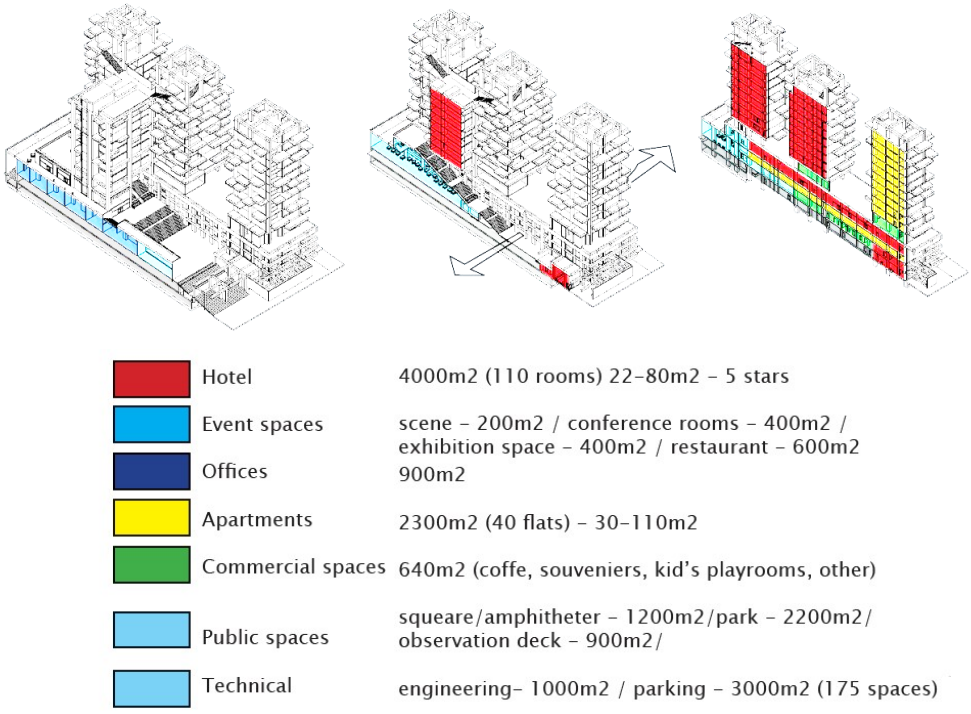


Fig 77.: Simplified scheme shows how functions are distriputed in the complex. It also shows approximate squeare area of each function. Schemes made by the author.

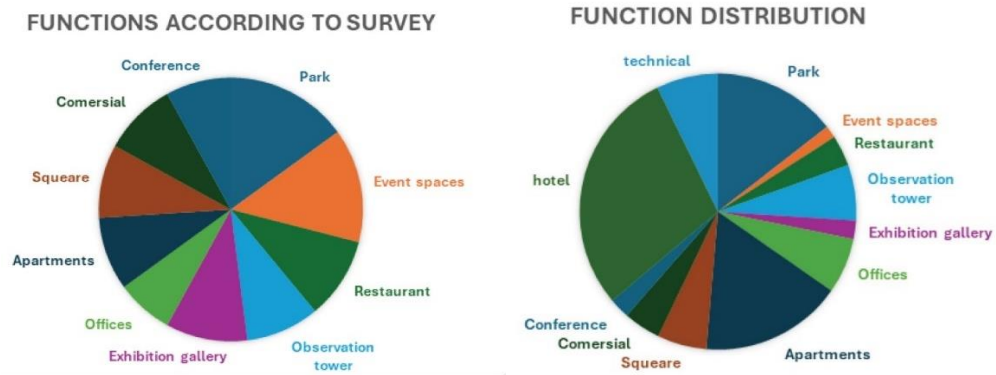


Fig 78.: Diagrams shows comparison between survey’s proposed functional distribution (left) and suggested more detailed distribution of functions (right). Made by the author.

2.5.2 Site plan

Main idea is to revive surrounding inner yards to attract padestrians to come inside the block's inner complex. Four different ways of entrance for padestrians (marked in red), Three different ways of entrance for vehicles (marked in blue).

General indicators: Density - 80% (maximum – 50%)/Intensity - 230% (maximum – 350%) Greenary (on ground) - 13% (minimum 10%) /Greenary (on building)- 140% /Max building height - 60m (maximum – 25m)/Parking spaces - 175/Parking spaces in block: new – 90; demolished – 60. Surplus – 30 spaces.

Number meanings:

1- apartments (17 rooms - 50m2/17 parking places)

2-"Britanica" complex/2.1-"Britanica" event space/2.2-"Britanica" hotel/2.3-"Britanica" apartments (playing ground on the roof)/2.4-"Britanica" offices/2.5-"Britanica" park

3-"Britanica" squere

4-"Žilinskas" squere

5-apartment's garden

(playground, senior chill areas)

6-16x16 place for firetruck to turn-around

7-"Lūžtanti banga" cozy inner yard. Connection with Freedom Avenue

8-apartments (32 rooms - 40m2 /32 parking places)

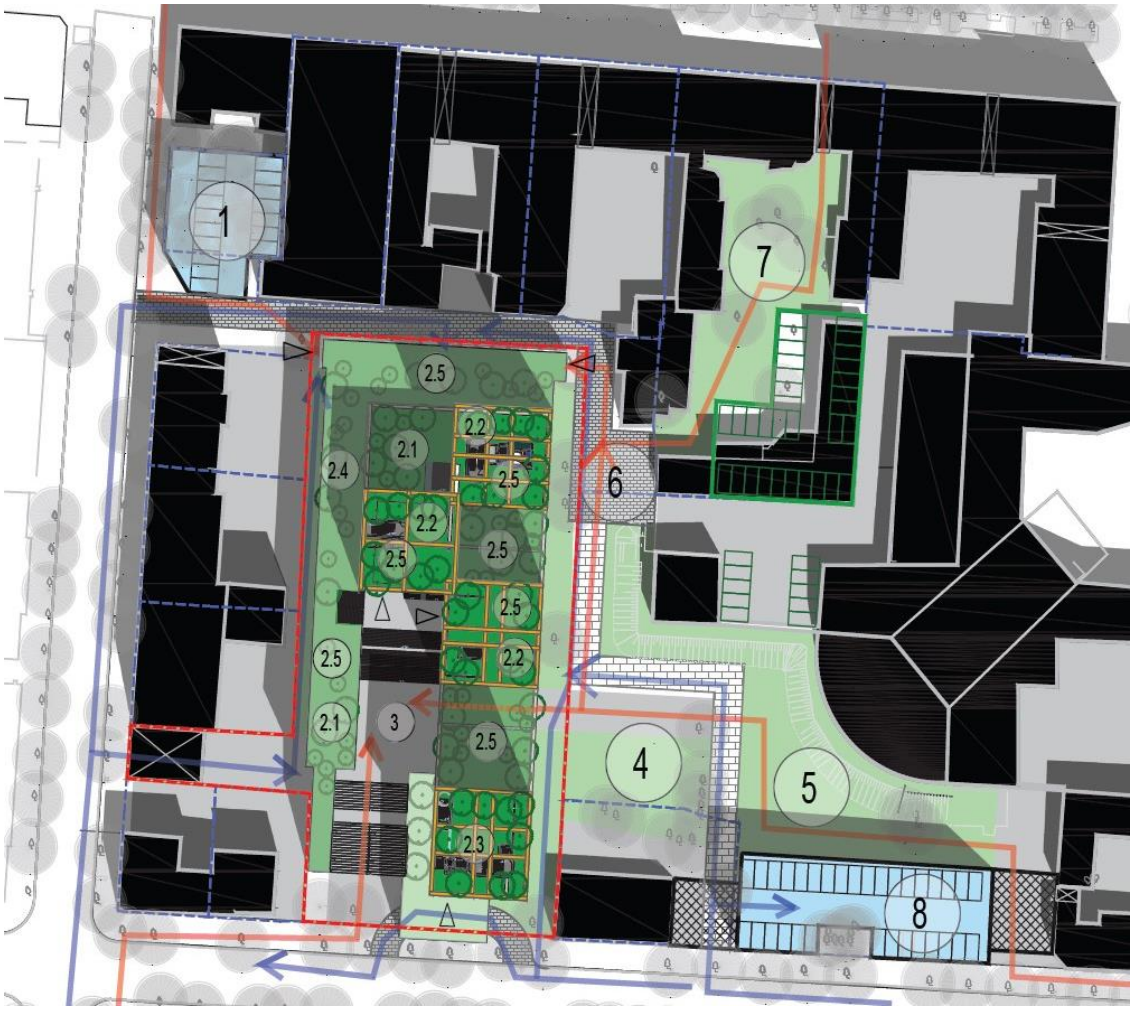


Fig 79.: Site plan drawing. Made by the author.

2.5.3 Entrances. Building has clear attraction points which all connect into unified system. Of course, there are some private entrances for apartment's residents and for technical support. It is very important to create clear and understandable entrance points in order to make the life easier for a curious visitor who just saw the building from the main walking street.

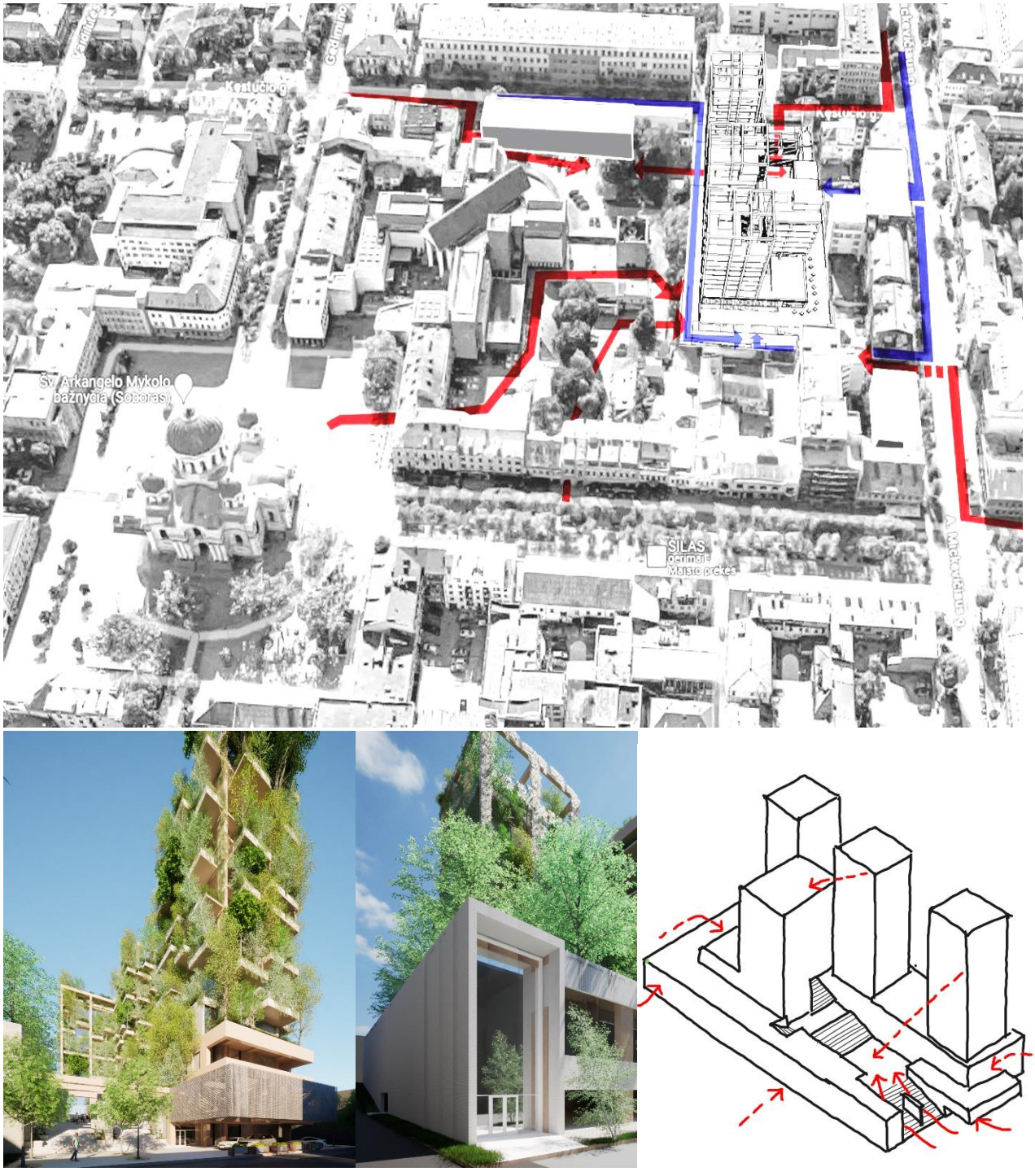


Fig 80.: Above – scheme show main attraction/entrance paths for padestrians (red) and vehicles (blue). Left below – visualization from Kestucio street shows the main antrance to the complex. Center below – visualization shows entrance point from the Freedom Avenue. Right below – scheme shows all different entrance paths to the "Britanica" hotel complex. Schemes and visualizations are made by the author.

2.5.4 Parking. Smart use of topography allows to create two parking floor with only one of them being underground. It is also suggested not to touch existing foundation of abandoned structure and plan parking places around it in order to do not damage them which could cause danger to people's health. Ground floor also has the main entrance to the five star hotel from Kęstučio street. (Fig 81).

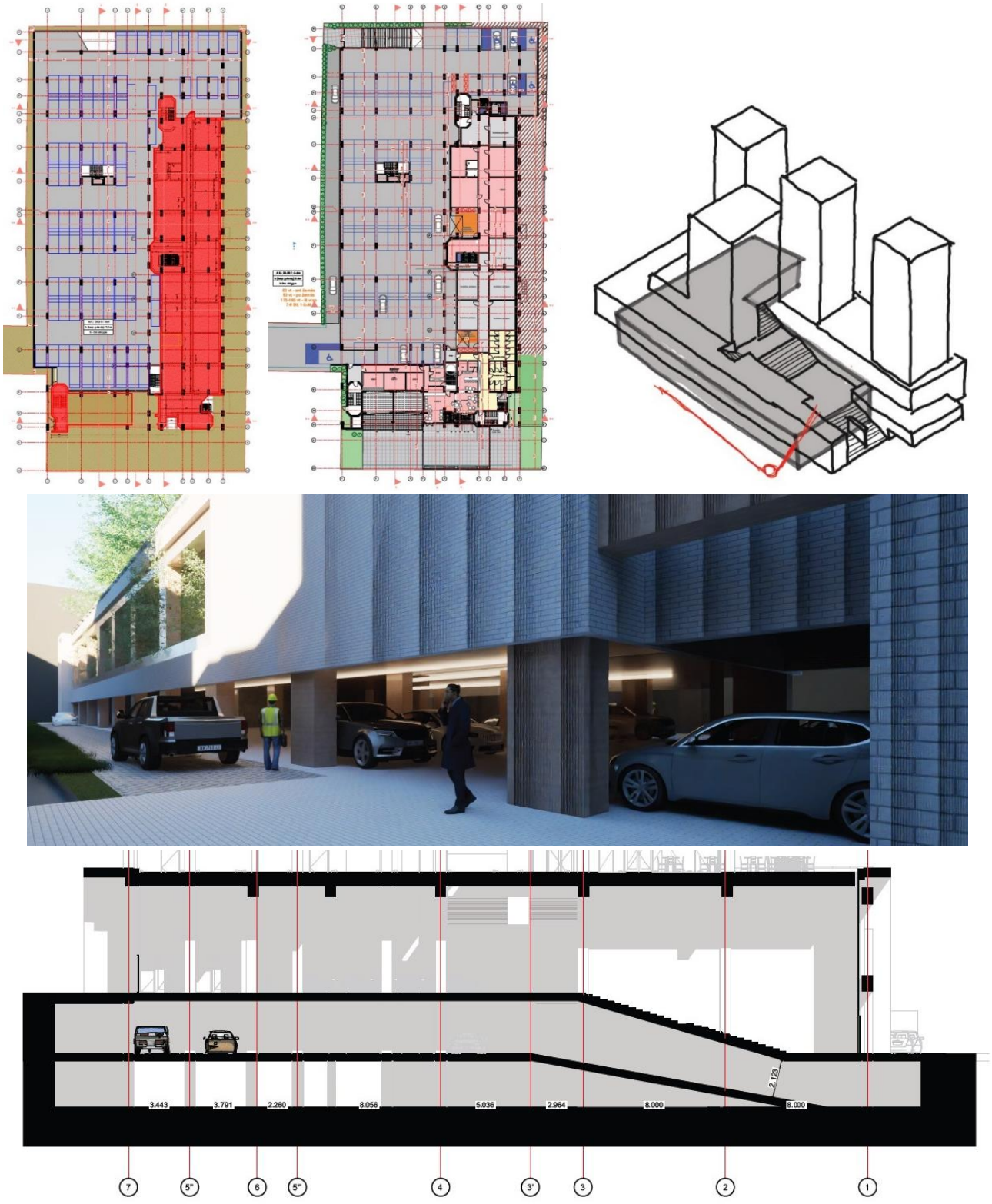
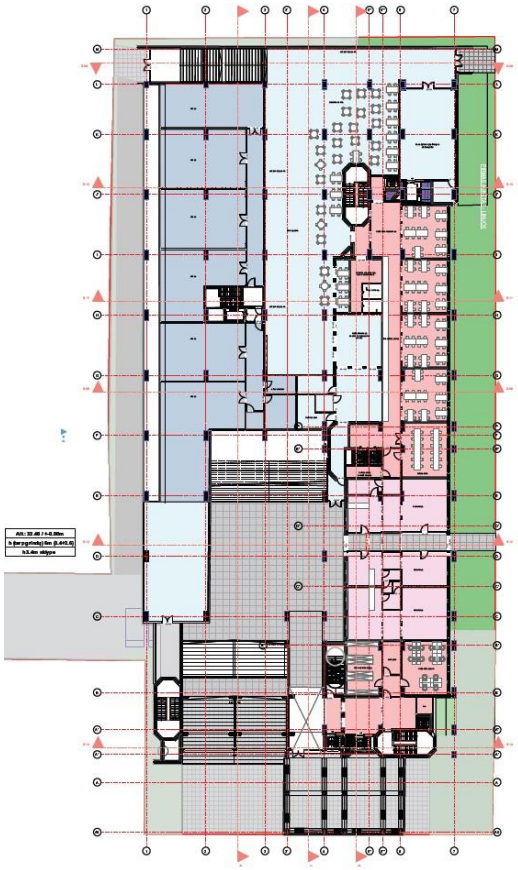


Fig 81.: Plans in left corner show parking plans. Scheme in right up corner show parking place in the complex. In the center visualization to ground parking from technical entrance. Section cut below shows how existing topography is used for double parking with only one underground parking floor. Schemes made by the author.

2.5.5 Squere and amphitheaters. Inner squere is created which clearly separates existing from completely new buildings. Volumes from all sides ensure privacy and reduce noises for the neighbouring building when events occur. Inner yard is connected with Zilinskas gallery though a small tunnel. By leaving ground floor for parking newly created squere perfectly allings with Zilinskas yard altitude. Finally, large staircase / amphitheater leads visitors straight towards lower terrace park in the way distributing padestrians flows in their respected functions: offices, commercial, conference hall, exhibition gallery etc.



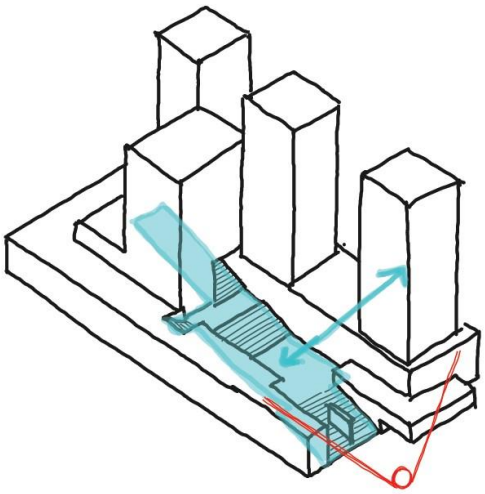


Fig 82.: Plan above – ground floor (squeare, amphitheter, exhibition hall, offices, comersial etc.). Visualization above shows inner squeare, visualizations left below shows staircases to lower park. Scheme below right shows where inner yard is in the complex. Schemes and visualizations made by the author.

2.5.6. Exhibition space and conference hall. Under the monumental staircase large exhibition hall with high ceiling is created, on top of its large conference hall which is also connected with five-star hotel via representative hall area. It also has its own private park terrace. Exhibition hall intensionally has minimal natural lighting to be possible to exhibit various painting which are sensitive to direct sunlight.

Fig 83.: Plan above – first floor (conference hall, hotel's entertainment area). Visualization above shows exhibition hall inside, visualizations in center shows view from conference hall to exhibition hall. Section cut below shows the height and position of exhibition hall (under staircase). Scheme on the left shows where these functions are in the complex. Schemes and visualizations made by the author.

2.5.7. Lower Park terrace. First public park level which is full of commercial activities like coffee shops, kid's playrooms and small restaurants (marked in pink). Park makes a clear devision between old and new structure elements.

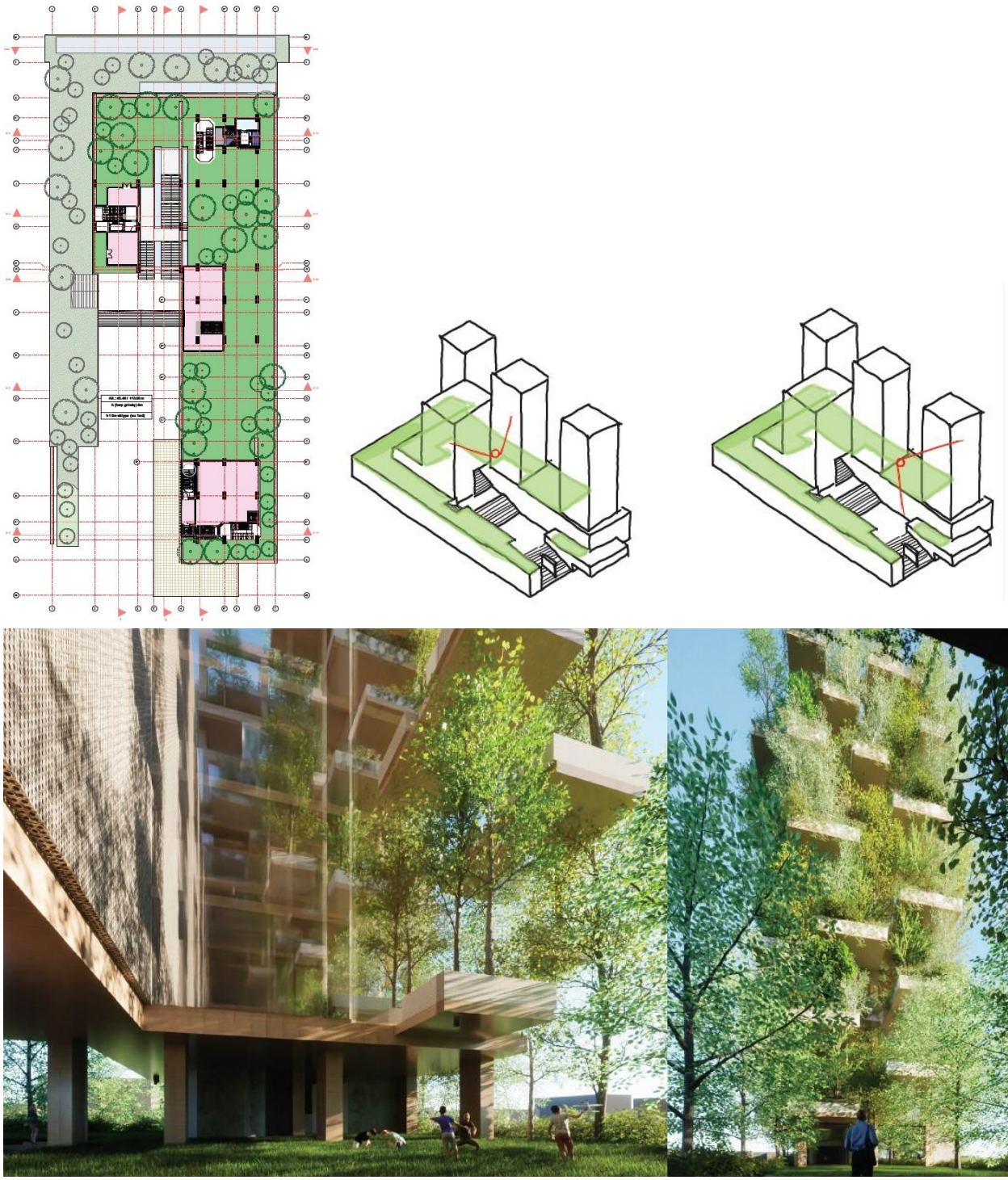


Fig 84.: Plan above – forth floor (lower park, comersial areas). Schemes above show where lower park is in the complex. Visualizations below shows how this lower park would look like. Schemes and visualizations made by the author.

2.5.8. Hotel and residental. Forth cube is required in order to meet with Lithuanian fire safety regulations(*1-338 Dėl Gaisrinės Saugos Pagrindinių Reikalavimų Patvirtinimo*, 2024), which states that hotels have to have at least two fire staircases and the distance from it to the farthest room cannot exceed thirty meters. Bottom tower cannot have staircase because it is impossible to create new sacht through existing reinforced concrete floors. Nevertherless, forth volume is cleverly hidden in order to not be seen from the most important viewpoint (Parodos hill). Third tower is fully residential because building codes allow one staircase for residential buildings and third tower has a potential to have only one fire staircase. In addition, last left floor with low ceiling are also added to residential complex, this floor sells small apartments around 18 sq. meters or less for very affordable prices. Residental floor plan can be found in appendix 25.

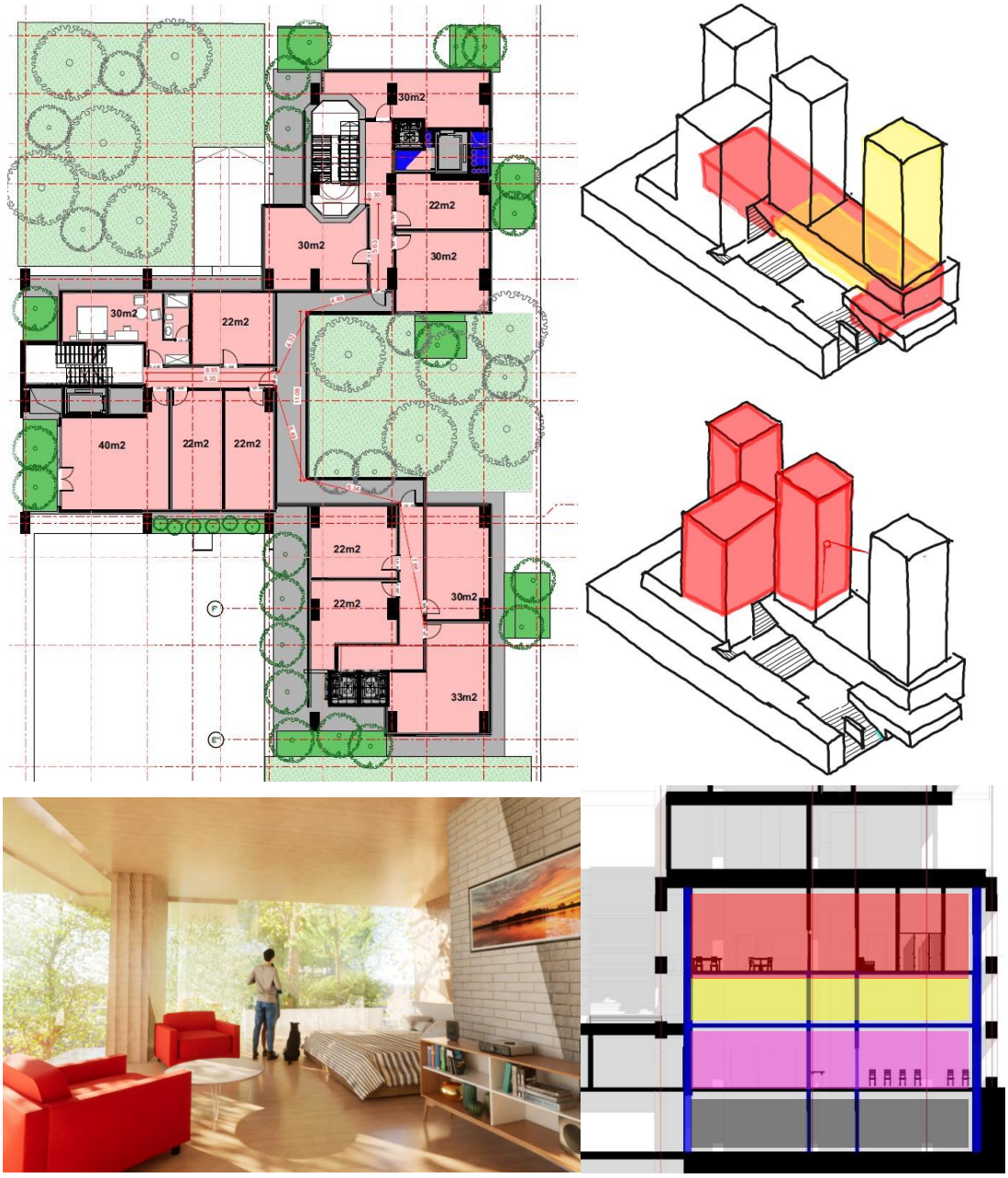


Fig 85.: Plans above 4-12 floors (hotel) show distances from fire staircases. Schemes above shows where hotel function is in the complex, it also shows how residental function intersects with hotel. Visualization below shows hotel room. Section cut below shows how functions are distributed in existing structure (red-hotel, yellow-residental, pink-comersial, grey-technical) – blue walls – left walls after demolition. Schemes and visualizations made by the author.

2.5.9. Observation deck and residential tower yard.

First number roof terrace is used by apartment residents, this terrace is completely private. Senior relaxation area and kid's playground can be found here as it is required by Lithuanian law. Second viewpoint is in public observation deck which can be accessed by express elevator from the first floor.

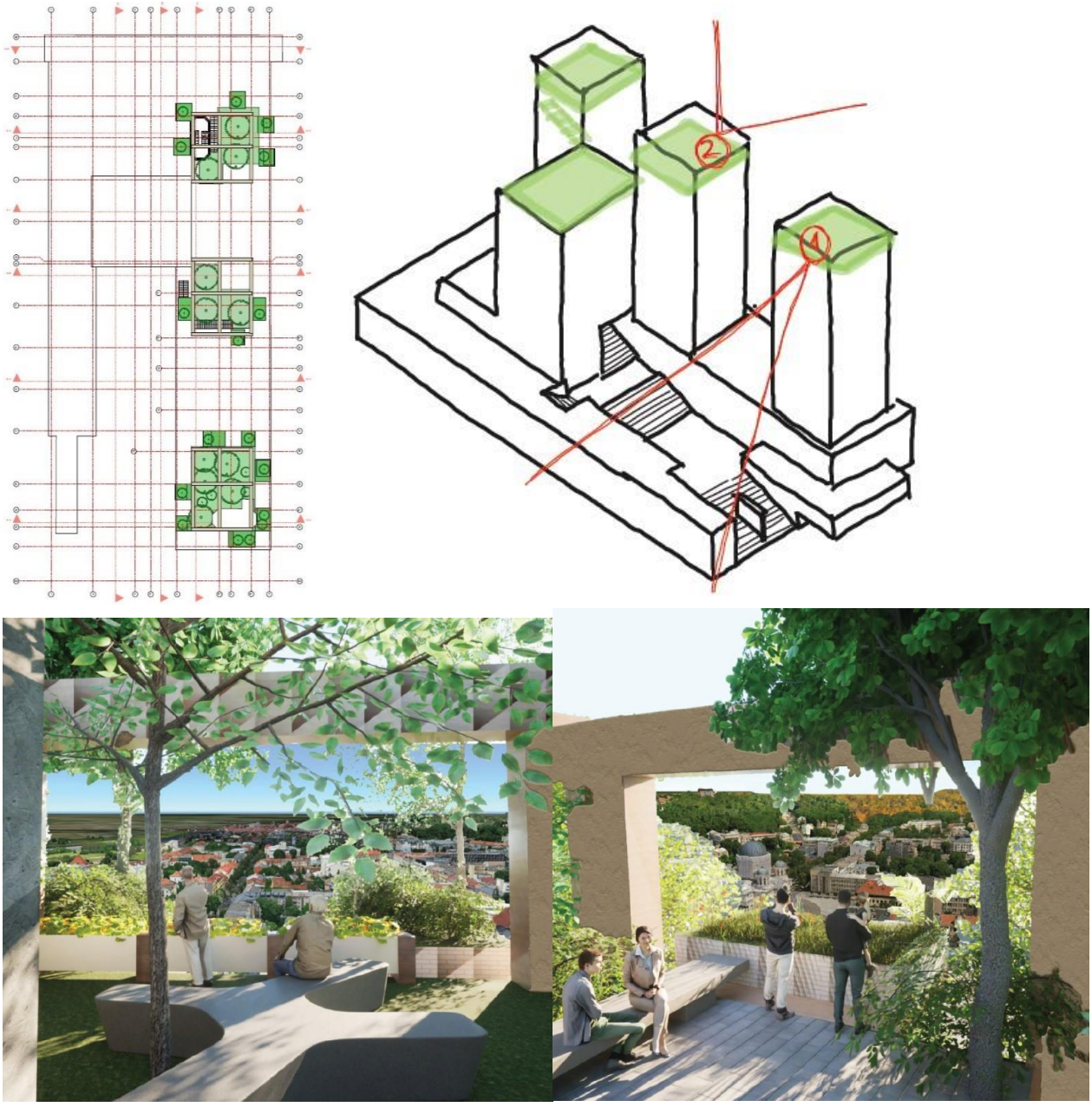


Fig 86.: Plans above 13th floor. Observation deck, higher park. Scheme above right shows where this park is in the complex. Visualization below shoes views which could be seen from these observation decks. Schemes and visualizations made by the author.

2.5.10. Multifunctional fire staircases.

Red – used by hotel/ dark blue – used by office sector/ yellow – used by apartment residents/ light blue – express elevator to observation deck on the roof. (fig 87).

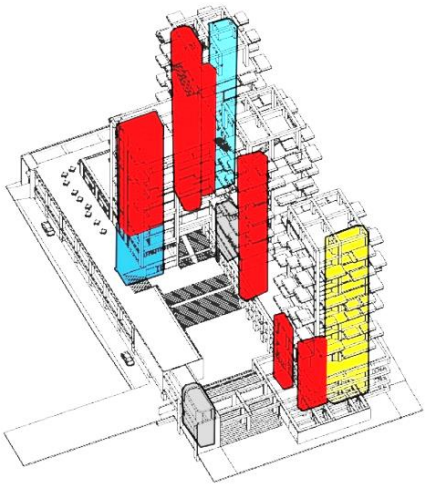


Fig 87.: Scheme which shows fire staircases which are used by different functions. Scheme is made by the author.

2.6. Evaluation of experimental design

General thoughts

Design is for sure not perfect, but if taken into consideration hard starting position and low potential for reconstruction because of out-dated ceilings heights and distances between staircases. In addition, hard challenge of mix-use complex in densely populated and urbanised historical city center. The experiment at least should spark inspiration and motivation to analyse and experiment with this "impossible" situation even further. To try and find more historical and more concrete arguments of culture value or genius loci for existing "Britanica" hotel. Demolition would clearly be a mistake. The research suggests that there should be another way to solve this situation while leaving as much existing structure and its philososophical monumentality as possible. You just cannot destroy one of the kind examples. A clear urbanistical mistake which can be easily erased from history and be forgotten in several decades or it could start new creative thinking outside the box.

Evaluation of proposal according to greenery index (Kapočiūtė et al., 2023)

This new and innovative evaluation code is still in beta version. According to it our proposal scored 3.21 – which is huge. We have to keep in mind that system does not have way to calculate and evaluate planted tress on facades (ony on the ground). Still, if we do not display any new planted tress "Britanica" complex scores – 2.04. (exact scores in appendix 28). Which is still double the amount of various examples in other western European countries. Figure 89 (left picture)– scored 0.82; (right picture)– scored 1.

Fig 87.: (left) Kuninkaantammi apartment block in Finland; (right) Norra Djurgårdsstaden apartment block in Sweden. Photos from (Kapočiūtė et al., 2023)

Evaluation of abandoned “Britanica” hotel buiding’ structural transformation.

Volume
Now (48.900m3) – after (17.850m3)- difference (-31.050m3)

Reindorced concrete colume
Now (8.000m2) – after (4.000m3) – difference (4.000m3)

Re-used concrete
“In 2006, material tests in Switzerland showed, however, that high-quality concrete can be produced even with the use of more than 90% of aggregates made from scrap. .” (*Is It Possible to Recycle Concrete?*, 2020)From 4000m3 deconstructed concrete we can create up to 3.600 m3 new concrete for underground parking. Proposed new constructions concsit of new reinfored concrete in underground parking (-2 floor) up to 3rd floor) that makes around 2.500m3 which means that we would still have additional concrete fot site paths and square pads. In addition, new complex would filter up to 0.001% CO2 emmited by Kaunas city. Kaunas(*Aplinka - Oficialiosios Statistikos Portalas*, 2019)emits up to 6 millions kilograms of CO2 each year, complex 200 trees filters up to 5000 kilograms of the year. (EcoTree, 2023).

Square area
Now (12.660m2) – after (3.000m2) – difference (9.660m2)

Economical benefits
Hotel profit – 110 rooms would create an income of around 150.000 euros per month.
Residential profit – 22 affordable housing units are created which could house up to 60 students with additional 30 smaller apartments for middle- and upper-class residents.

Cultural benefits
Conference – meetings up to 200 people.
Restaurant – up to 200 seating spaces in public zone; up to 160 seating spaces in hotel sector.
Concerts – performances for up to 300 people.

Greenary square area
Now (4303m2) – after (5870m2) – difference (1567m2)

Greenary index (Kapočiūtė et al., 2023)
Now(1.79) – after (2.04-3.21) – difference (0.25-1.42)

In conclusion, by demolishing larger portion of existing structure for adaptation purposes and reusing as much concrete waste as possible complex makes zero carbon emissions. Sadly, the impact for Kaunas city would be only minimal (0.001%). In addition, economical and cultural benefit would be huge.

Evaluation according to theoretical research

Experimental design proved that algorithm (huphotetical model) created from theoretical research conclusions is correct and working. “Britanica” hotel has a potential to be transformed. In addition, situation, clients and public’s needs determined that indeed regenerative design is the correct suggestion for abandoned building.

Evaluation according to empirical research

Experimental design solidified conclusions made in empirical research by proposing a higher mix-used complex, which was transformed by leaving existing structure as much as possible and creating a new vertical park in degraded city center of Kaunas, which would have an impact for central part regeneration. In addition, experimental proposals found higher building’s philosophical arguments which have references to Lithuanian values and history.

Conclusions

1. Theoretical research part showed that is hard to clearly define the official statement what is "abandoned" building or territory. Research suggests using universal four properties from which is three out of four is true the building or territory is abandoned. (1. no registered owner or owner is missing, 2. It has been vacant for six consecutive months or longer, 3. Building or territory creates various dangers to its surroundings (psychological, psychical, value), 4. Building or territory is not registered as a completed structure. It also showed that abandoned buildings can and should be classified by size, age, ex-function, and location in order to determine which building should be prioritized for transformation.
2. Theoretical research part showed that despite that most often used transformation method is remodelling the most successful transformation model considering sustainable integration principles is regenerative method, which encourages designers and architects think how to not only use less materials but also how to restore or even increase the resources after the construction. Main idea is that any insertion into existing status quo should improve overall wellbeing not only for humans but also for the environment.
3. Empyric research proved that existing "Britanica" hotel can be transformed to today's building regulations to a low-class affordable housing which is also well needed function in the city center of Kaunas city. It also proved that according to public and expert opinion and overall need of different function in Kaunas city center "Britanica" hotel can and should become a mix-used complex.
4. Empyric research proven that a higher volume building can be considered in the location of "Britanica" hotel. Research showed that public is on the edge of switching to supportive. In addition, viewshed analysis from protected city's viewpoints showed that higher building would be possible if it adapted "camouflage" technique with green facades which would help higher volume to blend in with Zaliakalnis hill. Finally, viewshed analysis also showed that two very important viewpoints can be created if the building's volume would be rearranged. Empiric research also proven why higher building should be considered in the first place. 1. Raising discussions, 2. Small support from expert interviews, 3. Genius loci of large building suggest leaving it, 4. High potential of the location and economical benefit.
5. Experimental design showed that mix-use complex is close to possible. Almost all social and client needs were reached. It also showed that brave and controversials ideas can really spark discussions and constructive criticism which what this situation needs, more creative thinking, more boundaries broken, more innovative proposals created. Different technical approaches should be testes in order to minimize as much CO2 emmited in

List of references

1. *1-338 Dėl Gaisrinės saugos pagrindinių reikalavimų patvirtinimo*. (2024). Retrieved January 10, 2024, from https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.388658/asr
2. *3D Kaunas (Lidar)*. (2024). Retrieved January 10, 2024, from https://maps.kaunas.lt/3d/
3. *705 Dėl statybos techninio reglamento STR 2.02.01:2004 "Gyvenamieji pastatai" patvirtinimo*. (2022). Retrieved January 10, 2024, from https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.226882/asr
4. *2009-02-18 Kauno architektūros-urbanistikos ekspertų posėdis*. (2009.). Retrieved May 18, 2024, from http://www.architektusajunga.lt/kiti/2009-02-18-kauno-architekturos-urbanistikos-ekspertu-posedis/
5. *Abandoned Buildings and Lots*. (2012, January 1). ASU Center for Problem-Oriented Policing. https://popcenter.asu.edu/content/abandoned-buildings-and-lots-0
6. Algimantas Miškinis. (2009). *„KAUNO NAUJAMIESČIO URBANISTINIO MODELIO PAIEŠKOS"*.
7. *Anne Lacaton and Jean-Philippe Vassal Receive the 2021 Pritzker Architecture Prize*. (2021, March 16). ArchDaily. https://www.archdaily.com/958565/anne-lacaton-and-jean-philippe-vassal-receive-the-2021-pritzker-architecture-prize
8. *Aplinka—Oficialiosios statistikos portalas*. (2019). Retrieved May 21, 2024, from https://osp.stat.gov.lt/lietuvos-statistikos-metrastis/lsm-2019/aplinka-ir-energetika/aplinka
9. *Architektūros objektas*. (2023.). Retrieved May 18, 2024, from https://autc.lt/architekturos-objektas/?id=1045
10. *Aukštybinių pastatų išdėstymo Kauno miesto savivaldybės teritorijoje specialusis planas*. (2007).
11. BNS inf., K. D. (2023, June 22). *„K26" galutinai pralaimėjo ginčą su Kauno valdžia dėl viešbučio vietoj „Britanikos" | KaunoDiena.lt*.

https://kauno.diena.lt/naujienos/kaunas/miesto-pulsas/k26-galutinai-pralaimejo-ginca-su-kauno-valdzia-del-viesbucio-vietoj-britanikos-1129783

12. *Bosco Verticale / Boeri Studio*. (2015, November 23). ArchDaily. https://www.archdaily.com/777498/bosco-verticale-stefano-boeri-architetti

13. Brooke Penman. (2021). *The choice between demolition or reuse: Developer insights*. UKGBC. https://ukgbc.org/news/the-choice-between-demolition-or-reuse-developer-insights/

14. *Building Adaptation in Construction -Objectives, Importance*. (2017, September 5). The Constructor. https://theconstructor.org/building/building-adaptation-construction/17792/

15. Bundanti viešbučių rinka Kaune. (2023, August 1). *Kaunas IN*. https://kaunasin.lt/bundanti-viesbuciu-rinka-kaune/

16. Capdevila-Werning, R., & Lehtinen, S. (2021). Intergenerational aesthetics: A future-oriented approach to aesthetic theory and practice. *Philosophical Inquiries*, *9*(2), 171–194. https://doi.org/10.4454/philinq.v9i2.343

17. Christele Harrouk. (2023, January 27). *OMA Wins Competition to Transform World's Oldest Museum for the Ancient Egyptian Culture in Turin, Italy*. ArchDaily. https://www.archdaily.com/995520/oma-wins-competition-to-transform-worlds-oldest-museum-for-the-ancient-egyptian-culture-in-turin-italy

18. Claire Brodka. (2023, August 23). *Rewilding in Architecture: Concepts, Applications, and Examples*. ArchDaily. https://www.archdaily.com/1005791/re-wilding-in-architecture-concepts-applications-and-examples

19. *Code of Laws—Title 12—Chapter 67—South Carolina Abandoned Buildings Revitalization Act*. (2020). Retrieved October 9, 2023, from https://www.scstatehouse.gov/code/t12c067.php

20. Cordero, E. (2001). *Sustainability in architecture* [Thesis, Massachusetts Institute of Technology]. https://dspace.mit.edu/handle/1721.1/65259

21. Cui, L., & Walsh, R. (2015). Foreclosure, vacancy and crime. *Journal of Urban Economics*, *87*, 72–84. https://doi.org/10.1016/j.jue.2015.01.001

22. *D1-91 Dėl statybos techninio reglamento STR 2.02.02:2004 "Visuomeninės paskirties statiniai" patvirtinimo*. (2022). Retrieved January 10, 2024, from https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.230706/asr

23. *D1-713 Dėl statybos techninio reglamento STR 1.01.03:2017 „Statinių klasifikavimas" patvirtinimo*. (2023). https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/998f6af39c3d11e68adcda1bb2f432d1/asr

24. *DALL·E 2*. (2024). Retrieved January 12, 2024, from https://openai.com/dall-e-2

25. Dixon, A. (2023, January 16). 10 Words that Describe an Abandoned House. *Writing Tips Oasis*. https://writingtipsoasis.com/words-that-describe-an-abandoned-house/

26. EcoTree. (2023). *How much CO2 does a tree absorb? Let's get carbon curious!* EcoTree. Retrieved May 21, 2024, from https://ecotree.green/en/how-much-co2-does-a-tree-absorb

27. Edita Stankevičiūtė. (2022). *Bažnyčios pastatą Garliavoje kaunietė pakeitė neatpažįstamai: Pravėręs duris, patenki į kitą pasaulį*. https://www.lrytas.lt/bustas/mano-erdve/2022/02/02/news/baznycios-pastata-garliavoje-kauniete-pakeite-neatpazistamai-praverus-duris-patenki-i-kita-pasauli-22245667

28. EL PAÍS (Director). (2021, March 18). *Kauno viešbutis „Britanika" | Aukščiau tik dangus | Arbatos pertraukėlė*. https://www.youtube.com/watch?v=d66ho463j3c

29. *FORTAI | Kauno tvirtovė parkas*. (2023). Kauno tvirtovė. Retrieved May 18, 2024, from https://www.kaunotvirtove.lt

30. Gassett, B. (2022, October 3). *What is an Abandoned House and What Happens to The Property*. Maximum Real Estate Exposure. https://www.maxrealestateexposure.com/abandoned-houses/

31. Genute. (2016, October 9). Raimonda Šimėnaitė: VU botanikos sodo eksperimentai neturi analogų. *Geltonas Karutis*. https://geltonaskarutis.lt/raimonda-simenaite-vu-botanikos-sodo-eksperimentai-neturi-analogu/

32. geoportal. (2024). *LEII žemėlapių peržiūros programa*. Retrieved January 13, 2024, from https://www.geoportal.lt/map/

33. Glendinning, M. (2023). *Tower Blocks UK: Rotherham Clifton House Site Redevelopment, n17-09.jpg*. University of Edinburgh. Edinburgh College of Art. https://doi.org/10.7488/DS/6100

34. Grazuleviciute-Vileniske, I., Daugelaite, A., & Viliunas, G. (2022). Classification of Biophilic Buildings as Sustainable Environments. *Buildings*, *12*(10), 1542. https://doi.org/10.3390/buildings12101542

35. Han, H.-S. (2014). The Impact of Abandoned Properties on Nearby Property Values. *Housing Policy Debate*, *24*(2), 311–334. https://doi.org/10.1080/10511482.2013.832350

36. Hoff, S. A. (2016). *Iowa Administrative Code Supplement*.

37. *Hotel Buildings Constructions Service*. (2022). Indiamart.Com. Retrieved May 21, 2024, from https://www.indiamart.com/proddetail/hotel-buildings-constructions-service-18562790691.html

38. *I-1240 Lietuvos Respublikos statybos įstatymas*. (2023). https://www.e-tar.lt/portal/lt/legalAct/TAR.F31E79DEC55D/asr

39. *Is It Possible to Recycle Concrete?* (2020, February 17). ArchDaily. https://www.archdaily.com/933616/is-it-possible-to-recycle-concrete

40. *Įspūdingas sodas ant stogo: Ekspertė dalijasi efektyviais sprendimais, kuriuos lengvai pritaikysite savo terasose*. (2022, February 27). lrt.lt. https://www.lrt.lt/mediateka/irasas/2000202978/ispudingas-sodas-ant-stogo-eksperte-dalijasi-efektyviais-sprendimais-kuriuos-lengvai-pritaikysite-savo-terasose

41. Jane Jacobs. (2016). *The Death and Life of Great American Cities*.

42. Kapočiūtė, G., Kazlauskas, I., & Znutaitė, G. (2023). *ŽALUMO INDEKSO SUDARYTOJŲ KONTAKTAI*.

43. *Kauno miesto istorinė dalis, vad. Naujamiesčiu*. (1999, October 28). https://kvr.kpd.lt/#/static-heritage-detail/A1C598E4-FEC0-45CD-96AB-6AB549A4B7F4/true

44. *Kauno miesto savivaldybė Planavimo dokumentai*. (2023). https://www.kaunas.lt/administracija/administracine-informacija/planavimo-dokumentai/

45. Kruger, D. J., Reischl, T. M., & Gee, G. C. (2007). Neighborhood Social Conditions Mediate the Association Between Physical Deterioration and Mental Health. *American Journal of Community Psychology*, *40*(3–4), 261–271. https://doi.org/10.1007/s10464-007-9139-7

46. Li, Y., Meng, X., Zhao, H., Li, W., & Long, Y. (2023). Identifying abandoned buildings in shrinking cities with mobile sensing images. *Urban Informatics*, *2*(1), 3. https://doi.org/10.1007/s44212-023-00025-5

47. Liaučius, M. (2015). *„BRITANIKOS“ VIEŠBUČIO KONVERSIJA Baigiamasis bakalauro projektas*.

48. Liepa (augalas). (2023). In *Vikipedija*. https://lt.wikipedia.org/w/index.php?title=Liepa_(augalas)&oldid=7099890

49. Lina. (2020, November 25). Sodas ant namo stogo: „Live Square“ terasos kūrimas. *Geltonas Karutis*. https://geltonaskarutis.lt/sodas-ant-namo-stogo-live-square-terasos-kurimas/

50. LLC, B. (2016, January 19). Contextual Doesn’t Mean Copying. *BUILD Blog*. https://blog.buildllc.com/2016/01/contextual-doesnt-mean-copying/

51. MVRDV. (2020, July 17). *Concordia Design Wrocław / MVRDV*. ArchDaily. https://www.archdaily.com/943957/concordia-design-wroclaw-mvrdv

52. *Nr. 886 patvirtintais teritorijų planavimo sprendiniais (Detalusis planas)*. (1999).

53. *OpenCities Planner (digital twin)*. (2023.). OpenCities Planner. Retrieved January 10, 2024, from https://eu.opencitiesplanner.bentley.com/www_ktu_edu/kaunasdigitalcity-stage1

54. Paprastasis ąžuolas. (2023). In *Vikipedija*. https://lt.wikipedia.org/w/index.php?title=Paprastasis_%C4%85%C5%BEuolas&oldid=7100984

55. Par Rose Barfield. (2019). *Bosco Verticale | Bricsys Blog*. https://www.bricsys.com/fr-fr/blog/bosco-verticale

56. Paulius Samoška (Director). (2020, May 10). *KAUNO VAIDUOKLIS - VIEŠBUTIS BRITANIKA | APLEISTOS VIETOS LIETUVOJE*. https://www.youtube.com/watch?v=TxcLWxw0qPY

57. Professor Verdelli, Laura. (2016). *Bottom-up Urbanism in temporary Urban spaces*.

58. *Regenerative design*. (2022). [Definition; Guidance; Project Knowledge]. https://www.designingbuildings.co.uk. https://www.designingbuildings.co.uk/wiki/Regenerative_design

59. *Regenerative Futures: Eight Principles for Thinking and Practice * Journal of Futures Studies*. (2023, September 27). Journal of Futures Studies. https://jfsdigital.org/articles-and-essays/2023-2/vol-28-no-1-september-2023/regenerative-futures-eight-principles-for-thinking-and-practice/

60. *Rehabilitation guidelines*. (2022).

61. *Savivaldybė: Po Kauno įrašymo į UNESCO kultūros paveldo apsauga ne griežtės, o efektyvės | KaunoDiena.lt*. (2023, September 26). https://kauno.diena.lt/naujienos/kaunas/miesto-pulsas/savivaldybe-po-kauno-irasymo-i-unesco-kulturos-paveldo-apsauga-ne-grieztes-o-efektyves-1141403

62. Schutte, K. (2021). *Historic Preservation and Sustainability: "The Greenest Building is the One That's Already Built."*

63. Shinde, S. (2021, February 8). *Architectural Theory: Contextual architecture*. RTF | Rethinking The Future. https://www.re-thinkingthefuture.com/rtf-architectural-reviews/a3208-architectural-theory-contextual-architecture/

64. Sibilla, M., Touibi, D., & Abanda, F. H. (2023). Rethinking Abandoned Buildings as Positive Energy Buildings in a Former Industrial Site in Italy. *Energies*, *16*(11), 4503. https://doi.org/10.3390/en16114503

65. *T-387 Dėl Apleisto ar neprižiūrimo nekilnojamojo turto nustatymo tvarkos aprašo patvirtinimo*. (2020). https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/f27ef120455e11ebb394e1efb98d3e67?jfwid=72zogkhkd

66. Tara Struyk. (2023). *The Factors of a "Good" Location*. Investopedia. https://www.investopedia.com/financial-edge/0410/the-5-factors-of-a-good-location.aspx

67. Thatcher, A. (2015). *HFSD definition working paper 19 08 2013* [dataset].

68. *Townhouse in Sweden by Elding Oscarson*. (2016). Retrieved May 18, 2024, from https://design-milk.com/townhouse-in-sweden-by-elding-oscarson/

69. Tranavičiūtė, B. (2023). Modernist Heritage versus Contested Legacy: The Case of "Radio City." *Buildings*, *13*(1), 246. https://doi.org/10.3390/buildings13010246

70. Tumber-Dávila, S. J., Schenk, H. J., Du, E., & Jackson, R. B. (2022). Plant sizes and shapes above and belowground and their interactions with climate. *New Phytologist*, *235*(3), 1032–1056. https://doi.org/10.1111/nph.18031

71. Turner, T. (2004). *Landscape Planning And Environmental Impact Design* (0 ed.). Routledge. https://doi.org/10.4324/9780203214534

72. Vertical Forest | Milan. (2014). *Stefano Boeri Architetti*. Retrieved January 14, 2024, from https://www.stefanoboeriarchitetti.net/en/project/vertical-forest/

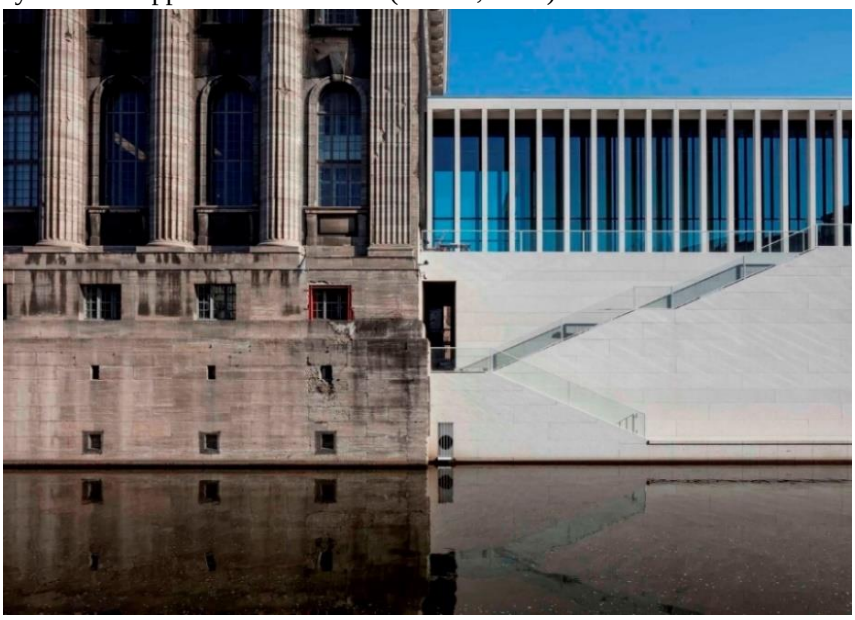
73. Viešbutis “Britanika.” (2013). *Pamiršta.lt*. https://pamirsta.lt/viesbutis-britanika/

74. Vogler, A., & Vittori, A. (2006). *Genius Loci in the Space-Age*.

75. Yegin, K. (2022). *Transformation of abandoned buildings and territories by sustainably integrating them into the infrastructural systems of the city*.

Appendices

Appendix 1.: Example of contextual/harmonious architecture. Jamne Simon Galerie_Ute Zscharnt by David Chipperfield Architects. (Shinde, 2021)



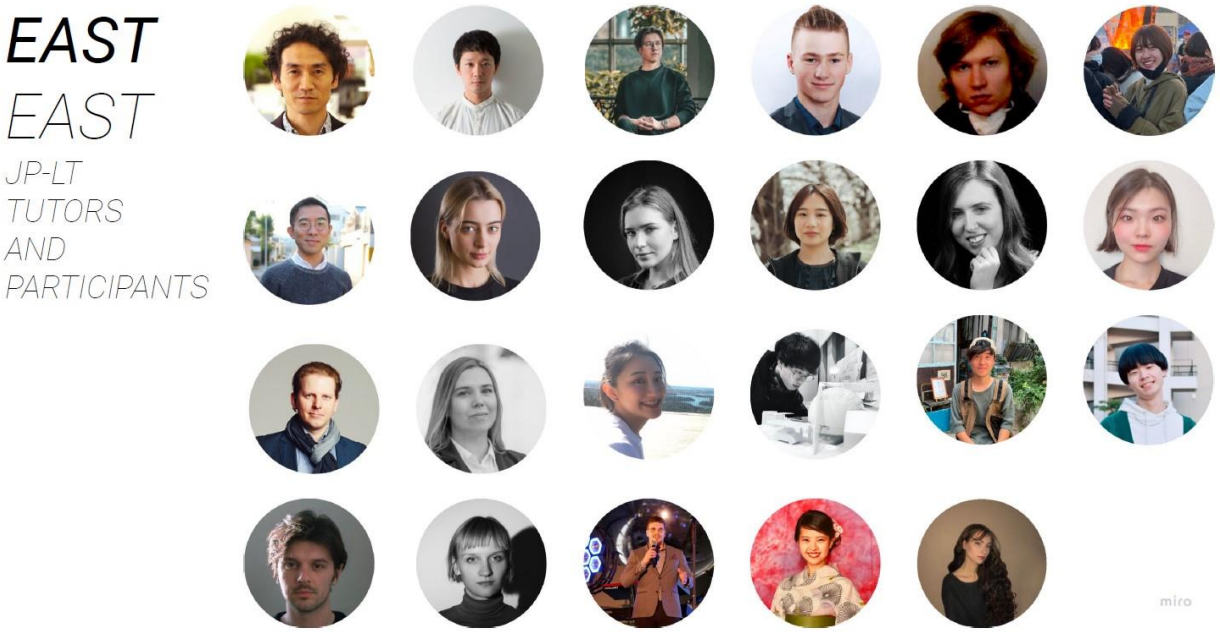
Appendix 2: Modern building beautifully harmonizing with the old classical one. Photo by Berger Roecker Architects)

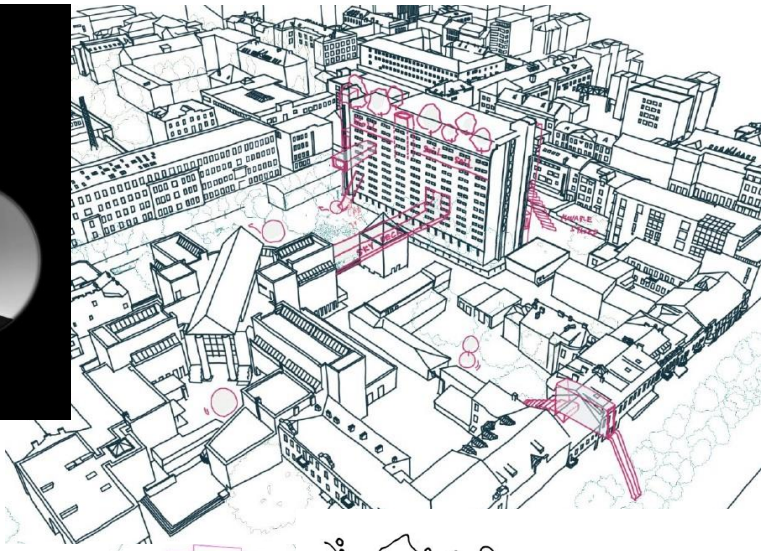
Appendix 3.: Different proposals from various architects for “Britanica” hotels transformation. Photos from (*2009-02-18 Kauno architektūros-urbanistikos ekspertų posėdis*, 2009.)

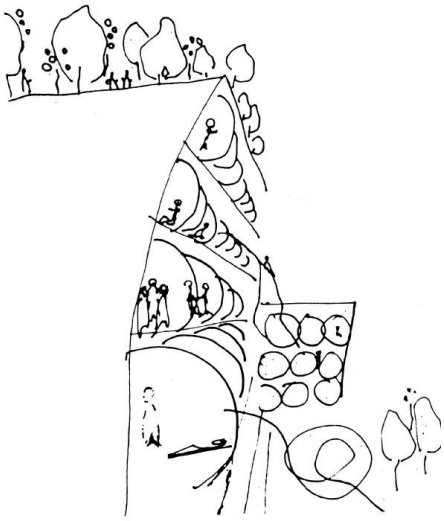
Appendix 4.: First detailed proposal of hotels reconstruction. Made by architect G.Nadkevičius.


VARTAI -1 AUKŠTE
Į POŽEMINĘ AUTOMOBILIŲ SAUGYKLĄ
PASTATO AUKŠTIS H=22.00 M
PASTATO DALIES AUKŠTIS H=10.95 M
PASTATO DALIES AUKŠTIS H=38.35 M
STOGELIO KONTŪRAS
SKLYPO RIBOS
STATYBOS RIBA, PAGAL GALIOJANTĮ DETALŲJĮ PLANĄ
T.JŪRAS
G.NATKEVIČIUS
T.JOKUBAUSKAS
A.RIMŠELIS
UAB "K26"

Appendix 5.: Examples of different approaches from east east 5 workshop held in 2022. Screenshots made by author from Miro board which author was a part of when working.







Economy and functions

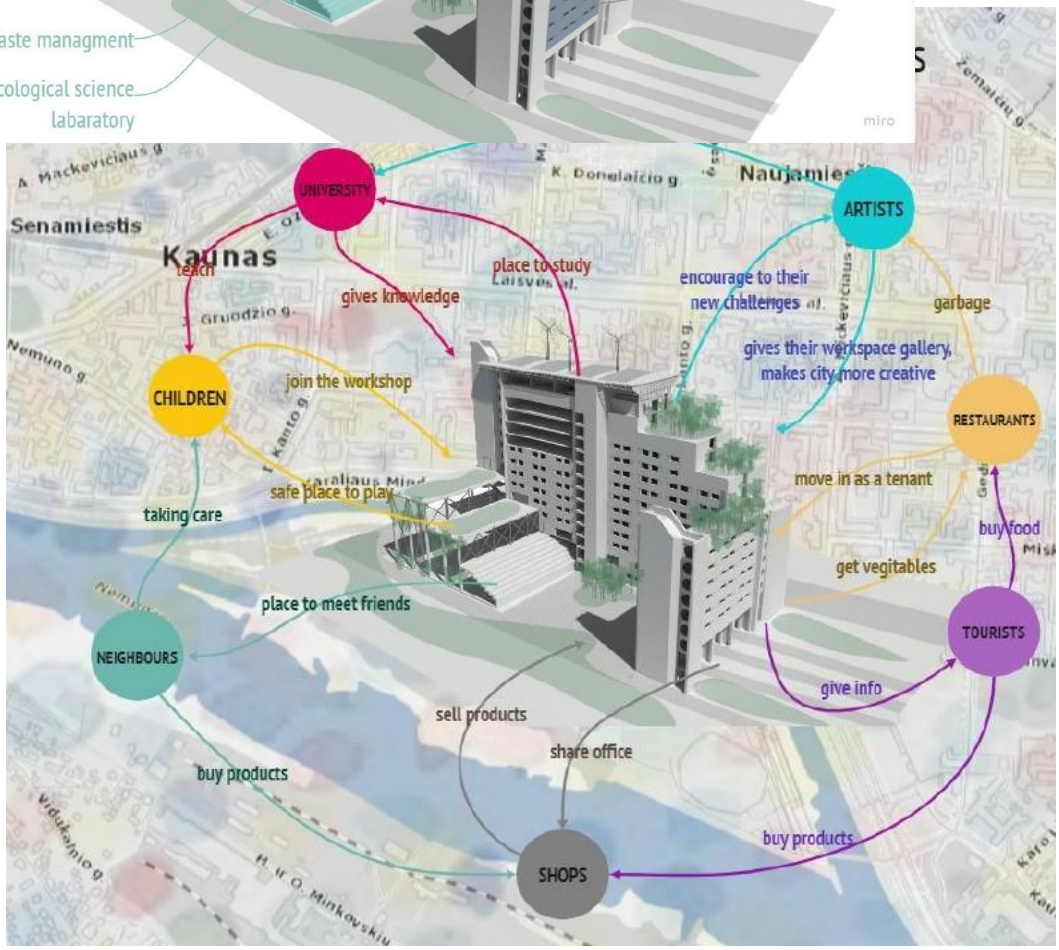
Akiha Shimizu

Adelė Astrauskaitė

Gabrielė Ibėnaitė

Motoki Susa

New functions, which we are creating in Britanicas building:



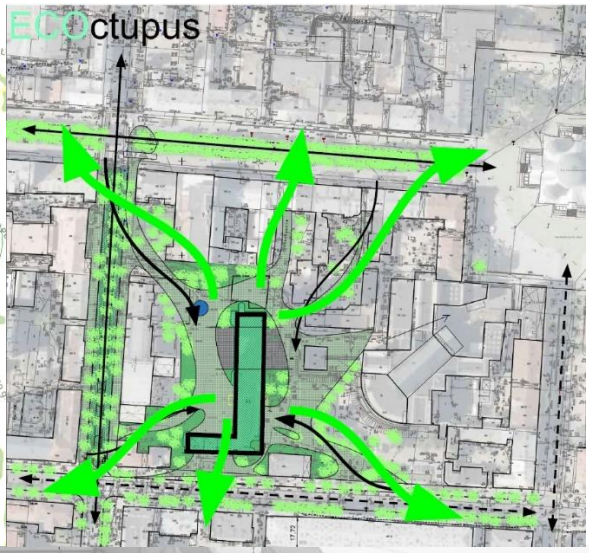
Ecosystem

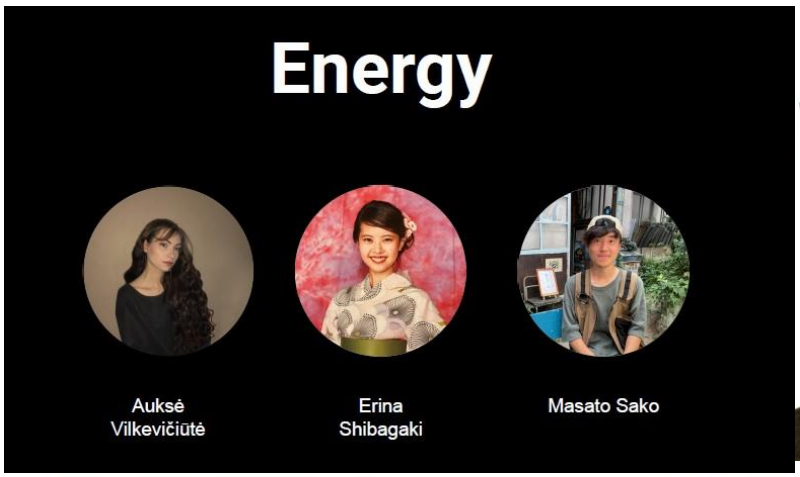
Tautvydas Zykevičius

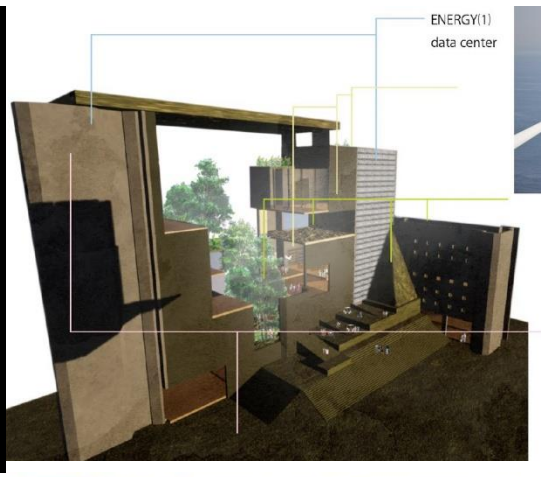
Martynas Stakvilevičius

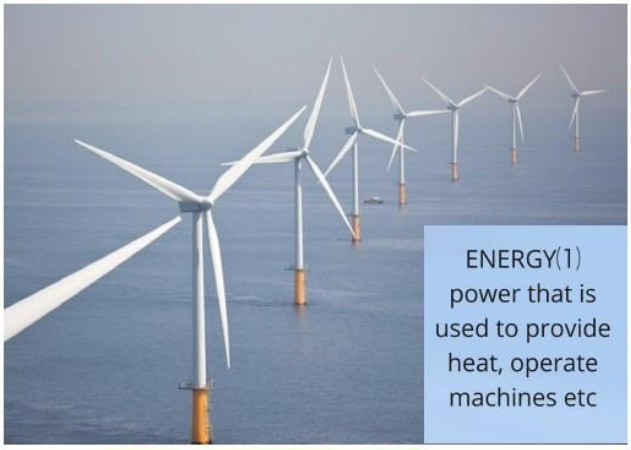
Keika Sato

Naoya Ando

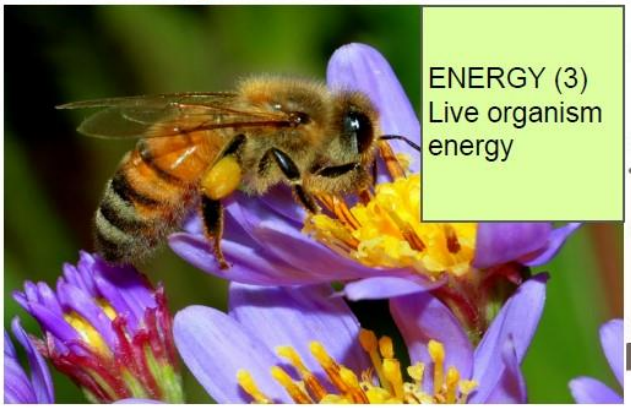




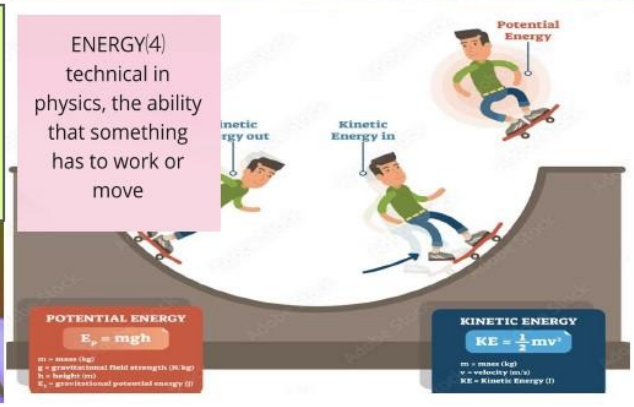




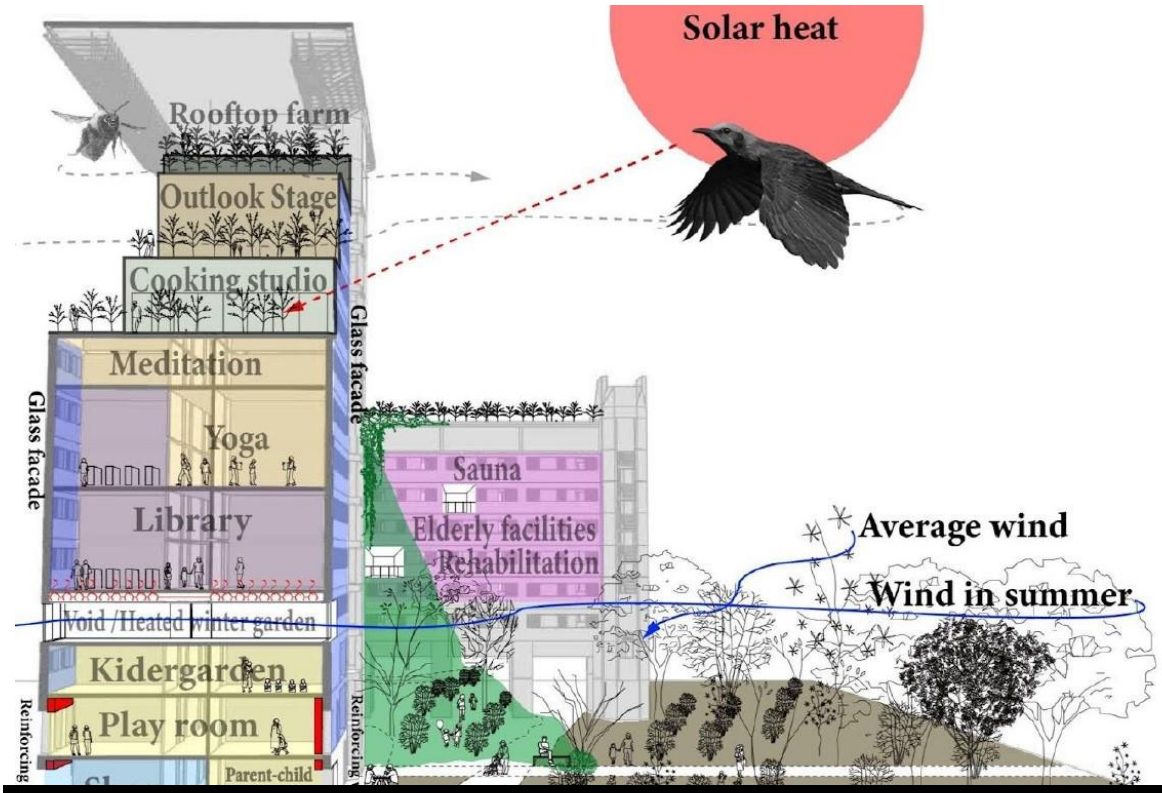
ENERGY(2)
the physical and mental strength that makes you able to do things

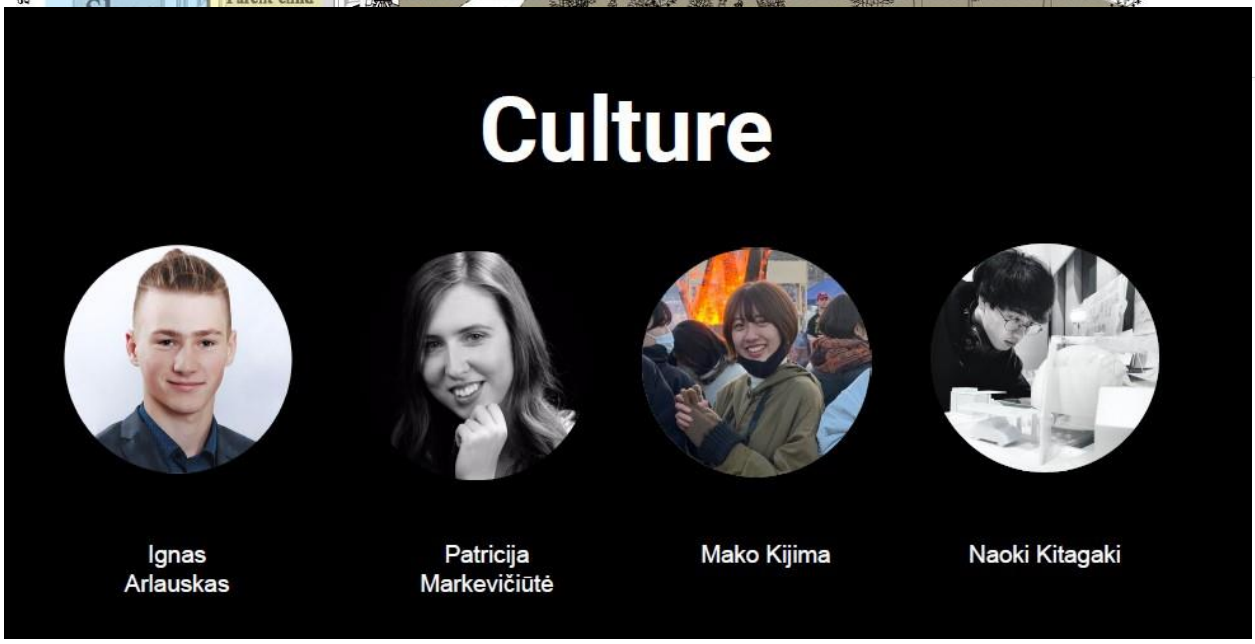


ENERGY(4)
technical in physics, the ability that something has to work or move



Examining the importance of energy on Earth, we wonder about the person himself and the environment that gives us energy.


Solar heat
Rooftop farm
Outlook Stage
Cooking studio
Meditation
Yoga
Library
Void /Heated winter garden
Kidergarden
Play room
Parent-child
Glass facade
Glass facade
Reinforcing
Reinforcing
Sauna
Elderly facilities
Rehabilitation
Average wind
Wind in summer


Culture
Ignas Arlauskas
Patricija Markevičiūtė
Mako Kijima
Naoki Kitagaki


1. Concrete wall
Graffiti
Art exhibitions (monumental artwork)

4. Low ceiling

Botanical garden

Entrance Hall, Attrium

5. Building height, long staircases

Architectural and urban scenery of Kaunas

Roof terrace

2. Cortyard

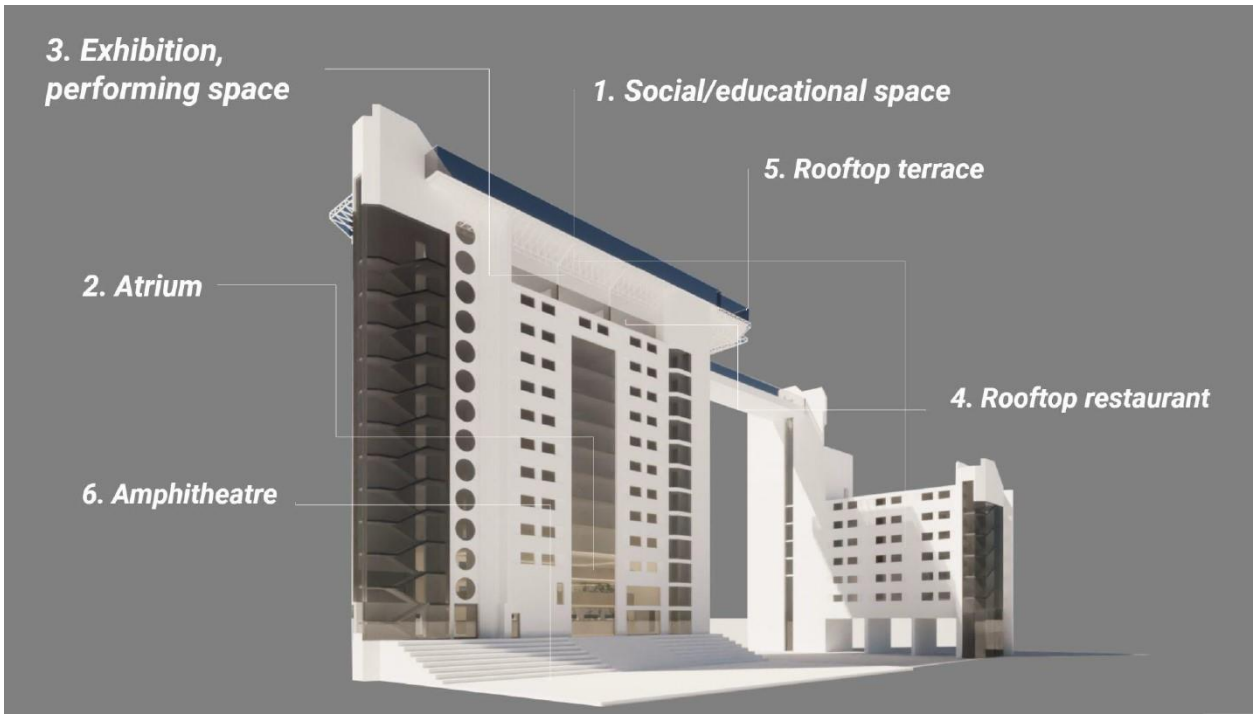
Performing art Festival

Amphitheatre

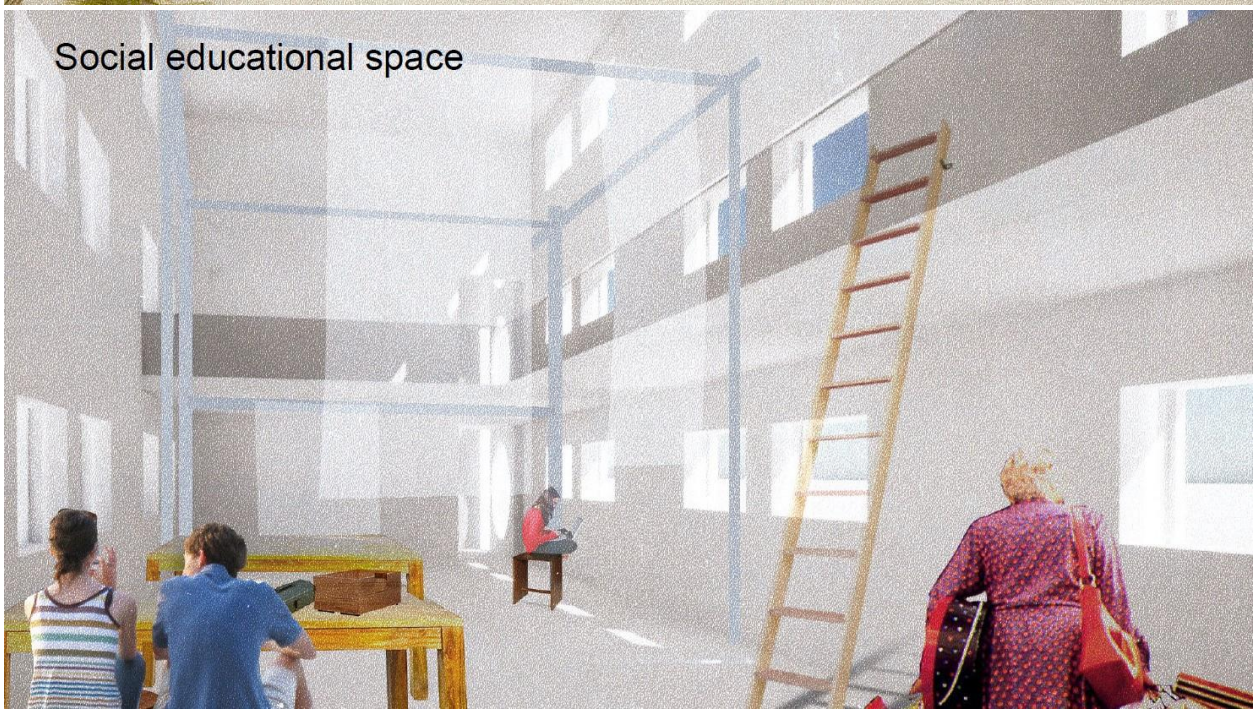
3. Hotel rooms

Social events, workshops, lectures...

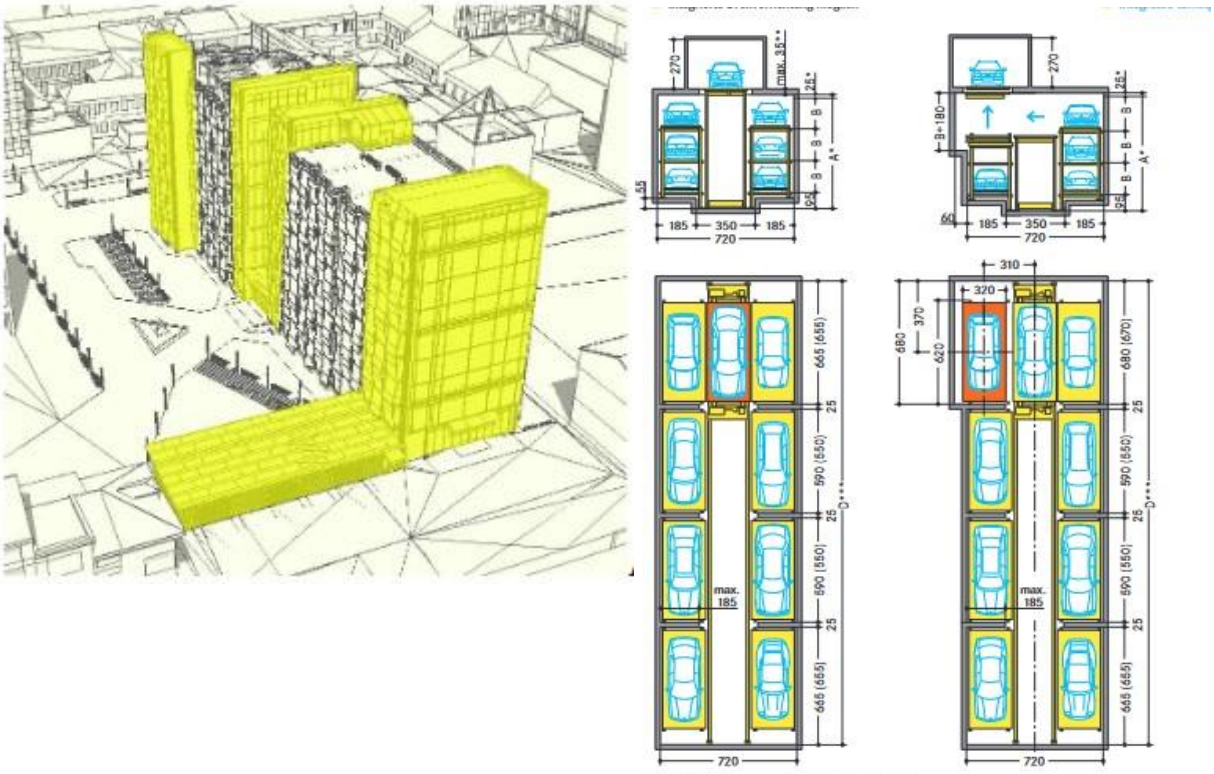
Educational spaces




Atrium


Social educational space

Appendix 6.: Screenshots from (Laučius, 2015) work. Showing his design proposal and interesting parking solution for the case.



Appendix 7.: Screenshots from (Yegin,2022) work. Showing his design proposal and interesting and very important research on the case.

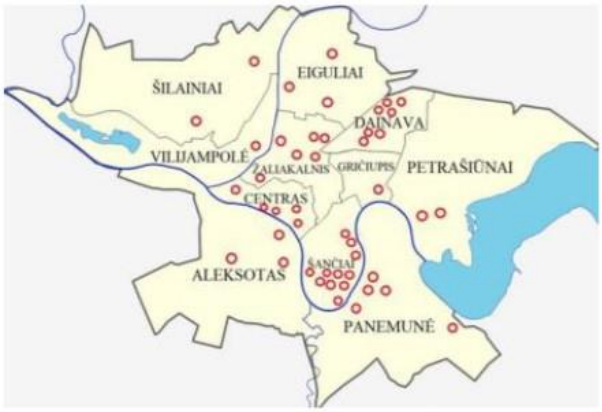


Fig. 35 Abandoned buildings by location in Kaunas City (Sinkevičiūtė & Januškevičiūtė, n.d.)

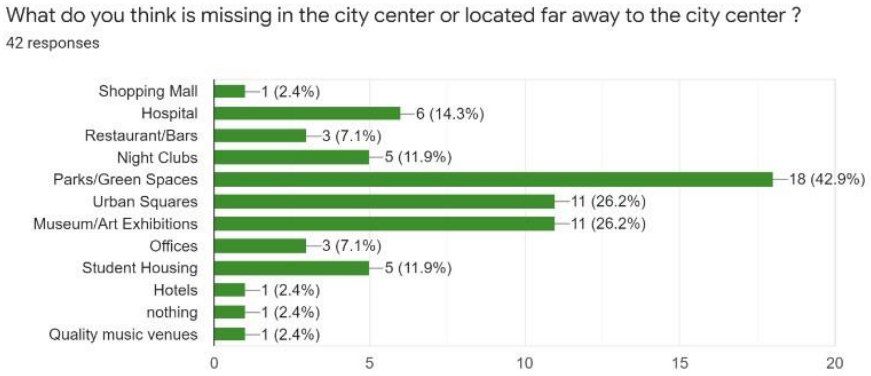


Fig. 48 Public Survey - What is missing in the city center?

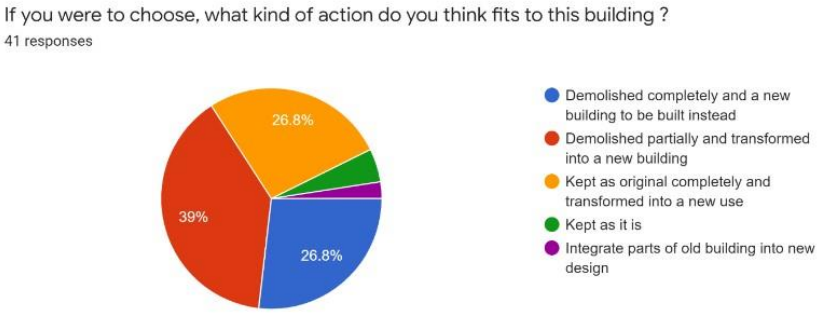


Fig. 52 Public Survey - If you were to choose, what kind of action do you think fits this building?

View analysis

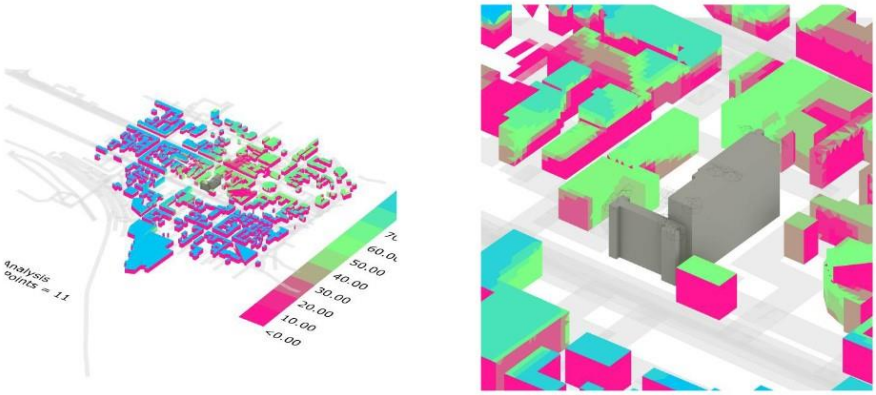


Fig. 78 Spatial Analysis - View Analysis from the roof of the building

Fig. 59 Nna - 1 - residential to Britanika, within 1500m

What kind of activities would you prefer to have in the location of the abandoned Britanika building ?

42 responses

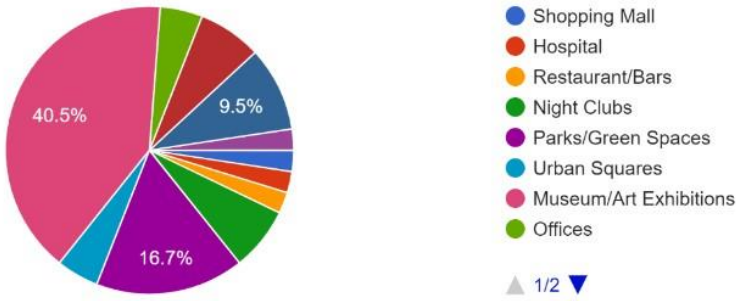
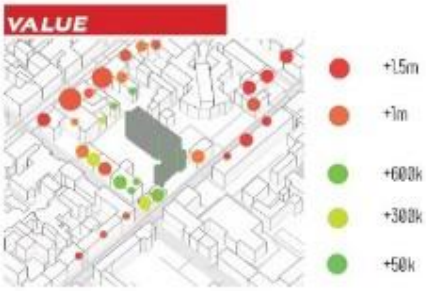


Fig. 57 Public Survey - What kind of activities would you prefer to have in this location?

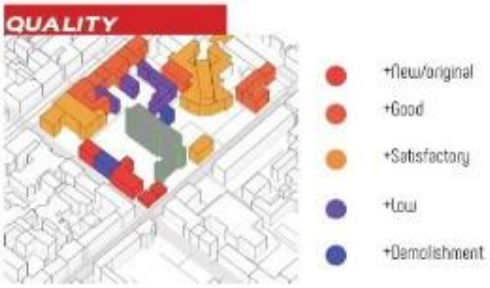
8.2.3. Site analysis

8.2.3.1. Building Surveys

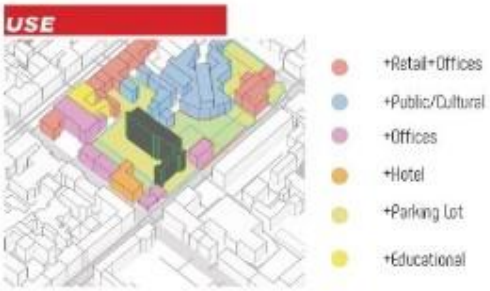
Surrounding of the building mostly consists of 15 to 20m high buildings, Average height is 15m. Britanika however rises as a tall building relatively to the cityscape.



Building value according to several real estate websites, shows that property values drop dramatically as they get closer to Britanika. This may be because of the abandonment issue, also the height of the building blocks the sunlight and view.



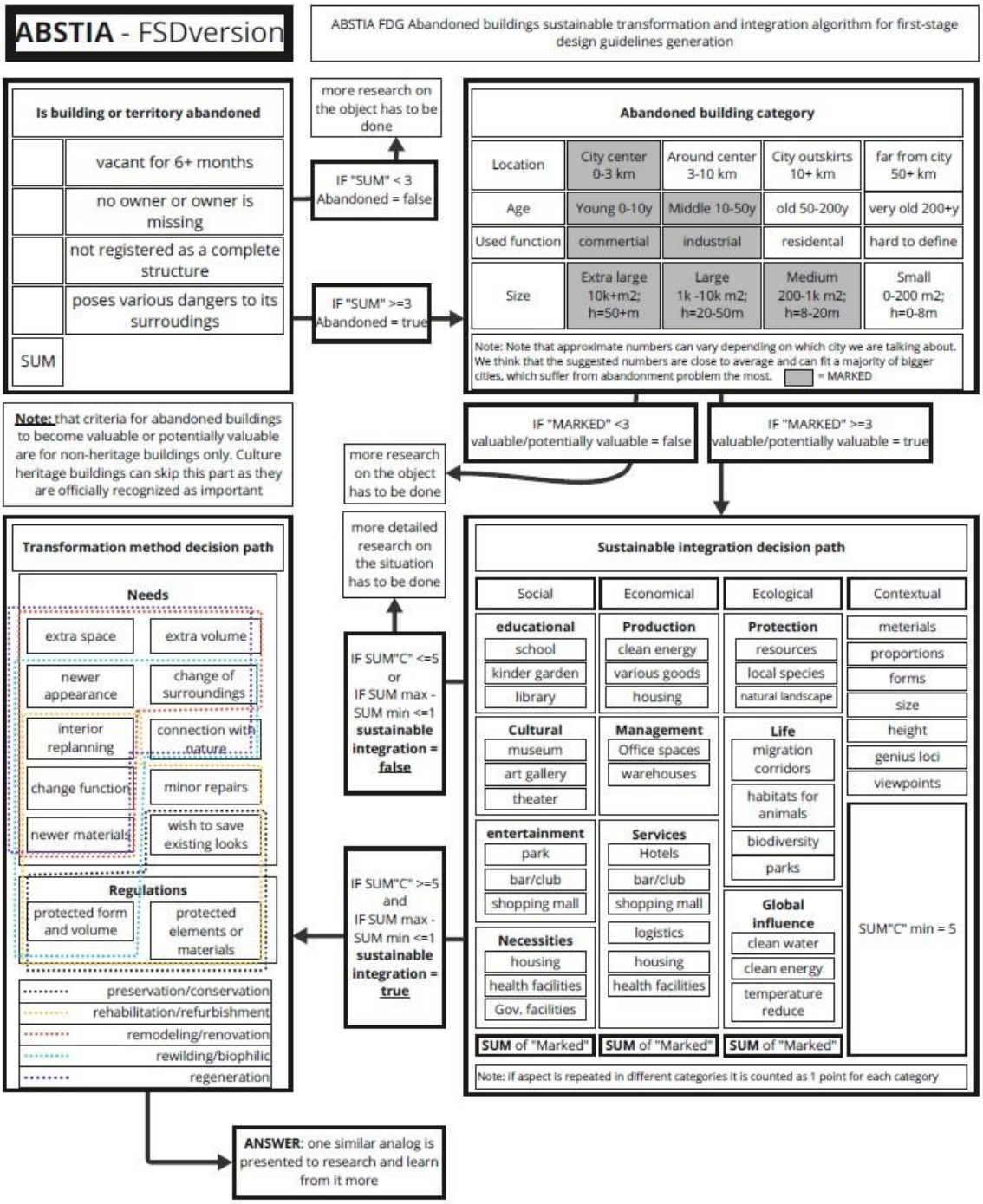
Buildings were evaluated according to their quality. According to the evaluation based on buildings integral parts such as exterior finishing, structural elements etc.



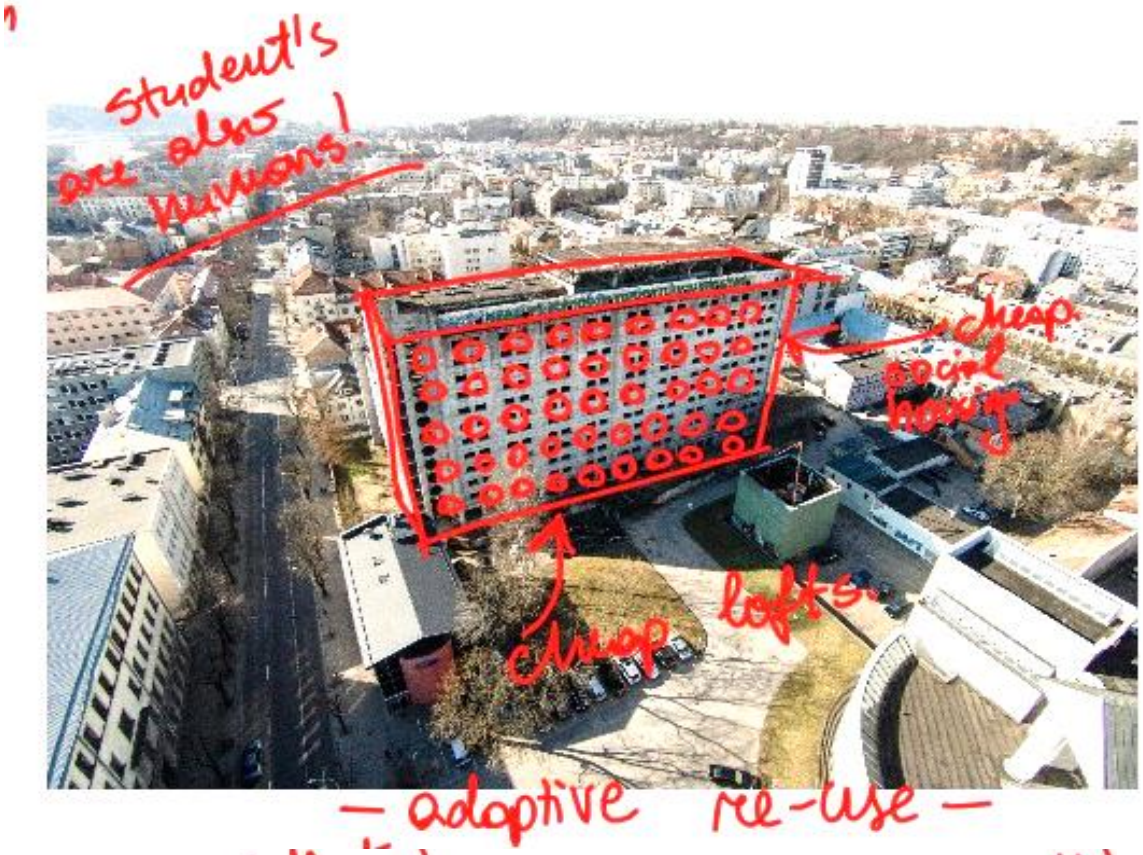
Largest area of use in the block is open parking lots for cars. This creates a large carbon footprint and also lowers the visual quality of the block.

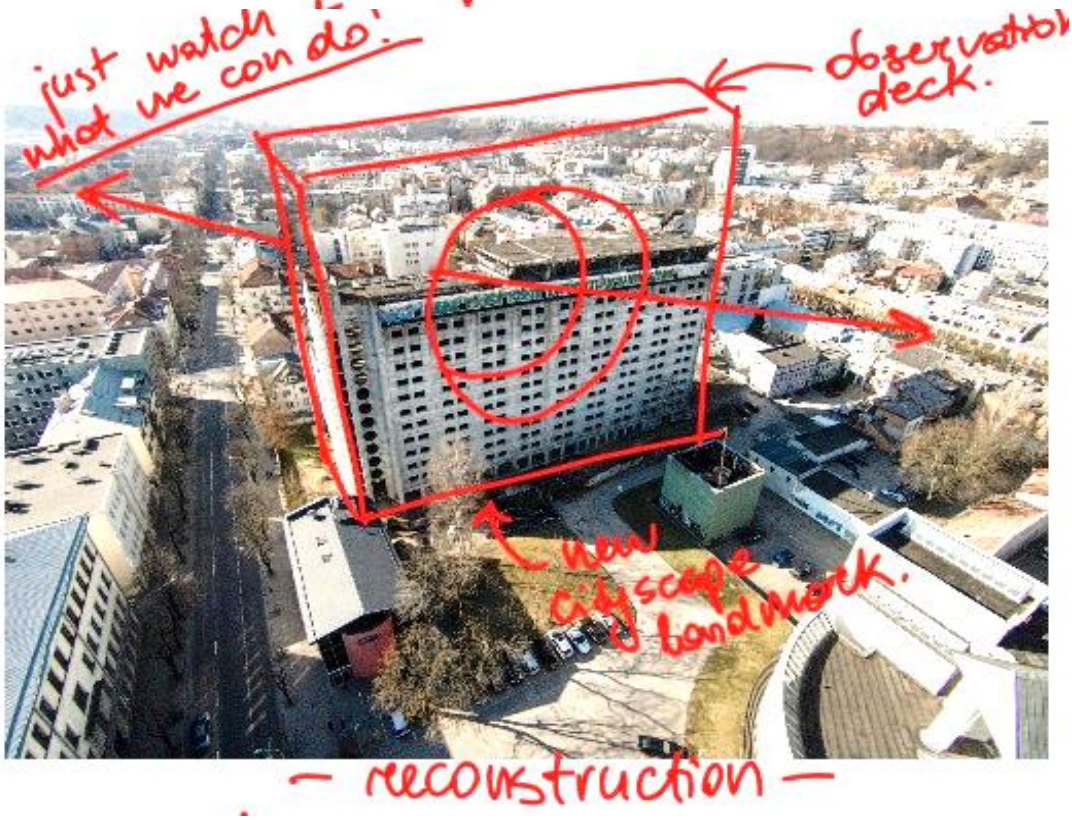
Fig. 96 Plot Surveys

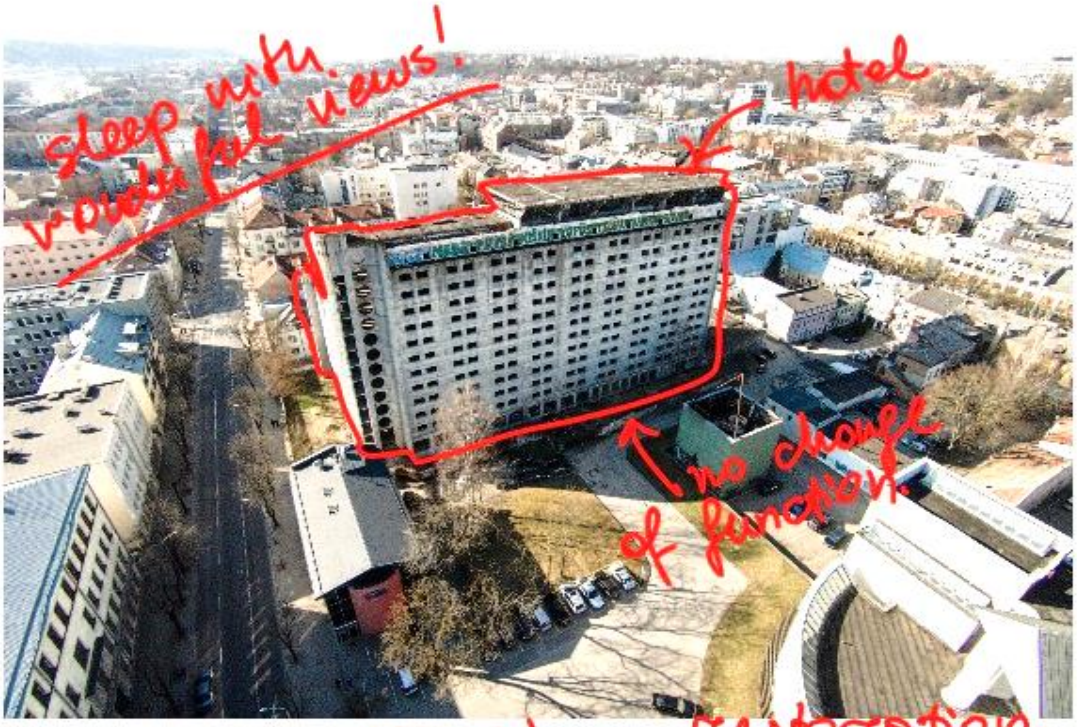
Appendix 8.: Abandoned building sustainable transformation and integration algorithm for the first design stage guidelines. Made by the author.



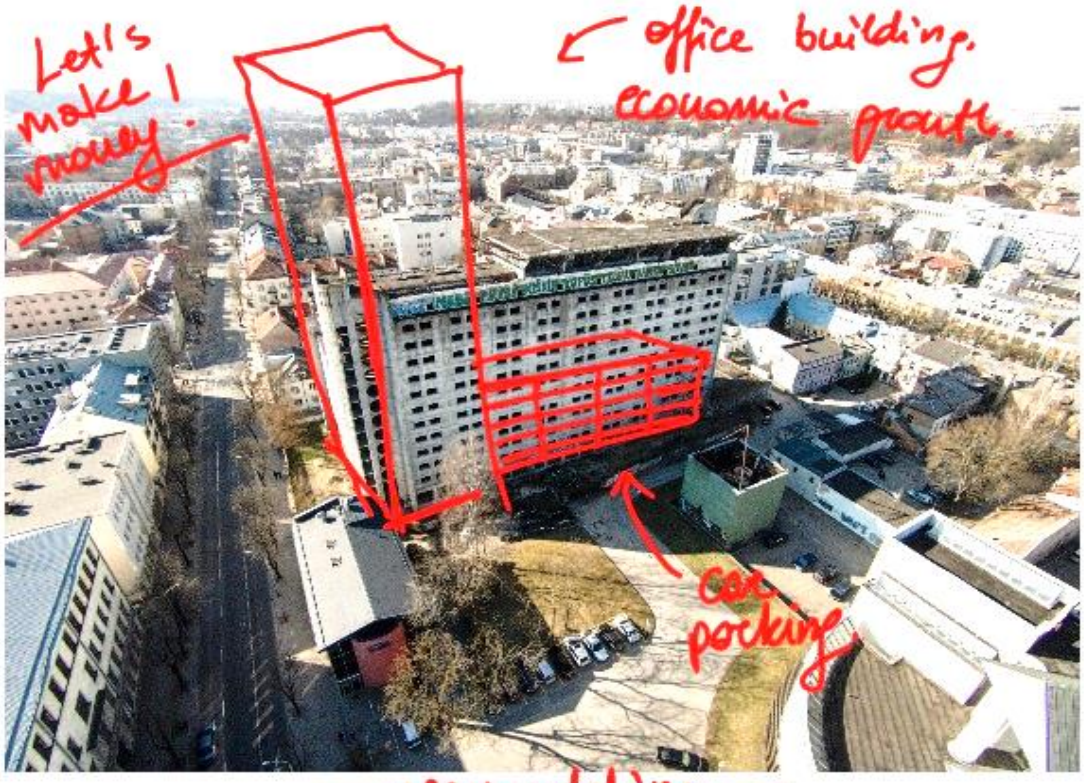
Appendix 9.: Quick different approaches for Britanica's case. Following research by design principles. Made by the author.





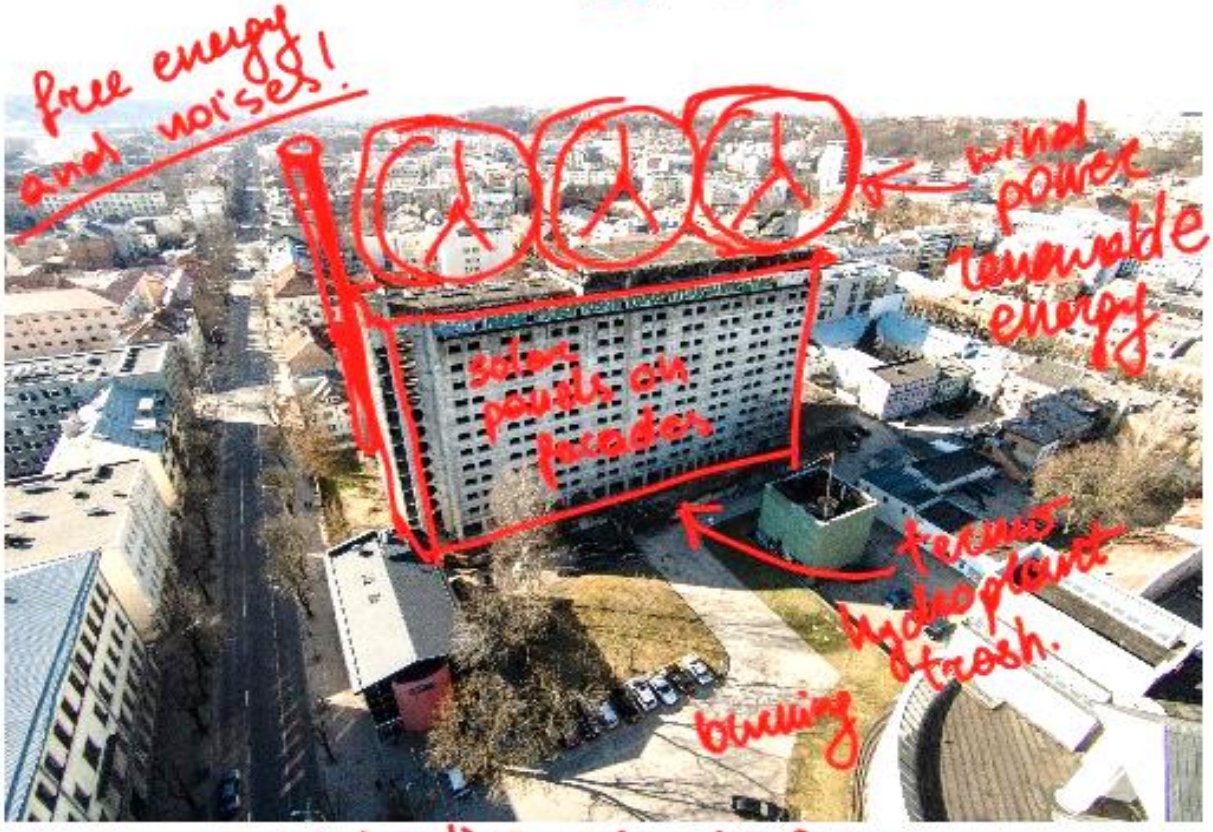


repair – restoration.



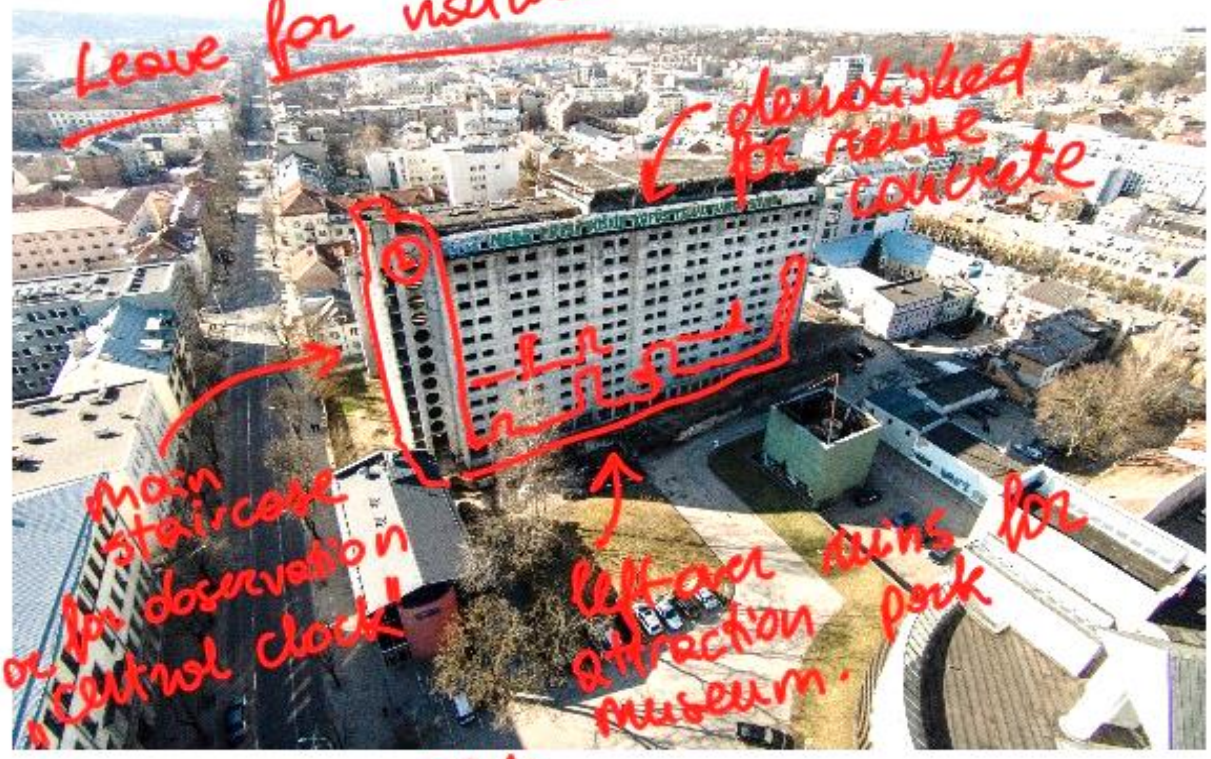
– remodeling –

– remodeling –
– regeneration –



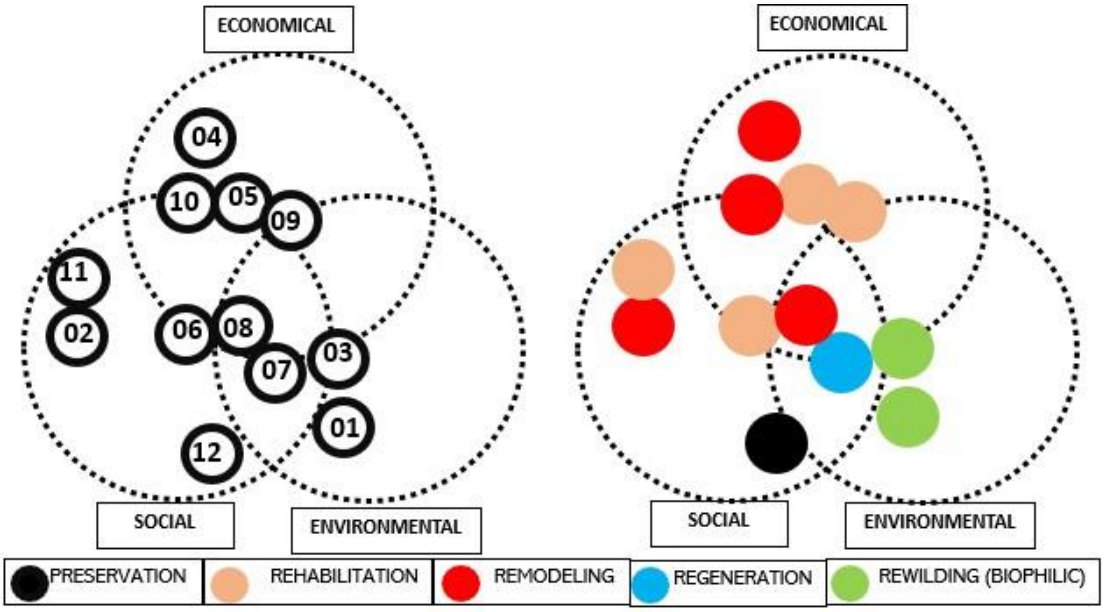
– adaptive re-use –
– remodeling –

biophilic rewilding



— rewilding —

Appendix 10.: Comparison of different analog's transformation methods around the world and Lithuania. In addition, proposals for "Britanica" hotel and research by design outcomes are compared.



Kaunas fortress park

Townhouse, Sweden

Tainan springs, Taiwan

Kaunas hotel, Kaunas

Drobes factory, Kaunas

Radio city, Kaunas

Green Apartments, Milan

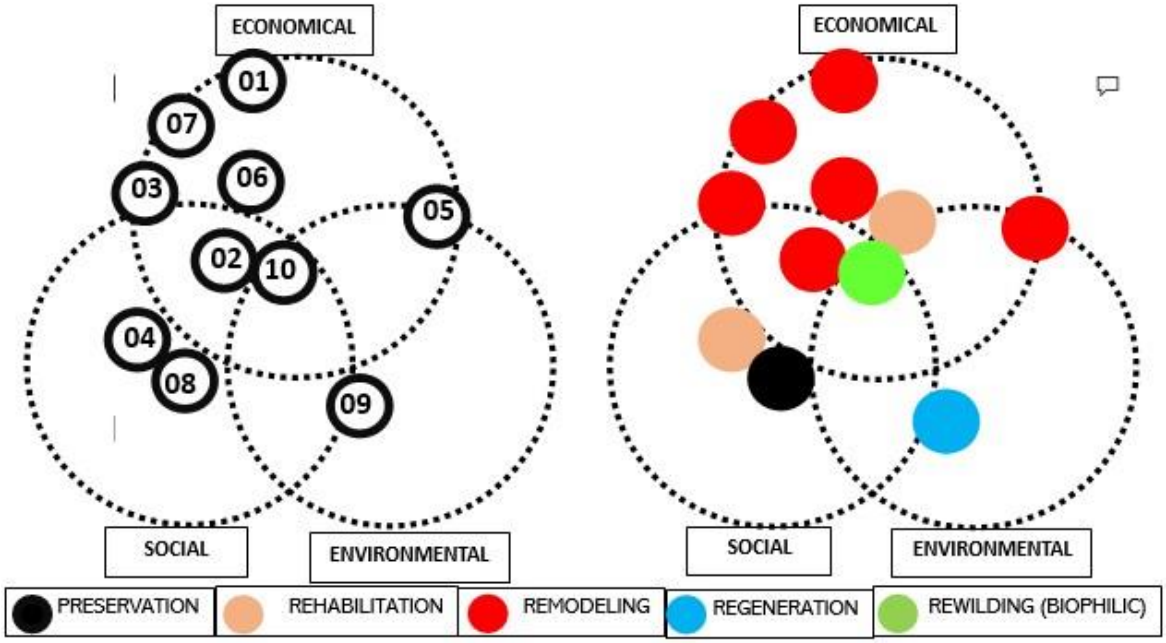
Park house, Wroclaw

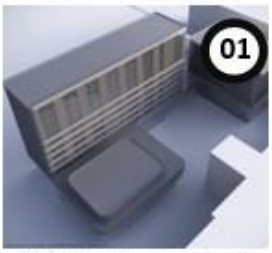
Zeitz MOCAA, africa

Train station, Vilnius

Egyptian museum, Turin

abandoned church, Garliava





G.Nadkevičius hotel+conf

Kemal Yegin housing

Ljaučius. hotel+offices

EE5 – Culture focused

EE5 – energy focused

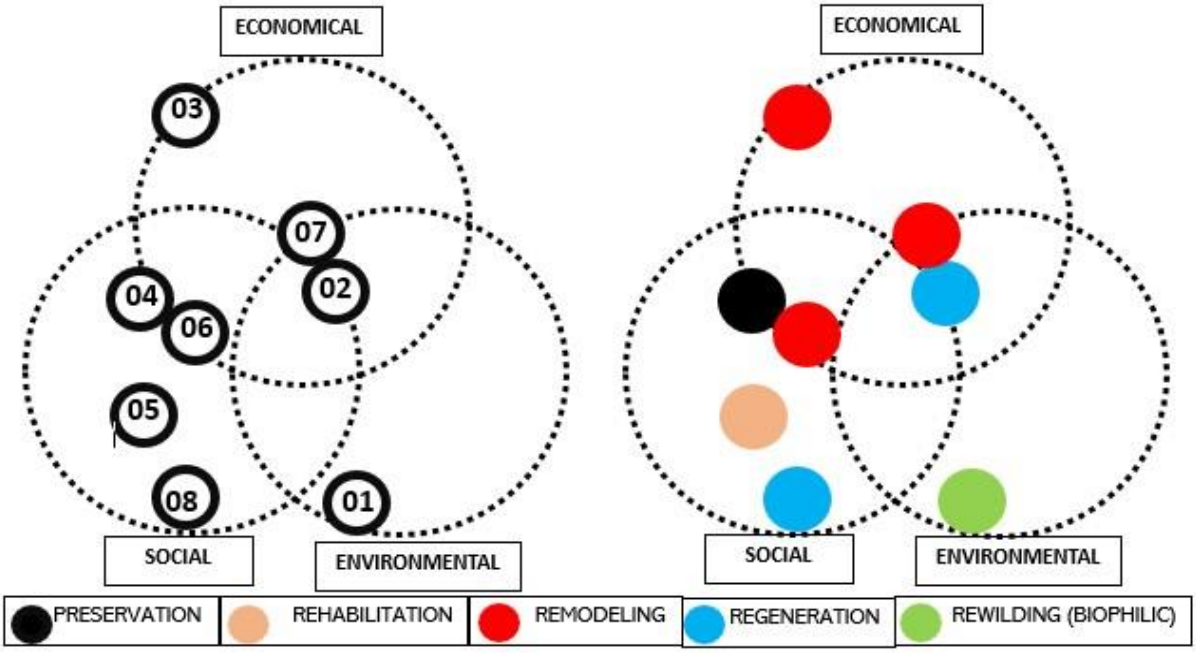
3DMstudio – glass hotel

G.Nadkevičius. hotel+conf

EE5-social focus

EE5-ecosystems focus

EE5-economic focus



Partly demolition, re-use, park from ruins

City vertical park and habitats for insects

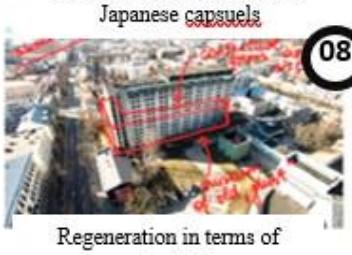
Vey high glassy offices, huge car

Restoration according to blue prints

Cheap social housing using Japanese capsuels

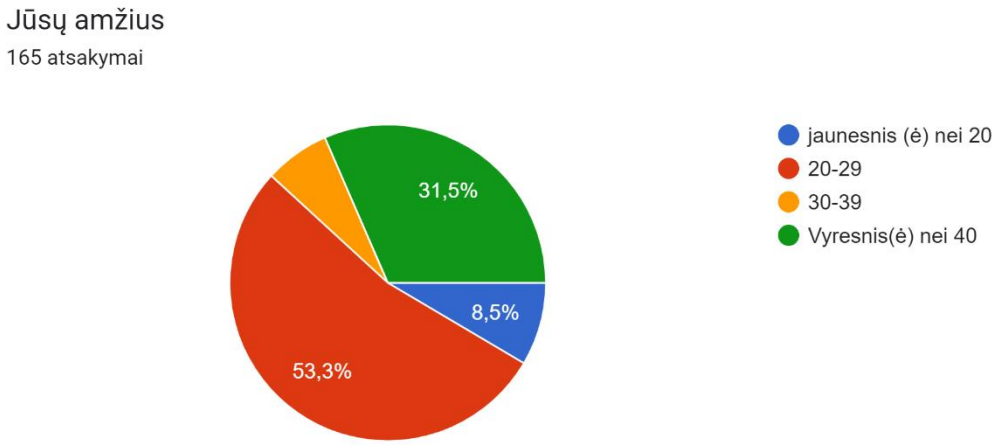
Complete remodeled culture center. landmark

Energy power plant

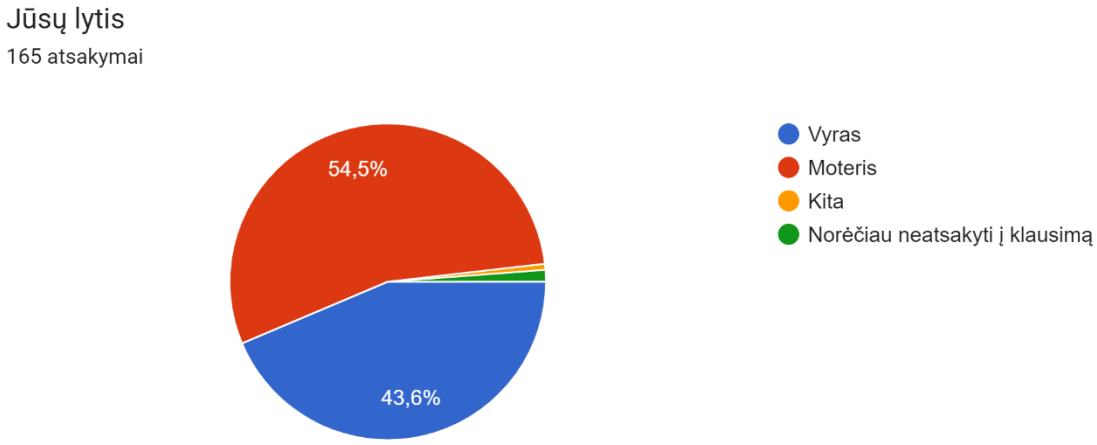


Regeneration in terms of contextuality

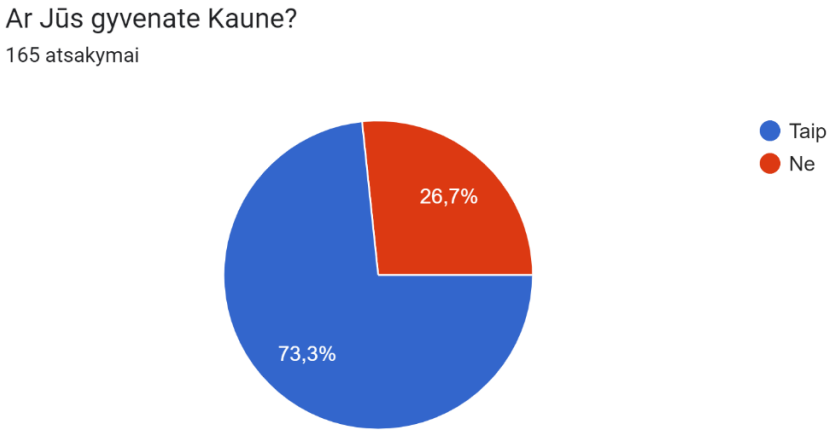
Appendix 11.: Survey was mostly directed to Kaunas city residents or city visitors who know existing situation well enough to express their opinion on it. We gathered opinion of 165 people. Majority of them were well knew the existing situation. This appendix shows all respondents age, gender and location information.



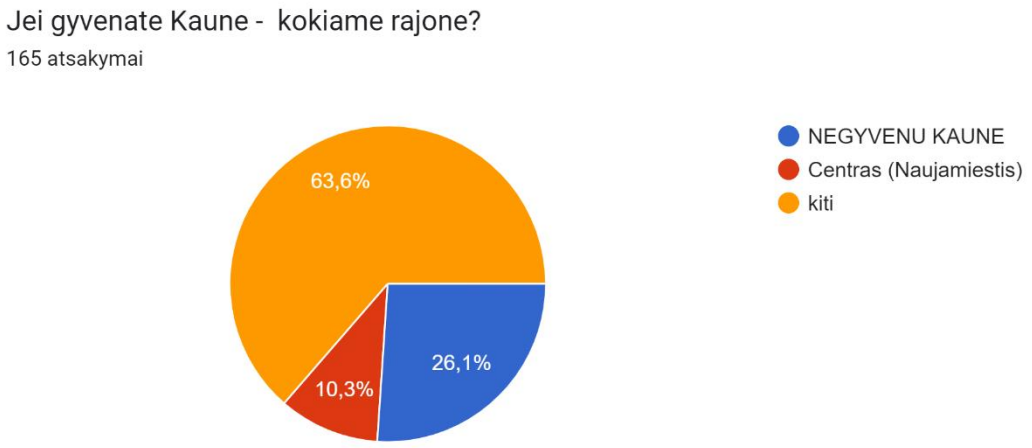
Age public survey partisipants?



Gender of public surveu partisipants?

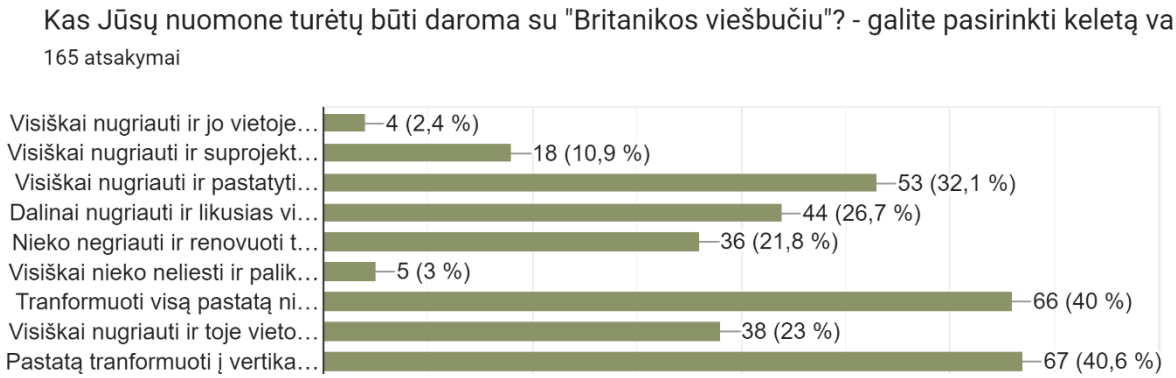


Does partisipant live in Kaunas?

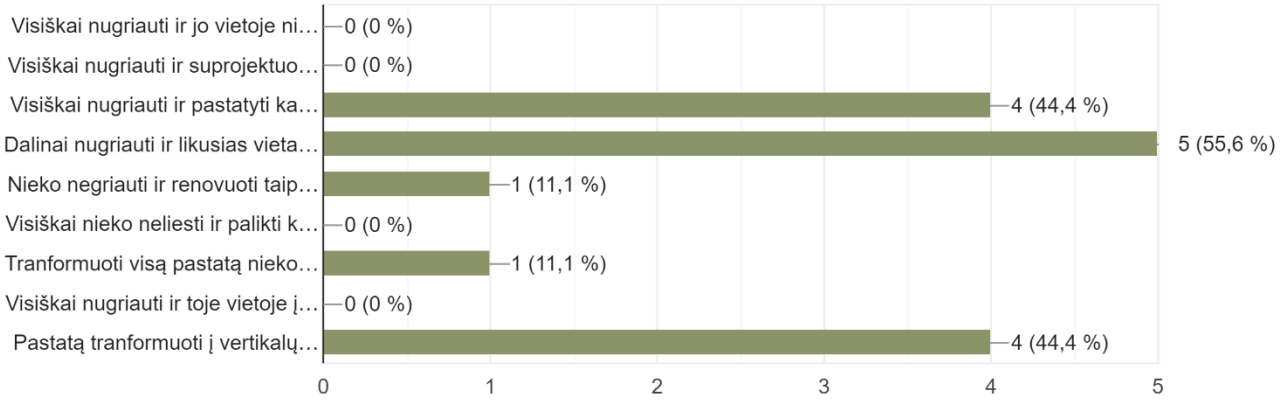


In which area of Kaunas partisipant lives?

Appendix 12.: Survey answers to the question: What do you think should be done with "Britanika Hotel"? - you can choose several options.

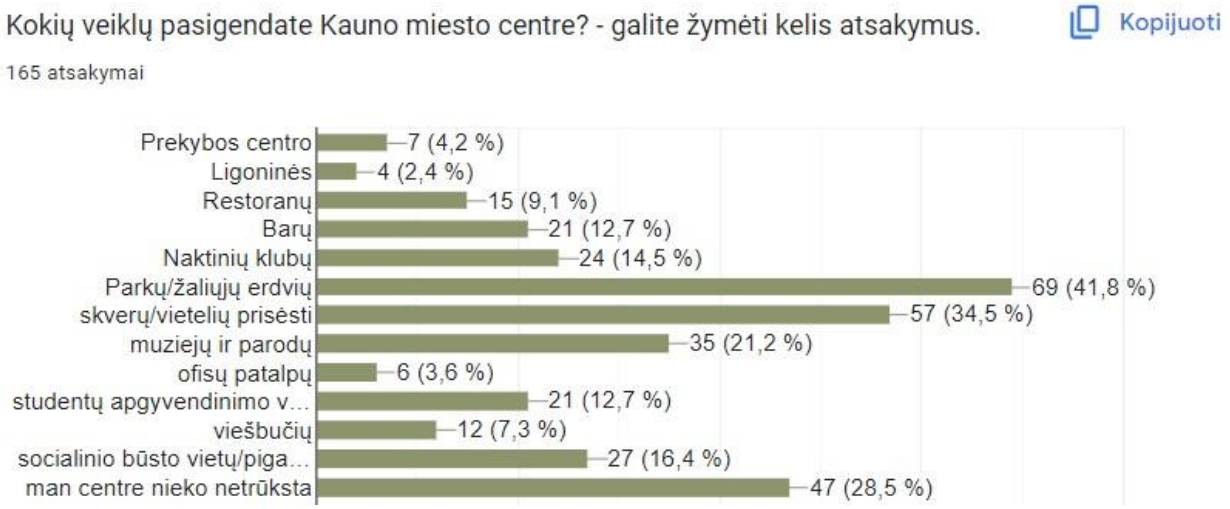


Screenshot by author from his public survey answers tab.

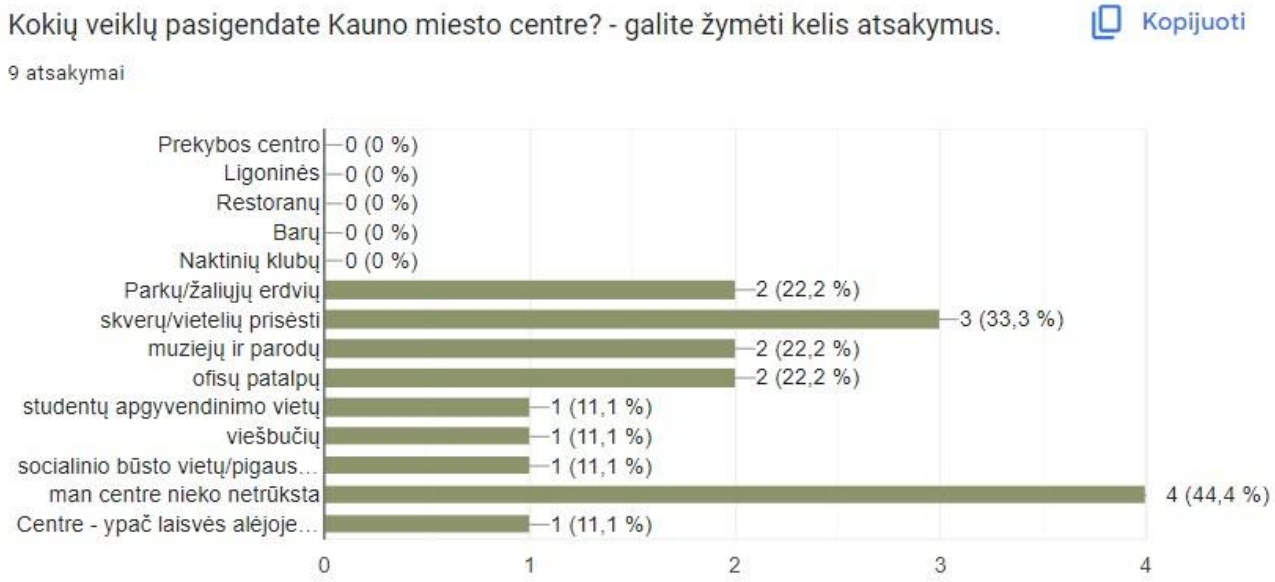


Screenshot by the author from his expert survey answers tab.

Appendix 13.: Survey answers to the question: Our question was not straight forward. We ask what functions in public opinion is the city center lacking.



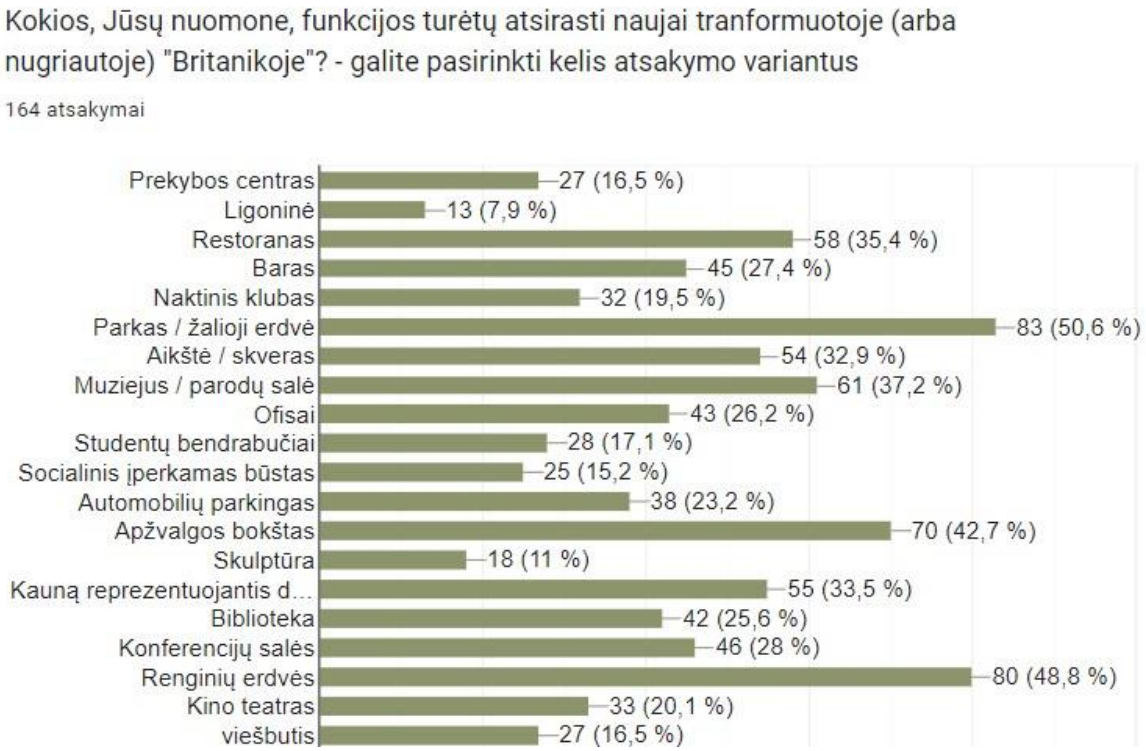
Screenshot by the author from his public survey answers tab.



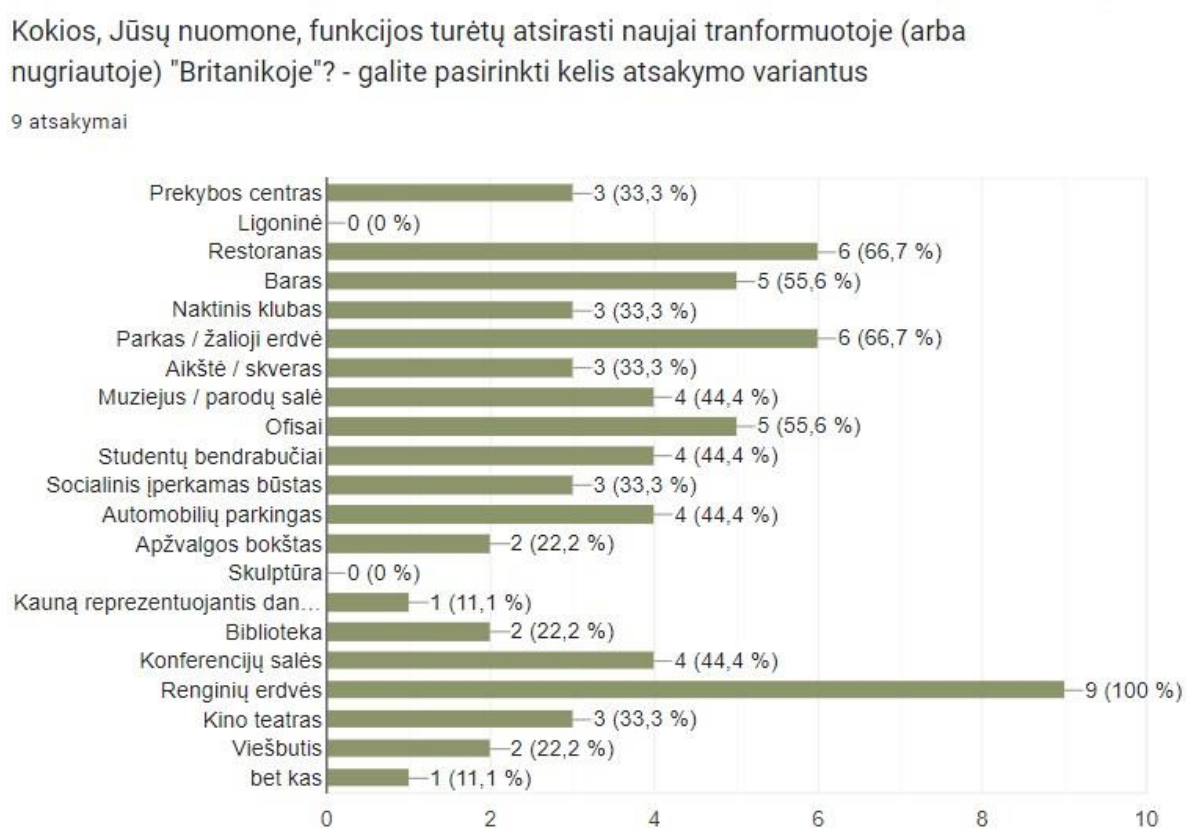
Screenshot by the author from his expert survey answers tab.

Appendix 14.: Survey answers to the question: What functions should be included in the newly transformed “Britanica” hotel?

.

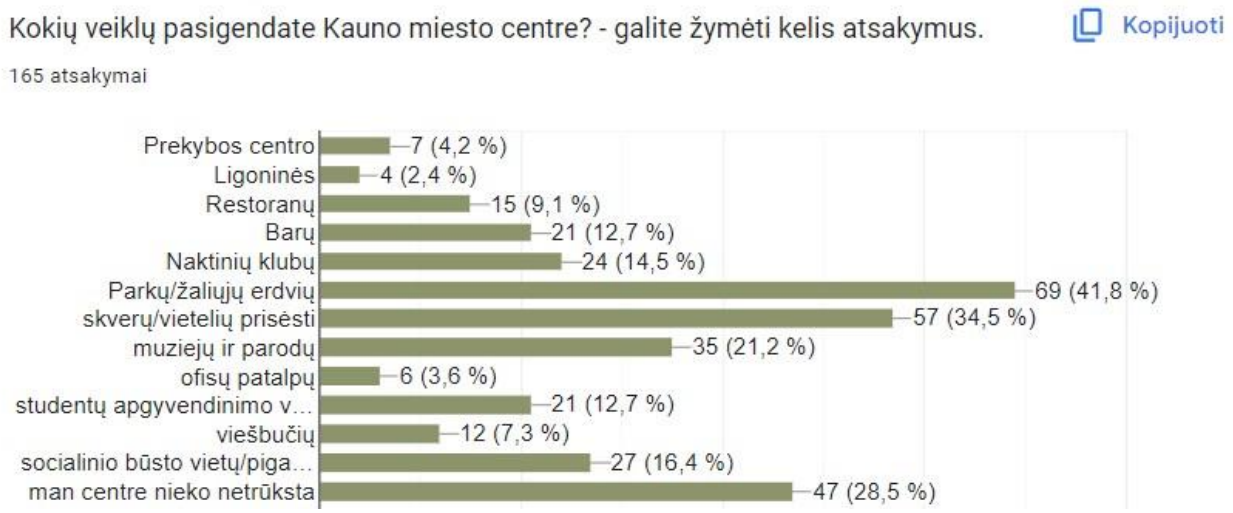


screenshot by the author from his public’s survey answers tab.

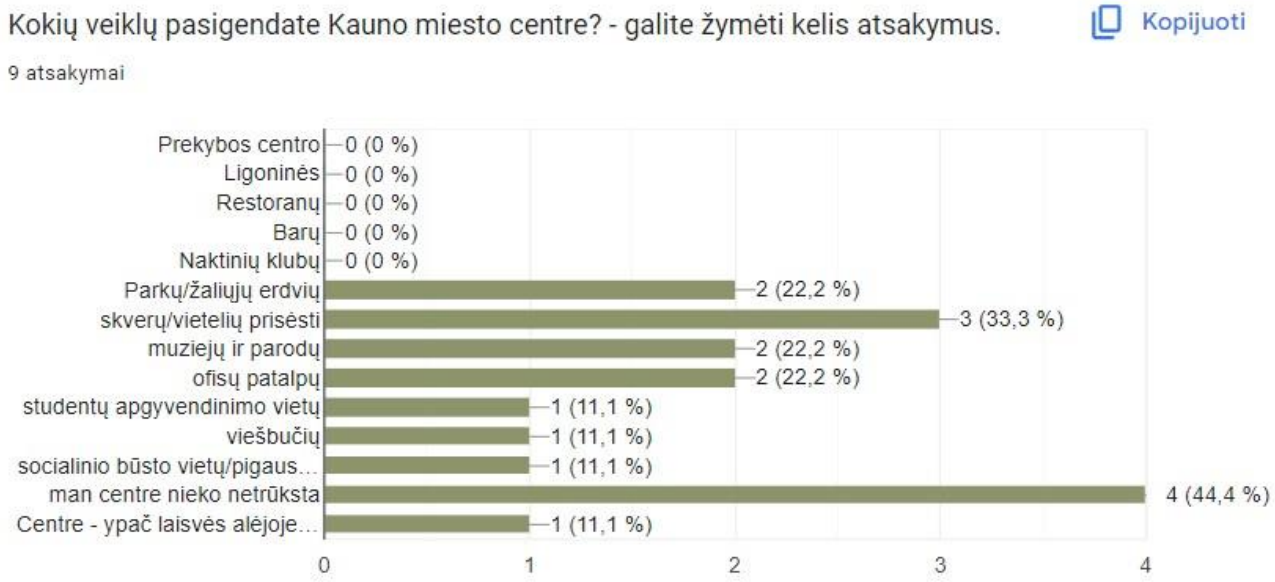


screenshot by the author from his expert survey answers tab.

Appendix 15.: Survey answers to the question: What are you usually doing in the Kaunas city center and what are you missing in it.

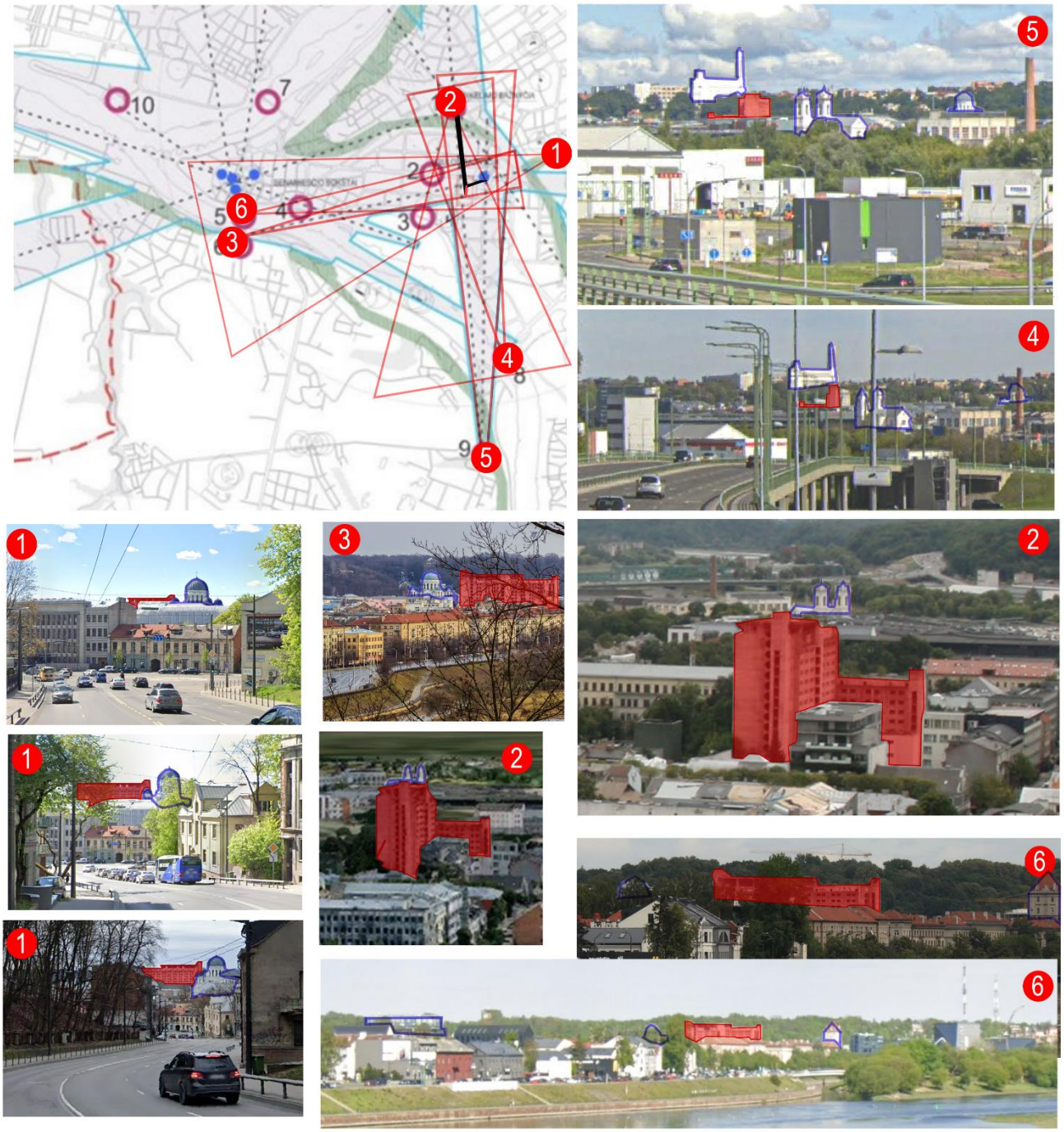


Screenshot by the author from his public survey answers tab.



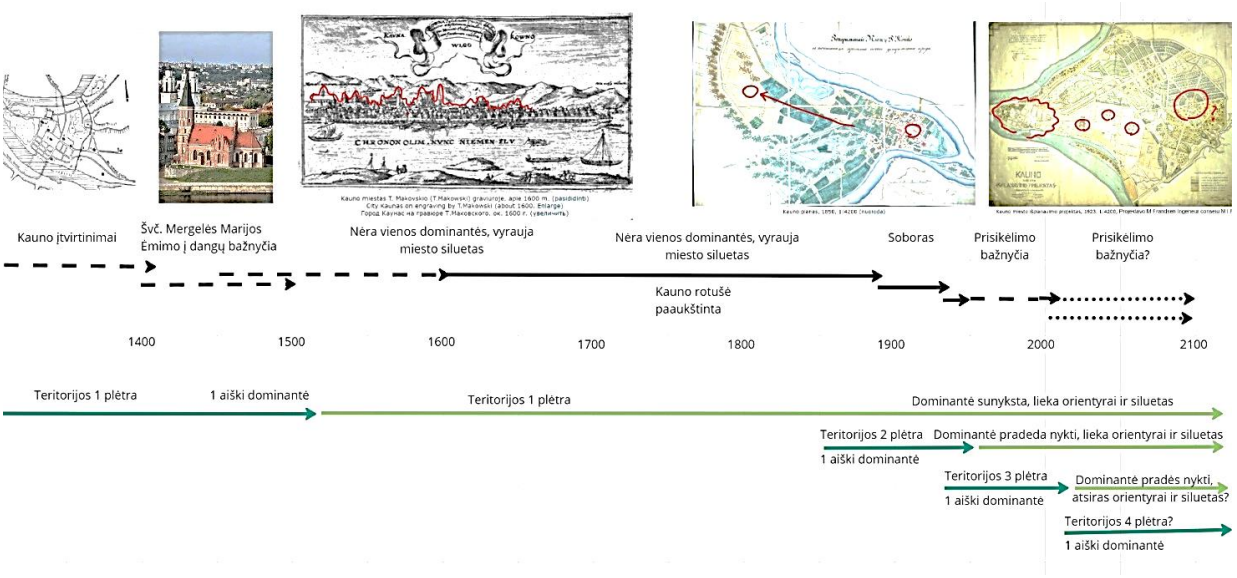
Screenshot by the author from his expert survey answers tab.

Appendix 16.: the research analysed official document of Kaunas city, in which all protected city views are listed.

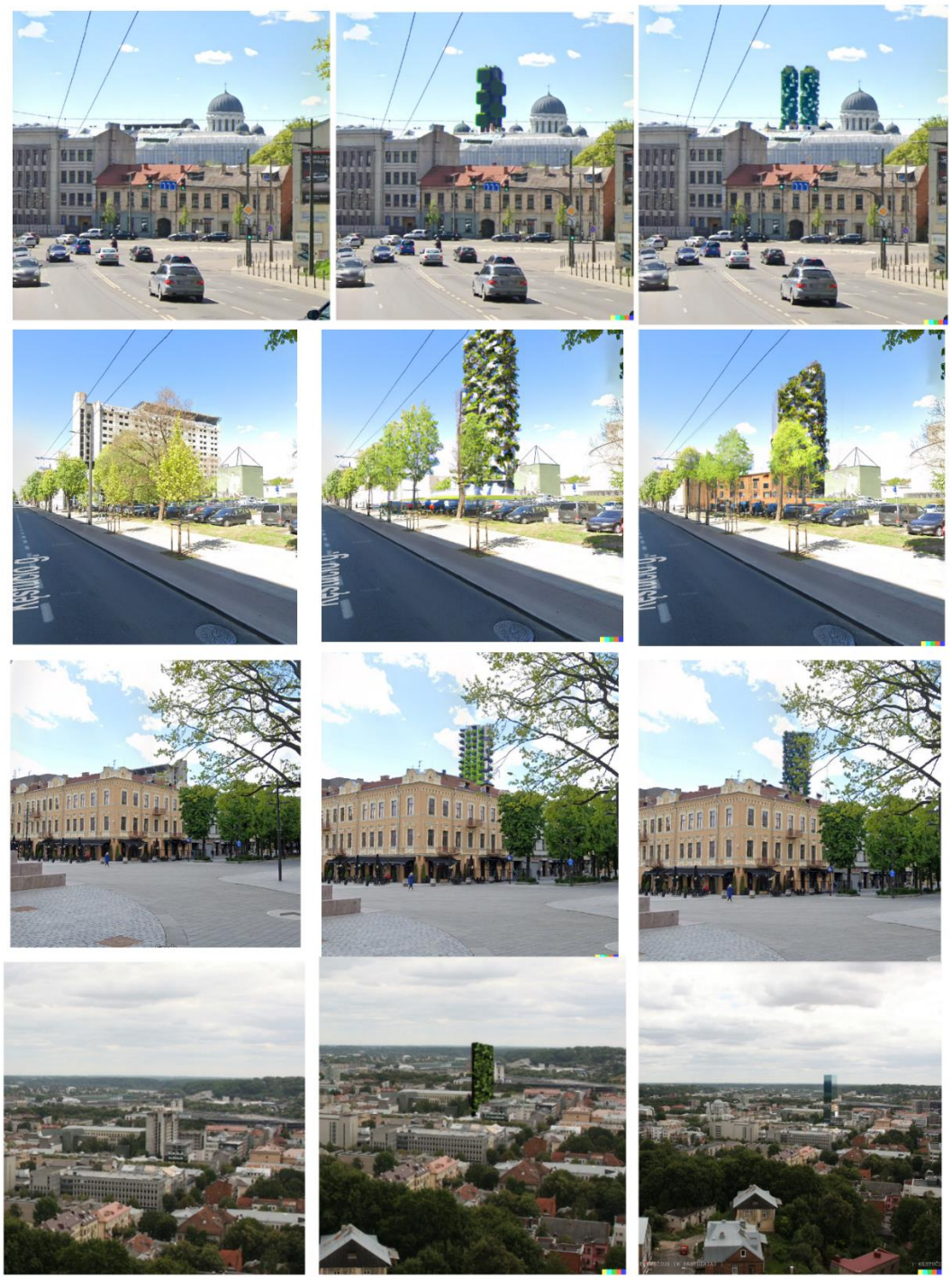


Views from all protected or important viewpoints of the city. Scheme made by author.

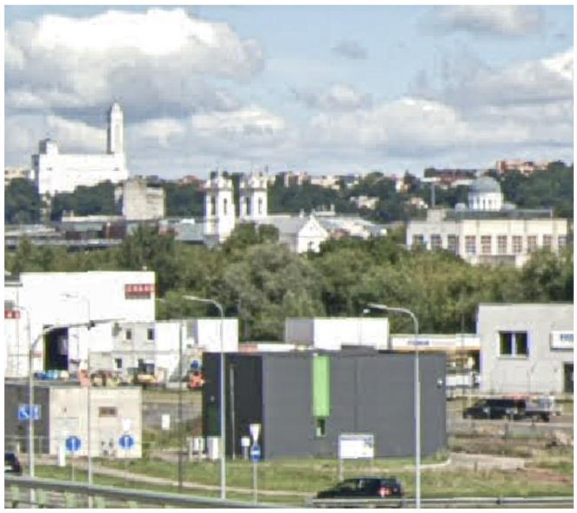
Appendix 17.: The research analyses how these dominating buildings change throughout the ages in Kaunas city.

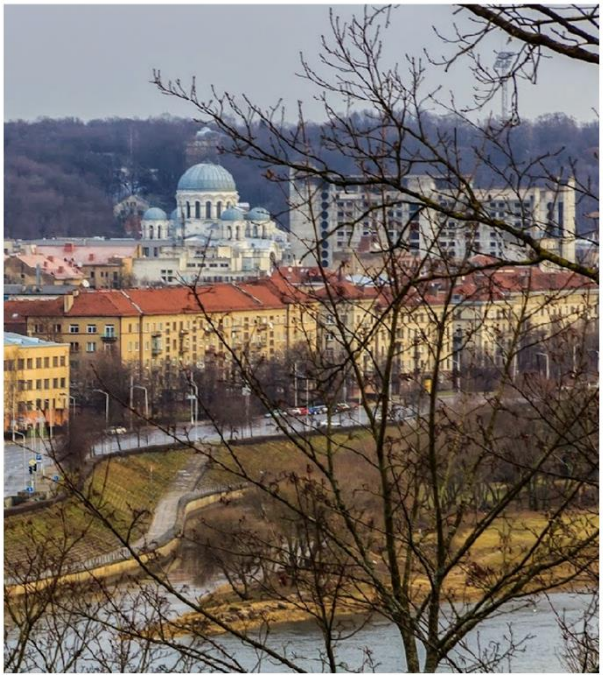
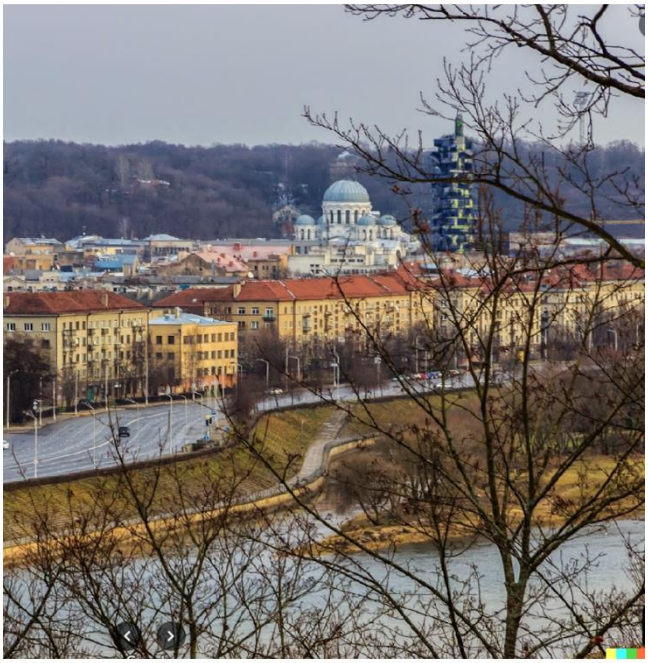


Appendix 18.: screenshots from google maps which are in exact spots from which city skyline is protected. images generated using AI powered tools, which helped quickly create and see how new high vertical form would look like in Kaunas city center context. (*DALL·E 2*, 2024) was used. We can see the results.



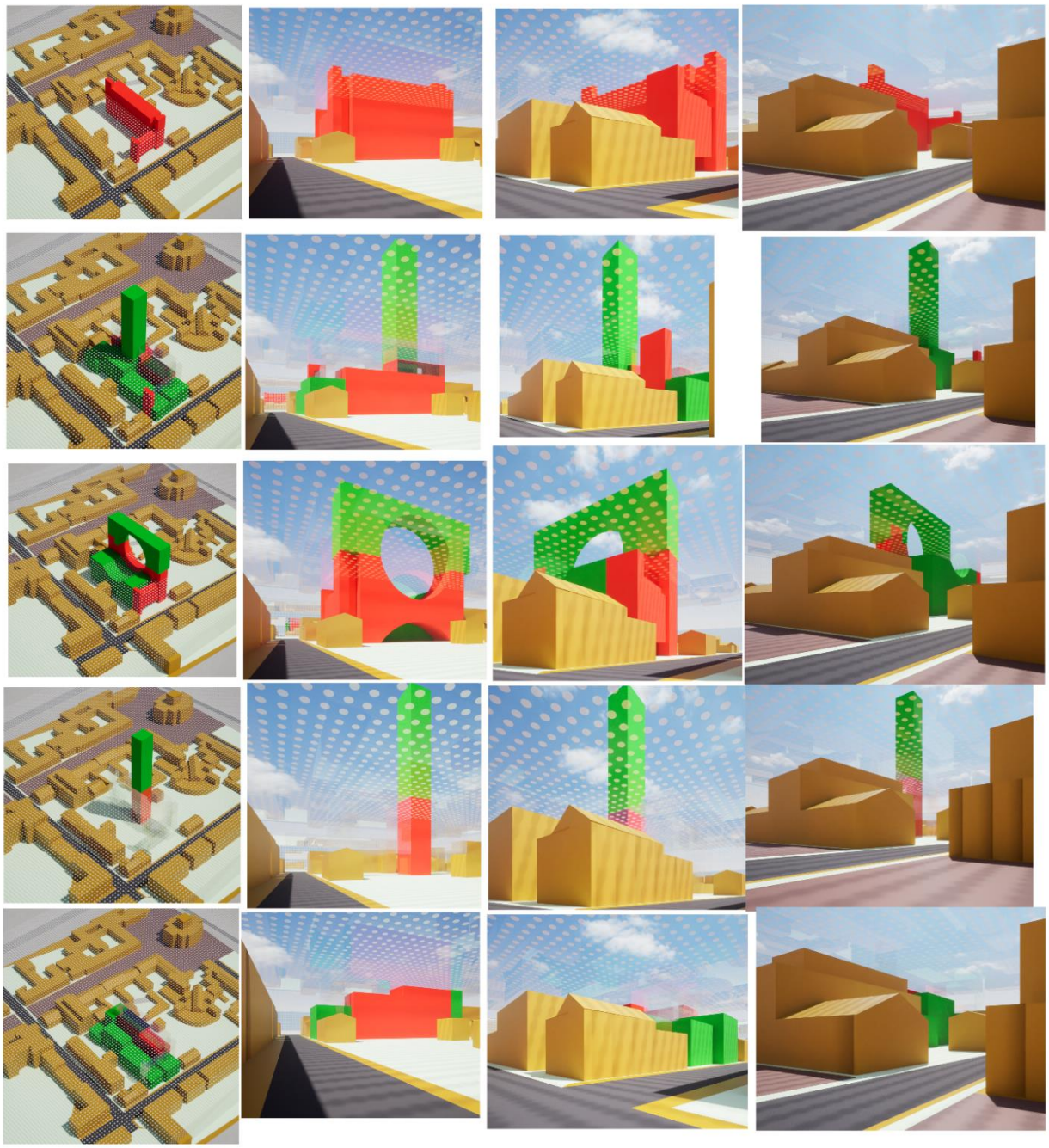
Views made by author using open AI dalle software. from the left – how it looks today and on the right two examples how it would look like with new vertical volume.
First from the top – view from Parodos kalnas,
Second from the top – view from Kestucio street,
Third from the top – view from Soboras squere,
Forth from the top – view from Prisikelimo church observation deck; (protected viewpoint)



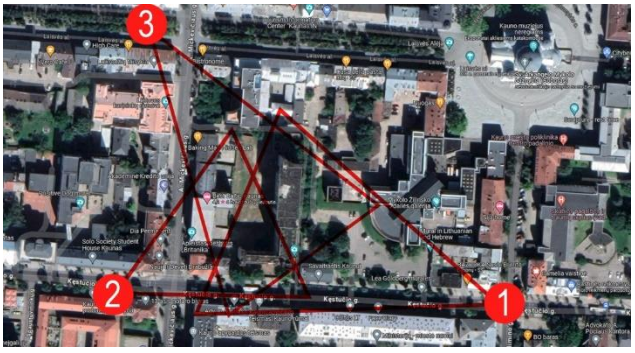

Views made by author using open AI dalle software. from the left – how it looks today and on the right two examples how it would look like with new vertical volume.
First from the top – view from Fredos hill, (protected viewpoint)
Second from the top – view from Ciurlionio brigde (protected viewpoint)
Third from the top – view from Aleksotas brigde, (protected viewpoint)
Forth from the top – view from Aleksotas observation deck, (protected viewpoint)
Fifth from the top – view from Laisves avenue,

Appendix 19.: Partisipants were presented with several quick 3D models for them to decide which of them they like the most.



3D proposals for „Britanika“ hotel. Made by author. White dotted lines mark 30m altitude – height which is allowed in this city area. In the bottom right you can see scheme which shows exact viewpoint presented in vizualizations. Red color – existing structure, green – built-up new volumes.

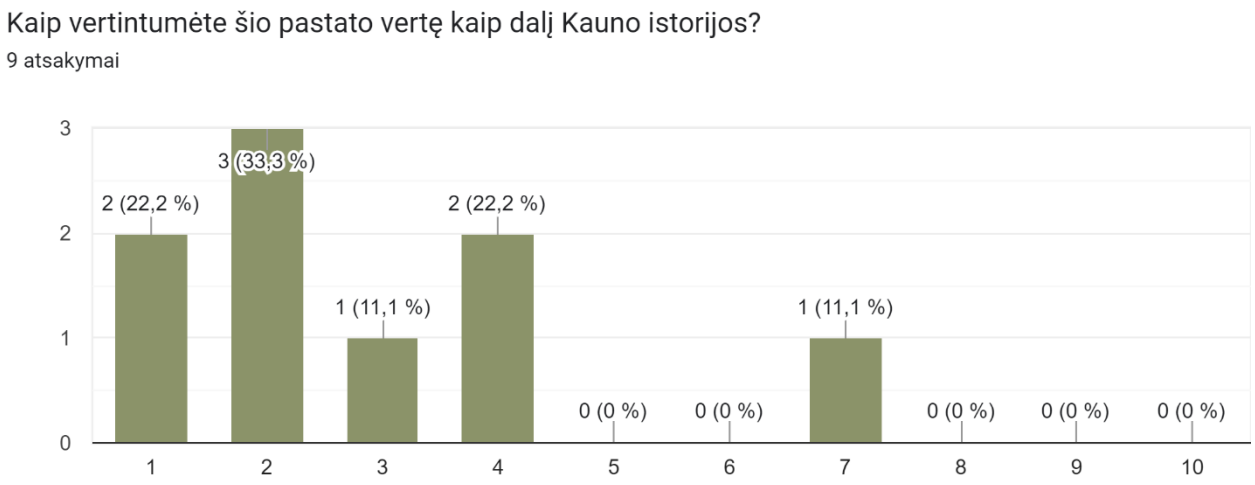
First from the top – existing situation
Second from the top – dense ground,
With high vertical tower
Third from the top – raising existing volume
And cutting a circle to open blocked views
Forth from the top – tower with squere
Fifth from the top – dense and low.



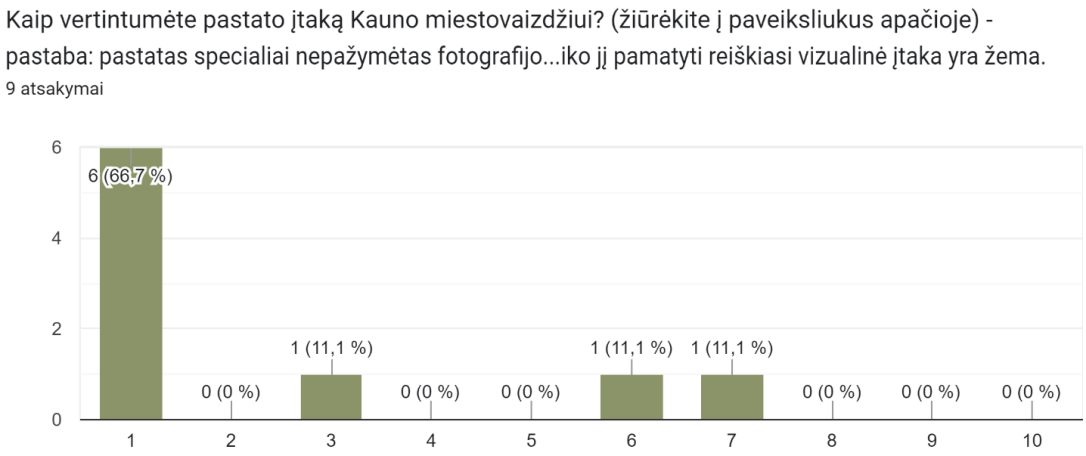
Appendix 20.: List of companies which received special survey dedicated to experts.

1. DO architetcs
2. 2mm architects
3. Naktevičius ir partneriai
4. RA studija
5. Šarūno Kiaunės projektavimo studija
6. J arch
7. Archispektras
8. Kančo studija
9. Bluma collective
10. MASH studio
11. mmap
12. afterparty
13.Office de architectura
14. Archas
15. Miesto planas
16. Nebrau
17. jpa
18. Bardane design studio
19. NESU studija
20. Dviejų grupė

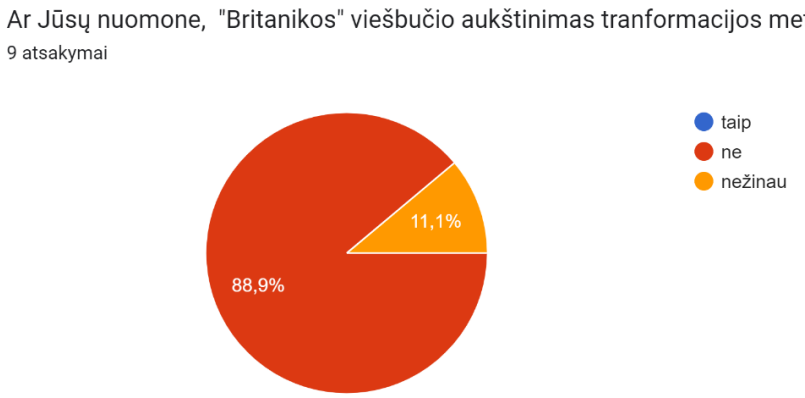
Appendix 21.: Experts's answers to higher volume proposal questions.



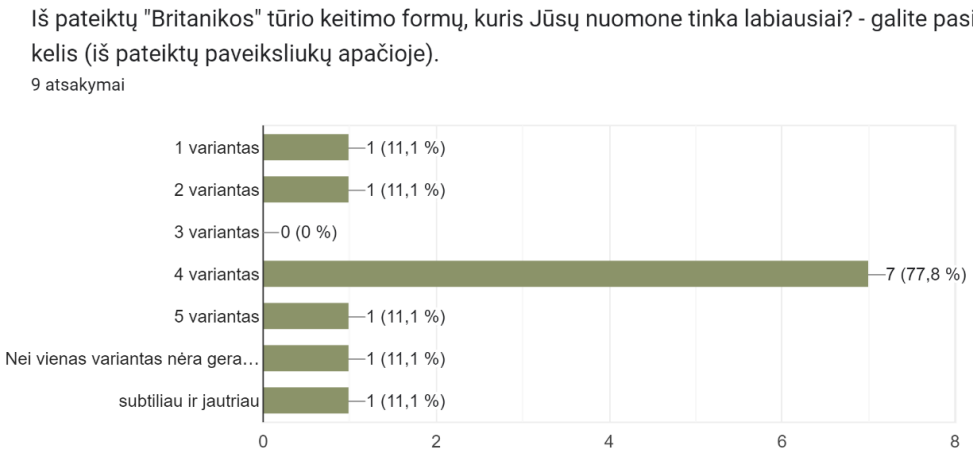
Screenshot by the author from his expert survey answers tab. Partisipant answers to question number 1.



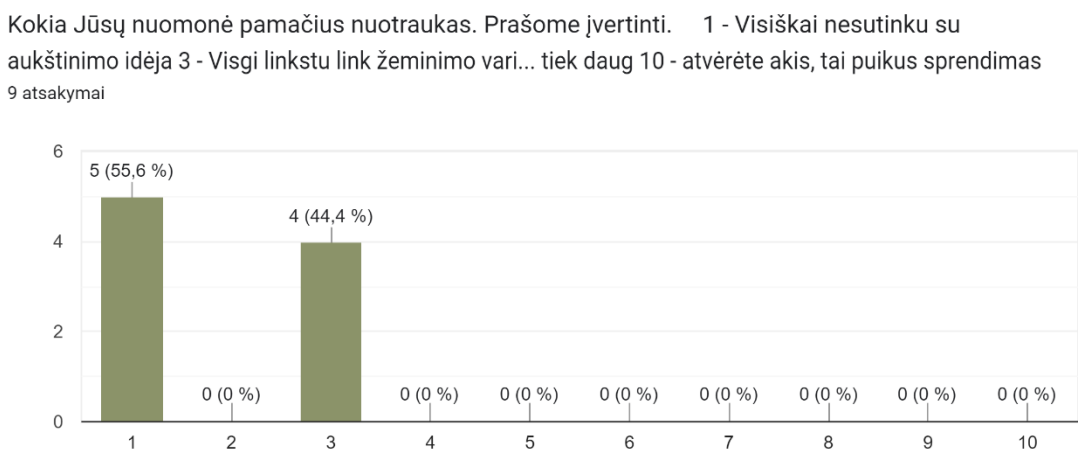
Screenshot by the author from his expert survey answers tab. Partisipant answers to question number 2.



Screenshot by the author from his expert survey answers tab. Partisipant answers to question number 3.



Screenshot by the author from his expert survey answers tab. Partisipant answers to question number 5.



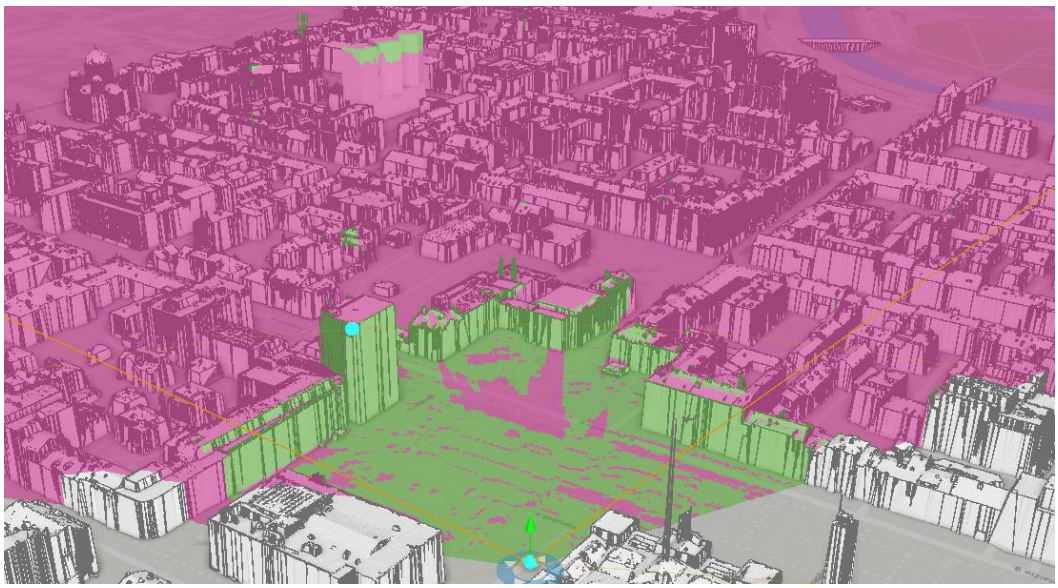
Screenshot by the author from his expert survey answers tab. Partisipant answers to question number 5.

Appendix 22.: screenshots from google maps: 1. From Parodos hill 2. From Laisves avenue

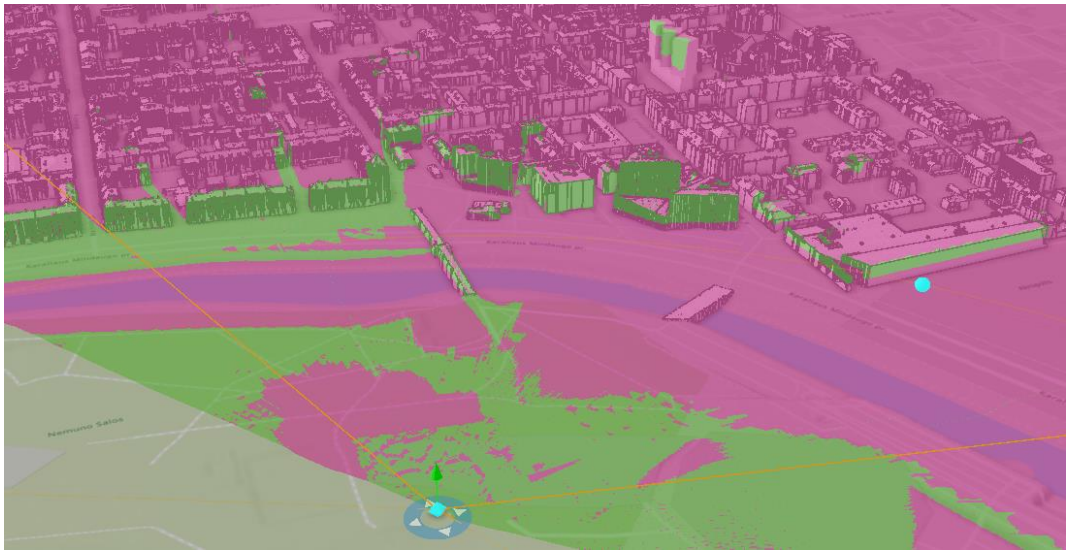
Appendix 23.: New proposed volume does not in any way effect Prisikelimo church and it's visibility from Ciurlionis brigde.

Appendix 24.: research analysed how new volume would influence other common locations in Kaunas city. Note that these locations and views from them are not protected.

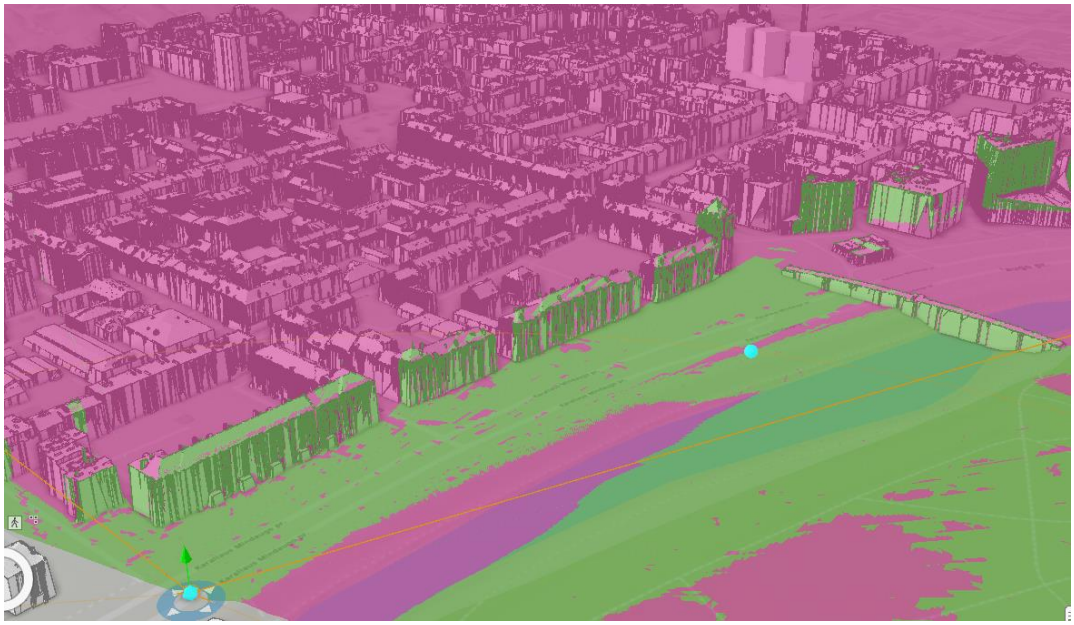
view from intersection near "Magnum" office



view from Unity squere.

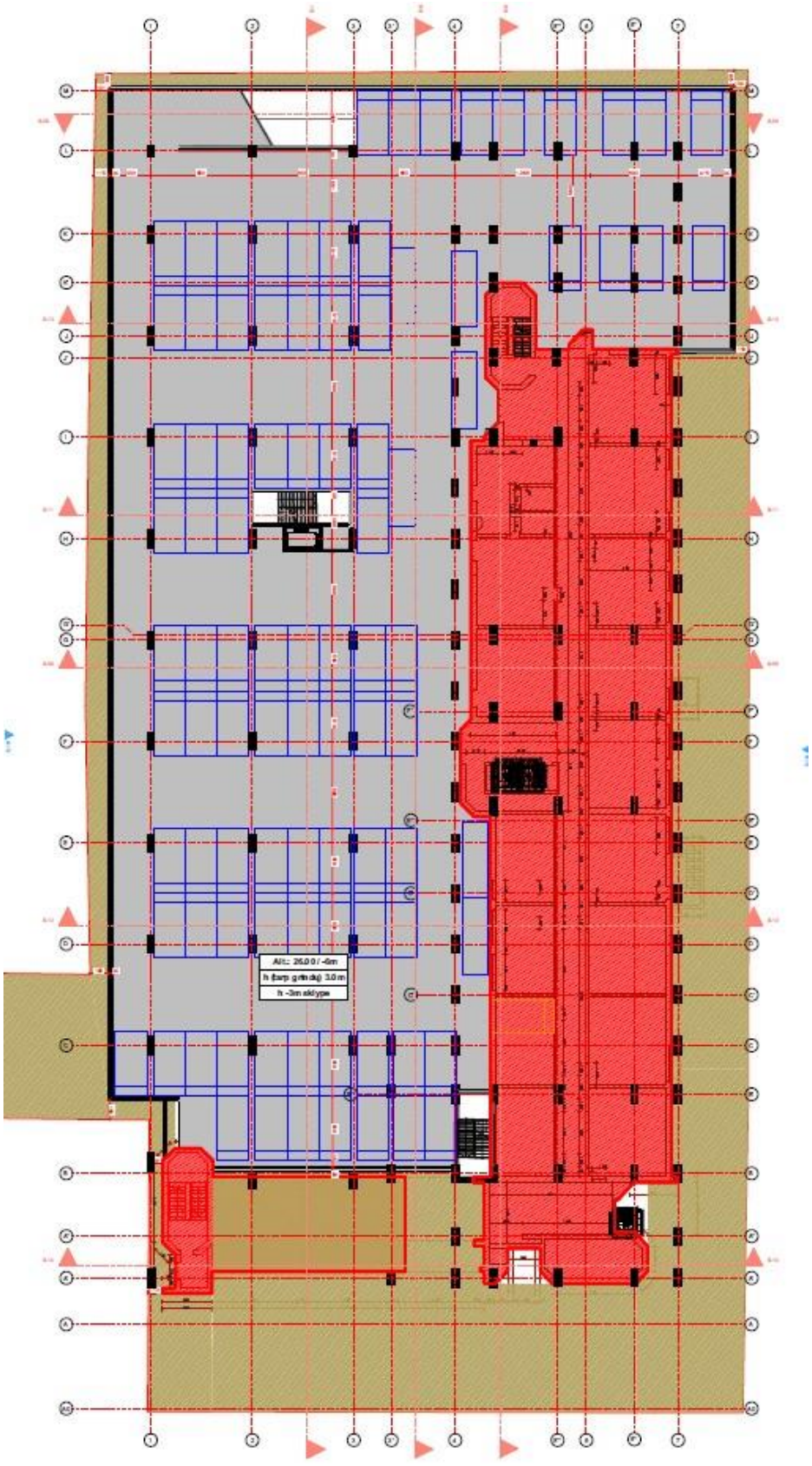


View from Nemunas island.



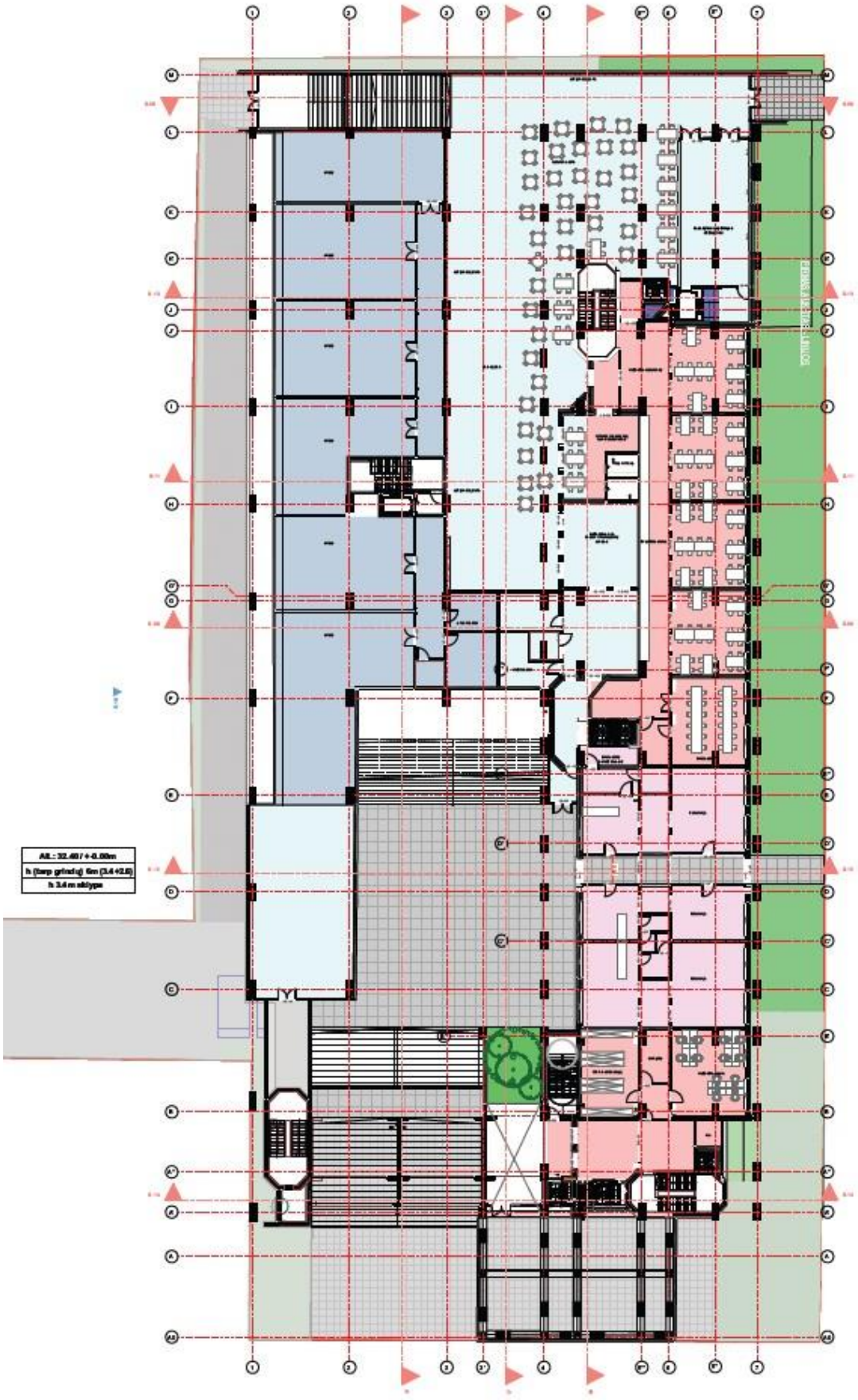
View driving toward Akropolis on K.Mindaugo avenue.

Appendix 25.: All floors of the building. Red- hotel; yellow – residential; dark blue- offices' light blue – public areas; pink – commercial areas; green – parks; grey – technical / parking.

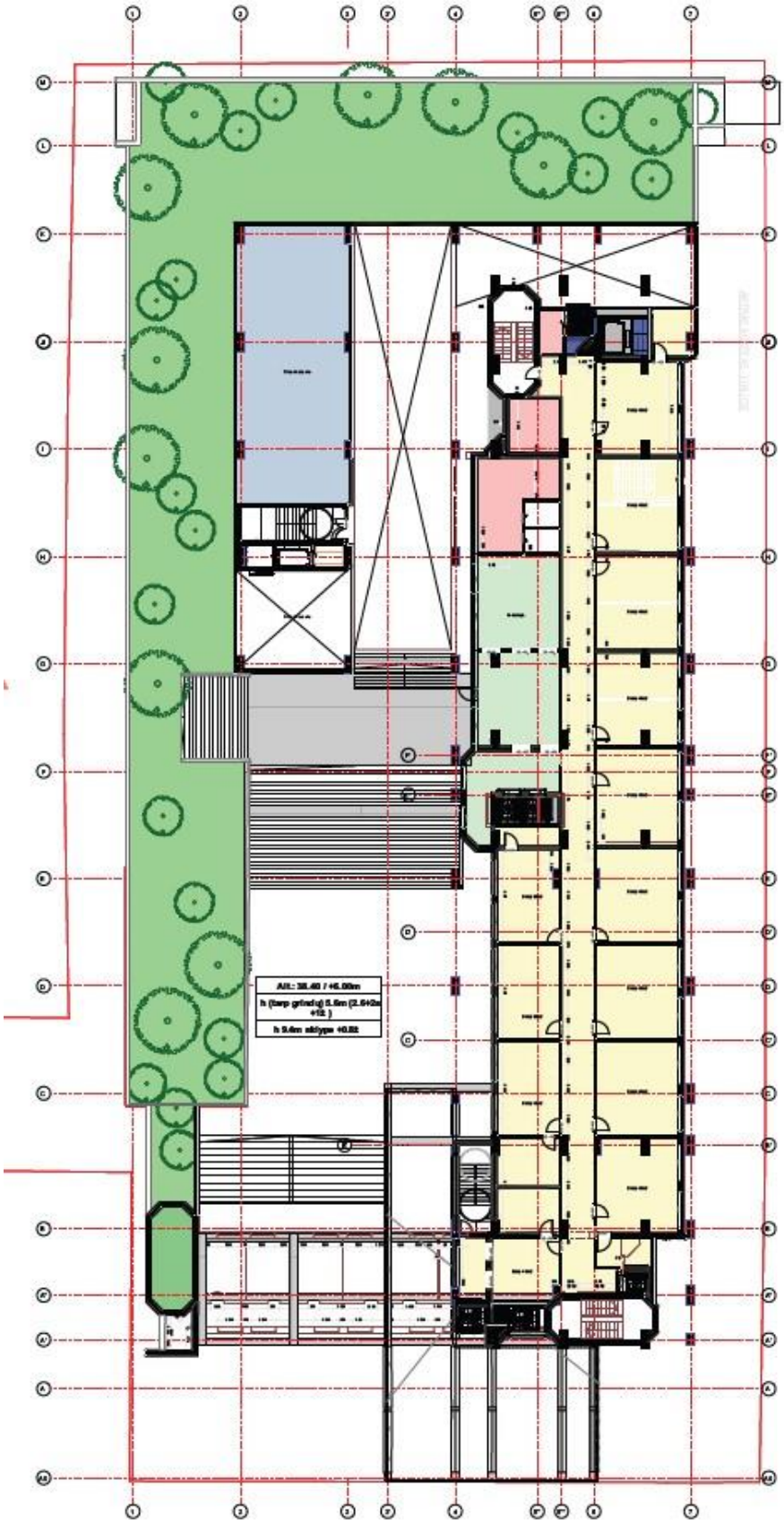


-2 floor

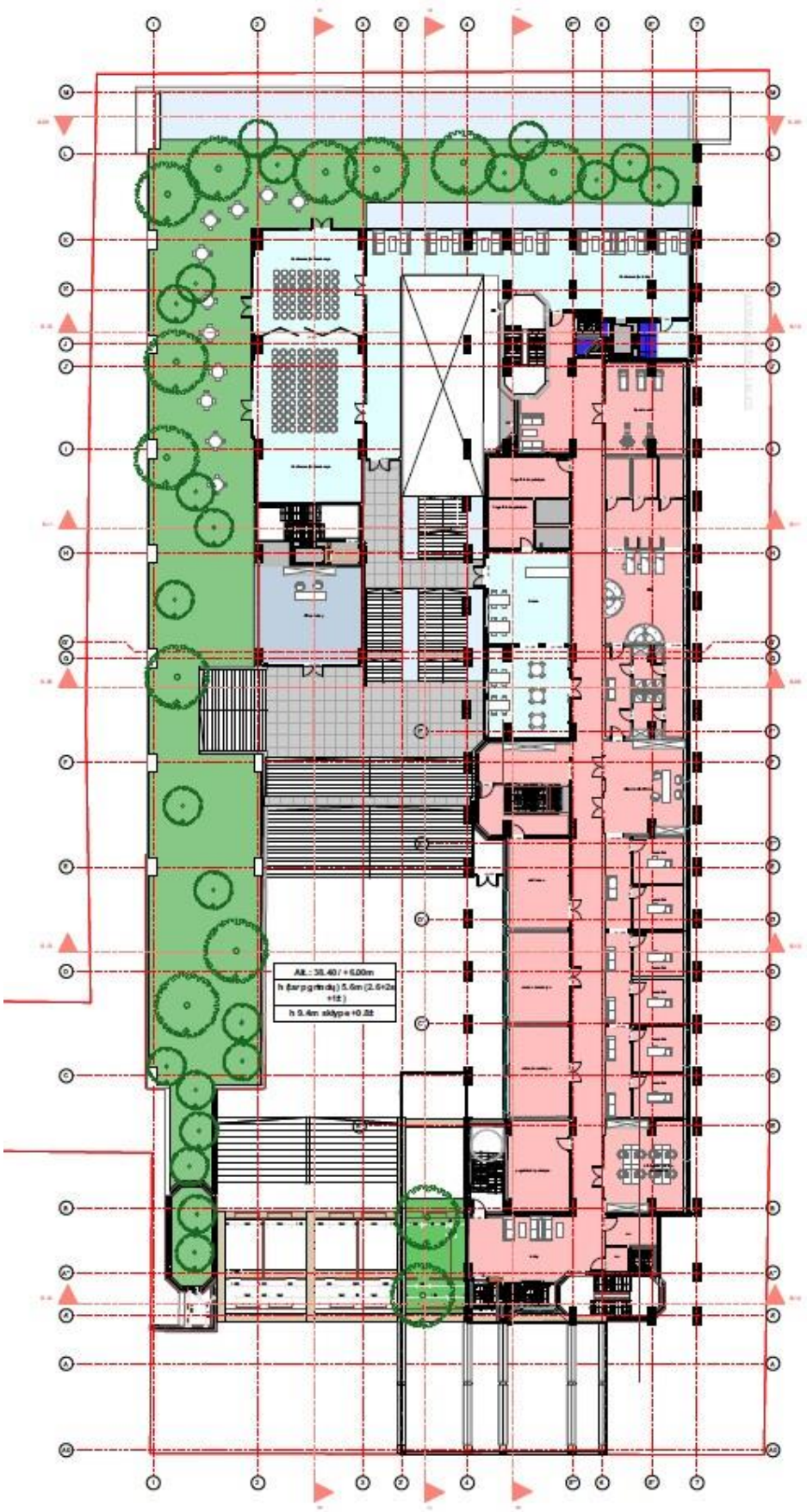
-1 floor



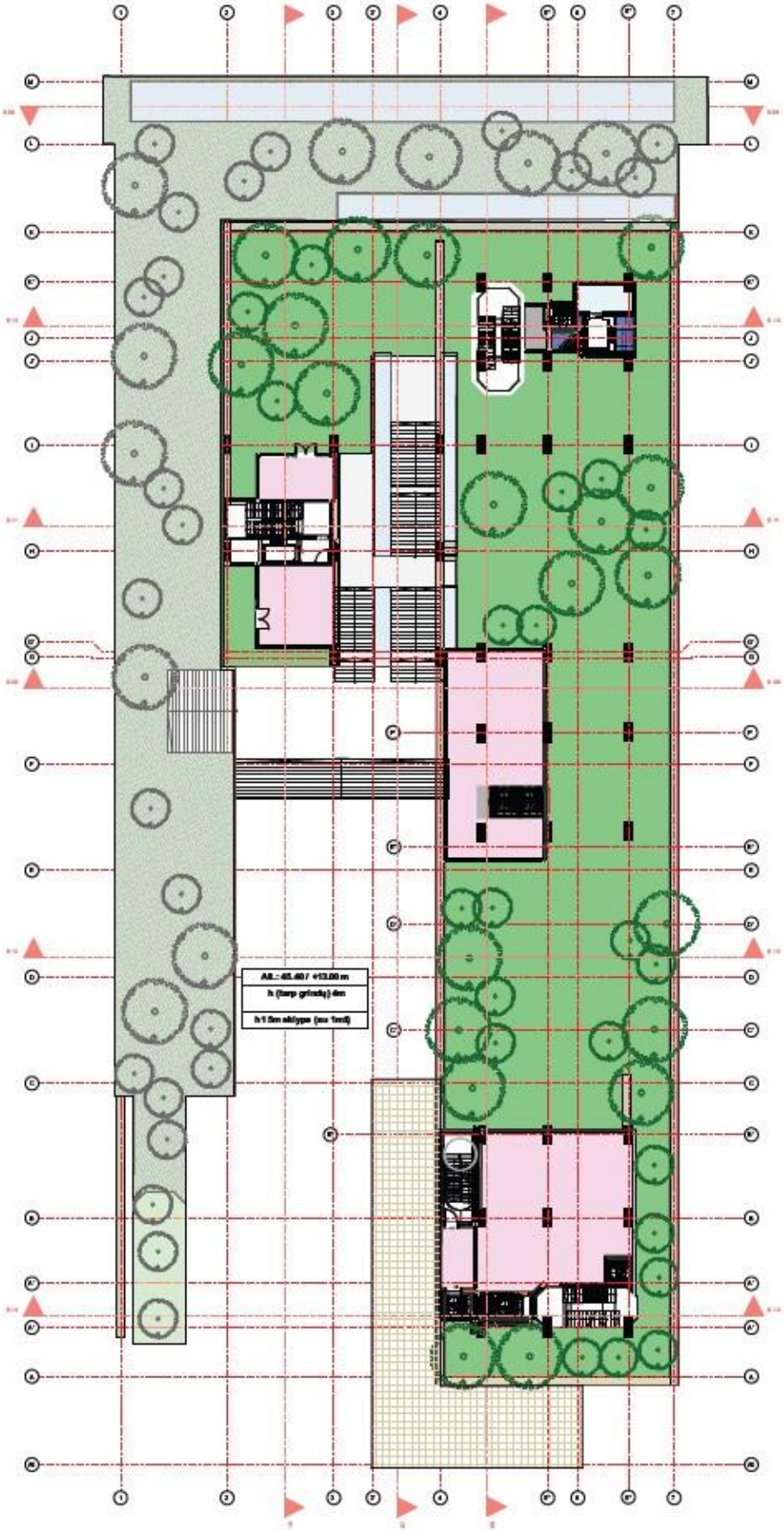
Ground floor



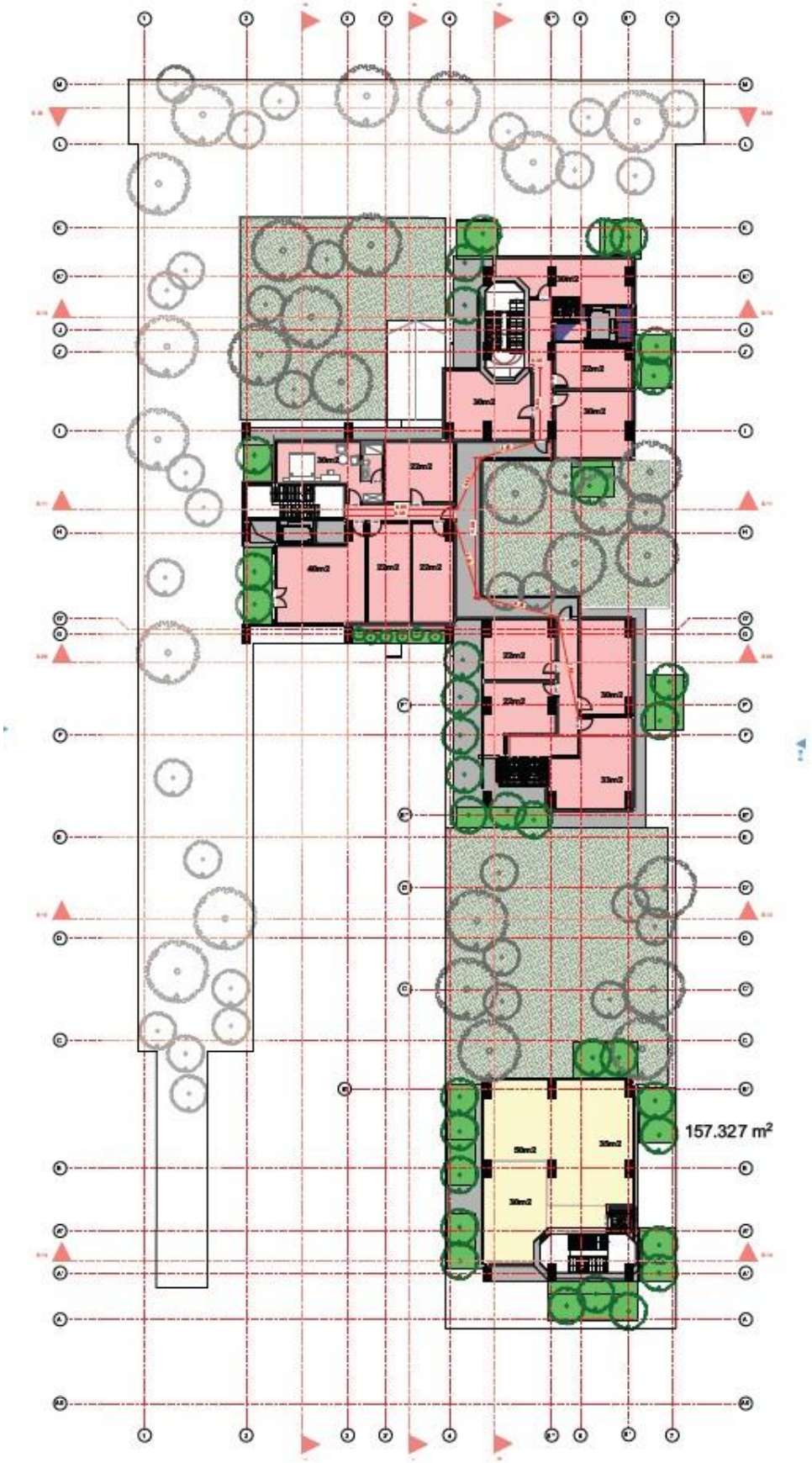
2rd floor. Last left floor with low ceiling, dedicated to affordable housing units from 18 to 40 m2.



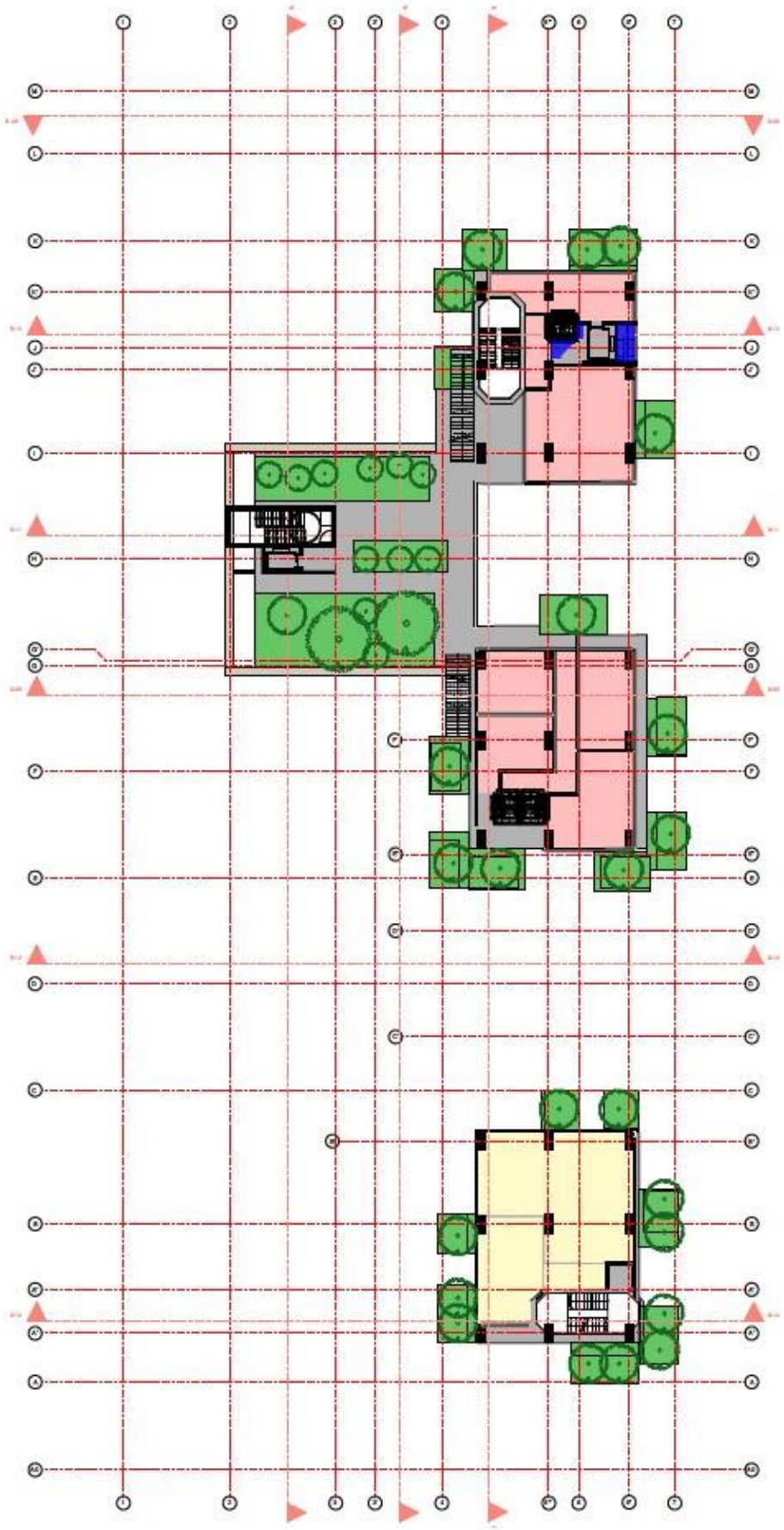
3rd floor



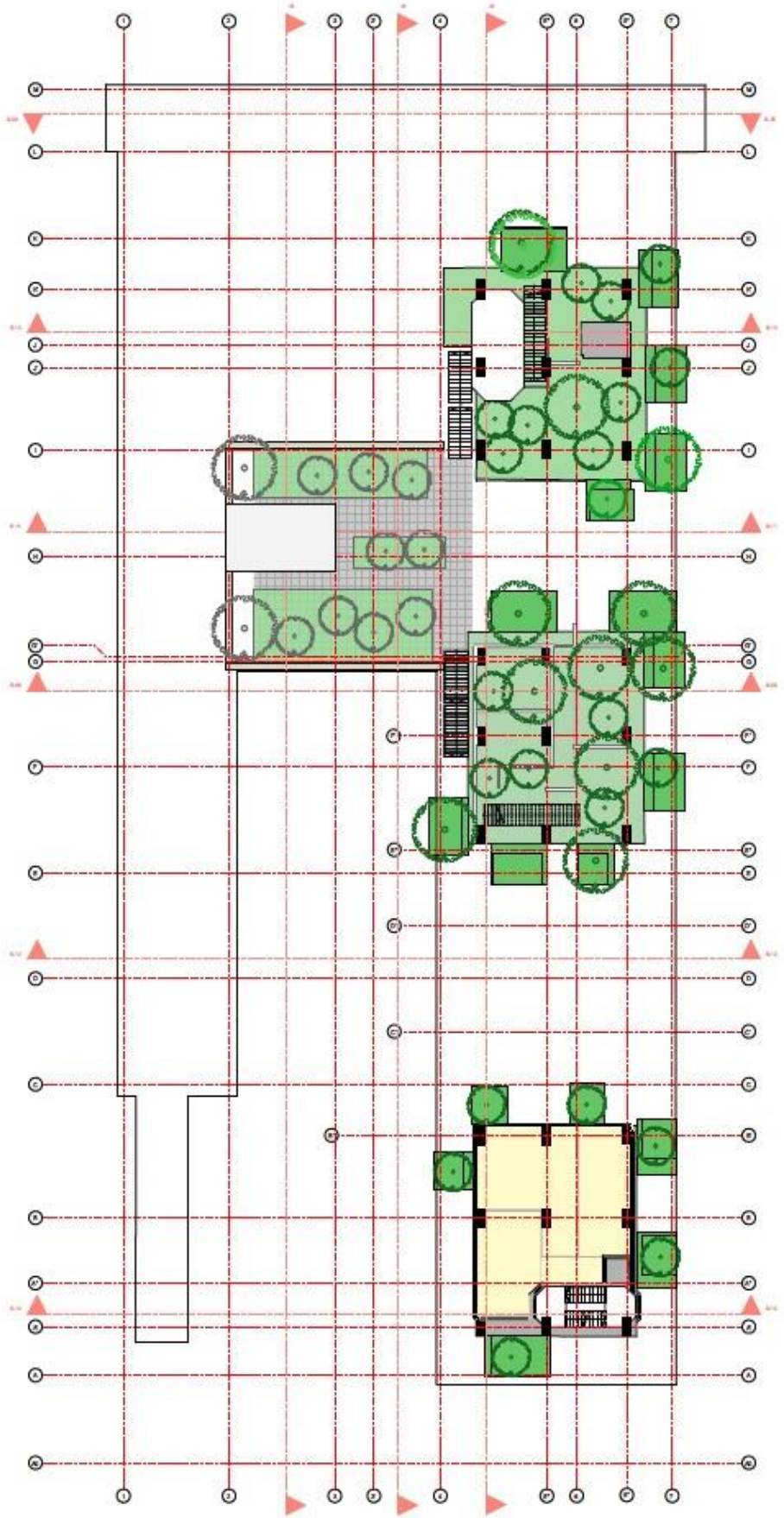
4th floor



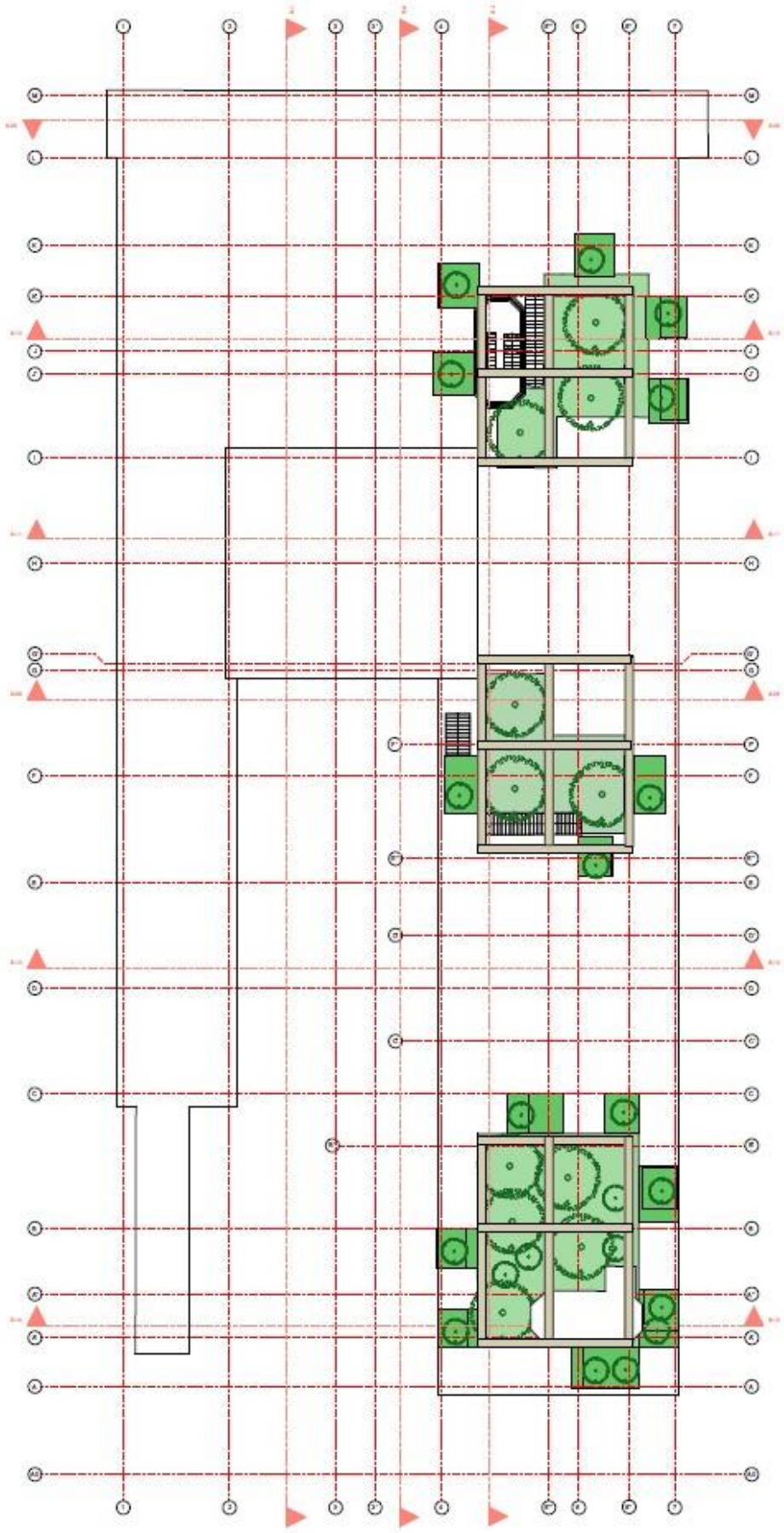
5th-10th floor



11th floor



12th floor



13th floor

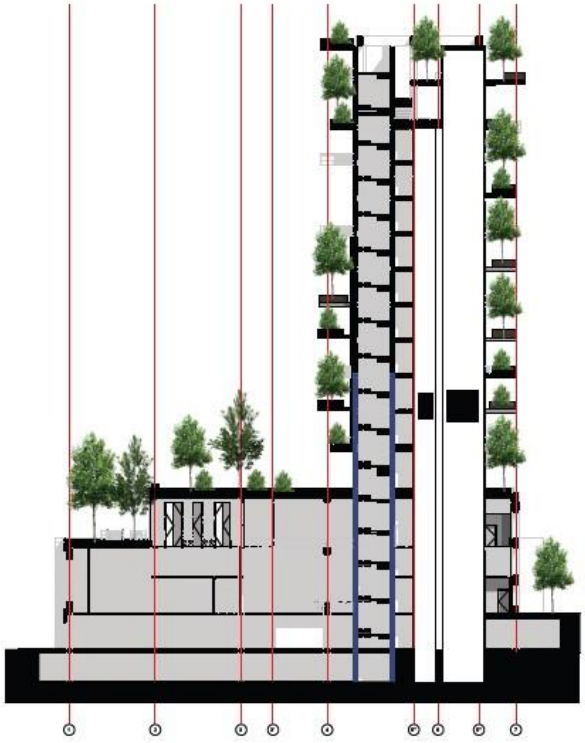
Appendix 26.: All facades of the building.

East facade. M 1:200.

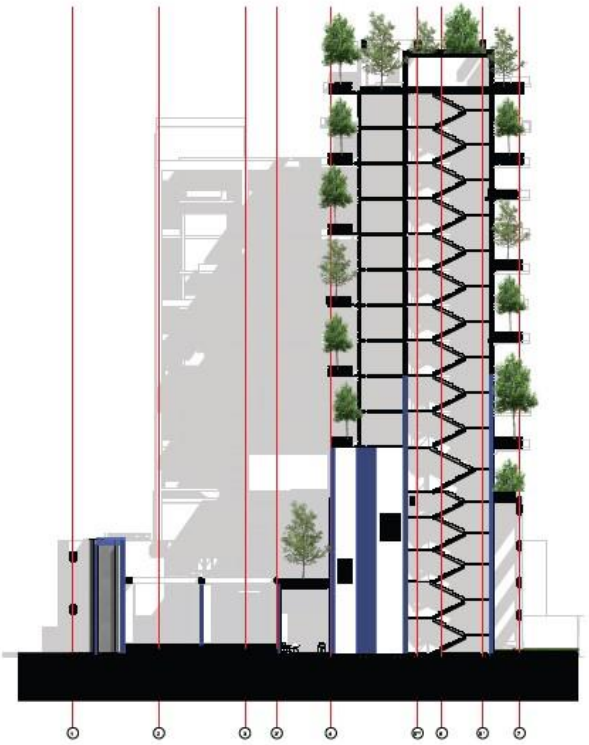
South facade. M 1:200.

North facade. M 1:200.

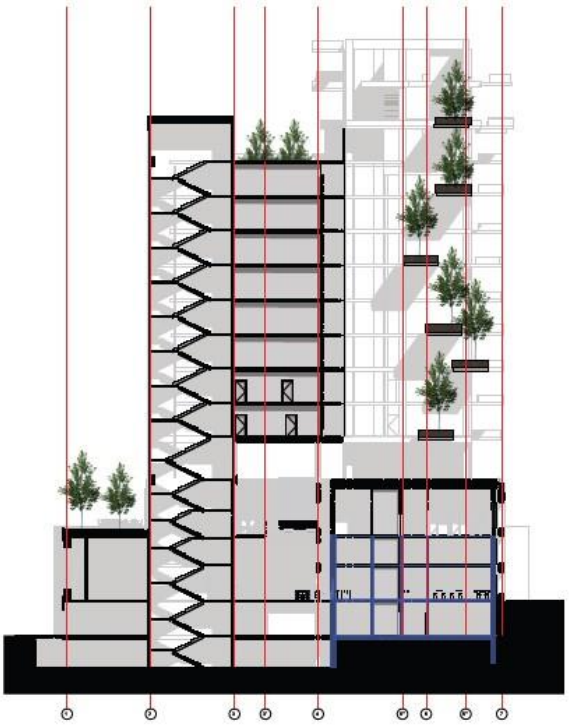
Appendix 27.: All the section cuts of the building.



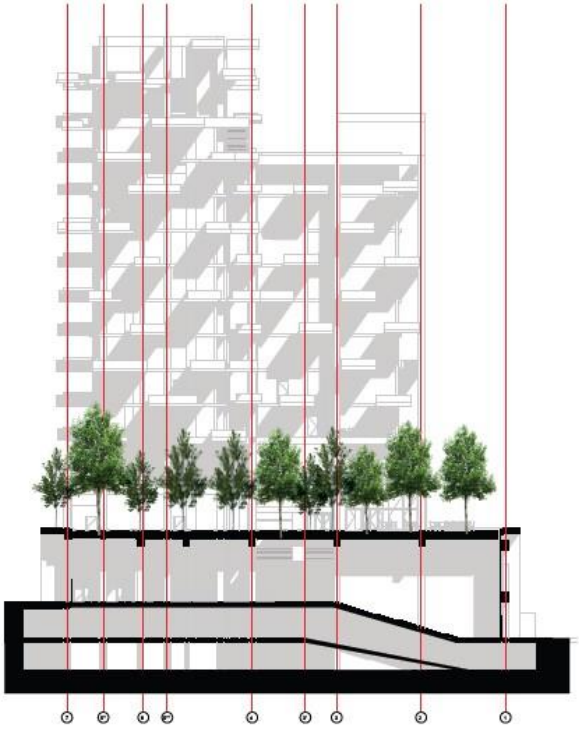
Section S-13. M 1:200. Drawing shows ifts which one on the left serves hotel block and one on the right is an express lift for complex visitors to go up to observation deck. On the left office antresoles can be seen with huge ceiling height of exhibition hall.



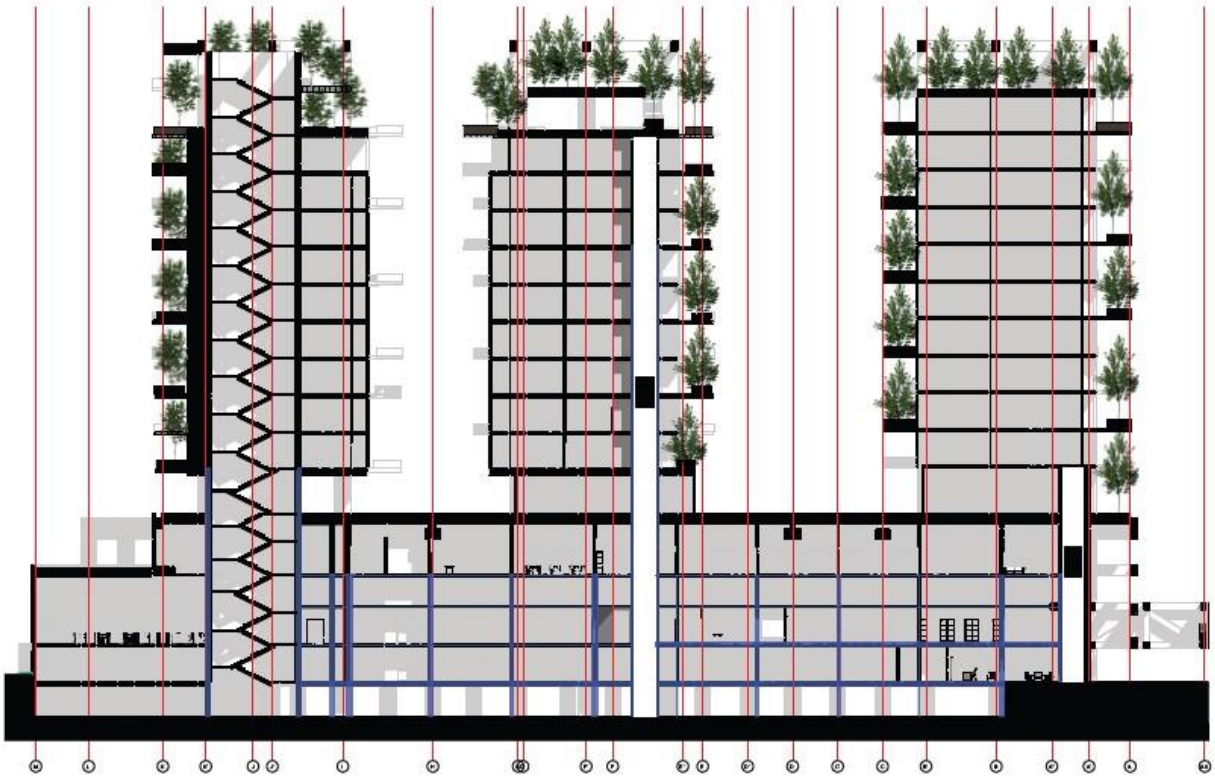
Section S-14. M 1:200. Drawing shows ifts which connects hotels reception area with lower park. Staircases serves all residental block and also acts as a secondary staircase of hotel in a case of fire.



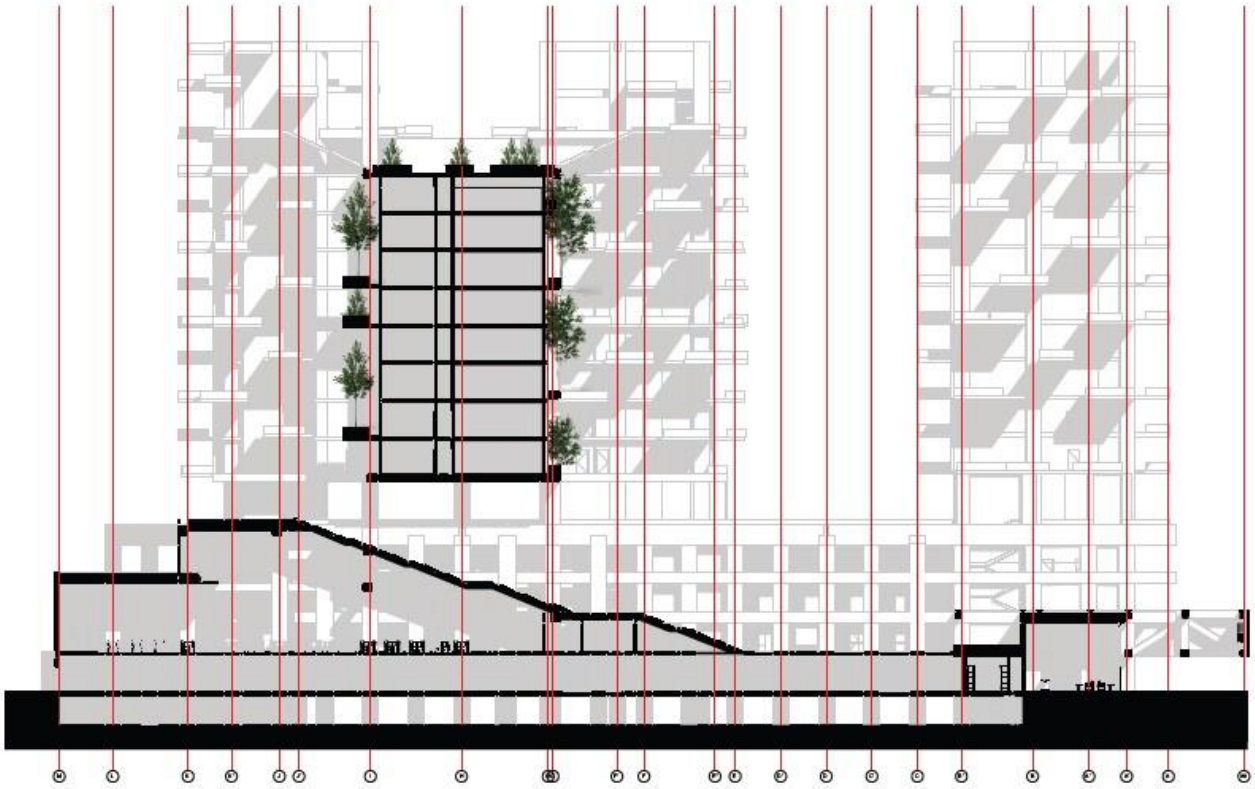
Section S-11. M 1:200. Drawing shows new staircase connecting office, hotel and observation deck.



Section S-08. M 1:200. Drawing shows how existing relief is used to create double parking with only one underground parking floor.



Section S-09. M 1:200. Drawing shows lift sachts, left-over fire staircase. Blue color shows remained walls of existing "Britanica" hotel.



Section S-07. M 1:200. Drawing shows staircase leading to lower park and exhibition hall under them.

Appendix 28.: Greenary index. (Kapočiūtė et al., 2023)

Reikalaujamas indekso balas
0.6
Rekomenduojamas indekso balas
0.8

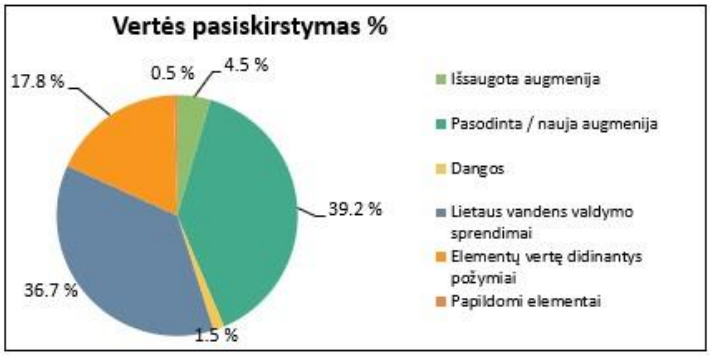
Žalumo indekso skaičiavimas

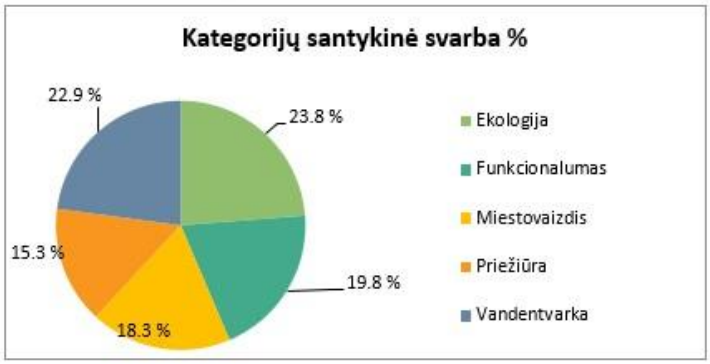
Žalumo indeksas	3.21
Reikalaujamas balas	0.6
Rekomenduojamas balas	0.8

Žalumo indekso skaičiavimas

Žalumo indeksas	2.04
Reikalaujamas balas	0.6
Rekomenduojamas balas	0.8

(left) recommended index; (center) index with façade plants (right) index without façade plants.





Paviršinių nuotekų kiekis, m^3	
22.2	
Vidutinis nuotėkio koeficientas C	Paviršinių nuotekų dalis, kuri turi būti sutvarkoma sklypo ribose (molis, priemolis), %
0.20	50%
Paviršinių nuotekų kiekis, kuris turi būti sutvarkomas sklypo ribose, m^3	
5.6	
Siūlomų vandens sulaikymo elementų bendras tūris, m^3	Likęs paviršinių nuotekų kiekis, kurį yra reikalaujama sutvarkyti sklypo ribose, m^3
400.0	0.0
Bendra nepralaidaus paviršiaus dalis, %	
26%	

Elementų grupė	Elemento apibūdinimas	Vienetai	Plotas arba skaičius	Koeficientas	Vertė	Nuotėkio koeficientas C
1. Išsaugota augmenija Daugiau info	1. Išsaugotas didelio augumo medis (pasiekiantis iki >10m aukštį, lajos skersmuo maliausiai 3 m)	vnt	1	3.4	85.7	0.0
	2. Išsaugotas vidutinio augumo medis (pasiekiantis 5 – 10m aukštį, lajos skersmuo maliausiai 3 m)	vnt	4	3.3	196.0	0.0
	3. Išsaugotas malo augumo medis (1,5–3 m aukščio) arba didelio augumo krūmas (pasiekiantis iki 5m aukštį)	vnt	2	3.0	60.5	0
	4. Išsaugoti malo augumo krūmai iki 1,5 m aukščio; paleme šliauliantys augalai	vnt	2	2.8	16.7	0
	5. Išsaugota sąlyginai natūrali lolinė augmenija	m^2	200	2.2	444.6	0.1
	6. Išsaugoti sąlyginai natūralūs vandens telkiniai su pakrantėmis (upelis, pelkaitė, kūdra, tvenkinys)	m^2	0	3.0	0.0	0
2. Pasodinta / nauja augmenija Daugiau info	1. Didelio augumo medis (pasiekiantis >10m aukštį)	vnt	40	2.2	2200.0	0
	2. Vidutinio augumo medis (pasiekiantis iki 10m aukštį)	vnt	80	2.1	2478.2	0
	3. Malo augumo medis (pasiekiantis iki 3m aukštį)	vnt	45	1.8	820.4	0
	4. Didelio augumo krūmas (pasiekiantis iki 5m aukštį)	vnt	10	1.7	86.4	0
	5. Malo augumo krūmas (pasiekiantis iki 1,5m aukštį);	vnt	200	1.6	959.4	0
	6. Atkurta pomiškio augalija (bent 100m2, aptverta)	m^2	0	3.4	0.0	0
	7. Daugiametis gėlynas (dekoratyvinis – kultūrinis) ir daugiamečiai paleme šliauliantys augalai	m^2	0	1.6	0.0	0.1
	8. Vienmetis gėlynas (dekoratyvinis kultūrinis)	m^2	0	1.2	0.0	0.1
	9. Sąlyginai natūrali lolinė augmenija (šienaujama ne daugiau kaip 1 kartą per metus)	m^2	0	1.8	0.0	0.1
	10. Miesto darlininkystės – sodininkystės plotai (ant lemės)	m^2	0	2.0	0.0	0.2
	11. Intensyvios prieliūros veja	m^2	400	1.2	488.1	0.1
	12. Daugiamečiai vijokliai (tolygu – 2 m2)	vnt	0	1.3	0.0	0.1
	13. Ialioji siena, kurios paviršius geba sulaikyti vandenį (vertikalus plotas)	m^2	0	1.0	0.0	
3. Dangos Daugiau info	1. Vandeniui laidus grindinys su žaluma (pvz. ažūriška trinkelių danga su žaluma)	m^2	250	1.0	261.5	0.2
	2. Vandeniui laidi biri danga	m^2	0	1.1	0.0	0.4
	3. Vandeniui pusiau laidus grindinys/danga be žalumos, vandeniui pusiau laidus asfaltas arba betonas	m^2	0	0.5	0.0	0.4
	4. Vandeniui nelaidus paviršius (apskaičiuojamas automatiškai)	m^2	*1473*	-	-	1
4. Lietaus vandens valdymo sprendimai Daugiau info	1. Šlapynė su natūralia augalija (vanduo išsilaiko didžiąja laiko dalį; kitu metu žemė išlieka drėgna) - B	m^2	0	2.9	0.0	0
	2. Lietaus sodas su įvairia sluoksniuota augmenija (nėra nuolatinio vandens telkinio, laidus dirvožemis) - B	m^2	0	2.6	0.0	0.1
	3. Sausa infiltracinė įduba ar latakas (griovys), padengtas augmenija ar biriu užpildu (nėra nuolatinio vandens telkinio, laidus dirvožemis) - S/K	m^2	0	2.0	0.0	0.1
	4. Biolatakas arba biojduba - B	m^2	0	2.7	0.0	0.1
	5. Drenažinis intarpas - S/K	m^2	0	1.5	0.0	0.2
	6. Vandens sulaikymo (sujungta su tolimesniu lietaus nuotekų tinklu, nėra nuolatinio vandens telkinio) arba kaupimo (pastovus vanduo) įduba (ar latakas), padengta augmenija ar užpildu - S/K	m^2	0	2.0	0.0	0.1
	7. Vandens sulaikymo arba kaupimo rezervuaras ar kitokia uždara talpa (vienetai: tūris) - S/K	m^3	400	1.1	424.0	0.2
	8. Intensyviai apželdintas stogas / ant stogo įrengtas sodas, dirvožemio gylis 50 - 150 cm	m^2	3070	2.0	6164.6	0.1
	9. Pusiau intensyviai apželdintas stogas, dirvožemio gylis 20 - 50 cm	m^2	0	1.6	0.0	0.2
	10. Ekstensyviai apželdintas stogas, dirvožemio gylis 6 - 20 cm	m^2	0	1.2	0.0	0.3
5. Elementų vertę didinantys požymiai Daugiau info	1. Medžiai / sumedėję augalai yra vedantys vaisius / žydintys	vnt	0	0.8	0.0	
	2. Išsaugojami krūmai yra guote (grupėje)	vnt	0	1.0	0.0	
	3. Didelio augumo medis yra pietinėje ar pietvakarinėje pastato pusėje ir suteikia jam šešėlį (ypač lapuočiai).	vnt	2	0.7	35.2	
	4. Vidutinio augumo medis yra pietinėje ar pietvakarinėje pastato pusėje ir suteikia jam šešėlį (ypač lapuočiai).	vnt	3	0.5	23.6	
	5. Mažo augumo medis yra pietinėje ar pietvakarinėje pastato pusėje ir suteikia jam šešėlį (ypač lapuočiai).	vnt	2	0.4	7.5	
	6. Sąlyginai natūralioje žolinėje augmenijoje vyrauja žydinčios vietinės rūšys	m^2	0	0.8	0.0	
	7. Naujai pasodinti medžiai pasižymi vietinių rūšių įvairove - mažiausiai 3 vietinės rūšys / 100 m2	m^2	1400	1.0	1393.6	
	8. Naujai pasodinti augalai ir krūmai pasižymi vietinių rūšių įvairove - mažiausiai 5 rūšys / 100 m2	m^2	1000	0.9	924.0	
	9. Ant nelaidžių paviršių (m2) susidarančios lietaus nuotekos yra surenkamos ir panaudojamos laistymui arba nukreipiamos į laidžius augmenijos plotus.	m^2	860	0.8	692.6	
	10. Ant nelaidžių paviršių (m2) susidarančios lietaus nuotekos yra nukreipiamos į dirbtinius tekančio vandens telkinius, pvz. latakus ar upelius.	m^2	0	0.7	0.0	
	11. Vandeniui laidi danga yra skirta žaisti ar sportuoti (pvz. skalda, dirbtinė veja, liejama sportinė danga)	m^2	300	0.4	110.7	
6. Papildomi elementai	1. Daržininkystės - sodininkystės plotai ant stogų	m^2	100	0.8	82.2	
	2. Elementai, palaikantys natūralias ir gamtines sąlygas ar buveines (pavyzdžiui, išsaugota negyva mediena / kelmai ar iškelti inkilai (tolvėu 5m2)	vnt	0	0.7	0.0	
	3. Žaidimų ir gamtos pažinimo erdvės iš natūralių gamtinių elementų įrengimas	m^2	0	0.7	0.0	

Appendix 29.: Suggested vegetaion which should be used for the green facades. (Tumber-Dávila et al., 2022)

Picture in summer	Latin name	Average height / maximum height	Tree crown diameter	Root's diameter / depth	Time to reach maximum size	Can it be placed in shadow?	Possibility to replant at maximum size	ciSu	ciSp	ciA
	Acer ginnala	5/10m	4-5m	1.5/1	5-10yr	+/-	6m height			
	Cornus mas	5/12m	4-5m	2/1	5-10yr	+/-	6m height			
	Padus virginiana	4-7m	2m	1.5/1	4-6yr	+	4m height			
	Acer platanoides fastigiata	15-20m	1-2m	1/1	15-25yr	+	8m height			

	Acer tataricum	4-10m	3-5m	0.7/0.7	8-20yr	+/-	4m height			
	Amelanchier lamarkii	4-6m	2-4m	0.7/0.7	30-40yr	+/-	5m height			
	Parthenocissus quinquefolia	20-30m lenght	1m	0.5/0.5	20-30yr	+	-			
	Salix purpurea	1-3m	2-3m	0.7/0.7	5-10yr	+	+			
	spirea	2m	2m	0.5/0.5	3-5yr	+	+			
	Cornus alba Elegantissima	1m	1-2m	0.6/0.6	3-5yr	+	+			
	Vinca minor	0.6m	-	-/0.3	1-3yr	+	+			

Appendix 30.: All posters for the presentation.

All posters in one place.

TRANSFORMATION OF BROWNFIELD SITES AND BUILDINGS AND SUSTAINABLE INTEGRATION INTO URBAN FABRIC

(BRITANIKA HOTEL CASE)

Importance of the topic

"The greenest building is that which is already built"
Carl Elefante, FAIA, 2016 AIA President

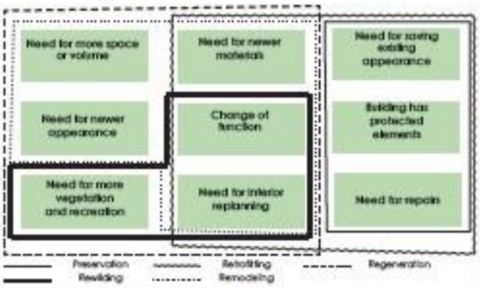
Theoretical research

"Derelict - voluntarily abandoned" (Dixon, 2003)	"Building has no official owner or the owner is missing" (T-387, 2020)	"Abandoned construction sites" (Li et al. 2020)
"... at least 60% of space [...] has been closed" (S. Carolina abandoned buildings revilitation act)	"...building that has remained vacant [...] for period of 6 consecutive months" (Li et al. 2020)	"...endangers the health, life or environment of people living near..." (T-387, 2020)

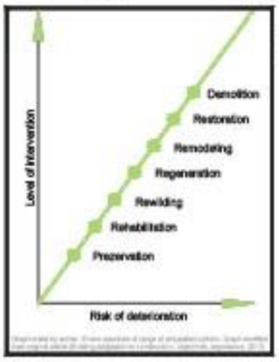
Typology of abandoned buildings

Location	City center 0-3km	Around center 3-10km	City outskirts 10+km	far from city 50+km
Age	Young 0-10y	Middle 10-50y	Old 50-200y	Very old 200+y
ex-function	commertial	industrial	residential	hard to define
Size	Extra large 10.000+m2 h=50+m	Large 1-10Km2 h=20-50m	Medium 200-1000m2 h=8-20m	Small 0-200m2 h=0-8m

Types of transformation methods

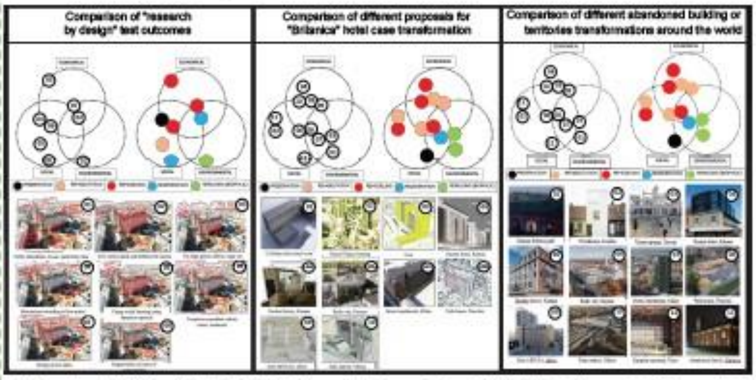


Scheme shows which parts of existing structure is modified with each transformation method. According to various need of client or public best transformation method can be selected using this diagram. Scheme made by author

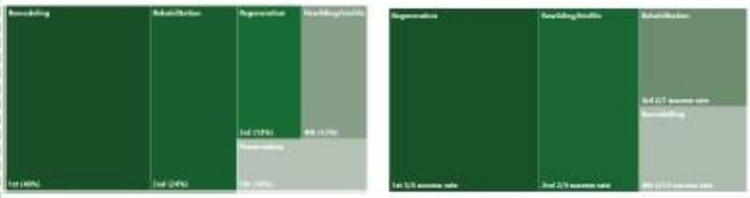


Transformation methods influence to existing buildings. Scheme made by author

Comparison of transformation method types

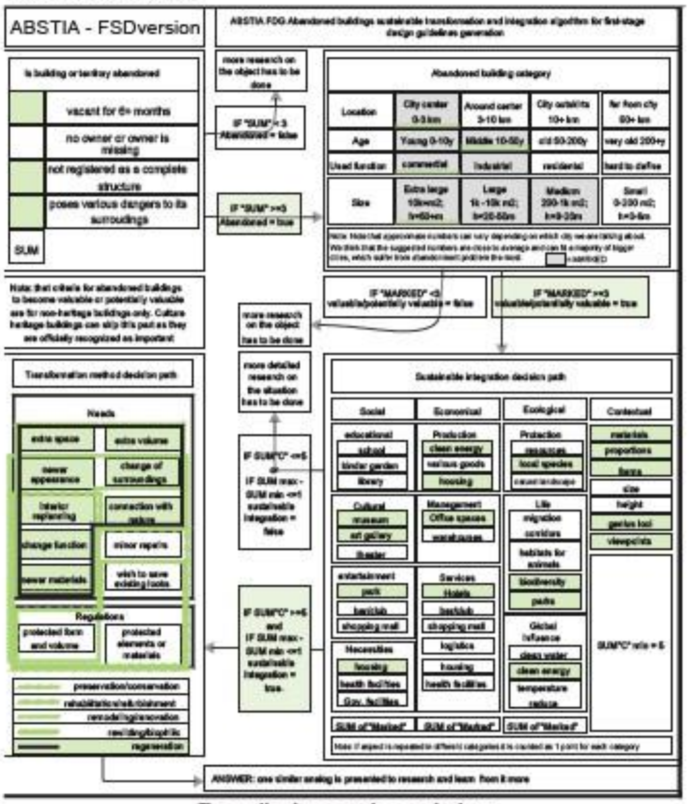


Worldwide analogs which had silimar situation to "Britanica" hotel were analysed and compared how sustainable their tranformations were. In addition, several already made proposals to existing "Britanica" situation and research by design approach were evaluated using the same method. (Scheme above made by author). Conclusions show that despite remodeling being the most often used transformation method, the most sustainable is regenerative transformation method.



Hyphotetical model

Teoretical research created unique algorithm which helps to evaluate existing abandoned structure's potential, sustainable integration requirements and transformation method suggestion. It helps future investors and desginers to see first guidelines which would help to decided strategies and planning for later stages.



Theoretical research conclusions

Teoretical research showed that for "Britanica" hotel has potential to be tranformed. The algorithm showed that the most sustainable transformation method according to client and public's needs would be regenerative method.

Empirical research

Research program

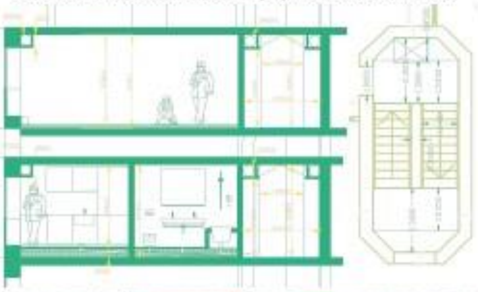
https://kaunasin.lt/bundanti-viesbucio-rinka-kaune/

Hyphothesis	Objects	Methods	Tasks
"Britanica" hotel transformation is better solution than demolition.	1.Kaunas city residents 2. experts 3."Britanica" hotel	1. Public survey 2. Interview 3. Analysis of the structure	1.Create survey 2.Publish survey 3.Analyse data 4.Contact and interview experts
"Britanica" hotel can and should become a mix-used building complex	1.Kaunas city residents 2. Kemal Yegin work 3.experts	1. Public survey 2. Interview 3. Analysis of the structure	1.Create survey 2.Analyse Kemal Yegin work 3.Analyse data 4.Contact and interview experts
Method of regeneration is the best solution for "Britanica" hotel transformation	1.Kaunas city residents 2. Lithuanian plants 3.Bosco verticale	1. Public survey 2. Interview 3. Analysis of plants	1.Create survey 2.Analyse Kemal Yegin work 3.Analyse data 4.Contact and interview experts
Existing hotel can become even higher and more contextual than now	1.City residents 2. Kaunas 3D 3. city's history 4. Height documents	1. Public survey 2. Interview 3. ArcGIS viewshed 4. Document analysis	1.Get data from geoportal.lt 2.Find revelant protected viewpoints 3.Analyse viewshed using ArcGIS program 4.Contact and interview experts

Hyphothesis 1

"Britanica" hotel transformation or partly demolition is better solution than complete demolition.

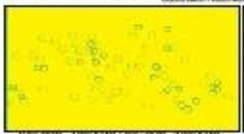
The research analysed data from East East 3 workshop to determine if existing structure planning and constructions can be reused for different function. Ceiling height and fire staircases were analysed.



Hyphothesis 2

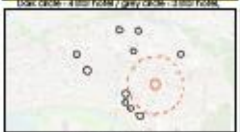
"Britanica" hotel can and should become a mix-used building complex.

Despite that Kaunas has a lot of different hotels in the city center, various articles mentions that Kaunas city is on the verge of luxurious hotel shortages. Especially for national or worldstars who needs the best rooms and service. In addition, big shortage of affordable houses for students can be seen. City center has a lot of higher education facilities but lacks dormitories.

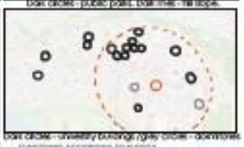


Dark circle - 4 star hotel / grey circle - 3 star hotel.

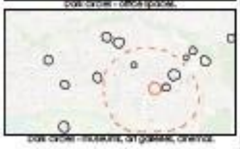
Dark circles - public parks. Dark lines - hill slope.



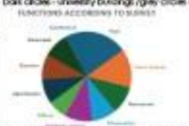
Dark circles - office spaces.



Dark circles - university buildings / grey circle - dormitories



Dark circle - museums, art galleries, cinemas.

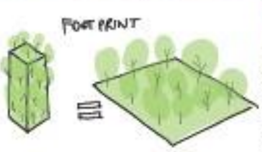


Public survey result for needed and wanted functions in transformed "Britanica" hotel

Hyphothesis 4

Method of regeneration is the best solution for "Britanica" hotel transformation.

Vertical park is well needed according to missing functional analysis. It is backed by public and expert opinion. Finally, this proposal could be only a start of various vertical parks in Kaunas city center, which would help to regenerate degraded and urbanised city center.



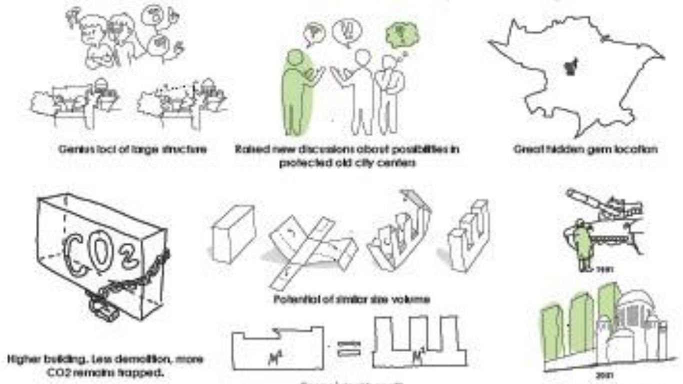
New Regenerated land of old city center would become a great passing stop for different local species and would become and integrated part of city center's ecosystem.

Research shows that one vertical park's greenary would be equal to 5 times bigger footprint area of forest.

Hyphothesis 4

Existing hotel can become even higher and more contextual than now.

There are a lot of reasons to analyse and propose higher building in "Britanica" hotel situation. First of all, 35% of public survey supports the idea, in addition several experts (R.Adomaitis, P.Vaitiekūnas, G.Natkevičius, S. Kaunas) in interviews mentioned that object should and can be higher for different reasons.



Genius loci of large structure

Raised new discussions about possibilities in protected old city centers

Great hidden gem location

Higher building. Less demolition, more CO2 remains trapped.

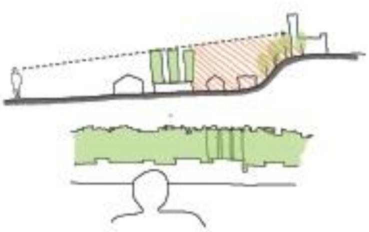
Potential of similar size volume

Economical benefit

Historical maturing

Protected viewpoint of Kaunas city

The research analysed legal documents which determine protected Kaunas city's viewpoints. "Camouflage" idea is tested through all revelant viewpoints.



Screenshot above is from protected Kaunas city viewpoints document. Scheme below shows section cut analysis of revelant views. This analysis shows that if "camouflage" idea is used new volume up to 56m could be built.

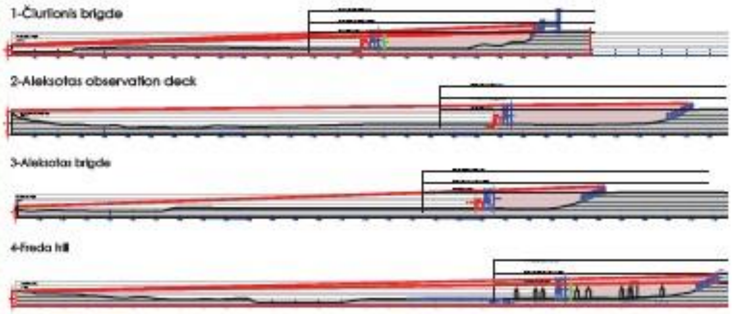
Scheme above shows simplified scheme of "camouflage" idea, how new higher volume dissapears looking from human perspective if he would stand in the area of protected viewpoint.

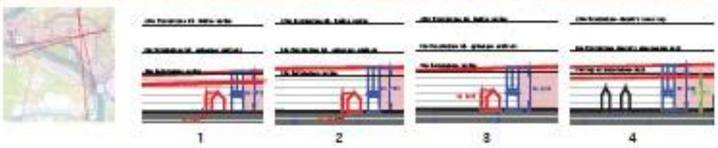
1-Čiurlionis brigde

2-Aleksotas observation deck

3-Aleksotas brigde

4-Freda hill





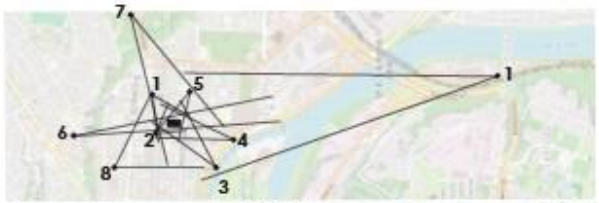
"Camouflage" idea

Screenshots below shows two most influencial viewpoints of Aleksotas brigde and Ciurlionis brigde (google maps). Visualization "after" shows how existing building dissapears and merges with Žilinsko hill in the background.

now | Aleksotas brigde viewpoint | after

now | Ciurlionis brigde viewpoint | after


7



Screenshot from google maps. View to "Britanica" hotel from Saboras square

Visualization after transformation. View to "Britanica" hotel from Saboras square

Screenshot from google maps. View to "Britanica" hotel from Freedom avenue

Visualization after transformation. View to "Britanica" hotel from Freedom avenue

Screenshot from google maps. View to "Britanica" hotel from Nemunas island brigde

Visualization after transformation. View to "Britanica" hotel from Nemunas island brigde

Screenshot from google maps. View to "Britanica" hotel from "Akropolis" intesection

Visualization after transformation. View to "Britanica" hotel from "Akropolis" intesection

Screenshot from google maps. View to "Britanica" hotel from Kestucio and Gedimino street intesection

Visualization after transformation. View to "Britanica" hotel from Kestucio and Gedimino street intesection

Screenshot from google maps. View to "Britanica" hotel from Prikiellmo church roof

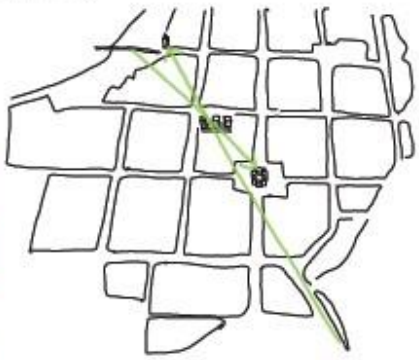
Visualization after transformation. View to "Britanica" hotel from Prikiellmo church roof

Screenshot from google maps. View to "Britanica"

Visualization after tranformation. View to "Britanica"

New opened views in the city

ArcGIS analysis also shows that new views could be created by changing existing "Britanica" hotel volume. (screenshots from ArcGIS program on the left) (simplified scheme showing new possible views below)



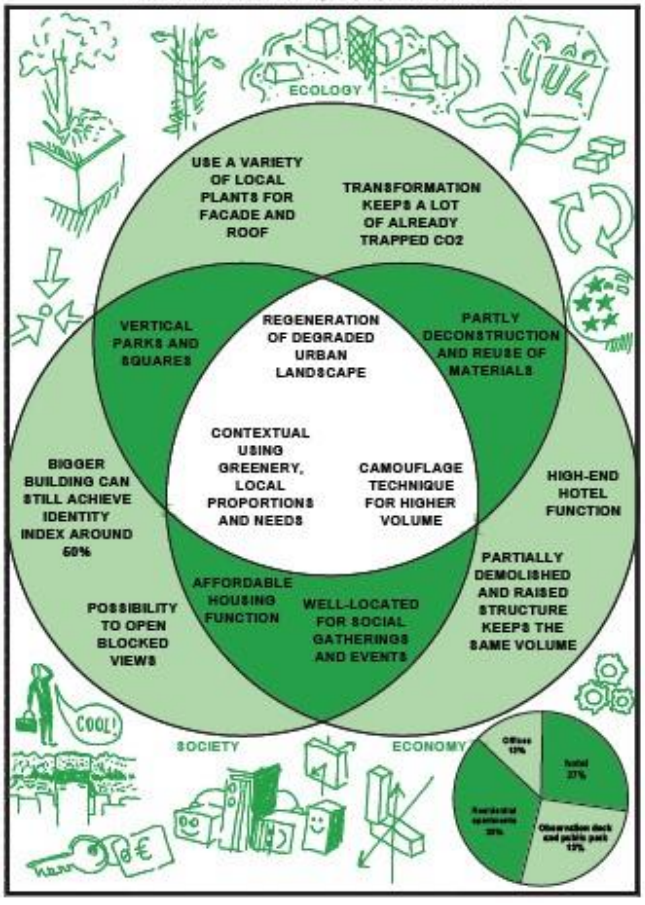
Urbanist's T.Turner SID index results

Landscape components	Topography: relief, R				Water bodies, W				Vegetation, V				Buildings, B			
Degree of visual contrast	large	average	small	insignificant	large	average	small	insignificant	large	average	small	insignificant	large	average	small	insignificant
Scale	20	8	6	4	8	6	4	2	8	6	4	2	12	10	8	6
Forms	3	4	3	2	3	3	3	1	4	3	3	1	8	7	6	3
Lines	3	4	3	2	3	3	3	1	4	3	3	1	8	7	6	3
Colors	20	8	6	4	8	6	4	2	8	6	4	2	12	10	8	6
Texture	3	4	3	2	4	3	3	1	4	3	3	1	8	7	6	3
Materials	3	4	3	2					4	3	3	1	8	7	6	3
Style									4	3	3	1	8	7	6	3
Fineless									8	6	4	2	12	10	8	6
Level of protection	15	12	9	6	12	9	6	3	12	9	6	3	16	13	10	6
Level of contrast	Large				Average				small				insignificant			
Sum of points	106-254				157-189 (144)				86-136				6-85			
% of blocked view	>25%				5-25%				4.9-1%				<1%			

T.Turner urbanist from England has created SID index (T.Turner , 2000), which helps designers to evalute level of contrast of their suggested architectural proposals. The research used this method to calculate level of contrast of high volume with green facades.
Proposed volume would fall in average contrast category. It has insignificant contrast watching to panoramic views, nevertheless it creates large contrast from street perspective.

Conceptual model

Conclusions made in empiric research creates clear conceptual model which directly guides design decisions. In addition, visualised model below shows what sustainable integration principle each decisions influences.



Experimental design

General technical solutions for all concepts

Large portion of existing structure is demolished because of low ceiling height.

Main lift sachts and fire-staircases area left for reuse purposes.

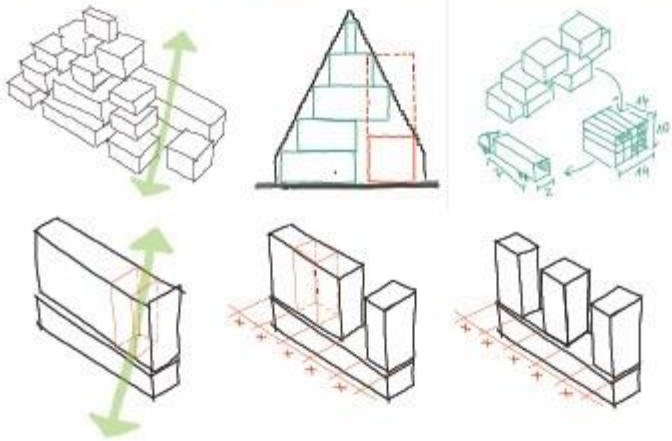
Demolished parts of existing structure are grinded and reused for underground parking and first three floors of new tranformed "Britanica" hotel. This ensures that minimal quantity of materials is wasted. Other materials are used for site's renovated paths and parking floors.

Soil which will be dig out for underground will be filtrated and used for vasos where plants will be planted. This minimazes soil transportation works which saves petrol for transportatio vehicles thus reducing CO2 emmisions while tranformating the structure.

Three tower concept

This idea is to create three high volume which would represent Lithuanian history. Volume's proportions is created by leaving empthy gap for new found views. This gap wide is the same as the volume. This rithm is copied through the volume's long side. This creates 2 similar size towers with 2 similar size gaps.

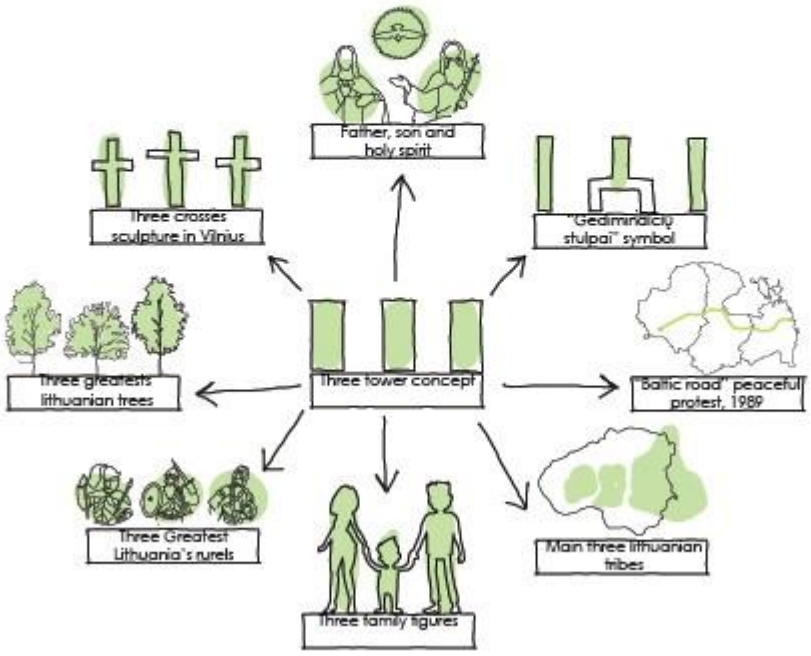
This proposal leaves more existing building. Leaving lift sachts and fire-staircases. Finally, this proposal creates more square meters than "boxes" proposal, because of these reasons this concept was chosen for further detalisation in experimental design schese.



Boxes concept

This idea is to use similar size and proportion volume as surrounding buildings. Create higher volume by making a "boxing" slope which perfectly allignz with allowed building height in the site (middle scheme). Concept does not block new found viewpoints. Finally, this proposal could be made out of module volumes, which would be transported with all enamities directly to the site.

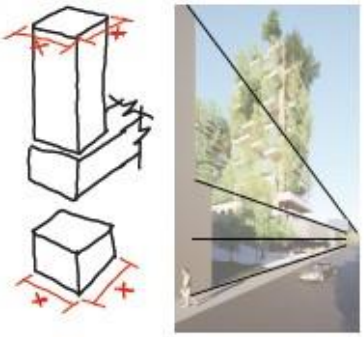
Problem of this concept is that its form is not fully clear. In addition, a lot of existing structure is destroyed, including staircases and lift sachts. Finally, columes does not represent lithuanian values directly as three towers do. Concept is more similar to Dutch architecture made from modular sistems, because of these reasons this concept was not chosen.



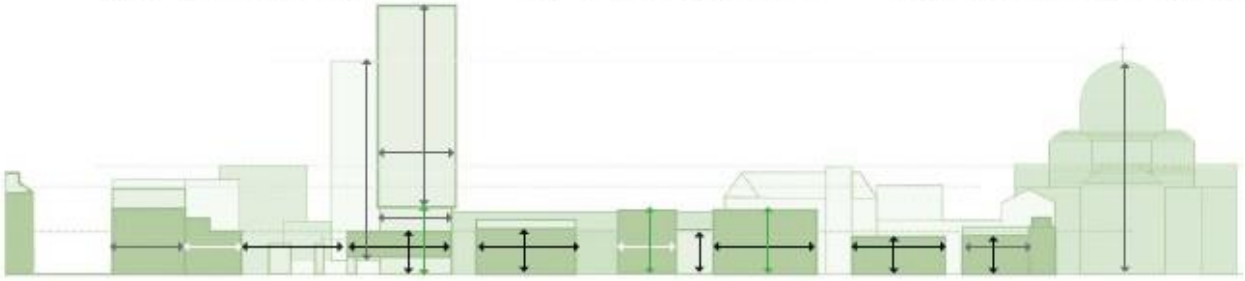
Bigger urban thinking

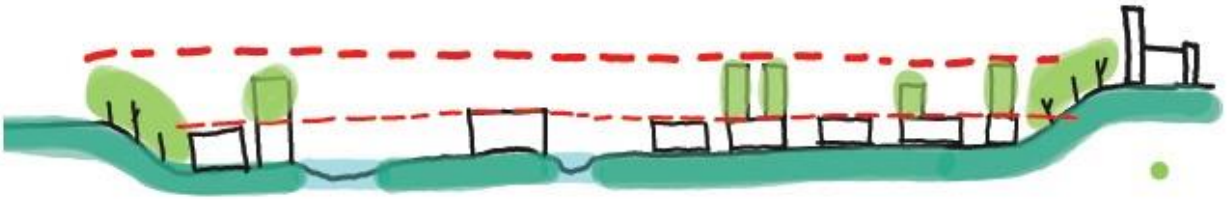
High vertical volume would act as a right nave in bigger urban context, as a landmark which connects Hermunas river with libraries on Zaliakalnis hill. Similar size and volume building theoricaly could be proposed in other side on urban block. Scheme made by author.

New higher volume takes inspiration from surrounding building and copies their sizes and proportions as showed in scheme on the right and below. In scheme above green circle represent building which footprint is small or identical to new proposed "Britanica" volume.



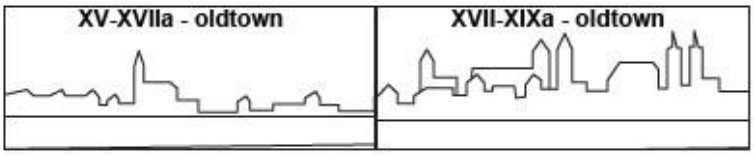
Scheme above right shows how new building ties to harmonically integrate itself into street perspective view. Hotel's console, which clearly marks main entrance to luxurious hotel fits perimetric block's build up and matches the cornices of neighbouring buildings.

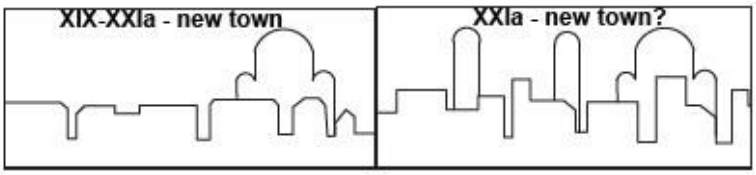


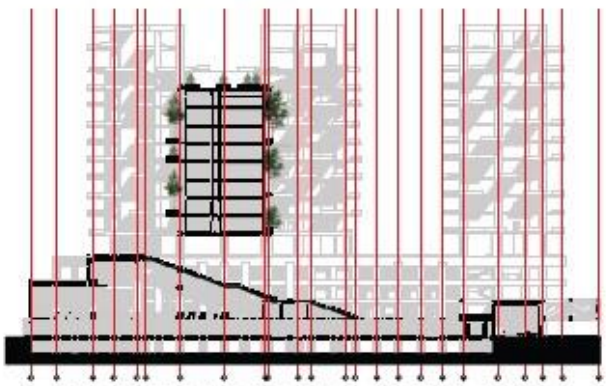


Scheme above shows how more vertical parts could be built in the "camouflage" zone.

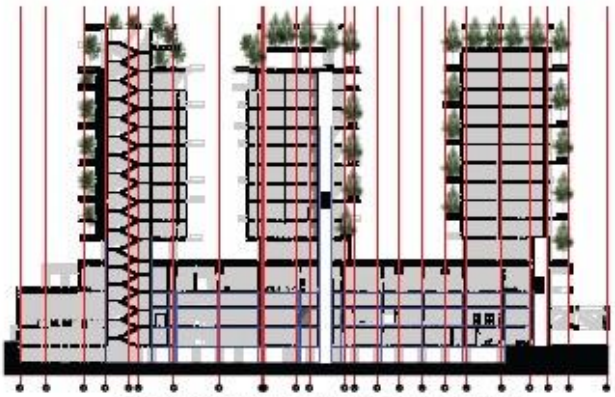
Scheme below show interesting phenomena and idea how Kaunas city center could become multi-dominant cityscape as it was with Kaunas oldtown - from one church tower to several towers which each act as a reference point for pedestrians. The research raises the idea that new city center of Kaunas could have similar metamorfosis. This proposal for vertical buildings should be analysed in more detail to ensure new dominant volumes are in good places, in order to ensure symbiotic relationship between them and pedestrians below.







Section S-07. lit 1:200. Drawing shows staircase leading to lower park and exhibition hall under them.



Section S-09. lit 1:200. Drawing shows lift sachts, left-over fire staircase. Blue color shows remained walls of existing "Britanica" hotel.

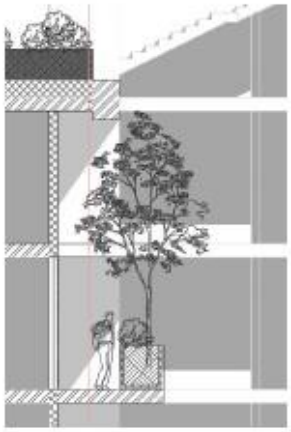
Facade greenary solutions

Tolarant to harsh climate, winds, shadow

Has relatively small root system and big height

Can be replanted at older age

Scheme above shows exact trees which are recommended to be used for green facades of transformed building. All plants have three main properties in common. They are tolerant to harsh climate, winds and could be placed in shadowy places, they all have relatively small root system (up to 1x1x1m) big height and small leaf crown. Lastly suggested plants could be replanted at old age, which would ensure that public, client and especially critics will not need to wait decades in order for proposed building to look exactly as it is presented in visualizations.



Scheme above shows section cut of small balcony which have medium size vase for facade greenary. Vases are insolated in order that plant's roots would not freeze.
Average height of facade trees is about two stories height.

Scheme above shows how vases and plants are specially placed on balconies and corneles. Vases with plants are placed minimum two meters from doors which lead to apartments or hotel rooms. This should minimise influence of any insects for residents.

Visualization from Kestucio street to main complex entrance in summer

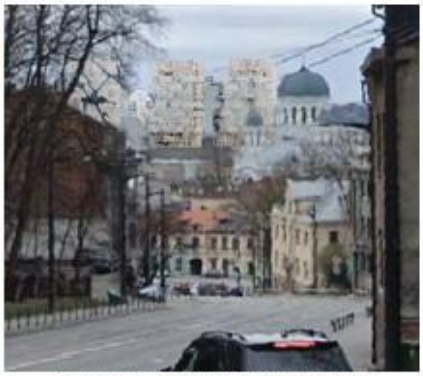
Visualization from Kestucio street to main complex entrance in autumn

Visualization from Kestucio street to main complex entrance in winter

Visualizations above and below show how the building would look like in different seasons of the year. The volume becomes dinamic and always changing. Wooden constructions makes building volume seem really cosy and warm in winter time, this beings bright and warm colors into grey and cold cityscape of Kaunas.

Visualization from Kestucio streets and Gedimino streets intersection to complex in autumn

Visualization from Parodos hill going down to main complex in autumn



Visualization from Parodos hill going down to main complex in winter

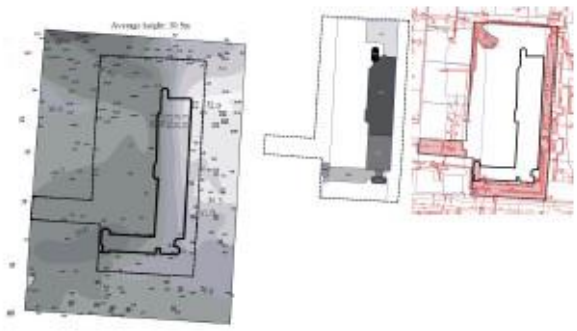
Territory's and site's analysis

Problems in the block. Scheme made by the author.

Weaknesses in the block. Scheme made by the author.

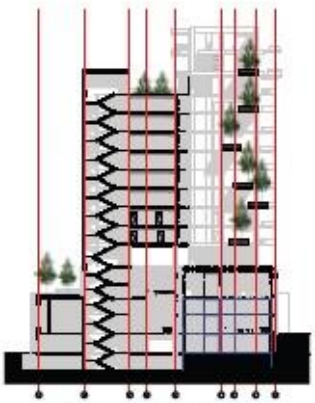
Strengths in the block. Scheme made by the author.

Opportunities in the block. Scheme made by the author.

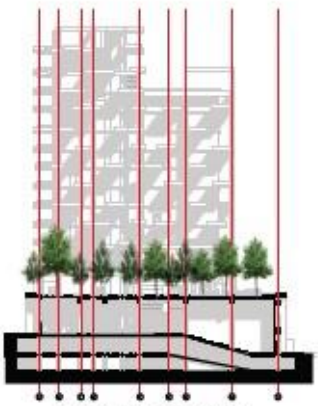


Site analysis. (left) topography, (center) existing structure's heights, (right) protected areas of various pipes and other engineering infrastructure. Schemes made by the author.

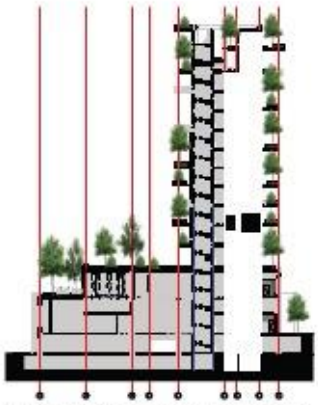
Accessibility in the block. Scheme made by the author.



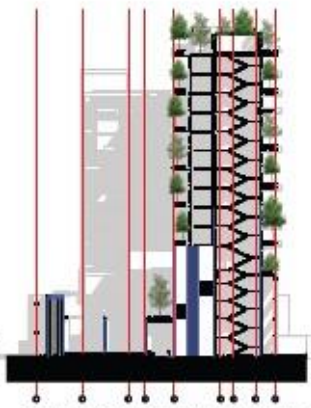
Section 3-11. M 1:200. Drawing shows new staircase connecting office, hotel and observation deck.



Section 3-08. M 1:200. Drawing shows how existing relief is used to create double parking with only one underground parking floor.

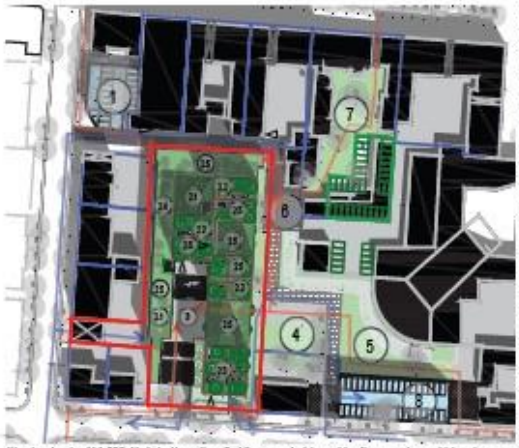


Section 3-13. M 1:200. Drawing shows lifts which one on the left serves hotel block and one on the right is an express lift for complex visitors to go up to observation deck. On the left office entrezoles can be seen with huge ceiling height of exhibition hall.



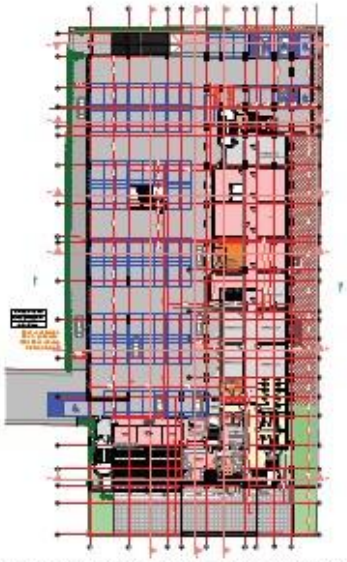
Section 3-14. M 1:200. Drawing shows lifts which connects hotels reception area with lower park. Staircases serves all residential block and also acts as a secondary staircase of hotel in a case of fire.

Planning solutions

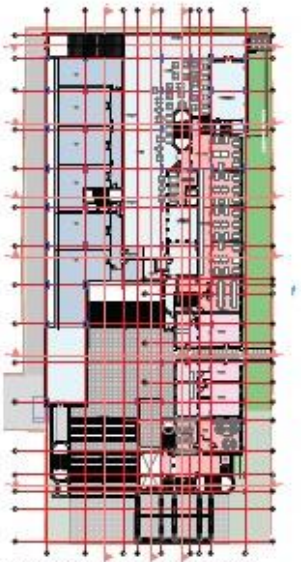


Site plan drawing M 1:500. Made by the author. Red lines – padestrian s, blue lines – various vehicle entrances paths to the complex.

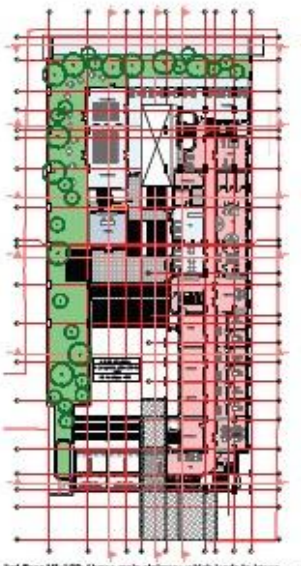
Bird – view entrance to the complex scheme. Made by the author. Red lines – padestrian s, blue lines – various vehicle entrances paths to the complex.



-1 floor M 1:200; Drawing shows parking area, hotel's main entrance and reception, residential's block seperate entrances, hotel's kitchen area and technical rooms with seperate technical entrances.

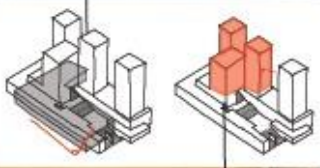


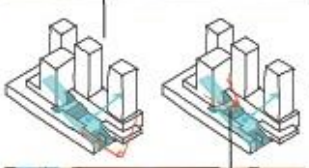
Ground floor M 1:200; Shows main inner square, hotel's administration floors, comercial area, hotel's and public restaurant area, exhibition hall, offices, main concert area, entrances from Freedom avenue and entrance to lifts leading to observation deck.

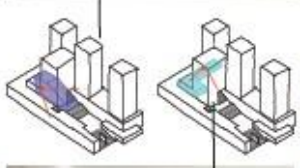


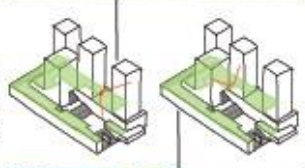
3rd floor M1:200; Shows main staircase which leads to lower park area, conference hall ,small bar (light blue), hotel's entertainment floor (red), entrance to offices(dark blue).

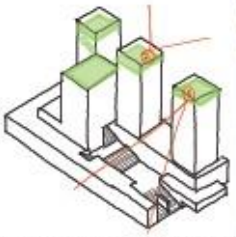
4th floor M 1:200; Shows lower park area with comercial zones (pink).







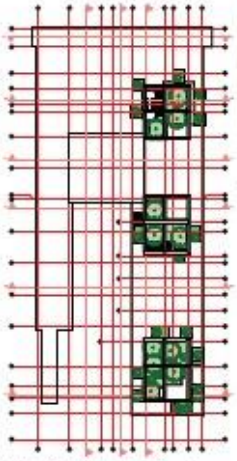




Scheme shows where observation deck is located in the complex. Made by the author.

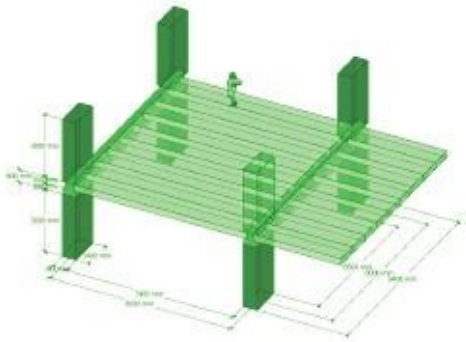
View from residential observation park (marked as number 1 in the scheme). You can see oldtown and Kestucio street in this visualization. Made by author.

View from public observation park toward Parodos hill. (exact location can be seen in the scheme marked as number 2). Made by the author.



13th floor M 1:200; shows observation parks. Two upper parks are open for public but lower block is completely private for residents of apartments block.

Technical solutions. First scheme shows how construction elements are put in together. Second scheme shows hybrid constructional system, where first 4 floor will be made from demolished and re-used reinforced concrete and other floor will be completed using CLT wooden construction elements.

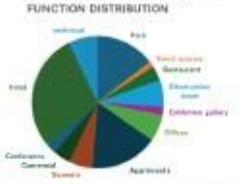


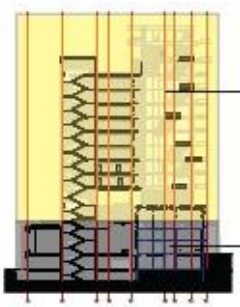
Funtional zoning. To find exact quantities needed a design program was creates which compared two previous most influencial proposals for "britanica" hotel. These suggestion then have been compared to public and experts opinions. Finally, client's needs were put into consideration. This analysis created minimal, good and perfect planning goals. At the end almost every minimal target was reached (reached or exceeded targets marked in green, yellow shows targets which have not reached minimal requirements.

"BRITANICA" HOTEL'S REGENERATION PROJECT'S DESIGN PROGRAM

Architects / Functions	1988 m. A.Paulauskas Program (existing, not planned)	2010 m. G.Natkevičius program	2024 m. T.Zylevičius program	2024 T.Zylevičius design
Hotel (room sizes, number) + additional functions (lobby, restaurants, kitchen, spa, gyms, massages, offices, conference, technical, others.) Room ceiling height	7010m2 (30-40m2 / 201 vnt) +1210.65 m2 2.5m	5085m2 (22-234m2 /213 vnt) + 2705 m2 (1900;0;233; 0;70;0;0;529;481; 400;1337.5) 2.8m	Min 4033 m2 (20-160 m2) Min 150 vnt Good 200 vnt Perfect 250+ vnt +1000 m2 (150; 500; 150; 0; 30; 500; 500;)	3939m2 22m2 – 50 30m2 – 51 40m2 – 6 80m2 - 1 110 rooms +2500m2
offices	0 m2	1503.06 m2	Min 1000 m2 Good 1540 m2 Perfect 2030 m2	960 m2 6 offices x 160 m2
Apartments (sizes)	0 m2	0 m2	Min 2000 m2 Good: 2500m2 Perfect: 3000 m2 (20-160 m2)	3939m2 30m2- 32 40m2- 6 50m2- 9 110m2 - 1
Commercial (coffee shops, markets, bars)	0 m2	0 m2	Min 500 m2 Good: 1000 m2 Perfect: 1500 m2	635m2
Event spaces (conferences, museums, exhibitions, galleries)	0m2	0 m2	Min 500 m2 Good: 1000 m2 Perfect: 2000 m2	1489m2 + 1600m2 (park on roof)
Parking (number of spaces)	n.d.	4614.51 m2 (200 vt)	Max 4033 m2 Min 150 vt Good 250 vt Perfect 400 vt	5939m2 175vt
Fire staircases	3	0	Max 6 Good 4 Perfect 2 or less	4
Corridors (%)	4440m2 (35%)	2033 m2 (16%)	Max 15% Good 12% Perfect 10% or less	1393m2 (10%)
Height	46.77m	36.35m	50+ m	68m
Total area (with area underground)	12883.65 m2	13883.54 m2 (17275.06 m2)	Min 10.000 m2 Good 12.000 m2 Perfect 15.000 m2 (14.000 m2)	12.000 m2 (17.000m2)

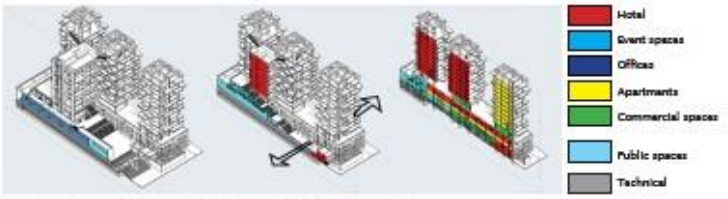
FUNCTION DISTRIBUTION



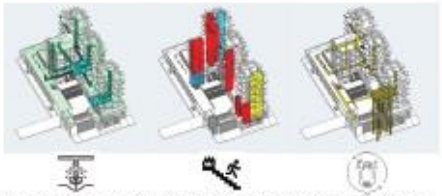


CLT wooden construction. Columns 1400x600mm

Reinforced concrete construction. Half re-used after partly demolition.



Schemes show how different functions are distributed in the complex. Made by the author.



Scheme shows preliminary engineering solutions for the complex. (left) watering system – pipes connecting to the facades, filtration systems and reservioirs, (center) fire-staircases and how they are distributed between different functions, (right) geothermal heating system. Made by the author.

South facade. M 1:200. North facade. M 1:200. East facade. M 1:200.