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Bridge Hotel

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Chapter 1

Introduction

1.1. Abstract

Idea for this master thesis comes from passion for Contemporary architecture and design. That is the key sentence which explains approach and methodology for research. Main goal was to explore and find out right answer how to build a Hotel above the river.

Bridge Hotel is a hybrid, combining bridge and hotel in one building. Location is on the Danube river lake in Vienna, so it was great inspiration for making a good project.

First and most important task was: find a good and unusual design; it must be good looking shape. That includes finding best compromise between location, users, and concept. Finding a harmony between nature and built structure, that is the key issue in this master thesis.

During a research it was real challenge to invent design which allows free space over the river, connect two river banks and build a hotel above the Bridge and river. Essential of construction was motivated by aviation engineering and yacht design. It was several months spent until is best solution founded. Solution includes logical connections for visitors, separating staff and guests, right position for rooms, restaurants, kitchen, choosing the best materials for construction and finally, finding the way how to connect Bridge and Hotel in one simple but stunning structure.

This master thesis tries to show that engineering and art together combined in one make Design. Great Design is Art.

1.1. Kurzfassung

Die Idee dieser Masterarbeit kommt aus Leidenschaft für die zeitgenössische Architektur und Design. Durch diesen Zusammenhang erklären sich der Ansatz und die Methodik der Forschung. Das Hauptziel war die richtige Antwort zu erkunden und herauszufinden, wie ein Hotel über dem Fluss zu bauen ist. Bridge Hotel ist ein Hybrid, das Brücke und Hotel in einem Gebäudekombiniert. Sein Lage befindet sich am Donauufer in Wien. Es war also eine tolle Inspiration für ein gutes Projekt. Erste und die wichtigste Aufgabe war: ein gutes und ungewöhnliches Design zu finden; es musste eine gut aussehende Form sein. Dazu gehört das beste Kompromiss zwischen Standort, Benutzer und Konzept zu finden. Eine Harmonie zwischen der Natur und der gebauten Struktur zu finden, das ist die zentrale Frage dieser Masterarbeit. Während dieser Forschung war es eine echte Herausforderung, das Design, das freien Raum über dem Fluss ermöglicht, zwei Flussufer verbindet und ein Hotel über der Brücke und dem Fluss baut, zu erfinden. Der Bau wurde durch die Luftfahrttechnik und das Yachtdesign motiviert. Es waren mehrere Monate, bis die beste Lösung konstruiert wurde. Die Lösung beinhaltet logische Verbindungen für die Besucher, eine Trennung von Mitarbeitern und Gästen, die richtige Position für Räume, Restaurants, Küche, eine Auswahl der besten Materialien für den Bau und schließlich die Suche nach der Art und Weise, wie man die Brücke und Hotel in einer einfachen, aber atemberaubenden Struktur verbindet. Diese Masterarbeit versucht zu zeigen, dass Technik und die Kunst gemeinsam in einem Design entstanden sind. Die Kunst ist der größte Entwurf.

1.2 Research motivation

Light is and always will be the essence of form. Being able to control its movement and intensity, as well as to follow its natural flow, is something that has always fascinated designers and architects. Playing with light, shape and materials, making flowing form, that was a purpose and motivation of this thesis.

Core idea was to design something new, something that not exists in the World, some new type of building. Combining bridge and Hotel in one building was real good way for research new possibilities in architecture and contemporary design. Throughout developing of the initial idea, main motivation was founded in aviation and yacht design. Location is on the river, there is about 200 meters wide gap between banks, and only light steel construction can be proper for use. Through exploring types of steel construction in mechanical designs in aviation, it becomes clear that Semi-Monocoque system combined with Composite and Dur-Aluminium would be perfect design. Also composite materials because of its performance shows up as good choice for reducing the weight of building.

During developing of concept, dimensions and shape varied and have been changed hundred times, but one topic was always there: creating a good looking body. Step by step, that body becomes a fuselage of an airplane. Drawings and sketches start to show that this building would be hybrid, airplane and yacht-combined in "flying" bridge hotel. From first to final phase of sketching there was two motives sky (flying, airplanes) and water (yachts). Location on the Danube Lake Donauinsel was the most perfect for such extraordinary architecture.



Fig. 1.1 Airbus A 380



Fig. 1.2 Mythos 122

1.2 Research motivation

The greatest motivation for this master thesis was found in my passion for car body design. All my methodology and approach to work on thesis is based on principals which are common for car body design, yacht design, airplane design and architecture. My approach start from theory that every of those kind of design (cars, yachts, airplanes, architecture) is actually one design, and has a simple Purpose to make beauty things, make life on Earth better. It is not easy to reach, it cost thousands and thousands working hours, but the goal is the same: desirable, stunning and functional form. Especially in car body design impresses the passion for small details and relation between designers and form, it combines engineering and art in the greatest level, that is the goal which is main goal and motivation in this master thesis. It is not matter if we talk about airplanes, yachts, cars or architecture, one is common for all: beauty and stunning form. It is not simple to get form, shape colors, functionality or materials which are acceptable for all people, but it Beauty is universal value and Beauty is the same through the time and space. It is hard to achieve design which is satisfying for all, but in less it should be inclusive for most of people.

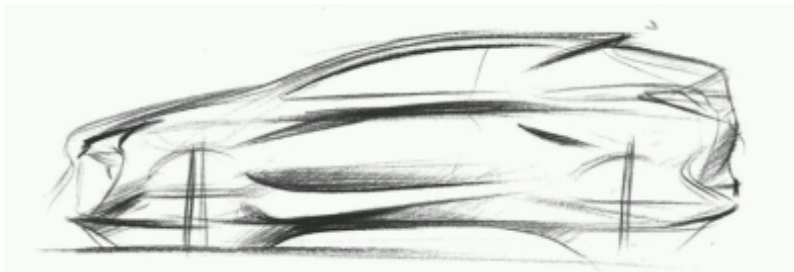


Fig. 1.3



Fig. 1.4



Fig. 1.5

1.3 Thesis organization and research methodologies

Thesis is organized in several chapters which include textual parts, Graphics, pictures, sketches and technical details. Each chapter shows research in one specific field.

For every of those research topics was spent a lot of time, including research in various books, magazines, internet web sites and technical brochures.

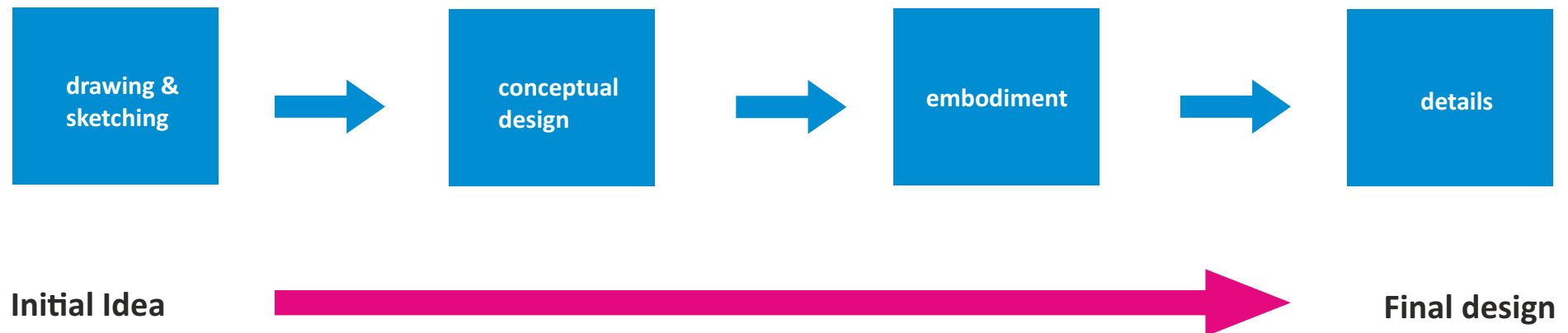
It was pleasure to collect new Knowledge about steel construction used in aviation Engineering and apply that in this master thesis.

Every specified chapter shows different views on topic, from different source combined with my own researches and collected experience throughout this thesis. It is organized to be easy for reading and simple to understand the essence of researched fields.

Aim of this master thesis was to explore new possibilities in architecture, new kind of design and the most important new hybrid structure made of Semi-Monocoque construction.

Main research was made in probe with shape and embodiment, because location is specific and requires sensitive approach. It was made thousand sketches and thousands 3d model experiment until final design is chosen. During those experiments it as supported with a lot of working hours reading about steel construction and high-tech airspace technology which could be applied in architecture.

New insights were brought to every chapter and with simple methodology were processed to show possibilities of materials and construction in design. Accent is pointed on using materials from airplane engineering and shipbuilding in contemporary architecture, and trying to find best solution how to connect hotel and bridge with simple, clear and functional connections.



1.4 Key Issues

Who? - Who are the users of the Hotel and the Bridge?

“Users” it’s the most important issue, we have to know for who we build something. Who are users and visitors, that is the first Input for initial idea for every design.

Answer:

- This Hotel is planned as a upper mid range category of service. It should be remarkable and interesting destination for various tourists which want to enjoy the view over the Danube river and stunning view to city of Vienna.
- This Hotel is not type of luxury seven stars Hotels, this hotel is acceptable for wide range of users, but of course it is not the cheap one.
- Bridge is actually extending of green park zone and represents the ambient of Hotel in level of river banks.
- Bridge is not provided for public traffic, it is planned just for pedestrians, bicycles, delivery and service vehicles (police, ambulance, firefighters).
- Bridge should be attractive for people who use the river for recreation and easy for use (walking, driving a bicycle and other types of recreation)
- **Accessibility for all:** Bridge and Hotel should be without barriers so it should be accessible for people in wheelchair.
- Bar on the Bridge and restaurant above should attract people from all parts of the city, especially at the weekend and at good weather time. Location is good connected with traffic, there is a lot of parking places, that is good proposal for people to come.

1.4 Key Issues

What? – What is the essence?

What is special about this hotel, and what 's distinguishes this hotel from other hotels? What is the reason that someone choose this hotel?

Answer:

- First impression should be unusual and remarkable shape and look like Hotel is some flying yacht above the river, something that looks like airplane and yacht.
- Whole structure looks like hybrid structure: half a building and half an airplane flying above the river.
- All structure is combined with bridge throughout with central pylon and make the outlook like from science fiction movie. That should be story of this concept and master thesis.
- Also unusual solution of connecting a Hotel and central bridge pylon with steel wires is unique in World now and should attract more guests to come, because more spectacle makes more attention, and more attention makes more guests arriving.
- Very important part of design is a hotel room. Every of twelve rooms have beautiful view on the river from every corner, including natural light in the bathrooms (which is rarity in most hotels worldwide).
- Finding a harmony between nature and built structure, unusual and inovative design, good looking shape, pleasant colors and materials, are the essence of this concept.

1.4 Key Issues

When? – When is the moment the concept is consumed?

Time of performance is the core of every good story, so with the design is the same.

Answer:

- Location is mostly good visited during every month in year; just in winter is a bit less because of colder temperature and wind. So time for performance is every day in year. Location is close to urban area surrounded by park and green area, so Hotel will be remarkable and attractive all the time, especially during the weekend.

- River banks on that location are well connected with other parts of town and very good equipped with pedestrian and bicycle pads so bar on the bridge will be perfect destination for recreation trips and break from downtown noise, crowded bars and restaurants

How? – How it will be made?

One of the most important issues is a material. Materials used in design are directly connected with users and materials are interface between design and our senses.

Answer:

Big width of the river has requested appropriate construction. As stated above, it was searched for design that not closes the perspective and visually block the view on sky and river. As appropriate materials shows only steel and solutions used in airplane engineering called Semi-Monocoque construction.

1.4 Key Issues

Why? – The purpose. Why is it important?

Aim and purpose are in the same way goal and task in architecture. It is hard to achieve, and only validate proof of good invested energy in some project is when it justified the purpose.

Answer:

- ‘ ‘ Make attention and money comes ‘ ‘ it could be appropriate quoits as a answer to this issue. Making something that is different from other is enough good reason to chose remarkable design for this Bridge Hotel. If we look on contemporary trends in worldwide architecture, we can see that spectacular architecture (unusual and spectacular form) is the best advertisement for every hotel.

Where? – Where is the location?

Location is the first and core input condition when concept is initializing, it is a main requirement throughout all design process. For this concept of the Bridge Hotel first condition was the river. Width of river has directed the type of construction and function displacement of the hotel.

Answer:

- Location is in Vienna, on the New Danube (Danube river)

- Approach to Bridge, connections with the streets and urban surround were crucial for design. Connections with park and green area on riveer banks were leading references for bridge design.

- During development of idea was always thought about perspective from ground, it was searched for design that not close the perspective and visually block the view on sky and river. Location will be analysed with more details in the next Chapter.

Chapter 2

Bridge as a Masterpiece of Human Creation

2.1 Bridge

"Of all the things created and built by humankind as a part of life's effort, nothing in my mind is better or worthier than bridges. They are more important than houses, more sacred, and more universal than temples. They belong to all and treat all alike; they are useful, always built for a purpose, at a spot where most human needs entwine; they are more durable than other buildings and serve no secret or evil purpose.

They are all essentially one, they are equally worthy of our attention, because they show the place where humankind encountered an obstacle and did not stop before it, but overcame and bridged it the way humankind could, according to understanding, taste, and circumstances." [1]

[1] The Bridge on the Drina , Nobelprize awarded novel
author: Ivo Andric (1892 - 1975)

A bridge is masterpiece of human creation built to span rivers and other obstacles, and great thing is that bridges don't close the way underneath (valley or body of the river) for the for the purpose of providing the way over them. There are a lot of different type of bridges and every of those designs have specific purpose and it is used for different situation. Function of the bridge is affected on design of bridges, also type of terrain, plot and location where is constructed, type of soil where is anchored, and material as the biggest input in design process. When humans made first bdriges they made them from wood and stones, and they were simple from simple construction and crossbeam structure. Common structures used in early bridges were wooden sticks, long reeds and other types of harvested fibers woven together which form ropes capable to connect and support together the materials used in construction.



Fig. 2.1 Ivo Andric in front of the bridge on the



Fig. 2.2 The Bridge on the Drina

2.2 Bridge type

We can categorize the bridges in few different parts. Usually we categorize bridges in way of structural elements, are they fixed or movable, what is the purpose-what they carry and which materials are used for construction. In this thesis will be categorized only by structure in construction.

Beam bridges are at each end of bridge structure supported by horizontal beams. They can be supported in simple way with beams connected across a single span, or in continuous way when beams are constructed in two, three or more spans. When is constructed with more spans, than is the supporters between span called as pier. In first beam bridges there were not complicated logs which is constructed across streams and other structures of bridge. In contemporary beam bridges, construction can vary from small scale wooden beams to very big scale steel construction (beam steel-boxes). The force from vertical elements becomes shear and flexural load on the construction of the beam, and it is further transferred to down substructures on parallel sides. They are mostly constructed from wood, steel or concrete. In structure there could be constructed from many supporting beams placed side by side with a deck plane above them, in direction to main beam and also side support to deck which is between them. Form of main beams could be in I-beam, box girders and trusses. Construction of them could be half-through or braced on all over top in way of creating through bridge. In reason that no moments are transferred, there is no way to accommodate thrust as from an arch bridge, and making innovative construction such is bow string arches and lenticular trusses which provide horizontal forces all through construction. Beam bridges are not often constructed to span more than 80 meters. This distance is not limit or restriction, so beam bridges should be designed in joined construction, creating the form of continuous span.

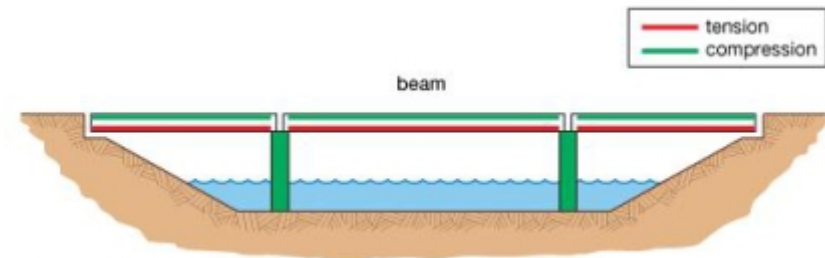


Fig. 2.3 scheme of beam type bridge



Fig. 2.4 Confederation Bridge, Canada

A truss bridge has a truss as load bearing construction. Connected structure elements are forming triangle units which are joined straight together. They could be stressed from compression, tension or combined together in response to dynamic forces. This type of bridges are some of the oldest types of modern constructed bridges and mostly have simple design which are designed by engineers in last century. This type of bridge is all around world the most popular owing to its economical and constructional efficiency.

Thanks to Newtons laws of motion and its application, the structure of a truss allows design and analyze modern truss bridges through physic and statics. For that aim of analysis, trusses are imagine to be jointed in connection of straight components. This assumption predict that units of the truss will be response just on compression or tension. Those units-components are: Diagonals, Verticals and Chords. In the type of Vierendeel truss must be achieved more sophisticated design and analyze for rigid joints to carry out big bending loads on the construction.

There is large variety of truss bridges thanks to the ability to carry out forces in various ways. When wood is used for construction than design may be more advantageous when we use wood for compression while other sorts of materials have different purpose. Modern materials such as steel, prestressed concrete are perfect for use in truss bridges. Steel is very resistant I durable material, and is very suitable for relieving the bending and shear. Prestressed concrete in combination with steel pellets is excellent choice for design of modern truss bridges. The most used type of truss bridge are: Allan Truss, K truss, Long truss, Baltimore truss and Bollman truss.

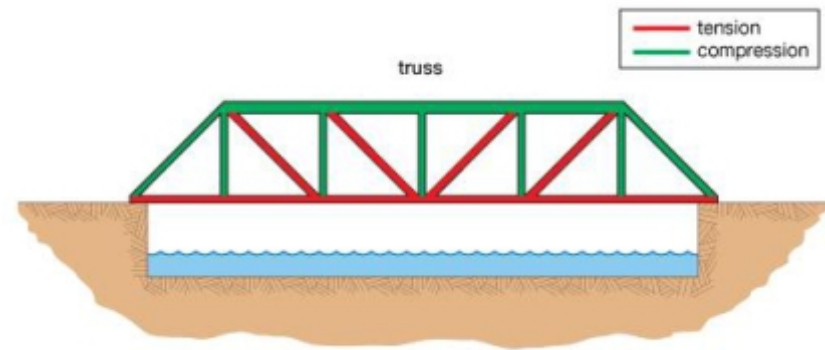


Fig. 2.5 scheme of truss type bridge



Fig. 2.6 Truss bridge

Cantilever bridges are constructed using horizontally positioned cantilevers beams which are anchored on only one end. In common they are designed to use a pair of continual spans which extend from different sides of supporting piers to join at the center of the bridge span. Cantilever bridges are designed using same materials and technology as beam bridges. In way of forces which are stressed through the construction there is difference between those two type of bridges.

Cantilever bridge is constructed using cantilevers which are structures projected horizontally over obstacle, supported by only one edge. Simple cantilever bridges we can use for small footbridges, and they are constructed from simple beams. Larger cantilever bridges which are designed to carry highways and railways, they are designed of prestressed concrete box construction, or strong structural trusses made of steel. Usually designing of cantilever bridges is in principal of balanced cantilever, that means steel truss or prestressed concrete beams cantilever spans are counterbalance each cantilever arm with opposite cantilever arm, forming a balanced cantilever structure. When they are attached to hard solid base (foundation), they are named as anchored arms. In bridges which are built on two base piers, there are projected four cantilever arms. Two of them are connecting and span the obstacle and more two are extending the next gap from the obstacle. Bridge foundation pier often is designed in shape like a tower in response of more balanced cantilever support and more strength for bridge superstructure. Tension of upper units and compression of lower units are carried by massive steel truss cantilevers. Construction distribute the tension through anchor arms to the outer support, and compression is distributed through foundation. Common for all types of cantilever bridges is segmental construction.

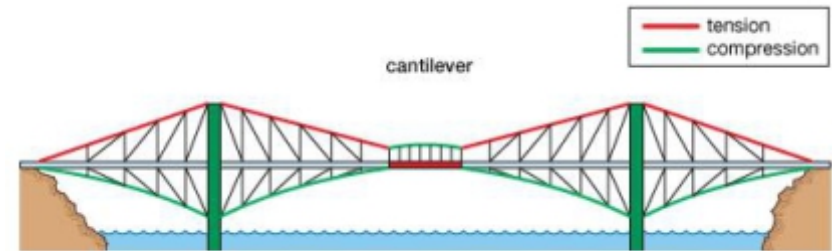


Fig. 2.7 illustrating principle of cantilever bridge



Fig. 2.8 Living model illustrating principle of the Forth

Arch bridges are specific type of bridges and they have arch abutments at both sides. Whole weight is carried by those abutments. First known arch bridges were constructed in ancient Greek. Specific of so called abutment is that is shaped as a curved arch. This type of bridges transfer the weight of construction elements through horizontal thrust dispersed on the abutments at sides. Longer and bridges with bigger spans can be designed with more arches, combined with other modern materials used today (prestressed concrete and steel construction). In common for alternative can be used brick and stones, but those materials are not suitable for much tension forces, and main characteristic of arch bridges is that the masonry arch bridges are projected for constantly compression force.

In process of building, each arch is built over a falsework frame which is temporary, and this process is known as centering. Important is that key stone in the middle of the bridge join the weight of two sides of bridge. It is interesting that if we put more weight on the bridge, structure stability grows, and bridge is stronger. For construction of arch bridges there is use of fill materials known as 'dead weight', which is filled over arch. That weight gives more stability and ensure tension from moving of arch rings caused by loads moving through the bridge. In past are used many materials such as rocks, stones, brick and unreinforced concrete. When is used masonry brick and stones, they are built together and mortar is planned to set before removal of falsework. Masonry arches are generally durable and resistant to settlement or undermining. In compare to modern bridges, arch type bridges are very heavy, requiring extensive foundations. Arch bridges are also expensive to build and they are in last decades suppressed by other types of bridges.

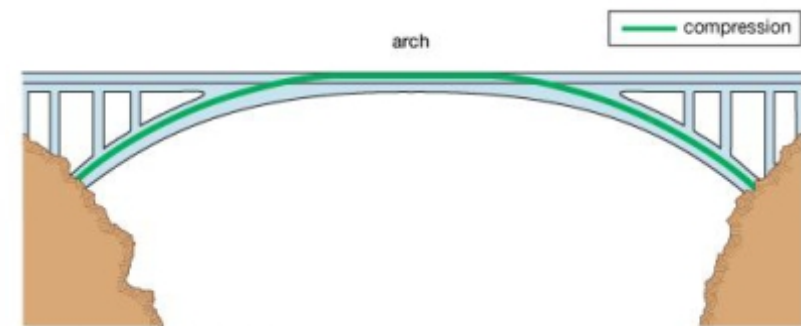


Fig. 2.9 Arch bridge



Fig. 2.10 Solkan Bridge, Slovenia

Suspension bridges are type of bridge which are suspended from steel cables. First suspension bridges were built from vines or ropes combined with bamboo pieces. Modern construction of suspension bridges, design is based on steel cables which hangs from towers and those towers are founded to cofferdams or caissons. Those cofferdams and caissons are anchored deep in to the underground below river or sea. There are many sub-types which includes simple suspension bridges, underspanned suspension bridges, ribbon suspension bridges, the deck suspended bridges and anchored suspension bridges. Common for all those types that main deck is haged between vertical suspenders.

Main form of suspended bridges in architectural view comes from cables suspended among main pylons – towers, and vertical suspender cables which carry whole massive weight of deck. Deck could be use for foot traffic, highways, railways or installation pipe-bridges. Suspended bridges are often built and constructed without any falsework.

Crucial condition is that suspension cables have to be anchored at each end of bridge span before main cables are loaded with some weight transferred into tension. Across the pillars are strong cables continued to the decks and further is connected with ground through anchors. Deck (roadway) is carried by strong vertical suspender cables which are called hangers. In some designs of suspended bridges, the tower is projected direct on a edge of river or canyon, where the road going to the main span, in other possibilities bridge will have two smaller spans projected between pair of pillars and deck is carried by under construction which could be made of prestressed concrete or truss construction. One of the best known suspension type bridge is Golden gate bridge in San Francisco, USA.



Fig. 2.11 Suspension bridge



Fig. 2.12 Golden Gate Bridge, USA

Cable-stayed bridges are similar to suspension bridges and they are carried by cables. For their construction is required less cables and towers are bigger and higher. Usually construction of cable stayed bridges is designed with two or more towers, and those towers (pylons) are main support construction for bridge roadways (decks). Characteristic purpose of the cables is that they are connected directly from decks to the pylons (towers), and they forming parallel lines pattern or fan shape vertical form. Main difference between cable stayed bridges and suspended is that by cable stayed bridges cables runs directly from tower to bridge decks (roadways) and by suspended bridges cables which carries the deck are vertically suspended from the main (two or more) cables which are connected (anchored) to river banks and running between pylons. For shorter spans we can use cantilever or beam bridges, but for longer spans there is optimal use of cable stayed bridges, but cable stayed bridges is usually used for shorter spans than suspended bridges. For smaller spans cantilevers bridges are optimal up to some distance, after they become too heavy if span is growth, and for suspension bridges there is optimal span which is really big length, so there is conclude that for some mid-range spans only economical and optimal solution is cable stayed bridge. There are four main types of rigging on cable stayed bridges. Mono design use a one single cable from pylon tower down to bridge deck. Harp design is called also parallel design and cables are parallel connected from pylons down to bridge deck. Fan design is type where cables are passing from one point over top of pylon and connected down on bridge deck. Fan design is best solution with minimum moment loaded on the pylons, but in service is not practical for maintaining. Star design is rare design and the cables are displaced apart on tower but connected in one point on the bridge deck.

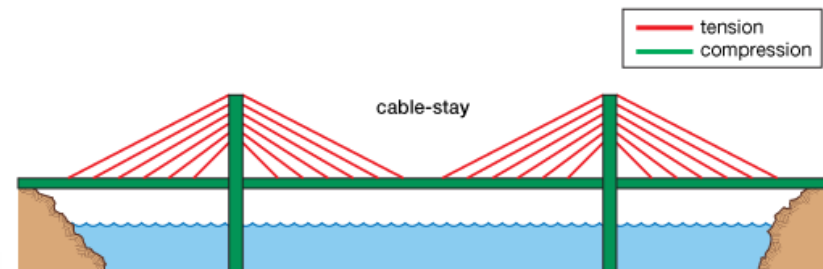


Fig. 2.13 Arch bridge



Fig. 2.14 Yokogawa Bridge, Japan

2.3 Bridge as Architectural presence in Art

Bridge as a phenomenon in Art can play many roles:

- As a main focal point and inspiration for some book, novel or movie
- As a metaphor for some painting, music or poetry
- As a work of art itself, like architectural inspiration
- As the main subject in photography or painting
- As model for other such as sculpture and other fine arts

In modern architecture bridges are often used as a place for sculpture and art. Very popular on bridges was figures of animals, especially figure of Lions, which are serving as guardians of bridges. In history there is well known example of Marco Polo Bridge on China (1192) and Four centre street bridge in Calgari, Italy (1917).

Bridge can symbolize in some way approach to transition in dreams, in some kind of over-psychological imagination. Bridges are Symbol of crossing in new way of life, new style in life, new possibilities or passing from one meaning in to something what is opposite to first reality.

Meaning of bridges can be viewed from many of aspects, in first it is crossing over obstacle, crossing the river, crossing in to some new country, to new strange civilization, or escape from some undesirable situation to new chances. Bridge can be critical juncture in life, also in real life and in literal meaning. Bridge is also when change our life through changing our bad habits, or trying to become better person, bridge is when we get married and crossing through bridge of life in new born and holy partnership called Marriage. And we can not forget first and crucial meaning and that is birth, crossing from unknown world to this, or bridge from womb to real existence.



Fig. 2.15



Fig. 2.16

In many movies there is presence of Bridges as crucial moment in plot of movie. Usually bridges are represented as literal point of artistic view on ordinary life or otherwise in imaginal futuristic view. We can talk about many where in the middle of movies happens big explosion of bridge and train fall down into river. That moments could be described as most exciting for viewers. From that we can conclude that Bridges have great meaning for human beings, we all admire the bridges, bridges are our need, purpose, goal, and bridges make our life on Earth possible. It is particularly interesting how is Golden Gate bridge represented as an Icon of Pop Art. From its opening in 1933, that bridge is all time inspiration for artists. As Architectural masterpiece it is kind of spectacle, and it is attracting millions of tourist every year. It is more than architecture, but for all other bridges we can say the same: Bridges are more than life. In many cultures bridges are very important part of culture. Many rituals are connected to bridges, and Bridges are Connect or Wall to other cultures. Also we can see that many state borders are drawn exactly through river and bridges. That is the reason why are many countries and armies made the wars for bridges. In many wars, and many circumstances, bridge has a meaning of life or death. From that real situations was born influence to art (movies, music, paintings etc.). It is really hard to notice numerous movies which glorify Bridge as a main creation which was built by human hands. In some movies story is about relation between Bridge and War, or some examples where some big monster or some natural catastrophe hits some bridge and make life impossible.

So we can conclude that Bridge is main point in functionality of modern civilization. Bridges have great role in society, and Art will always recognize Bridge as a masterpiece of Human Creation.

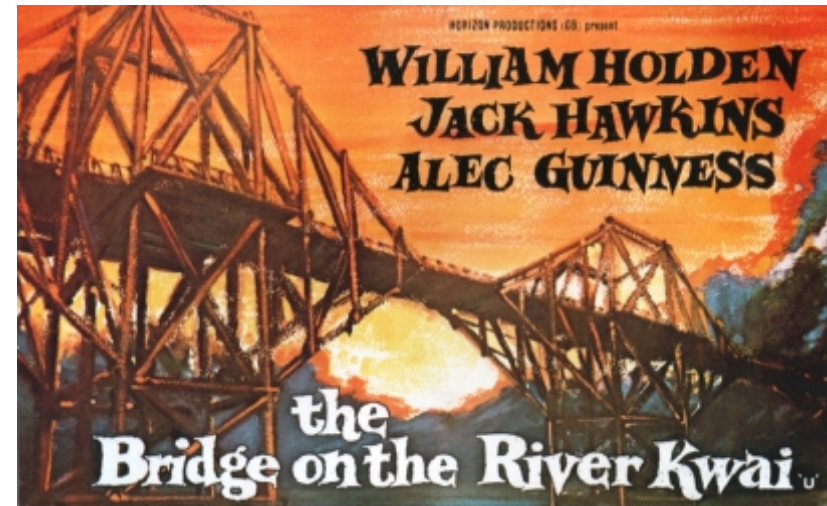


Fig. 2.17



Fig. 2.18

Bridge as a Barrier



Fig. 2.19 civilians flee over military pontoon bridge, Korean



Fig. 2.20 Between East and West, Berlin Bridge barrier, during the

Bridge on movie screens: The Golden Gate Bridge, icon of Pop Art



Fig. 2.21



Fig. 2.22



Fig. 2.23



Fig. 2.24

The Greatest of the great: Golden Gate Bridge



Fig. 2.25 - The Golden Gate Bridge is an example of suspension bridge and it spanning the Golden Gate channel between San Francisco Bay and the Pacific Ocean. The structure connect the American city of San Francisco, California – the northern tip of the San Francisco Peninsula – to Marin County, linking two U.S. Route 101 and California State Route 1 across the strait. The bridge is one of the most internationally recognized symbols of United States.

The "Infinite Bridge" is special designed bridge for the "sculpture by the Sea" festival in Aarhus and architects were Gjøde&Povlsgaard. This festival is the biggest and most specific outdoor exhibition of sculpture. Dimensions of this bridge are about 60 meters in diameter, and circular spans hovering over azure blue water of beautiful bay. Location of the bridge is sited near the popular quay and it is well visited and accepted from locals. It is interesting by this bridge that when visitor walk on the deck it has feeling like walking on the water surface, it encounter surrounding landscape, water and bridge underneath in one feeling, in one stand point. Panorama on site is wonderful, the unparalleled sightseeing point, height and depth above the water offer a unforgettable panoramic view like anywhere else. On this infinite bridge it is possible view the city and the bay in the same endless panoramic perspective. Architects gave the best opportunity to immerse in landscape and nature, and enjoy from this unusual infinity bridge. During the tide, visitors can feel the waves on foot, or they can put their toes in the water, and it is really interesting that this bridge have not any rail. In the same it is attraction, there is more intimacy with the landscape and nature, but in the same it could be dangerous for non-swimmers. But any way, this is beautiful architectural composition. Structure is really simplified and it is built piece by piece off site. Structure is made of wood and it is consist of sixty large units, each 2.5 meters wide and 3.15 meters long. Weight of those units was about 250 kilograms. Building process is predict on-site montage at the beach. Diameter is 60 meters and circumference measure 190 meters. Main aim and purpose of this project is renew contact between the gulf, coast, jetty from one side and city and visitors on other side. From the Bridge deck, visitors can experience the bay, sea, forest and all surrounding landscape in one endless panoramic view.



Fig. 2.26 Circular infinity Bridge, photo:



Fig. 2.27 Circular infinity Bridge, photo:

2.4 Bridge as Ambiance in urban context

Bridges are some of the most magnificent and glorious marvels of design and engineering. They connect opposite river banks, towns, countries and societies. Bridges and their constructors are also leaders in innovative design and building systems. Every of the bridges in the modern world are constructed to be enough strong to endure all wetter conditions, climate change and natural catastrophies. They carry roads, and meaning of the roads for all people is the most important society issue in all circumstances. During day or night, summer or winter, in peace or war, there is always meaning of bridge as the most important creation made by human hands.

Through history and development of urban structures and cities bridges always played crucial role. Since ancient Babylon when is spanned Euphrates river, connecting the two sides of one metropolis city, bridges becomes dominant point in every city and urban developing plan. Without bridges urban structure would be limited just on one side of river banks. We can imagine modern world and modern cities without bridges. Bridges gives new possibilities for progress and new dimension of urban structure development. It will be very interesting to see how will be bridges in future develop and lead to new progress in design and architecture. In future development of bridges will be permanently included traffic issues and developing of transportation progress.

Today modern bridges carries roadways, railways and combined function, but in future it will be impacted by discoveries of some new kind of transportation. Maybe new kind of drones would reduce meaning of bridges. But one is for sure, for long time bridges will be the most important infrastructural building.



Fig. 2.28 Conceptual rendering



Fig. 2.29 Cirkelbroen Bridge, Denmark

Apart from engineering challenges, the primary contextual issue is that a bridge high enough to avoid obstructing the flow of under traffic (maritime, river), and wow it will be impacted on architectural view, because ships becoming bigger and bigger, so bridges would also increase the scale. So it is issue who to keep normal dimension and ratio in compare to nature and urban context. Future bridges should be not bigger than cities itself. We can consider the Brooklyn Bridge as a well known example which was built to a height sufficient to have capacity to masts of sailing ships that still plied the East River in the end of 19th century, and which, like Nabopolassar's bridge, replaced ferry services. As one engineering marvel, this bridge was over and above so massive that its approaches reached deep into the heart of Manhattan, overshadowing many urban blocks and requiring the demolition of some other blocks. In Europe, where water parting care to be smaller than similar in North America, main rivers narrower and where many bridges had been built long before the invention of suspension or steel-truss technology, a much more additionally design has long predominated. Better than sending approaches deep into the urban structure, cities in Europe tries to raise masonry embankments directly against the river, allowing a bridge even of essential height to discharge traffic directly onto riverfront banks. Bridges in Europe were also calculated as architectural works in their own right intended to be experienced on foot, and incorporated with sidewalk, sidewalk lighting, sculpture, benches and other pedestrian facilities. Running along those facilities at just few steps above water level are often found quays, which was before served the shipping trade but which today have been converted to roadways or areas for recreation, patio for cyclists and pedestrians. In some examples, the city itself extended out to the bridge, turning transportation infrastructure into a bustling city street with shops and homes (Ponte Vecchio and the Rialto Bridge).



Fig. 2.30 Brooklyn Bridge, USA



Fig. 2.31 Rialto Bridge, Venice, Italy

2.5 Bridges in Vienna

In City of Vienna there is **1,716 bridges**. It is the true fact that Vienna has four time more bridges than Venice. Bridges in Vienna are part of urban ambience and architecture, and with many historic fountains, sculptures and parks, make this city one of the most livable cities in the world.

As a city on the Danube, Vienna has numerous bridges:

- 10 bridges over the Danube
- 32 over the Danube Canal
- 40 over the Wien River
- 271 U-Bahn bridges and many more.



Fig. 2.32 Empire Bridge Vienna



Fig. 2.33 Rossauer Bridge



Fig. 2.34 U-Bahn Bridge



Fig. 2.35 Donaustadt Marina Bridge



Fig. 2.36 Aerial View to Danube river and



Fig. 2.37 Viennese bridges and Danube river at night

Chapter 3

Hotels and Tourism

3.1 Hotel

Hotel is building which provide paid lodging on limited time basis. The first hotels were the Inn of medieval Europe. From the mid-17th century, coaching inns were a place for lodging for coach travelers. Slowly, Inns began to provide to richer clients in the mid-18th century. One of the first modern hotels with modern facilities was opened in Exeter in 1768. Hotels wererapidly built throughout North America and Western Europe in the early 19th century, and luxury hotels began to build in later part of the 19th century. Abilities provided in modern hotels could be in range of small room with low quality beds up to high range luxury apartments with huge beds, private swimming pool and similar luxuries. Facilities which fallows some hotel are: entrance lobby, bars, restaurants, kitchen, casinos, swimming pool, congress rooms, sport facilities and many other guest services. Small, lower-priced hotels are able to offer only basic guest facilities. Bigger and luxurious hotels may offer many more service and advantages. Also larger and much more priced hotels usually offers additional services such as business centre, press centre (with internet connections, computers, printers and other office equipment), childcare, sport facilities like tennis or basketball courts. Hotels room are numbered or named with specific name, so guest can easily identify the room. Some hotels have specially decorated rooms. Those rooms can be custom designed with special furniture, with special board arrangements and IT equipment such as special desk for business, with special computers, special light appliances, and numerous other devices which improves comfort in room. There is also numerous types of hotels, and they will be certainly described in next pages, but we have mention one extra ordinary type and that is Japanese capsule hotel which provides a small capsule-room only for one person sleeping and shared bathroom with other capsules.

Hotel services vary in function, size and costs. Many hotels and companies for hospitality have certain standards to determine and classify hotel types.

Job positions, hierarchy and organizational chart is different in every hotel and hospitality service. It varies in hotel type, function and rating (class). Also it is in connection with ownership and main managing crew.

In common, hotels are run by main hotel establishment and General Manager, who is head executive officer. There is also various department heads and they administrative staff, middle managers, and line level supervisor.

Highest profession in hospitality and hotel industry is hotel management, and it is worldwide accepted career field and academic field. Hotel managers are well prepared and certificated in universities and they are prepared for hospitality practice. In hotels and resorts is also one very important job position and that is Concierge.

Concierge helps guests by assisting various tasks such as booking hotels, making restaurant reservations, arranging hair dressing, reservation for spa services, recommending night life clubs, booking taxi, limousines, airplanes, boats, coordinating luggage assistance, managing for tickets to special events, and assisting with various tourist arrangements of local attractions. Concierge is also responsible for assisting for sending and receiving packages.

3.2 Hotel type

Operations in some hotel can be viewed from several aspects: in size, function and cost. In common, hotels and main hospitality companies which are leaders in hotel industry, have set world wide accepted standard for classification of hotels. Main categories are:

Upscale luxury:

Best premium class of hotels is marked as Upscale full luxury hotels. They offer best service and all inclusive luxury. In Upscale full service hotels is offered highest level of service, personalized assistance and professional service accommodation. Hotels in this category are rated with five and more stars, and they are equipped luxury room, full service restaurants, heliports, swimming pools, and many other high rated luxurious facilities.

Full service:

Full service hotels are also rated with high grades, up to five stars (depends of country and local rating standards). In Full service hotels is also offered best accommodation and personal service, with modern restaurants, luxury comfortable rooms and all necessary service for this type of hotels. There are full service restaurants, swimming pools, ballroom, conference room and other luxury amenities.



Fig. 3.1



Fig. 3.2

Historic inns and boutique hotels:

“Boutique hotels are smaller independent non-branded hotels that often contain upscale facilities of varying size in unique or intimate settings with full service accommodations. Boutique hotels are generally 100 rooms or less. Some historic inns and boutique hotels may be classified as luxury hotels. Examples include Hotel Indigo and Kimpton Hotels.” [4]

Focused or select service:

“Small to medium-sized hotel establishments that offer a limited number of on-site amenities that only cater and market to a specific demographic of travelers, such as the single business traveler. Most focused or select service hotels may still offer full service accommodations but may lack leisure amenities such as an on-site restaurant or a swimming pool. Examples include Crowne Plaza, Courtyard by Marriott and Hilton Garden Inn.” [5]

Economy and limited service

“Small to medium-sized hotel establishments that offer a very limited amount of on-site amenities and often only offer basic accommodations with little to no services, these facilities normally only cater and market to a specific demographic of travelers, such as the budget-minded traveler seeking a "no frills" accommodation. Limited service hotels often lack an on-site restaurant but in return may offer a limited complimentary food and beverage amenity such as on-site continental breakfast service.” [6]

references:

[4], [5], [6] Wikipedia (2017), <https://en.wikipedia.org/wiki/Hotels>



Fig. 3.3

Extended stay:

“Extended stay hotels are small to medium-sized hotels that offer longer term full service accommodations compared to a traditional hotel. Extended stay hotels may offer non-traditional pricing methods such as a weekly rate that caters towards travelers in need of short-term accommodations for an extended period of time. Similar to limited and select service hotels, on-site amenities are normally limited and most extended stay hotels lack an on-site restaurant. Examples include Staybridge Suites, Candlewood Suites, Homewood Suites by Hilton, Home2 Suites by Hilton, Residence Inn by Marriott, Element, and Extended Stay Hotels.” [7]

Timeshare and destination clubs:

“Timeshare and Destination clubs are a form of property ownership also referred to as a vacation ownership involving the purchase and ownership of an individual unit of accommodation for seasonal usage during a specified period of time. Timeshare resorts often offer amenities similar that of a Full service hotel with on-site restaurant(s), swimming pools, recreation grounds, and other leisure-oriented amenities. Destination clubs on the other hand may offer more exclusive private accommodations such as private houses in a neighborhood-style setting. Examples of timeshare brands include Hilton Grand Vacations, Marriott Vacation Club International, Westgate Resorts, Disney Vacation Club, and Holiday Inn Club Vacations.” [8]

references:

[7] Wikipedia (2017), <https://en.wikipedia.org/wiki/Hotel>

[8] Wikipedia (2017), <https://en.wikipedia.org/wiki/Hotel>



Fig. 3.4



Fig. 3.5



Fig. 3.6



Fig. 3.7



Fig. 3.8



Fig. 3.9

Hotel New York is located in Rotterdam, in the beautiful former head office building of the Holland America Line (Shipping Company). From this place emigrate thousands of people, they left for North America, hoping for a better new life. It was so long time ago, and nowadays, people come in this hotel to celebrate, eat, drink, sleep and do business in beautiful atmosphere. When guests enter the building, they can feel that it is the place where all it happened, all travelers and emigrant experience and hope for new life. There is all around sense of nostalgic memories, many photos of emigrants, rough iron hotel staircase, numerous trunks and traces of past time travelers.



Fig. 3.10



Fig. 3.11

3.3 Tourism

Tourism - as economic and social phenomenon

We can say that tourism is traveling for sightseeing and pleasure, or traveling for business. Also tourism is attracting and accommodating people to come and visit some place, and most important issue is who to entertain guests. Tourism is separated on domestic and international tourism. Officially, the World Tourism Organization generally explain tourism like a activity witch main purpose is holiday, and tourist are people who traveling out of their usual environments with an aim to see and explore other places, or traveling for just business purposes. It is really hard to define all subcategories but in generally modern tourism is more than simple holiday activity only.

We can define tourism as domestic or international, and both kind of those mentioned tourism have great influence on some country incomes. For many country, tourism plays main role in their economy and budget balance. Tourism is for many economies vital income interest and affect in all structures in society. Tourism is vital source for economy income for all countries and all regions. In response to big influence to incomes, economies and society all around the world, there is accepted one global declaration called Manila Declaration on World Tourism. Declaration is accepted in 1980 defines tourism as essential to the nations and life of society, because tourism is direct affected on social, educational, cultural and economic field of every nation. Also tourism plays great role in international affairs and relation between worldwide economies. In some economies tourism is account up to 30 % of all income and trade service. It is influenced through guest arrivals, traffic (roadways, airports), exports of goods and other tourist services.

There are many following services which benefit from tourism. There we include: tourist guides, domestic goods selling, entertainment services, casinos, shopping malls, cultural services (museums and theaters), sightseeing, cruise ships and taxi service. All mentioned services and categories produce the bigger income and make the growth of economies.

In last decades, tourism has rapidly growth and develop in diversification branches to become one of the fastest growing economic field in the world. Contemporary tourism is widely linked with population growth and economy develop, and there is constantly growing of tourist destination and attractions. These factors have placed tourism as key term for economical and social progress in most countries.

Worldwide growth of tourism in many countries has increased economic and benefits in employment and in many others related fields. Tourism produce growth in building sector, agricultural sector, transportation, and many other social and economies sectors.

In relation to tourism growth, United Nations assist and gives support to worldwide in promoting of sustainable tourism development. Income should be followed with measures that positioning tourism in ever more complex international market and global ecology issues. United Nations World Tourism Organization (UNWTO) require from all countries to support more as possible renewable energy in tourism development and promote sustainable tourism as a key issue in further growth of tourism as industrial sector.

Sustainable tourism

"Sustainable tourism is envisaged as leading to management of all resources in such a way that economic, social and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity and life support systems." (World Tourism Organization)

Sustainable development implies "meeting the needs of the present without compromising the ability of future generations to meet their own needs." [9]

[9] Sustainable tourism definition, World Commission on Environment and Development, (1987)

Sustainable tourism is connected to ecological and social carrying and further is related to cultural level in developing of some society. Sustainable tourism is involving all structures in some touristic organization in some country, and it is influenced to all tourism planning. There is also Integrating tourism developing which integrate all structures of one society in one aerial project for increasing regional economic and tourist potentials. In studying of tourism development we have to mention also negative impact of massive growth of tourism. It is most influenced on social changing and cultural negative consequences. Massive growth of tourism is related to ecology and sustainability of some biological community.

Sustainable tourism should be considered as an separate and autonomous field of economic and touristic development and growth of national income.

Ecotourism

Eco-tourism is a rather vague term that partially resembles a marketing gimmick, and partly still is supported by the behavior of tourists who consider themselves eco-tourists. In fact, it is the form of tourism in which participating ecologically conscious individuals and groups, whose actions on the environment trying to reduce the effects of what creates the so-called mass tourism. Many of them are subsumed under the concept of eco-tourism, but recently many in the region want to take advantage of its industrial underdevelopment in order to attract their territory those tourists who prefer untouched areas. But even for the arrival of these tourists need is some kind of infrastructure that many regions do not yet have.

TIES (The International Society for Tourism) once defined ecotourism as "responsible travel to natural areas that preserves the environment and improves the welfare of local people." Some basic characteristics that are related to the concept of eco-tourism and accommodation that's there and offers eco-travelers is naturally preserved areas, the use of simple forms of accommodation, strict adherence to environmental protection, including a limited number of visitors. Guest that uses this type of vacation is expected untransformed environment or partially transformed the environment, and in some ways the experience of merging with nature. With eco-tourism is often associated types of tourism such as nature tourism, rural tourism, and also agro - tourism.

Recession tourism

Recession tourism is trend in contemporary tourism which is grown from worldwide global recession crisis. Recession tourism is sort of low-range and low-cost destination but in same way high-value experience. Many recession tourism destinations became popular in last ten years and made real touristic boom. This touristic concept made many popular hot spots thanks to decreasing world job market and low living costs, so many tourists came in such places in purpose to save budget. For many tourists is most valuable fact to spend less money and get more as possible of hospitality.

Educational tourism

Educational tourism is type of tourism connected with traveling in purpose of education, learning and teaching. In modern world there is a lot of students and teachers who change their usually environments and travel to other destination in aim of education. Educational tourism is growing because of the increasing popularity of education, exploring of new knowledge and the enhancing of technical competency outside one environment. In this type of tourism, the main purpose of the tour or leisure activity includes traveling into another country to learn about the culture, study tours, or to work and apply skills learned in the classroom in outdoor environment, such as in the International Practicum Training Program. The inspiration for this type of tourism include: learning about other cultures and counties, language learning, future job opportunities, political stability, further reputation and many more.

Creative tourism

Creative tourism is grown as a branch of cultural tourism, and it is increasing rapidly in last decades. Creative tourism is developed from touristic traveling in purpose of interactive educational aim. Creative tourism is narrowly connected to sustainable development and there is many associations such is UNWTO who support and assistance developing of creative tourism. Name Creative tourism was given by Greg Richard and Crispin Raymond who were supporters for numerous research projects for the European Commission in field of cultural and creative tourism. Creative tourism is described as tourism where tourists have direct connection and participation in culture in host society through interactive experiences. There are many positive examples where creative tourism make great growth of income and level of culture development in host community.

Many worldwide known organizations such as UNESCO was made successful projects (City of New York) which tries to connect domestic host culture and numerous tourists in Creative Tourism as authentic experience. Creative tourism tries to promote active connection between specific culture of some location and touristic services as one touristic attraction. Interest of tourists for this type of tourism is constantly growing and it is all time changing and improving the world wide various touristic offers. Concept of creative tourism is also remarkable in less developed countries, and become significant term for economical growth and cultural development.

Business tourism

Business tourism is also known as business travel, and it can be described as limited subcategory and branch of general tourism. In business travelling is combined working as job, and touristic travelling combined in one. So we can describe business tourists as people who works on travelling, and travelling with business as main purpose.

“Some definitions of tourism tend to exclude business travel. However, the World Tourism Organization (WTO) defines tourists as people "traveling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes.

Primary business tourism activities include meetings, and attending conferences and exhibitions. Despite the term business in business tourism, when individuals from government or non-profit organizations engage in similar activities, this is still categorized as business tourism.” [8]

Medical tourism

Medical tourism becomes also very popular in last decades, particularly in South American countries, South east Asia, East europe and India. As most visited touristic destination in purpose of medical tourism is Cuba. Many tourist comes in mentioned touristic destination in attention to make some aesthetics plastic surgery. This field of tourism make enormous income for local medical institutions.

Reference:

[8] Wikipedia (2017), https://en.wikipedia.org/wiki/Business_tourism

Social tourism

As Social Tourism we can define such type of tourism which is adjusted for low-income guests. United Nations have supported this type of tourism as legally right for all to afford vacation and rest for holidays. Social tourism can be described as low budget extension of touristic offers in some destination. Further it is connected with recession type of tourism and together should be alternative for expensive and hard reachable and luxurious touristic destinations. Worldwide exist various standards for this type of tourism but generally is determined by local hospitality market, and in latest decades it is grown with standards almost up to higher range of touristic services.

Sports tourism

In last thirty years, sport tourism has increasing its popularity worldwide. Events such as Olympic game, Soccer World Cups, and Asian Games have launched new trends in tourism. All those mentioned spectacles gain economies and level of touristic offers in those areas. Many following services such as transportation, airports, excursions guides are also increasing as a sport tourism. Many travel companies began to sell additional services to packages for some Sport event abroad, so sport tourism getting to be promoter of whole touristic potential of some region. On first place we should mention Olympic games like worldwide spectacle which brings enormous income to whole tourism industry and make the biggest promotion for tourism in general.

3.5 Tourism trends

Every year shows up some new trends in worldwide hotel industry. Every trend brings something new and changes the offers and service in hotels, and making new rules in hotel business. Every trend, every novelty discovers new possibilities for better accommodation for guests.

In-Room Technology

In-Room Technology is the latest trend in a few years which brings more IT equipment in hotel rooms and makes them more comfortable for guests with special requests. It is important to mention that contemporary guests want to experience much better IT equipment than they have at their home. Gone are days when it was enough just to have free internet connection in rooms. In modern rooms are many surprises for guests such as customizable IT technologies and appliances which are included in every function in room. There are diverse sorts of customizable lighting, in-room main board tablet (which controls heating, window curtains, music sound level), smart mirrors and smart toilet equipment. All mentioned IT equipment is available to be adjusted to guest's preference and set up before they arrive in room.

Design, Brands and New Markets

Design, New Markets and New Brands are connected world is changing very fast and changes are blended in one main stream. When we talk about Design then we should mention minimalist design trend as dominant in modern hotel architecture. Many hotel management tries to spread their activities in diverse sort of hospitality branches and trying to offer different types of services to offer for guests. New Markets are showing up every year and South-East Asia is leading market and trend setter in new design standards.

Company Culture

Company Culture is a very important issue in contemporary hotel industry. All members of hotel management and all employees have to be truly engaged and concentrate on promotion of hotel services. To get benefits and company growth, all offers in hospitality should follow top trends in worldwide hotel branches. Also hotel management should well treat their hotel employees, and further those employees as hotel staff will well treat their guests. Guest treatment is a crucial term in hotel culture rate level. Satisfied hotel management crew and hotel staff means satisfied guests, and satisfied guests mean growth of hotel income. Key issue for all these connections is relation to improvement of company culture.

Culinary Options

Culinary Options are leading as main attraction in many hotels, and many hotels are worldwide recognized by their quality of cuisine. Modern guests expect high level of Culinary Offer and it will make their final opinion about hotel rate generally. Even if talk about grab-and-go meal options, all hotels should give their best because bed without good meal will not bring the guest back again. Globally many hotels depend on their level of service, offer combined sorts of food, including traditional domestic and also foreign international food. Also really important is delivering service, and availability to order food in swimming pools and similar services, known as open-eat concept.

Mobile Check-in

Mobile Check-In is in last few years globally accepted as new trend as the IT technology reached imposing level of secure. With enormous developing of Smartphones, guests get opportunity to check-in themselves without losing of time, it can be done from other place, there is no need for personal contact, and as a result it is also saving time and budget for hotels. With mobile Check-In guest can directly contact with Hotel staff and customize desired room, adjust all necessary equipment and finally from taxicab go direct in the room. There is also big field for improvement and innovation, for example with connection of hotels and airports, connecting guests and additional touristic attractions in area and many more options. Developing of mobile technologies will improve tourism and give chance to more services to include in touristic offer of some community.

Artificial Intelligence

Artificial intelligence influence more and more in modern hotel rooms. Modern technology enables diverse sorts of IT appliances to accommodate guests, including IT tablets, IT controlled air-condition in rooms, IT controlled lighting and curtains, IT controlled TVs and audio equipment. Also there is many probes in China and Japan with robots which provides assisting to guests as personal assistants, housekeeping and help in all circumstances. In future there be more usage of robots as employees and robotics will make big influence in hotel industry, but it is not desirable that robots fully replace human crew. Hotel will use artificial technology just as additional offer as attraction for guests.

Sharing Economy - Alternative Lodging

Sharing Economy is also known as Alternative Lodging, and trendsetter are global brands like AirBnB and similar hospitality companies. AirBnB becomes primary Lodging brand and with its online virtual possibilities has set standards in hotel business. Many tourists will rather choose this type of lodging because of its lower prices and good standards of hotel services and other including offers. Other hoteliers should work on strategy how to simplify the business and look in AirBnB type of hotels for inspiration how to get new guests. Also there are possibilities for other hotels services because systems like Uber and AirBnB will become exhausted of worldwide market game, and as result there will be more opportunities for new brands and new companies. But for sure today hotels should find motivation in new alternative trends as AirBnB service and try to use advantages of modern IT technologies.

Chat and Social Networks

Text and Chat becomes everyday need of modern humans. Applications for textual chat like Viber, Whatsapp, Messenger becomes most popular way for communication between people so situation in tourism is following this global trend. In many modern hotels there is direct communication between guests and hotel staff. Throughout chat and text messages guests have option to order food, arrange some features in room, arrange other external services and thanks to modern technologies all this can be done without language barriers. Also in many hotels there is internal social network, so guests have possibility for conversation between each others and interact.

3.6 Hotels and Tourism in Vienna

Vienna is city worldwide known as attractive and one of the most livable cities in the world. There are many features which are very appreciated by locals and international guests such as historic heritage, good traffic connections, a lot of hotels, and really big touristic offer for everyone. In common tourists visit Schönbrunn Palace, Central heritage area in center of the city, and Belvedere Palace. In last few years, in Vienna was more than 15 millions overnight stays annually. Vienna is town with great potential for more developing of tourism. In this part of Europe, Vienna is for sure only metropolis which is known as global brand. Security and political stability give more positive reputation and bring every year more and more tourists. Touristic service is well organized, and through commercial worldwide is attracting tourist from all around the globe. Mostly, in the biggest number, tourist comes from Europe: Germany, Netherlands, Switzerland and Italy. And from further distance, the largest number of tourist comes from USA, China and Japan.

Tourism is an important fragment of Vienna's economy income. In Austrian whole income, tourism rate as 9% in general domestic product. Austria has high level ratio inhabitants-to-guest bed, with six inhabitants per one guest bed. All parameters define Vienna and Austria as one of the highest "per capita income" in Europe. Vienna have almost the same number of tourist in winter and summer season, and the best visited months are February in winter season and July/August in summer season.

Austria ranked best score in worldwide tourism in 2007, as 9th placed, with 18.9 billion dollars, and 20.8 millions international tourist arrivals. Vienna as a Capitol get most of those income, and for sure is that tourism in Vienna and followed services will constantly grow in future years.



Fig. 3.12

Tourism 2015 - Overnight stays in million

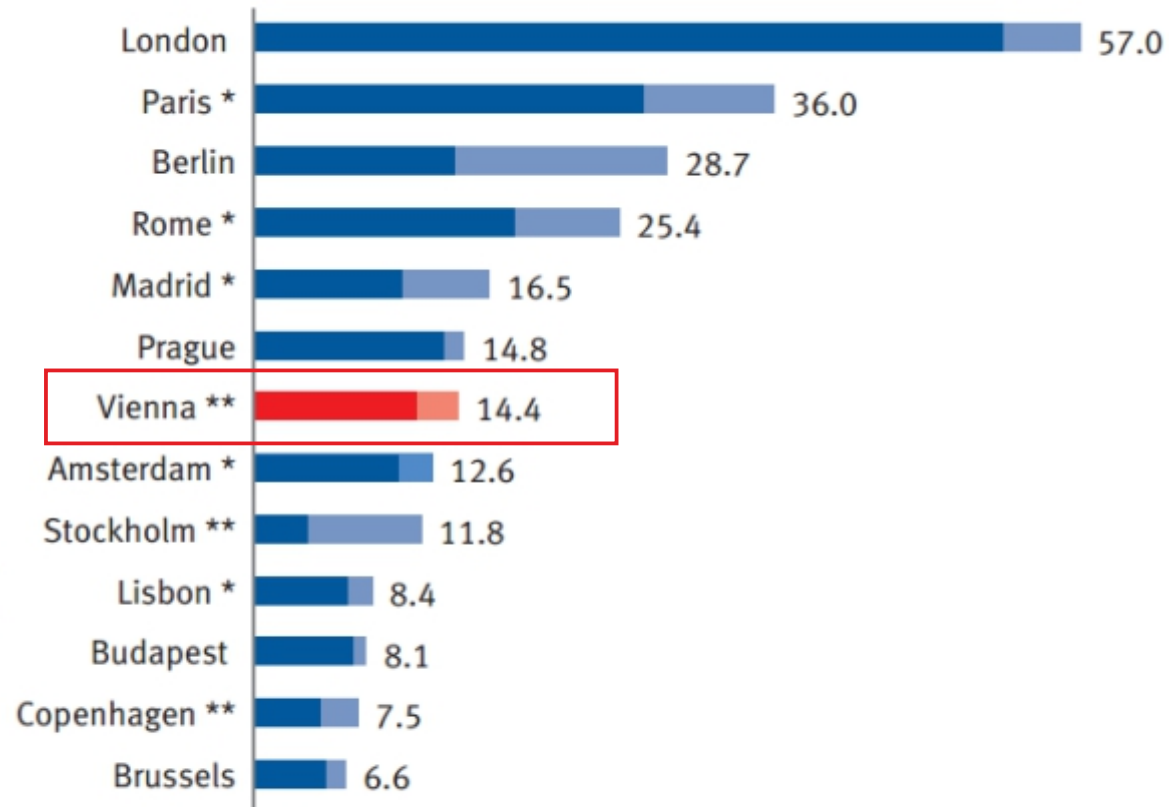


Table 1

■ international tourism
■ domestic tourism

Table 2

Tourism data 2015 - Austria	
Arrivals	39.4 m
Overnights	135.2 m
Tourism income from foreign guests (in Euro)	18.4 bn
Tourism income from domestic guests (in Euro)	20 bn
Average duration of stay (overnights)	3.4

Table 3

Provincial capital	Tourist overnight stays		
	total	from Austria	from abroad
Vienna	13,524,266	2,481,250	11,043,016
Salzburg	2,634,694	687,147	1,947,547
Innsbruck	1,489,874	406,235	1,083,639
Graz	1,029,022	474,782	554,240
Linz	775,514	377,062	398,452
Klagenfurt	401,892	210,589	191,303
Bregenz	331,759	107,406	224,353
St. Pölten	140,982	96,655	44,327
Eisenstadt	59,148	33,939	25,209

Source: Statistics Austria.

Arrivals by country:

Rank	Country	2015	2016
1	 Germany	11,750,027	12,134,836
2	 Netherlands	1,671,581	1,734,453
3	 Switzerland	1,309,660	1,400,251
4	 Italy	1,051,490	1,122,936
5	 United Kingdom	802,552	875,664
6	 China	497,925	715,119
7	 Czech Republic	660,086	711,351
8	 United States	632,512	708,233
9	 France	516,770	517,708
10	 Belgium	514,264	514,329
11	 Hungary	493,055	501,595
12	 Poland	425,730	456,615
13	 Spain	309,794	348,768
14	 Denmark	264,704	331,507
15	 Russia	467,565	313,406
16	 South Korea	234,557	277,032
17	 Romania	264,704	275,806
18	 Japan	245,306	236,621
19	 Sweden	205,501	224,258
20	 Slovakia	176,760	194,186
	Total foreign	25,291,371	26,718,945

Table 4

Chapter 4

Location

4.1 Key fact about Vienna

Vienna becomes one of the best ranked cities in the modern world. Vienna is the largest city in Austria, Capitol, and one of nine federal states of Austria. Vienna is the main cultural and economical town in Austria, and also in central Europe region. Vienna has population of almost 2 million of 1.8 million, and wide region of Vienna metropolitan area has almost 3 million of people.

Vienna is also political center of Austria and one of the leading political factors in Europe. Vienna is 7th largest town in population in Europe and second largest city with German speaking population. Until the beginning of twentieth century and World War I, Vienna has more than 2 million inhabitants in within city limits. Vienna was trough all past decades one of the main cultural political but also and touristic centers of Europe.

Today, Vienna is host to many global recognized organizations, including United Nations, OPEC and many more others. The city has total area of 415 square kilometers, and is located in east of country. Location between Hungary, Slovakia and Czech Republic provide conditions for economical, industrial and touristic growth and potential for further developing of urban area. Vienna is officially recognized from United Nations as World Heritage Site.

United Nations describe Vienna as World Heritage Site because of Viennese cultural, historical and scientific basis and importance for human history. Also UNESCO recognized Vienna as site with significant importance to collective interests of civilization. Vienna is defined as landmark with special cultural, historical and geographical unique, and its culture left remarkable influence on human development. Viennese touristic potential will growth and influence all surrounding cities, so increasing of touristic services of Vienna will upgrade whole area of middle Europe.



Fig. 4.1 Vienna International



Fig. 4.2 Schönbrunn Palace

Vienna is located between oceanic climate and humid subtropical climate. Summers are warm with temperatures 24 to 34 °C. Winters are dry with temperatures about -5 up to +5°C. Snowy days in the winter are not uncommon, but rare compared to Tirol and Vorarlberg regions. Spring and Autumn are in medium range of temperature.

Vienna is organized of 23 districts (Bezirk). Vienna is one of the best rated and richest regions in the European Union: Its gross domestic product of EUR 47,200 per capita constituted 25.7% of Austria's GDP in 2013. Its size is 159% of the EU modal. On the list for 2016, Vienna is on worldwide level marked as ninth most powerful city in economy. For sure, in future this success will be continued.

With an income of 86% in domestic gross value, Viennese service sector is the most important promoter of developing in whole region. Industry and commercial services have a rate of 14.5% in gross value, and agriculture has a share of minor 0.07%. We have to mention production of Wines which is related to traditional and cultural values of Viennese society.

In Vienna, the most significant service is business sector, with a trade rate of 14.7% of general value. Also manufactured goods, scientific and technologies, real estate and hospitality services are very important factors in Viennese business income. In outgoing and incoming direct investments of Austria, Vienna is taking a big part with contribution up to 60%. All those mentioned references define Vienna as a leading hub for business and investment in this part of the World. Positive growth of industry and business sector refers to approximately increasing of tourism and attracting more tourists to come and visit Vienna. Noticeable trend is emergence of new business hotels and private apartments for rent as a response to growth of business guests arrivals.



Fig. 4.3 Vienna Theater



Fig. 4.4 Belvedere Palace



Fig. 4.5 Museum of Art History



Fig. 4.6 Karlskirche, Karlsplatz



Fig. 4.7 'St. Stephens Cathedral

4.2 Vienna and Danube river

For all Viennese, river Danube is place for recreation and enjoyment, synonym for nature. Danube river and two lakes: Old Danube and New Danube, which are close by, make the unique landscape and natural beauty. This area is widely use from Viennese for recreation, sports, and weekend rest of city rush. By Danube river and two mentioned lakes, exist numerous restaurants, hotels, beech clubs and many other touristic attractions.

Old Danube (Alte Donau)

Old Danube is also lake from main Danube river, and it is surrounded with many parks, gardens, numerous restaurants and clubs on by the water. There are many promenades and running paths, also Old Danube is known as place in Vienna where you can rent a boat and enjoy the sailing. There are many yachting clubs and eleven boat-rent companies. There are many place where tourist can enjoy the beaches and summer touristic attractions. Old Danube have more than two kilometers of beaches, with playgrounds, bars and also wave pools. It is for sure that Old Danube is beautiful place for rest and it has great potential to offer unforgettable hours of holidays.

New Danube (Neue Donau)

New Danube is located between Danube river and Old Danube. It is also side type of channel-lake and it is built from 1972 to 1988. New Danube stream parallel to the main Danube river in length of about 20 kilometers. Main purpose is to direct excess water in case of floods. Project of building this channel was supported by United Nations through UN Human Settlements program called UN-Habitat.

Donauinsel

Donauinsel or on English "Danube Island", is a well known island between Danube river and New Danube. It has longitudinal and narrow shape, length of approximately 20 kilometers, and up to 120 meters wide. On whole Island there are park areas, beaches, places for concert and holidays. It is also unique bio-natural sustainable community with protected sorts of plants and animals. There are some interesting notes about this magnificent island: Donauinsel is one of the favorites bicycle roads in Vienna; Every Year there is held a big music festival called "Donauinselfest"; There is famous Viennese beach called Copa cagrana; and finally but not least, Donauinsel is favorite location for beach volleyball and many other summer sports.



Fig. 4.8 Donauinsel at evening

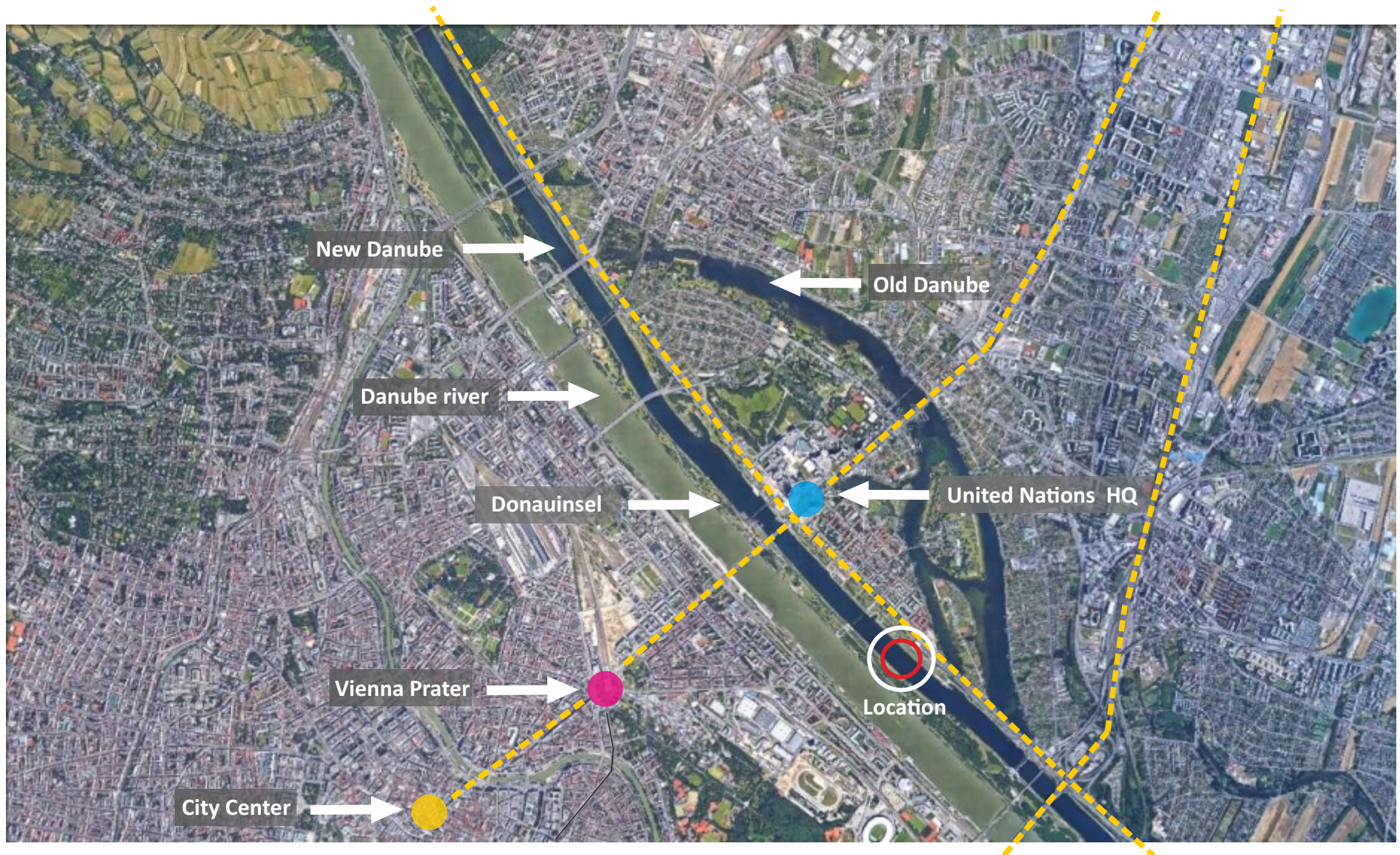


Fig. 4.9

4.3 Location for the Bridge Hotel

Main Highway and road connections

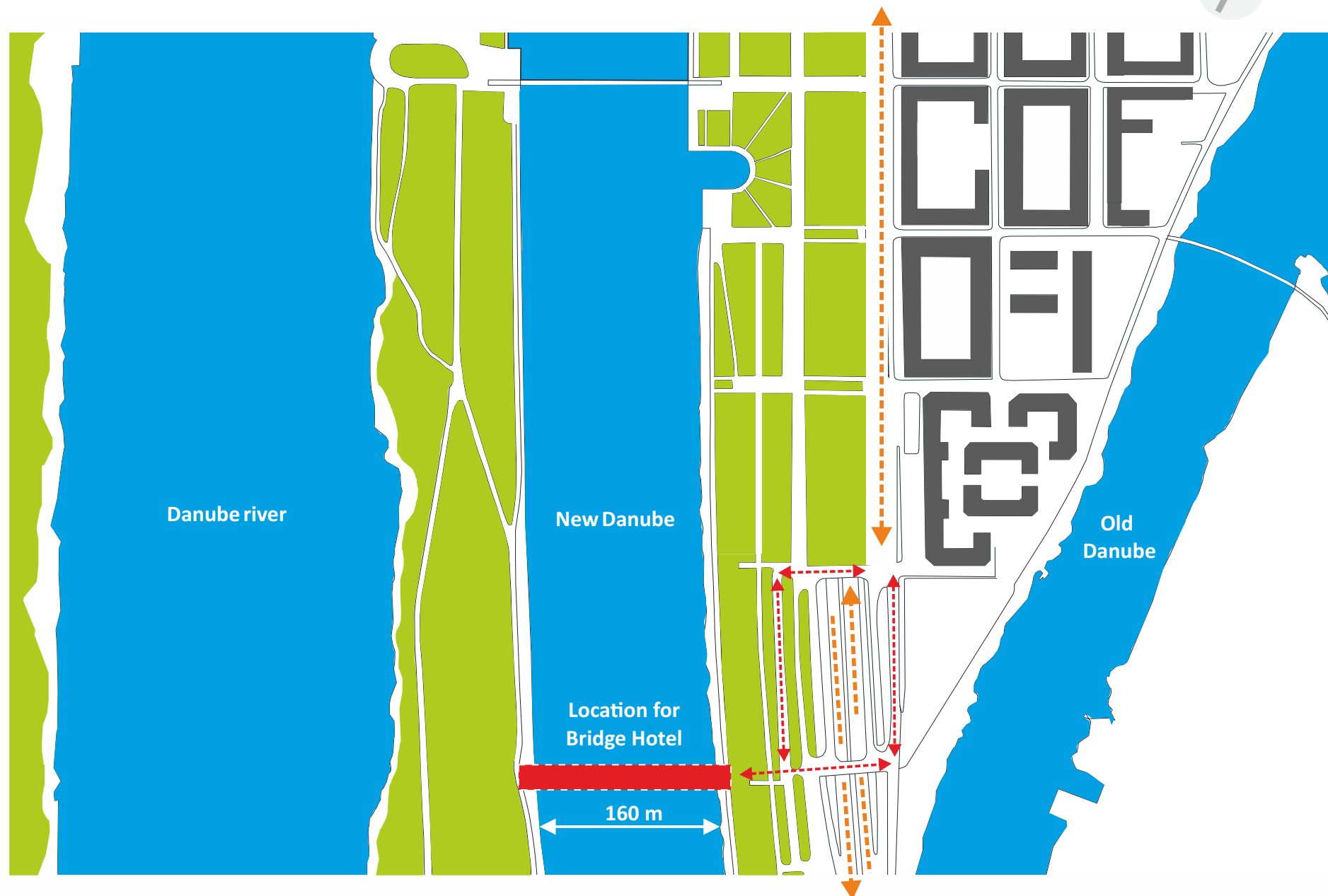
0 1 2 3 4 5 km



4.3 Case Study - Location for the Bridge Hotel



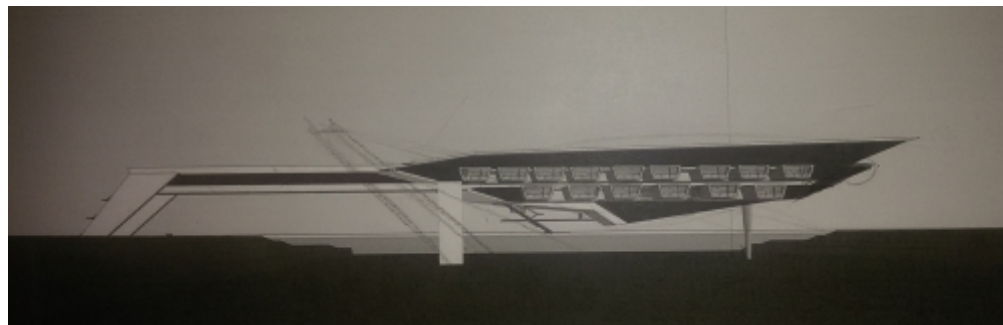
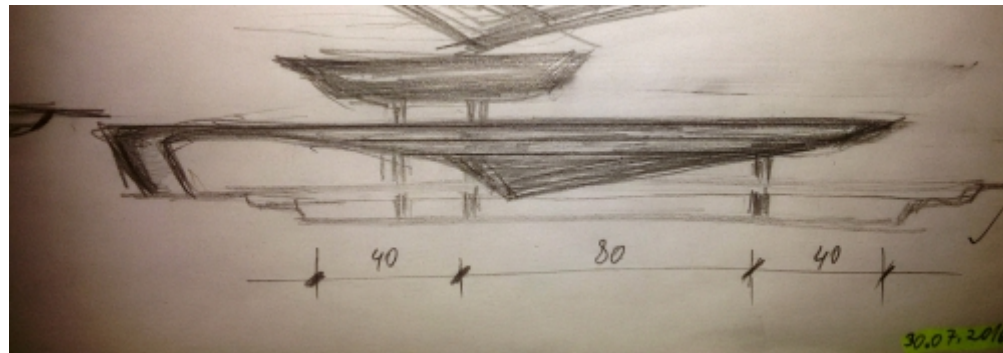
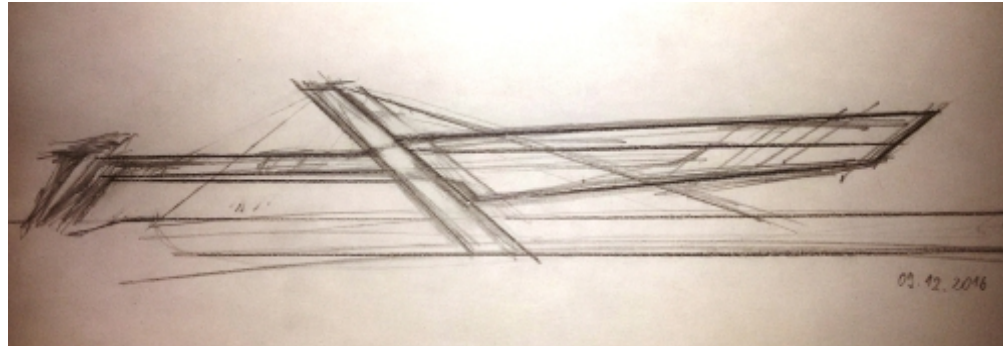
2.2 Location for the Bridge Hotel



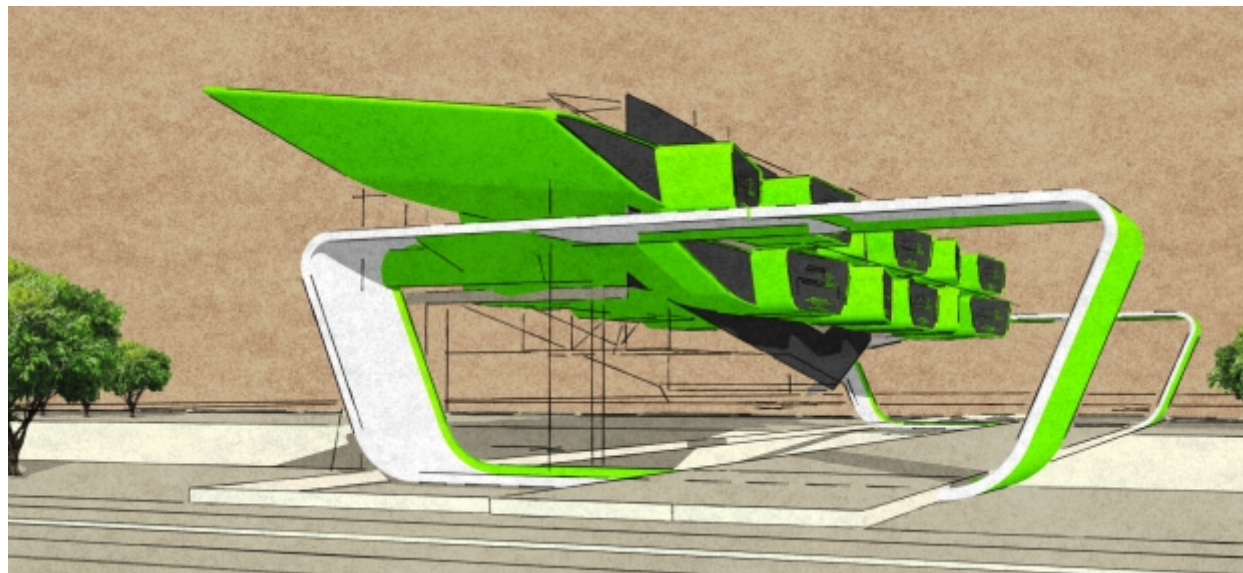
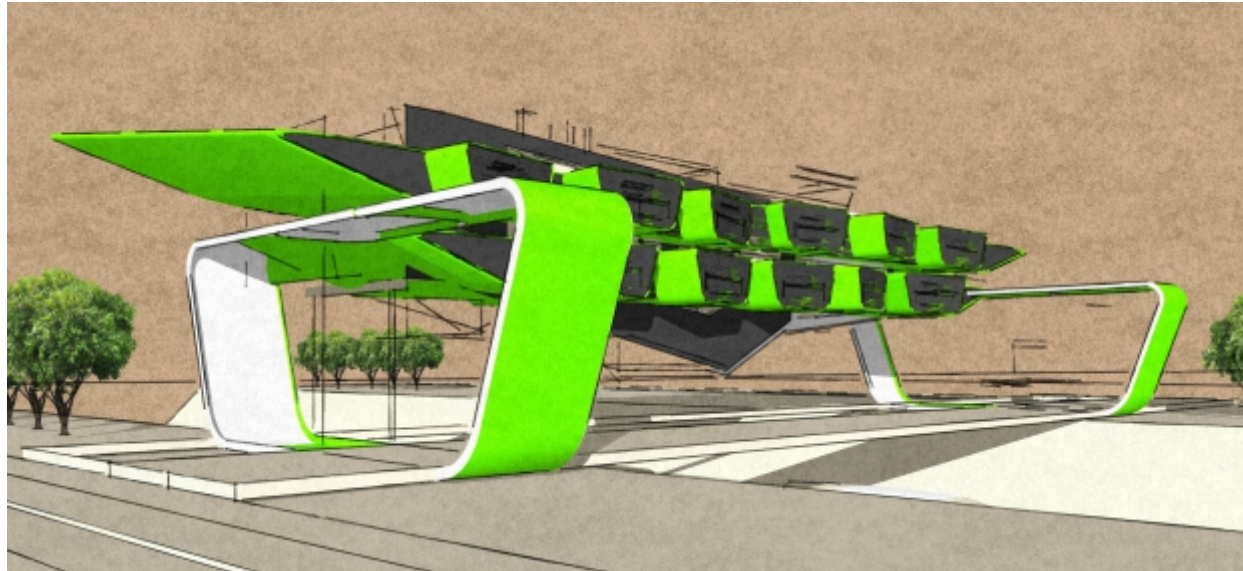
Chapter 5

Project

5.1 Concept



5.1 Concept



5.2 Sustainability

In last decades many hotel companies realized that sustainability has great importance for development and success in hospitality business. On first place it is important because of issues of environment, and also following economical and social issues. Also as really important is cost care and financial savings through sustainability process.

Sustainability has enormous impact of all sectors in global hotel industry through energy consumption saving, water recycling, and many other energy saving projects. Today hotels consume much more energy, and basically are oriented to renewable goods, green energy and alternative fuels. In common water which is used for kitchen, laundry, cleaning, maintaining and toilets is recycled and it is used as technical water. Also is the same with paper, furniture, towels, batteries, there is nothing to waste, everything could be recycled.

There are many wrong thoughts that sustainability and recycling is much more expensive than ordinary sources of energy. In fact, many researches approved sustainable and renewable energy as economically better solution than traditional sources of energy. Also improvement of IT technology can additionally decrease energy consumption and with good architectural solutions significantly reduce energy consumption costs (solar, geothermal, double glass facades, etc.).

There is also remarkable improvement of sustainability and social-tourism issues, with tourism responsibility programs and including touristic society in sustainable eco-projects. Global trend is that all new hotel follows regulations about sustainable building, and use benefits of investing in green architectural solutions.

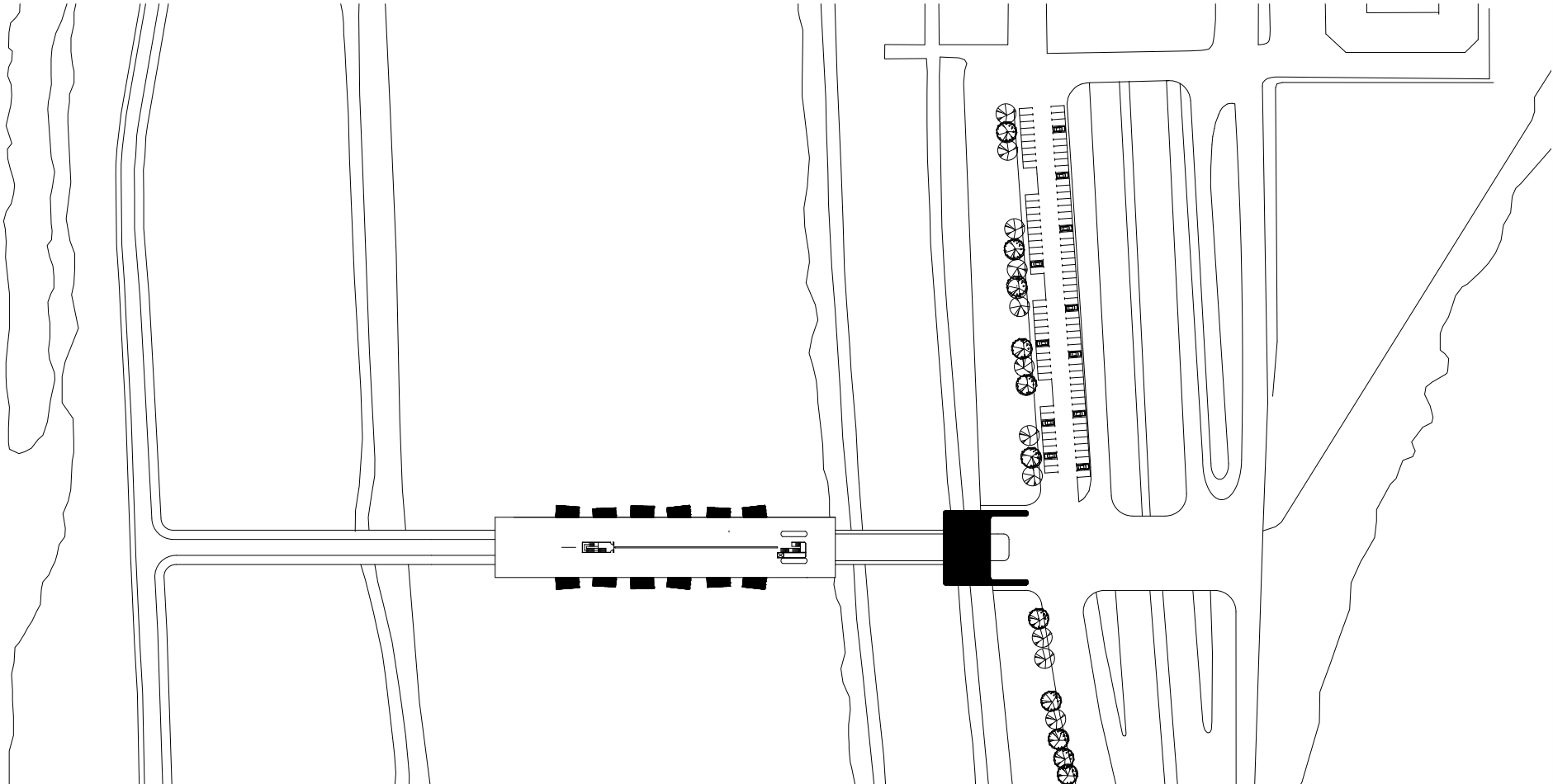
For this concept of Bridge Hotel is planned to integrate many green solutions which provides sustainability and decreasing energy consumption. Enhanced guest experience, and energy save, that is goal and one of the key issues.

There are some proposals:

- Ecological tested materials
(Energy consumption and efficiency)
- Renewable Energy System for Power generation
(Solar Energy, Geothermal, Micro Turbine)
- Lighting alternative
(LED Lighting System)
- Energy Efficient Appliances
- Onsite Waste Management System
- Centralized Energy and Lighting Management
(Computer Aided Indoor and Outdoor Lighting System)
- Guest Room Energy Management System
(Motion sensors, Smart Outlets)
- Kitchen Sustainability system
- Elevator efficiencies
(Motor, Lighting)

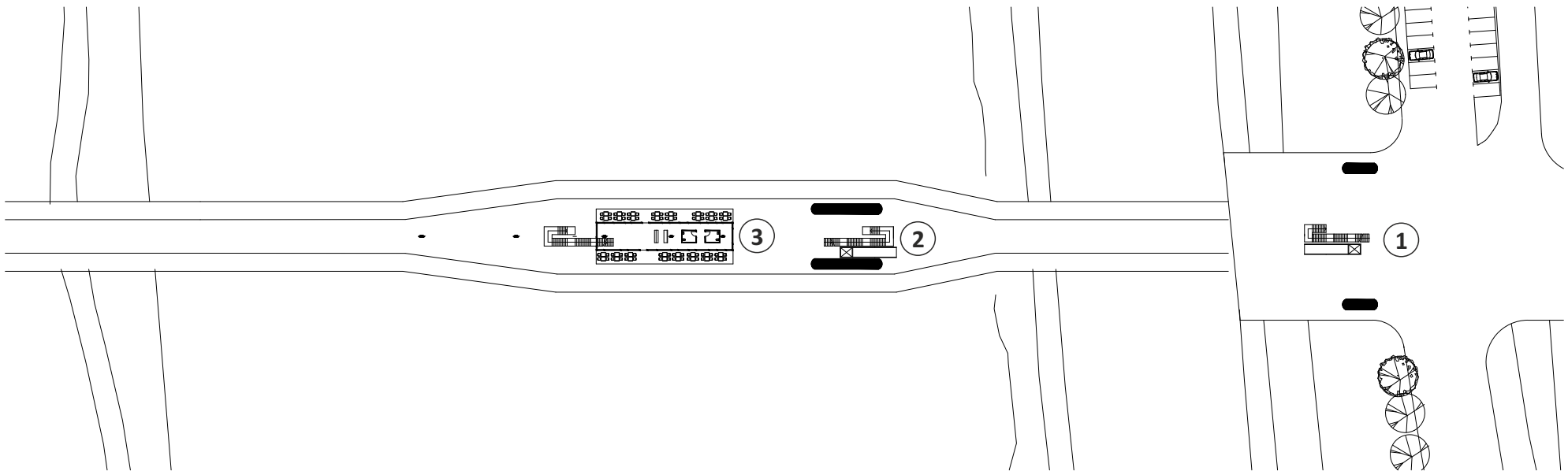
5.3 Site Plan

0 50 100 150 m



5.4 Ground level

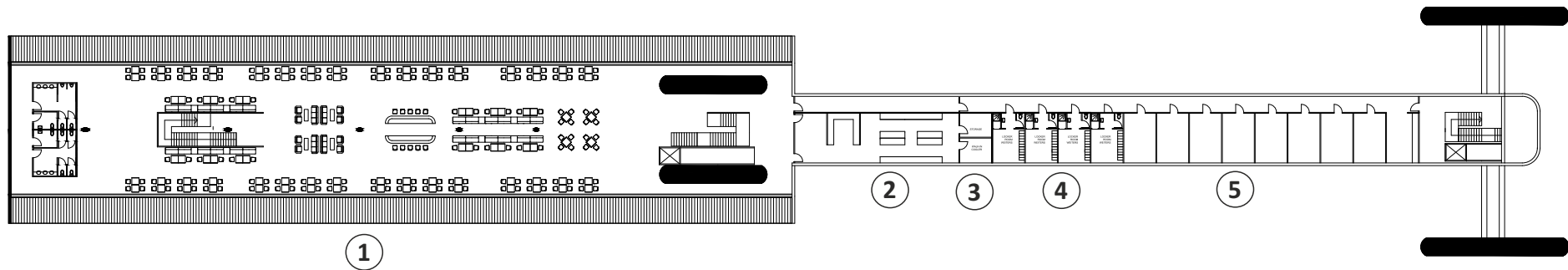
0 25 50 75 m



- 1. Main entrance from ground
- 2. Entrance from Bridge
- 3. Bar

5.5 First floor plan

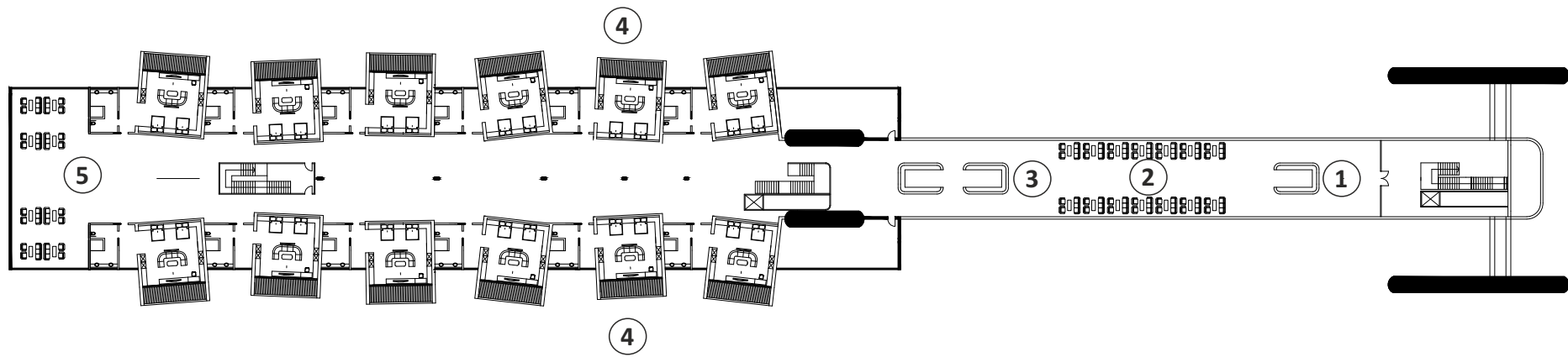
0 20 40 60 m



1. Restaurant
2. Kitchen
3. Storage and Walk-In Cooler
4. Locker Rooms
5. Staff Rooms and Office

5.6 Second floor plan

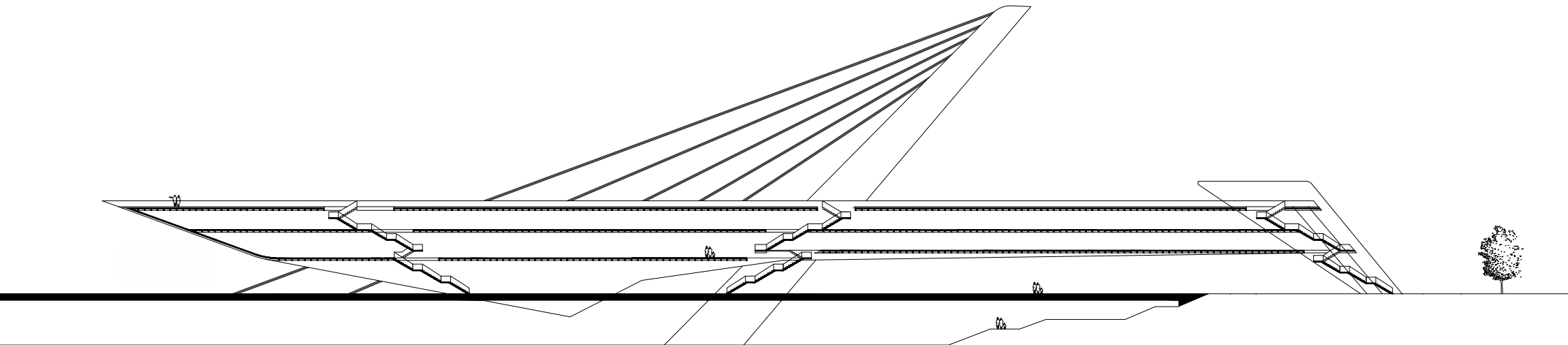
0 20 40 60 m



- 1. Security
- 2. Lounge - Lobby
- 3. Reception
- 4. Guest Rooms
- 5. Free time room

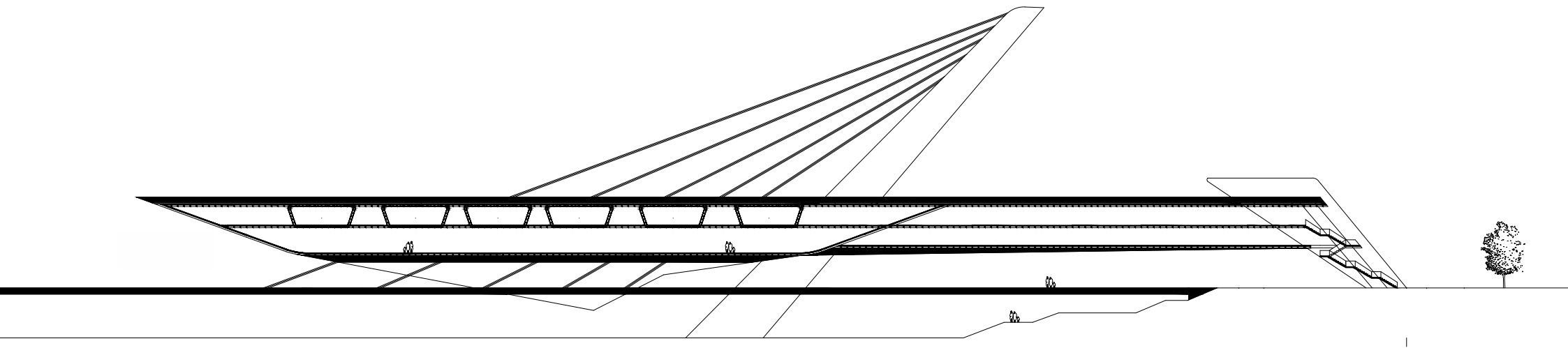
5.7 Section A-A

0 20 40 60 m

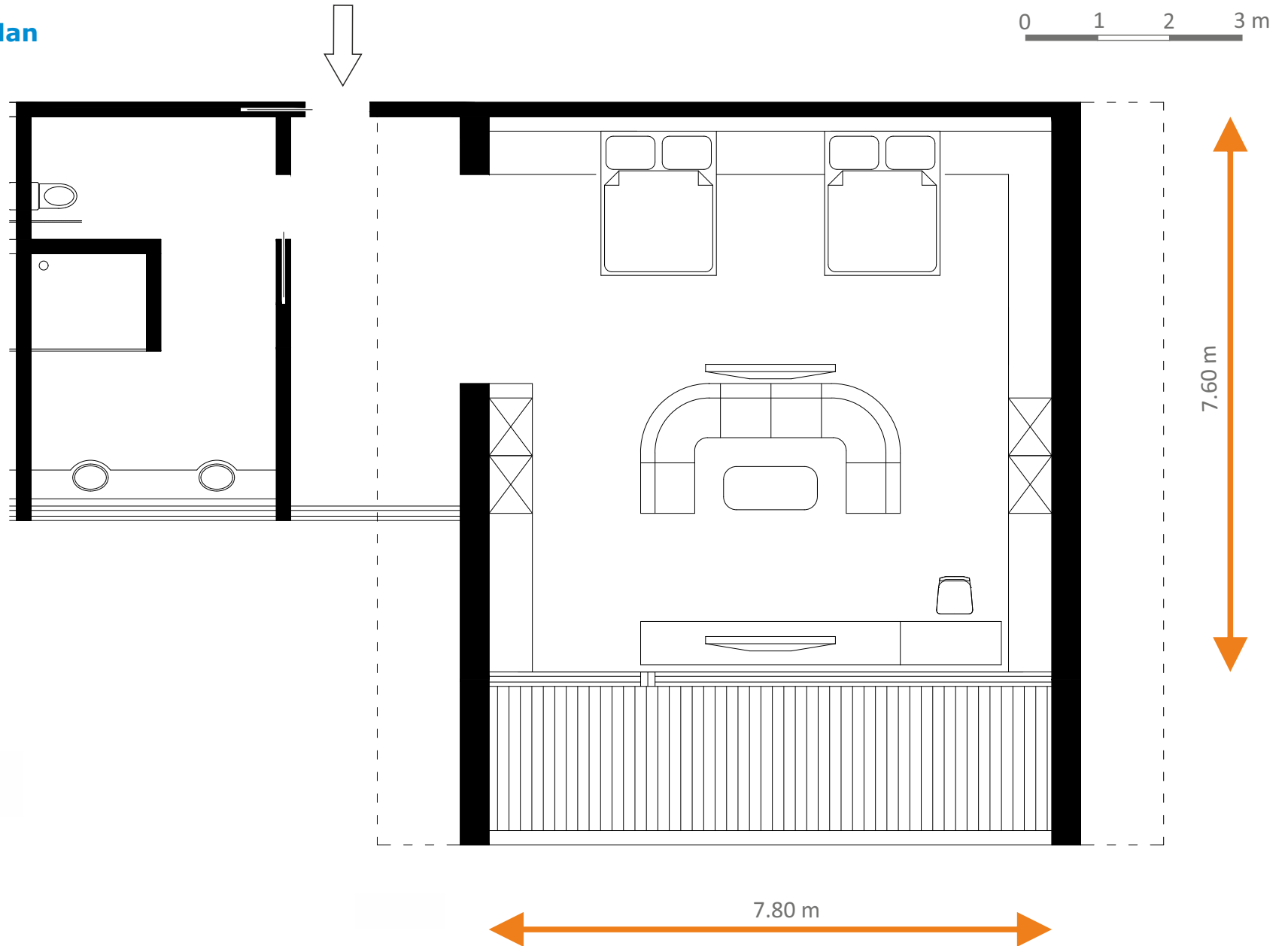


5.8 Section B-B

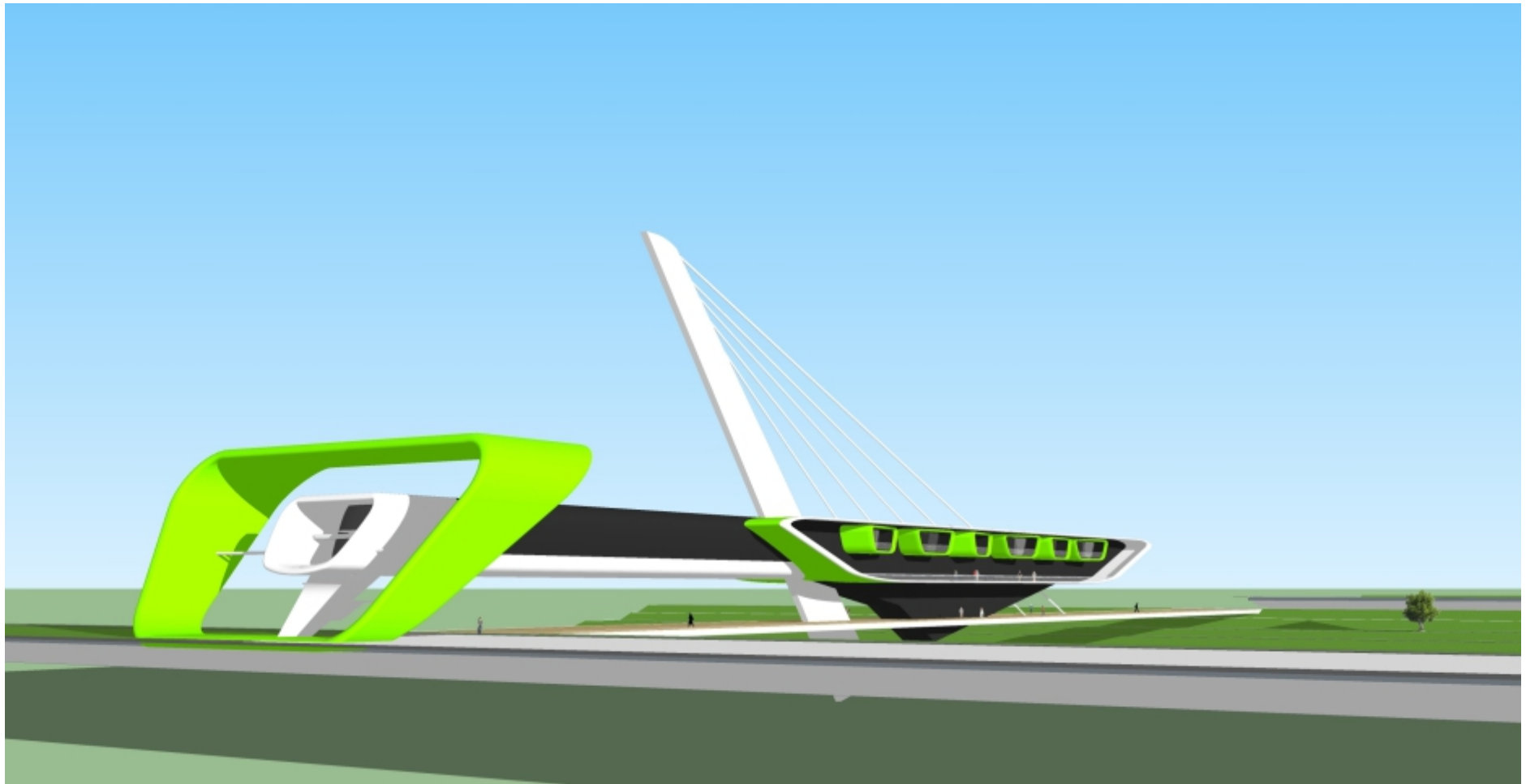
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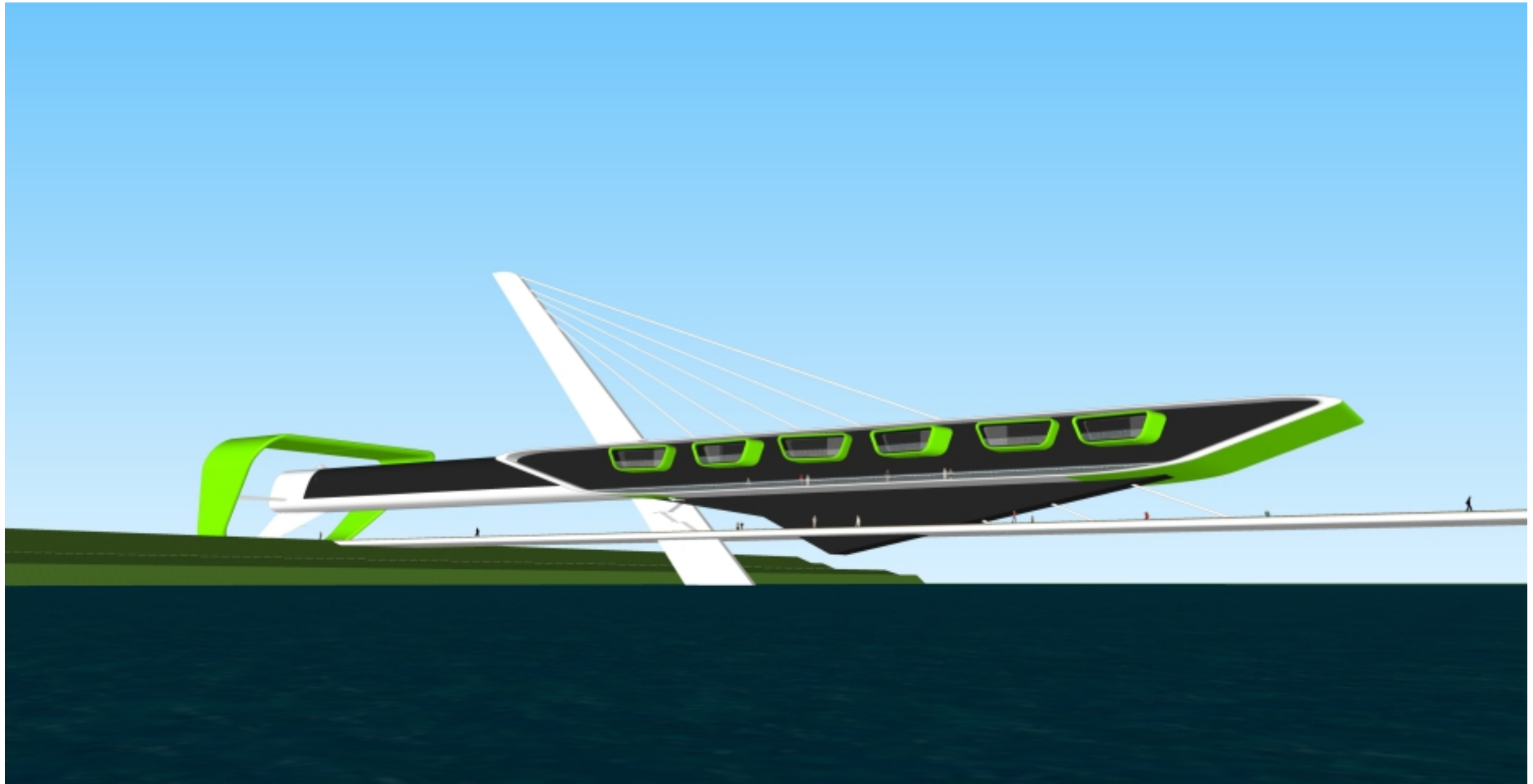
5.9 Room plan



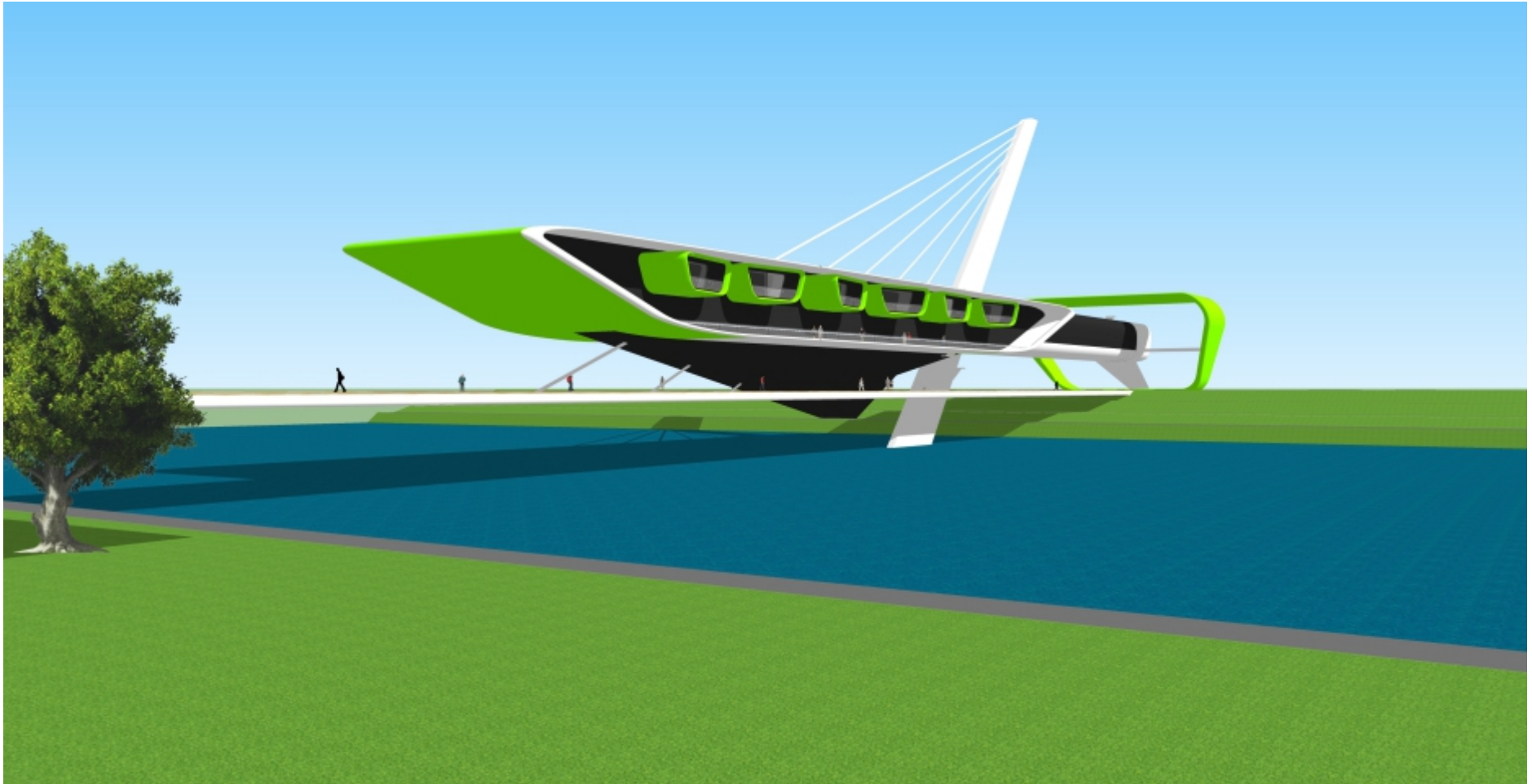
5.10 3D Visualisation



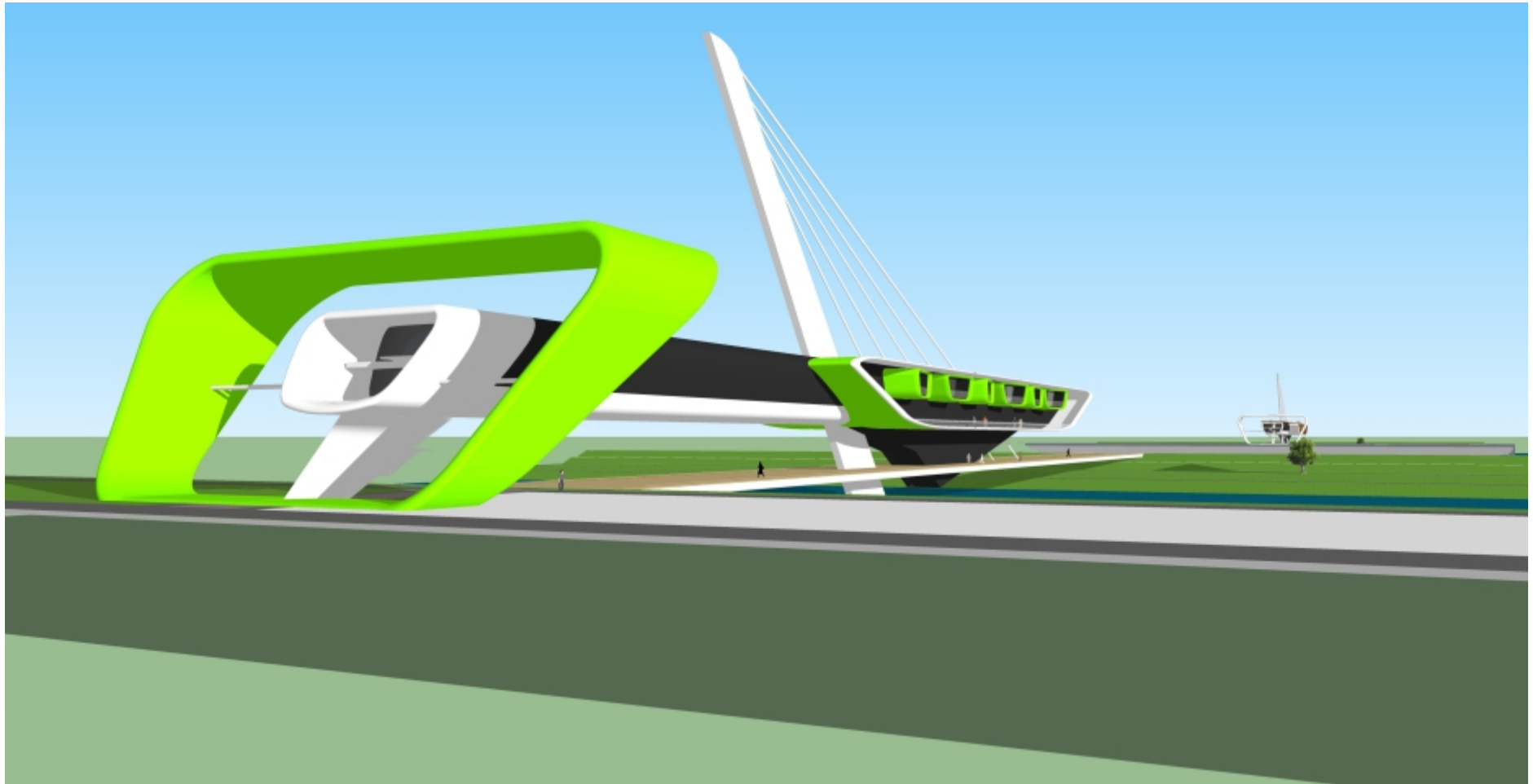
3D Visualisation



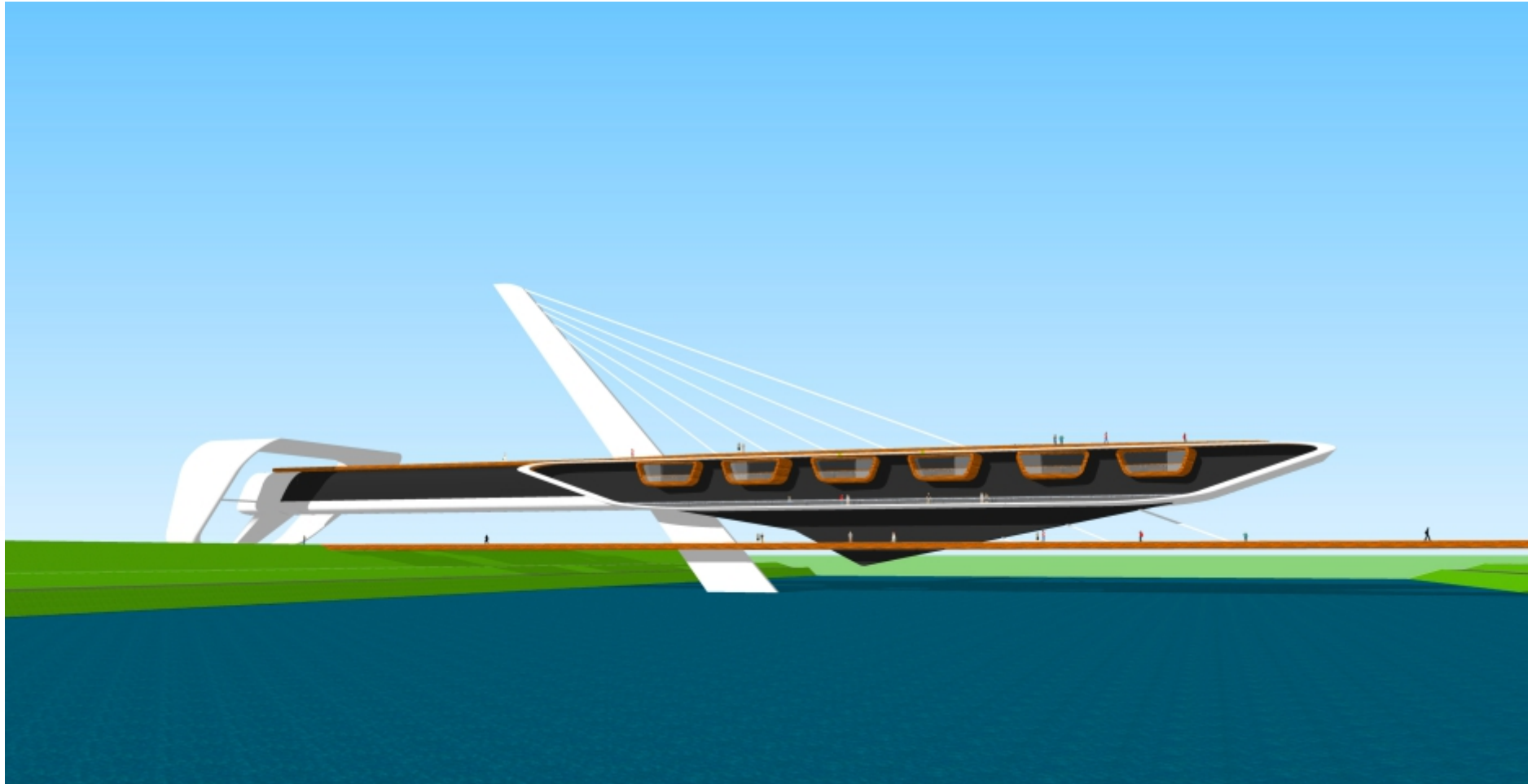
3D Visualisation



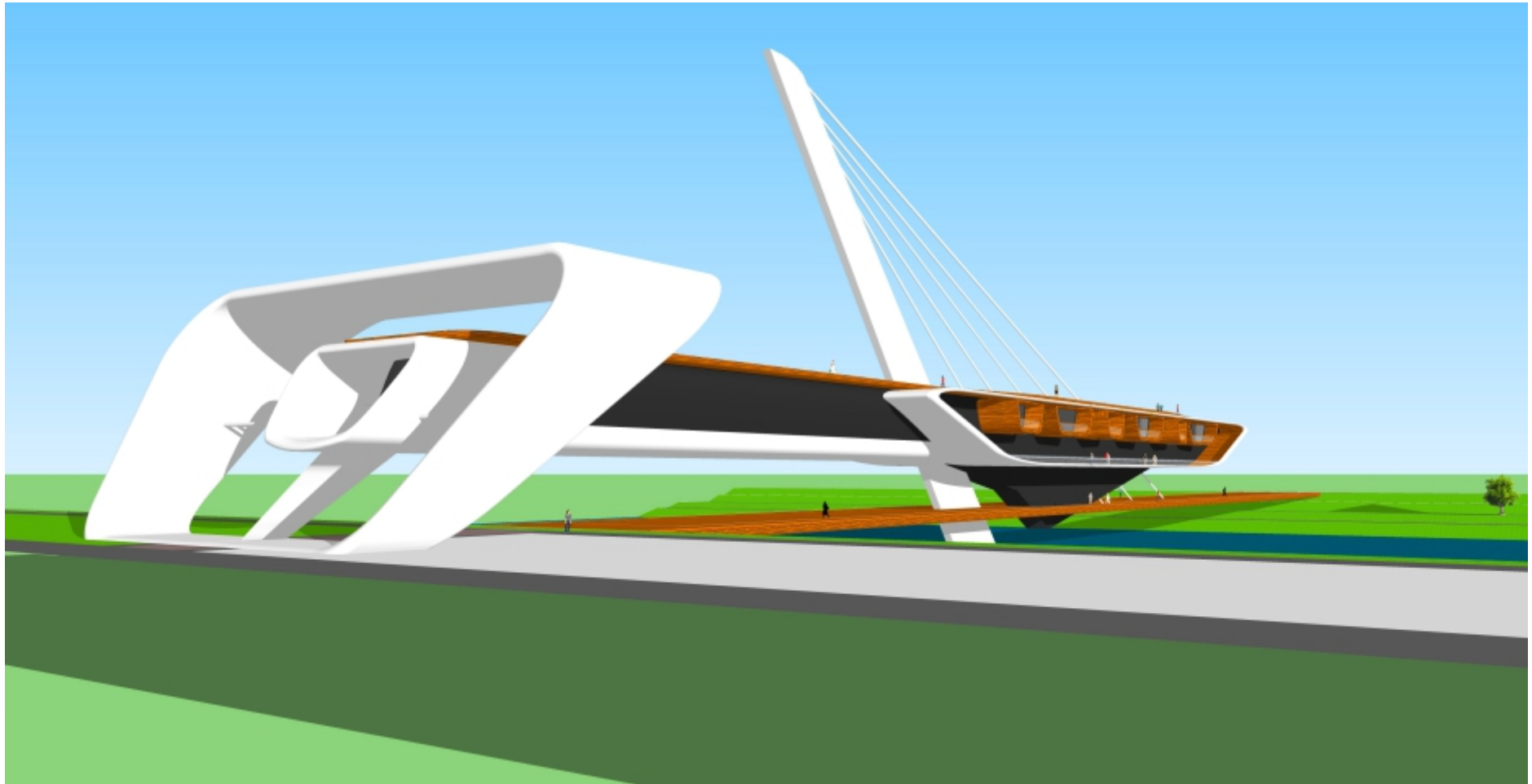
3D Visualisation



3D Visualisation



3D Visualisation



Chapter 6

Final Words

Contribution

Main research was made in probe with shape and embodiment, because location is specific and requires sensitive approach. It was made thousand sketches and thousands 3d model experiment until final design is chosen. During those experiments it as supported with a lot of working hours reading about steel construction and high-tech airspace technology which could be applied in architecture. Accent is pointed on using materials from airplane engineering and shipbuilding in contemporary architecture, and trying to find best solution how to connect hotel and bridge with simple, clear and functional connections. New insights were brought to every chapter and with simple methodology were processed to show possibilities of materials and construction in design. All methodology and approach to work in thesis is based on principals which are common for car body design, yacht design, airplane design and architecture. My approach start from theory that every of those kind of design: cars, yachts, airplanes, architecture etc., is actually one design, and has a simple Purpose to make beauty things, make life on Earth better. It is not easy to reach, it cost thousands and thousands working hours, and the goal is the same: desirable, stunning and functional form. It is not matter if we talk about airplanes, yachts, cars or architecture, one is common for all: beauty and stunning form. It is not simple to get form, shape colors, functionality or materials which are acceptable for all people, but it Beauty is universal value and Beauty is the same through the time and space. First impression should be unusual and remarkable shape and look like Hotel is some flying yacht above the river, something that looks like airplane and yacht. Whole structure looks like hybrid structure: half a building and half an airplane flying above the river. All that structure is combined with bridge throughout with central pylon and make the outlook like from science fiction movie. That should be story of this concept and master thesis.

Results collected during research

All my work on this master thesis left a great impression on me and my future work. Main results was on personal developing and introducing in own possibilities and issues during design process. After long years being out of design and architecture, this master thesis put me back in architecture and design. A lot of time was spent on research of construction type, materials and construction and materials in airspace industry.

All results collected during research will be included in my further professional development. Combining bridge and Hotel in one building was real good way for research new possibilities in architecture and contemporary design. It was real challenge for exploring new construction type and functional organization of building. Location is on the river, there is about 200 meters wide gap between banks, and only light steel construction can be properly for use. Through exploring types of steel construction in mechanical designs in aviation, it becomes clear that Semi-Monocoque system combined with Composite and Dur-Aluminium would be perfect design. Also composite materials because of its performance shows up as good choice for reducing the weight of building.

During developing of concept , dimensions and shape varied and have been changed hundred times, but one topic was always there: creating a good looking body. Step by step, that body becomes a fuselage of an airplane. During drawings and sketching, it starts to shows that this building would be hybrid, airplane and yacht- combined in bridge hotel. Also during developing of idea, it was found many difficulties, issues and solutions about how to build and construct new Design, with mutual characteristic of hotel and bridge.

Conclusion

This Master Thesis is just one of examples how such issues as “project of hybrid Bridge Hotel” can be solved. There are many possibilities, and river as a location will always be interesting for architects. Also Bridges as masterpieces of human creation represent focal point of every urban structure and combining function with other types of buildings (hotels, shopping mall, residence building) with bridges will be increasingly represented in future. Especially in high density urban area will be interesting to combine such types of buildings, in respond to cities and population growth. Also development of new IT technologies and mobile smart telephones will change functionality and form of architecture in future. Combining Hotel and Bridge in one Design was great re-discover, and great chance to explore new possibilities and alternatives in architecture.

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