

# Booklet

Herman Ehrnberg  
AUSD 21

### 1.1.1 - Infrastructure Type

---

Phase 1 - Hybrid Space and Growth Network



Liubarto bridge, Lithuania



Sõpruse bridge, Estonia



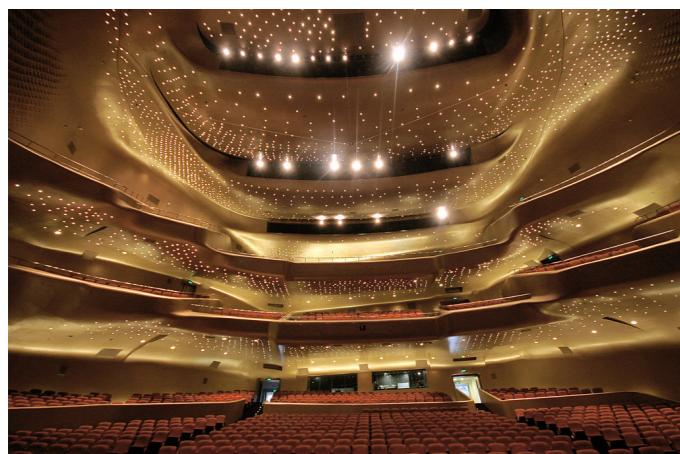
Unknown, Unknown

As a bridge stretches over its landscape a very one-dimensional space is created under it. It can provide a sense of security as the bridge shelters the space from its surroundings, where, at the foot of the bridge, this feature is the most pronounced. The space is also accompanied by muffled noise from the traffic above. What effect this has on how the atmosphere is perceived may vary from person to person. To me, it makes the space feel hidden, as there is so much activity on the bridge that is oblivious to the gem below.

## 1.1.2 - Human Space Type



Dalhalla Amphitheatre, Sweden



Guangzhou Opera Hall, China



Regent's Park Open Air Theatre, London, England

To take advantage of the sheltered atmospheric spaces created by infrastructure, a programme involving artistic experiences seem suitable.

## 1.1.3 - Hybrid Space Concept

How the spatial properties of a bridge satisfies the spatial needs of an auditorium



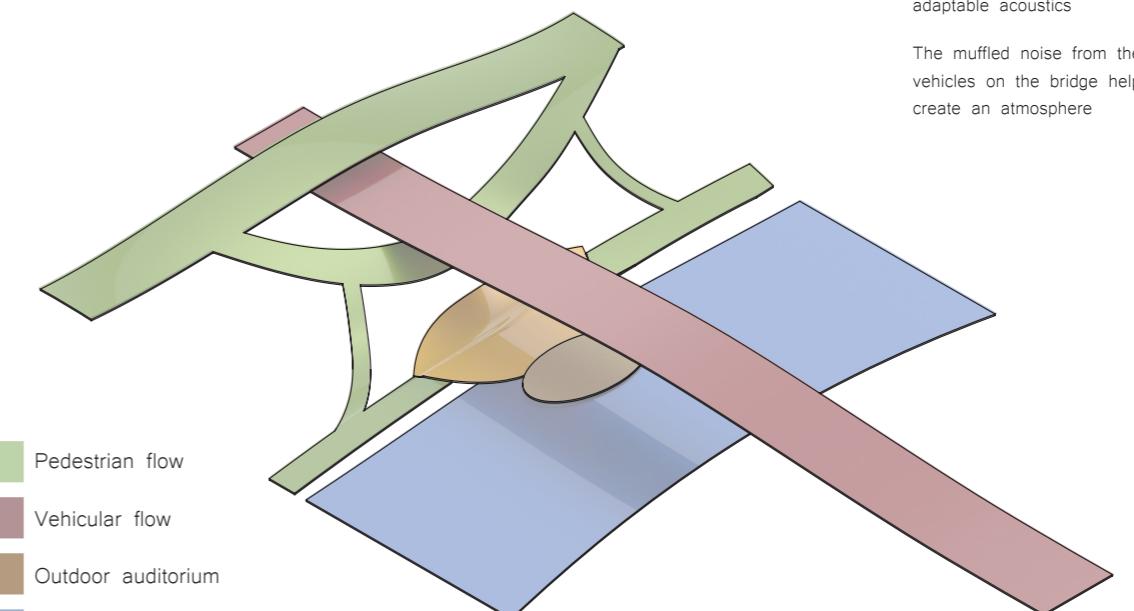
Natural slope providing a great view of the performance and the river



A central location in a city is suitable for a public space such as a park and an auditorium



The foot of the bridge as a space defining feature provides shelter and improved acoustics as it envelopes the audience

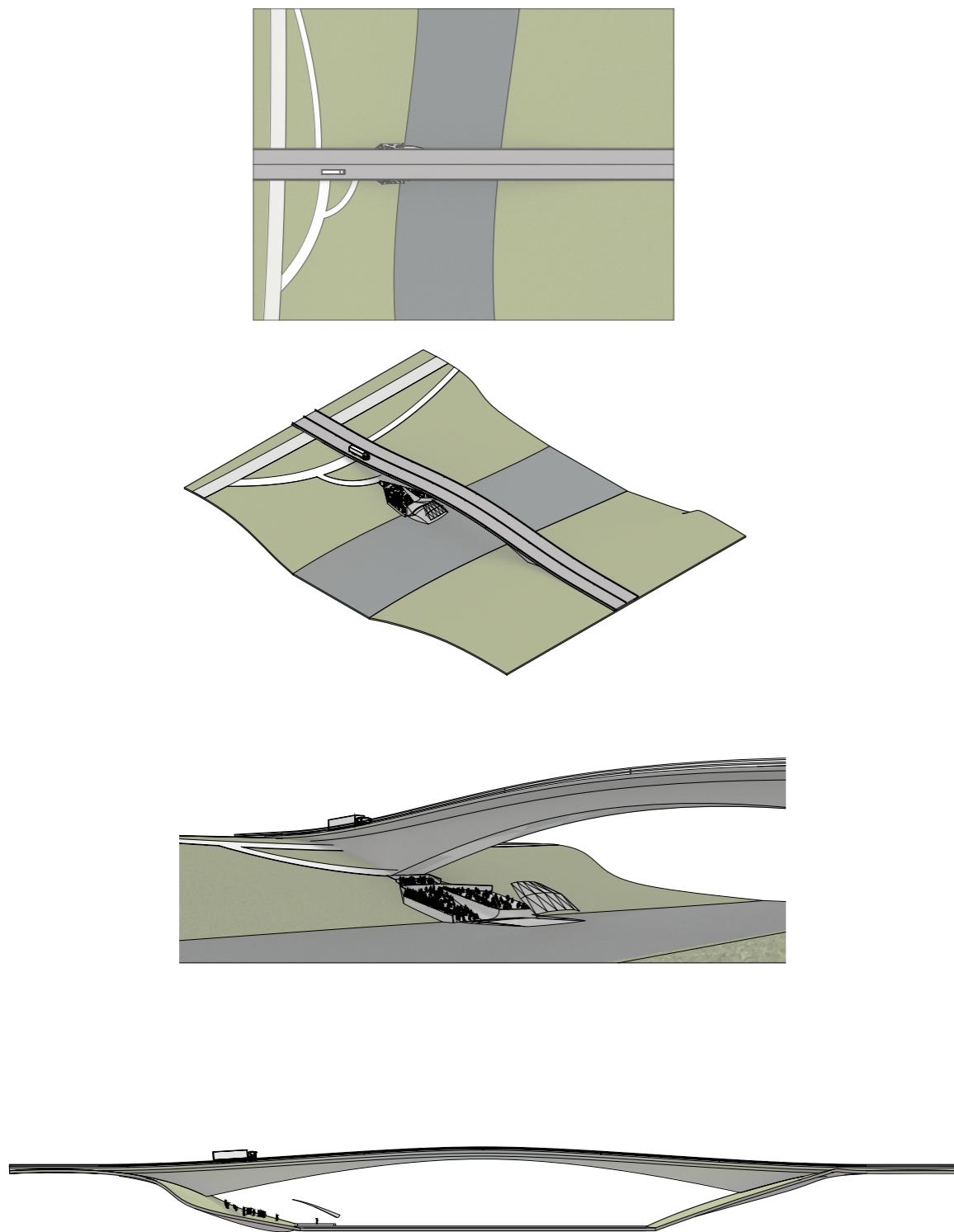


Bridges in cities are often located in a very central location and offers a sheltered and often unused space beneath them. This space can be better utilized considering the potential granted by the high intensity flows of people in its close proximity. This proposal is imagining a transformation of the space to a cultural hub including a relaxed park crossed with an atmospheric outdoor auditorium.

## 1.1.4 - Hybrid Space, System

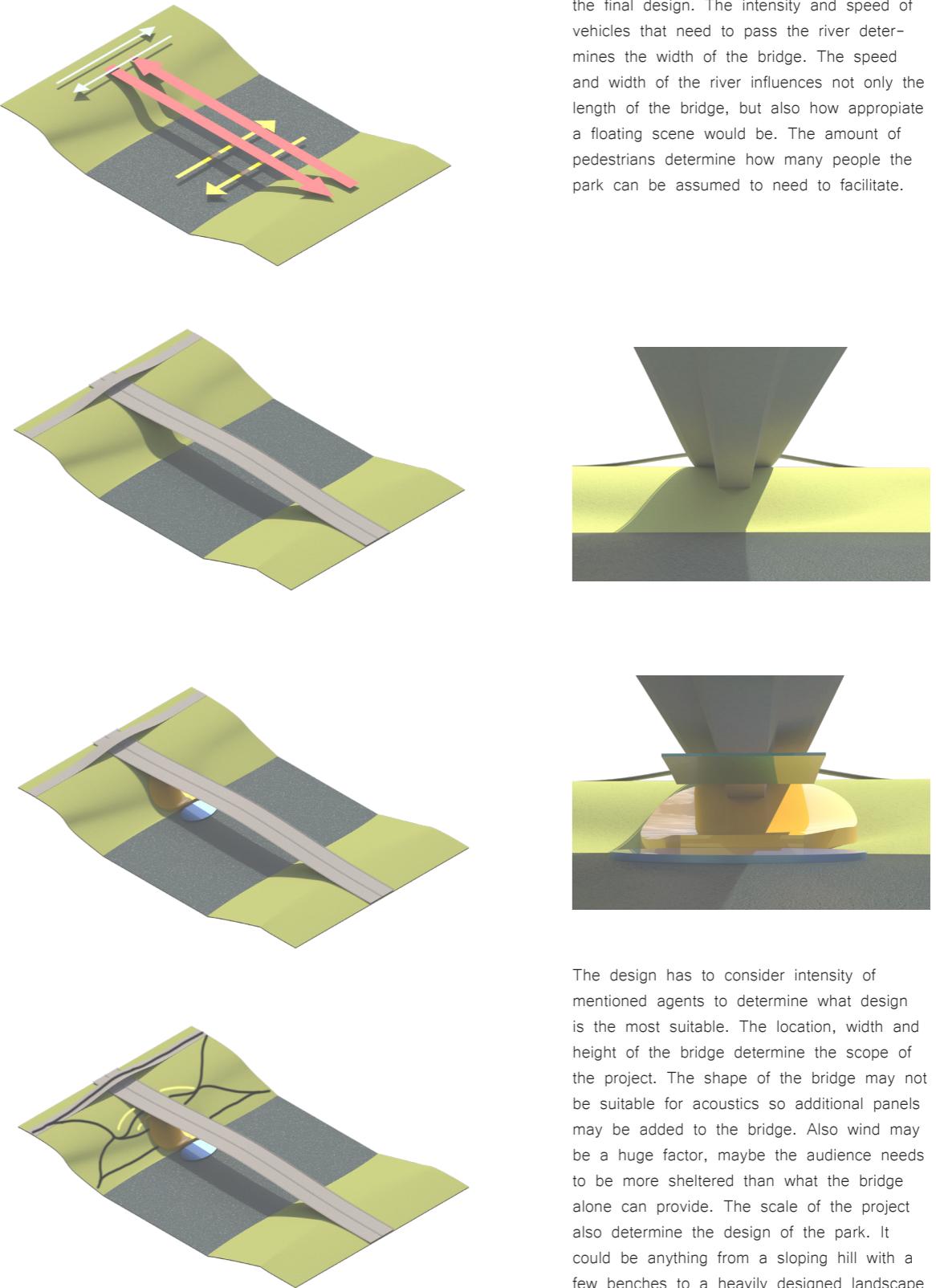
An example of how a medium sized bridge could be utilized

The vehicular infrastructure and its agents are unaffected by the public space below while providing a cosy envelope for the auditorium. The auditorium does not only benefit from the bridge but also from any boats passing by in the river as they can serve as a backdrop. Pedestrians passing through the area have the option to rest in the park while enjoying the view and possibly a performance on the floating stage.

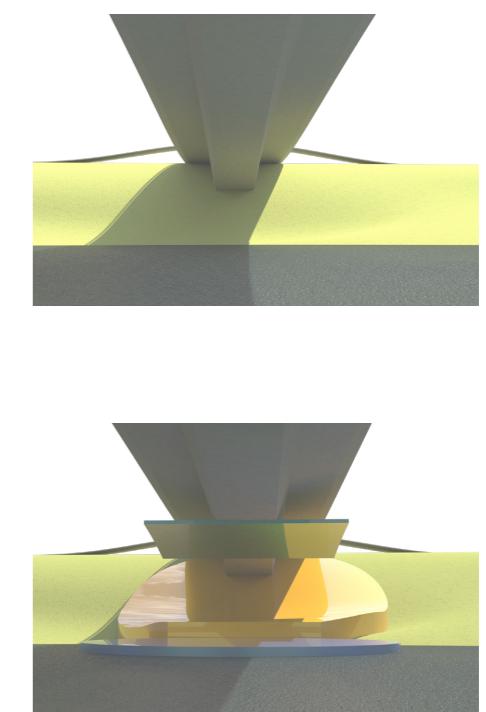


## 1.1.5 - Hybrid Space, Design Procedure

The process from a need for infrastructure to a design concept



There are three main agents that influences the final design. The intensity and speed of vehicles that need to pass the river determines the width of the bridge. The speed and width of the river influences not only the length of the bridge, but also how appropriate a floating scene would be. The amount of pedestrians determine how many people the park can be assumed to need to facilitate.

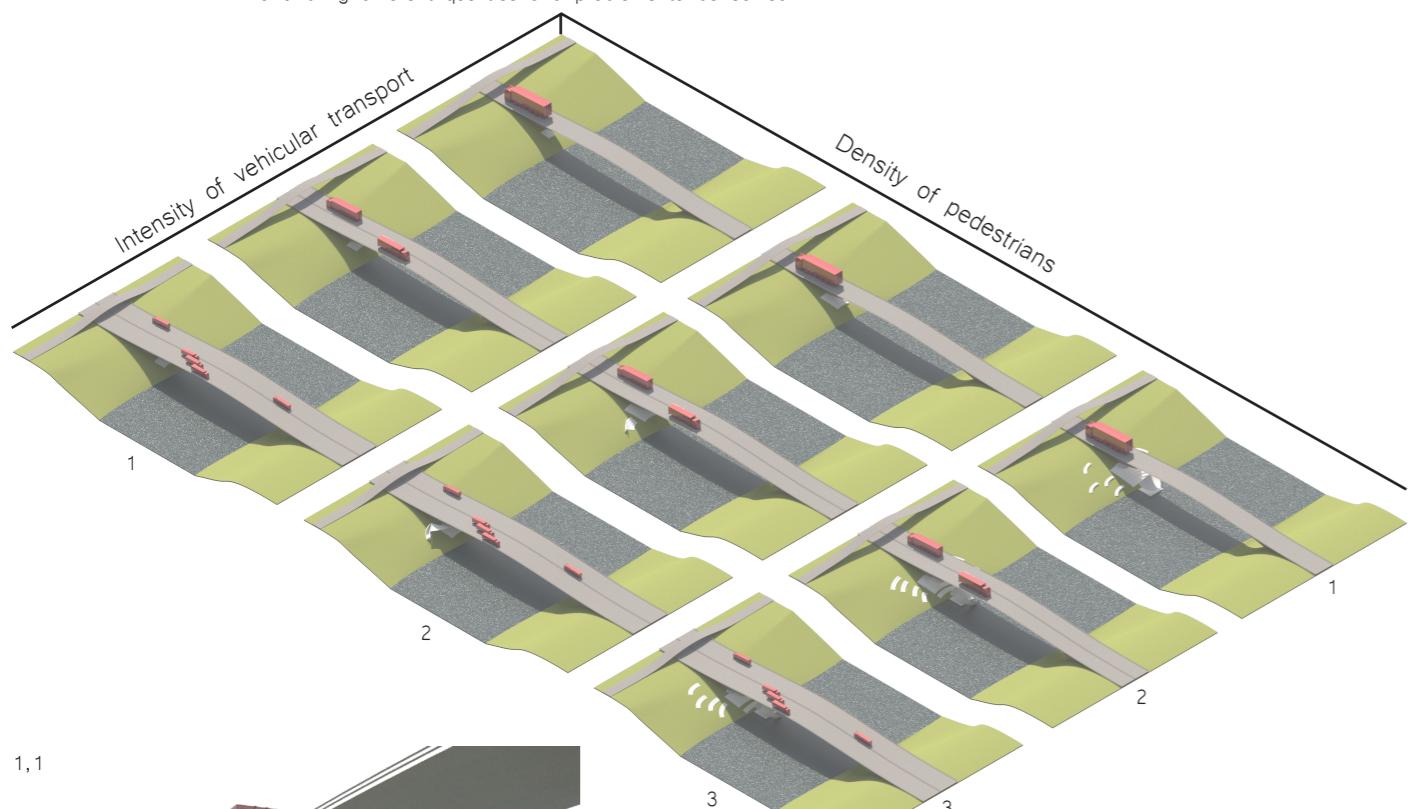


The design has to consider intensity of mentioned agents to determine what design is the most suitable. The location, width and height of the bridge determine the scope of the project. The shape of the bridge may not be suitable for acoustics so additional panels may be added to the bridge. Also wind may be a huge factor, maybe the audience needs to be more sheltered than what the bridge alone can provide. The scale of the project also determine the design of the park. It could be anything from a sloping hill with a few benches to a heavily designed landscape including amphitheatre seats, restaurants or even a skate park.

## 1.1.6 - Hybrid Space, Variations

Design variations depending on intensity and density of an agent

Simplifying the design process to just two main parameters is a valuable tool. However, only relying on this is obviously not good for the final project as all landscapes and bridges vary and bring different qualities and problems to be solved.



1

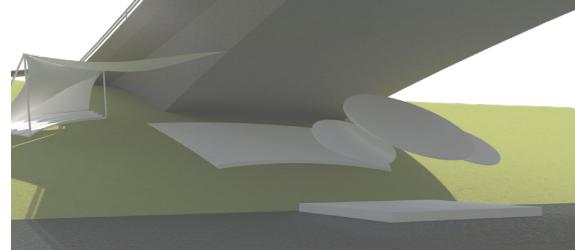
2

1,1

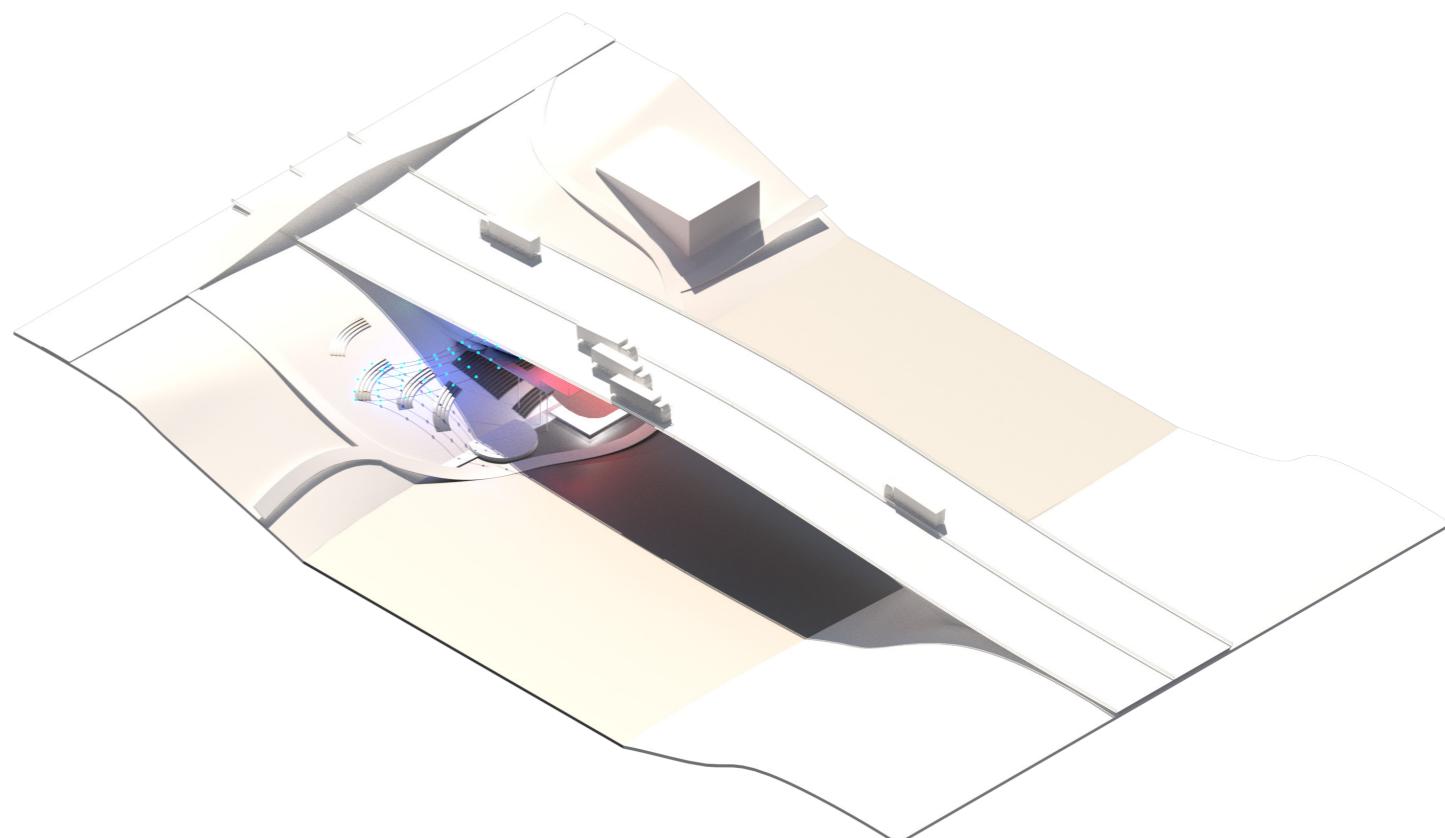
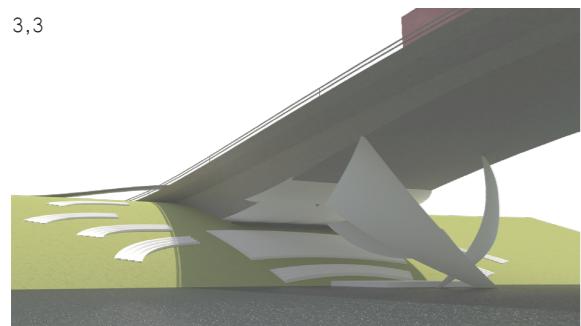
As the bridge gets larger the auditorium can become larger. As the amount of pedestrians increases the park itself can be more heavily designed. As the auditorium grows the sound quality can also increase with the addition of sound reflective panels.

2,2

Taking the shape of the natural landscape, the height of the bridge and wind in to consideration would also be very



3,3

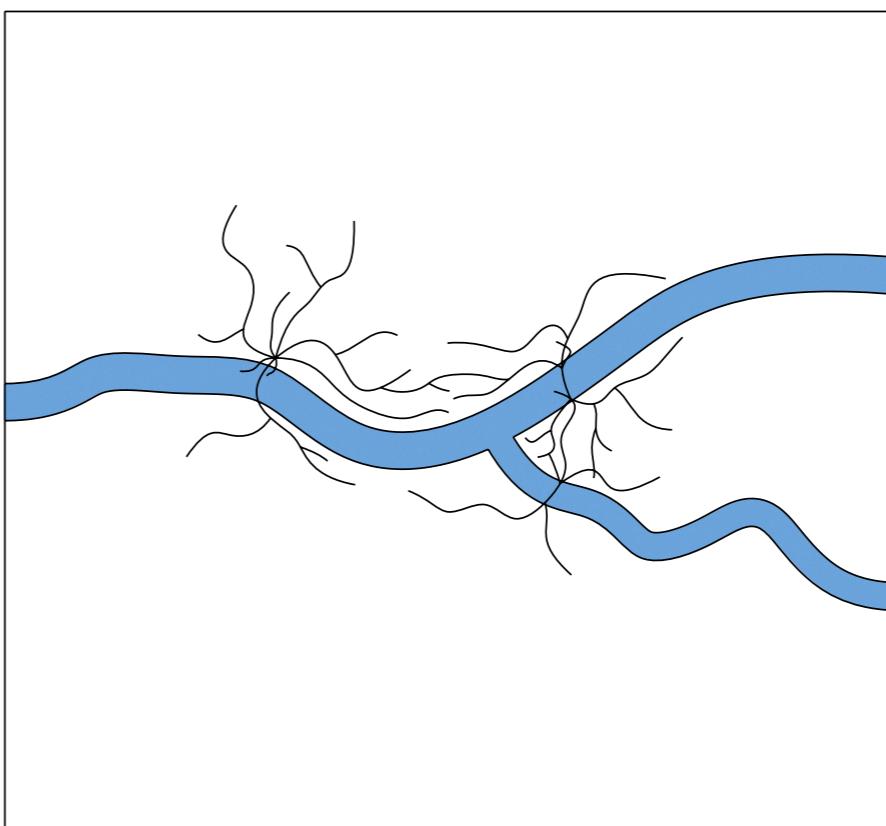
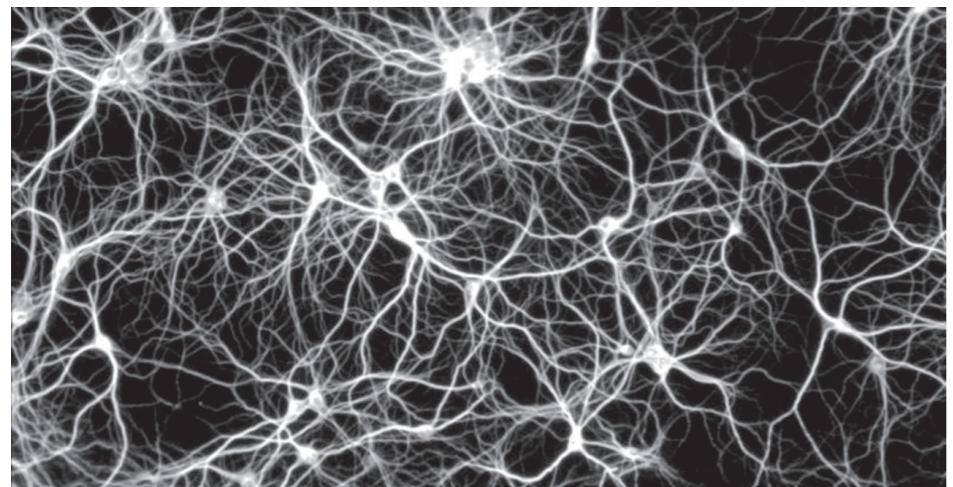


## 1.2.2 - Growth Network, Concept

### 1.2.1 - Growth Network, Type



Neural networks and brain cells work in a very similar way. The network grows stronger as individual nodes or cells searches to connect with eachother. The connections strengthen as the intensity of the information passing through them increases.



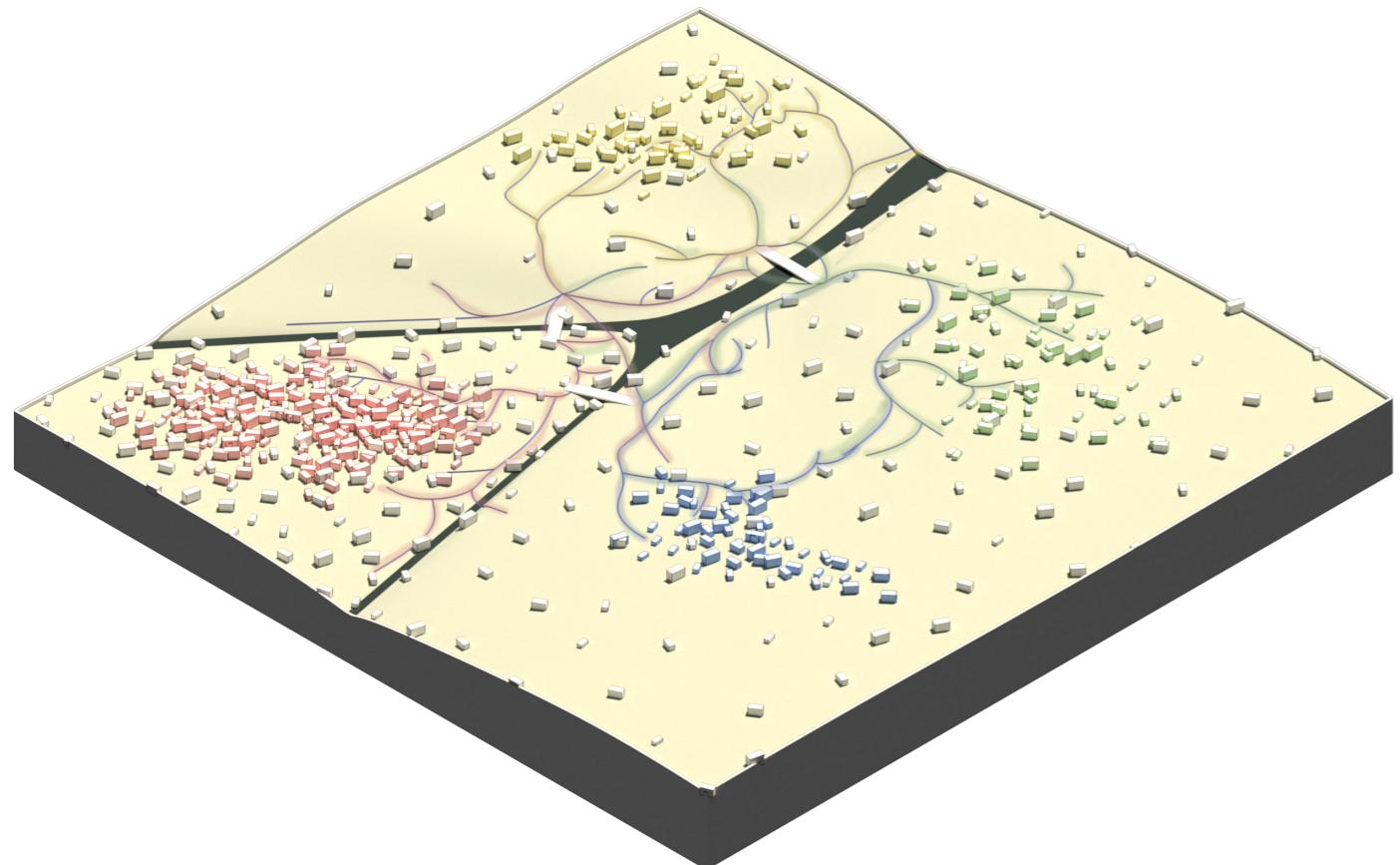
Similarly, to how a neural network, brain cells or ants grow into large networks, the park is imagined stretching out and connect with other cultural hotspots in the city. As the network is traversed, a cultural gradient forms along different paths and saturate with, to an unpredictable degree, culture from all parties. As these connections grow stronger over time, it is imagined that the park will find more use-cases. After some time, perhaps, one under-bridge space turn into a space used simultaneously to satisfy the entire network..

### 1.2.3 - Growth Network, System

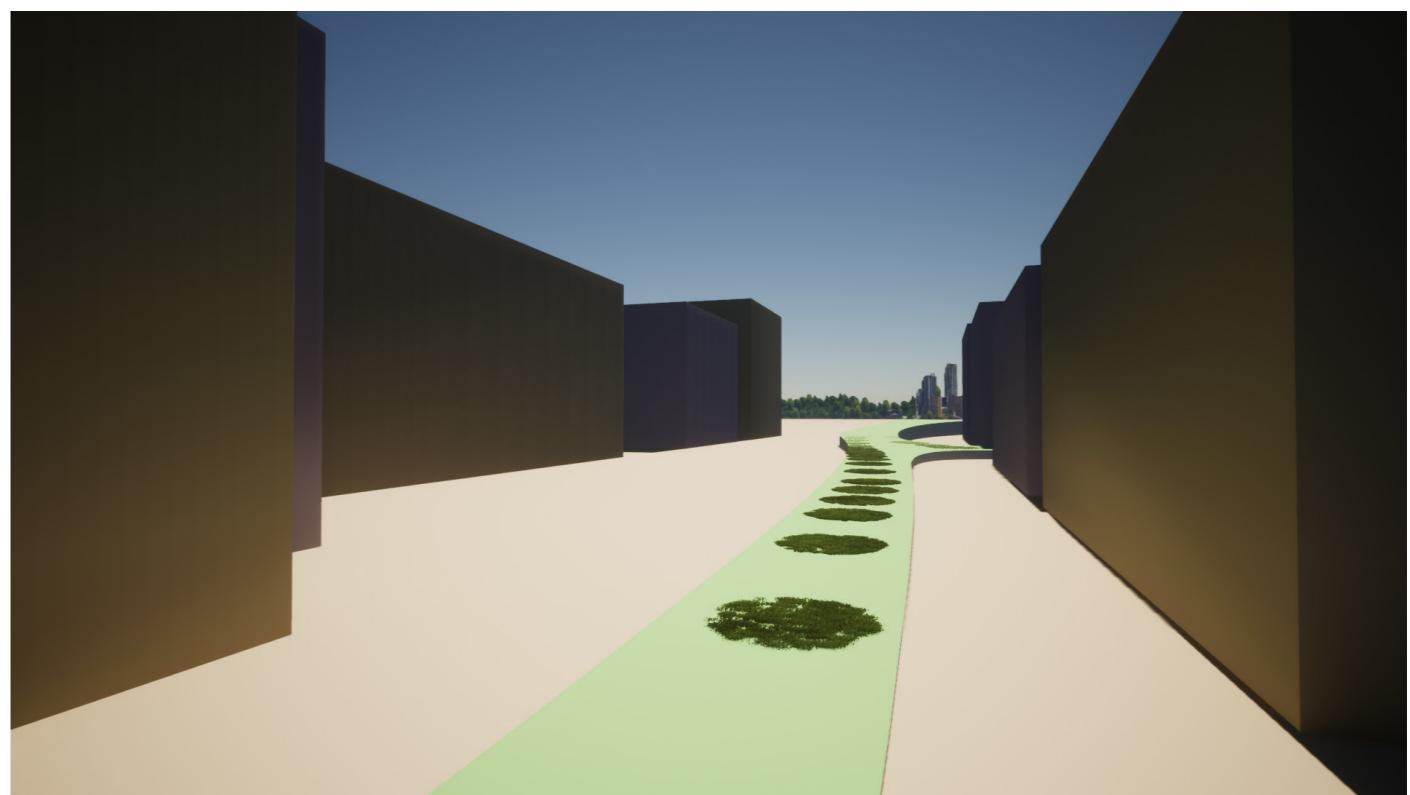
The requirement set on the network is locally dependant on how strong the connections are- intensity of pedestrian flow. If the intensity is very low the network may not be visible to the unaware. It can be nothing but thin strips of grass in the city scape thats hints, through design language, at a larger network . However, if the connections are very strong with a high intensity, the parks need to be very large, potentially elevated from the street.

Design rules:

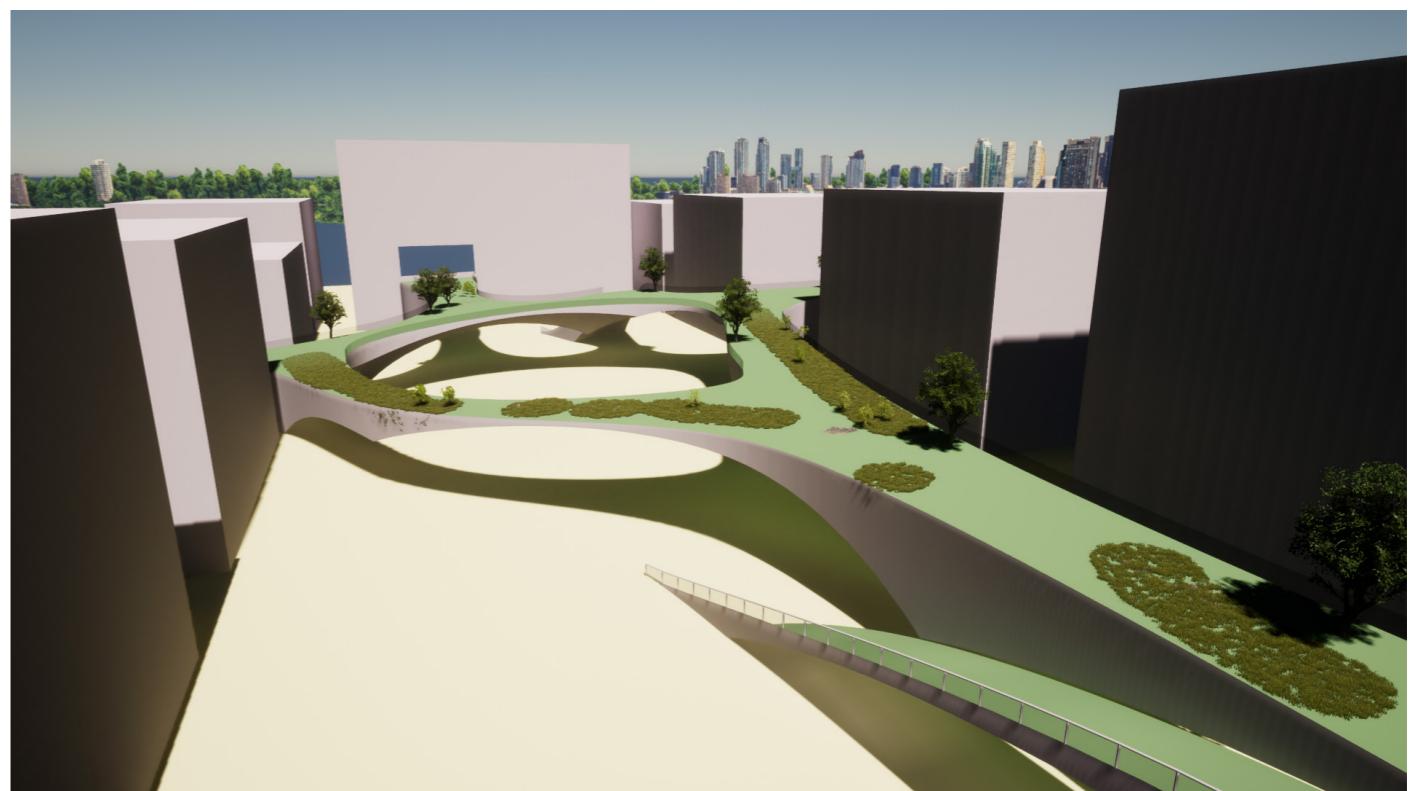
- Have a strong visual connection to the main network, big or small
- Be inviting to the public to use it, increase its desire to grow
- Engage the public, let them chose if and where it should grow to legitimize its growth
- Promote murals and such from the local community, the network wants to be a symbol of how all communities are tied together



### 1.2.4 - Growth Network, Variations



Draft with moderate pedestrian traffic and no vehicles.



The connection has grown very strong with a large pedestrian flow. It is elevated to help vehicular traffic.

---

# HYBRID SPACEJAM

---

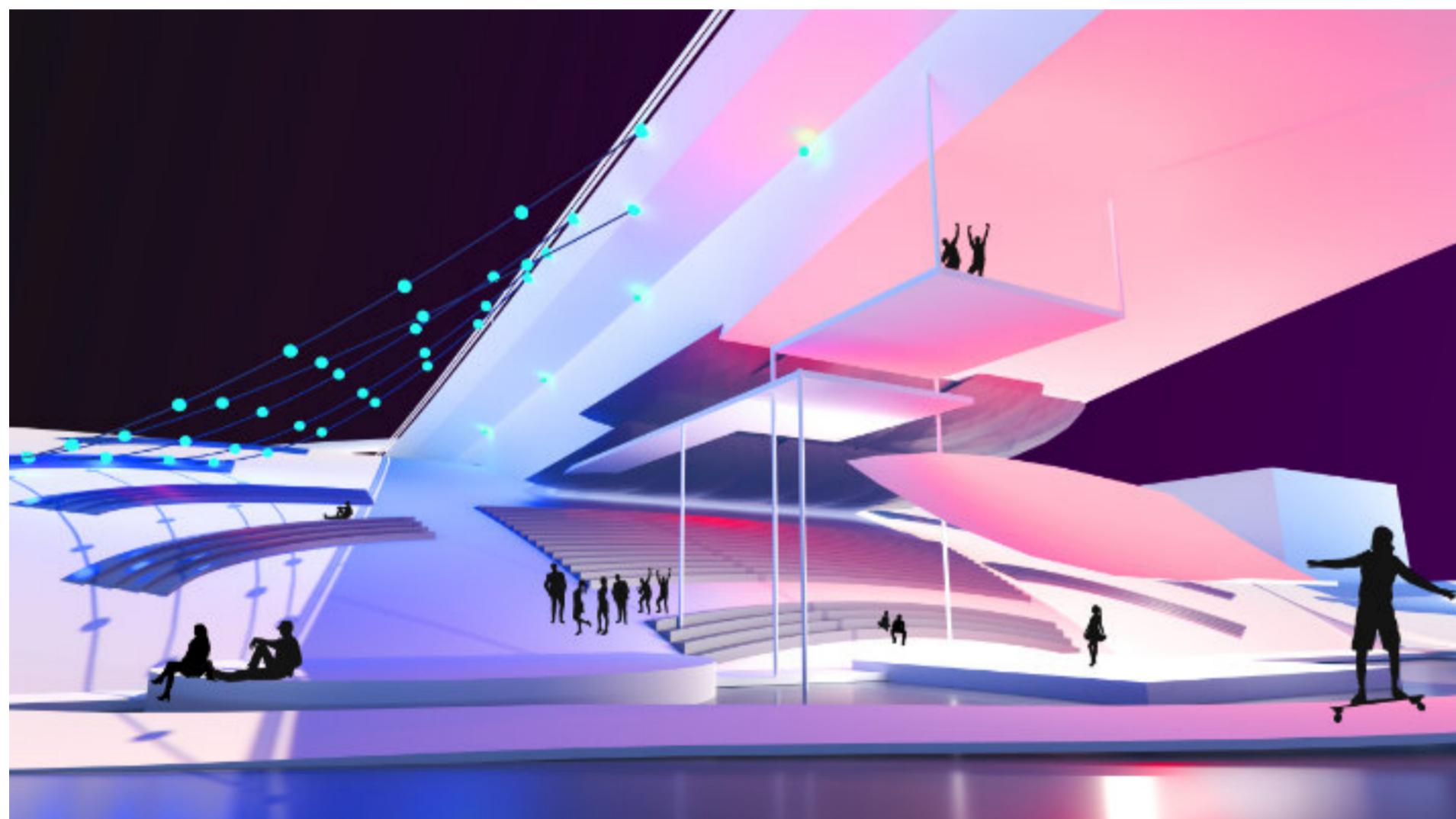
A PROBLEM SOLVING COLLABORATION BETWEEN THREE HYBRID CONCEPTS

HERMAN EHRNBERG

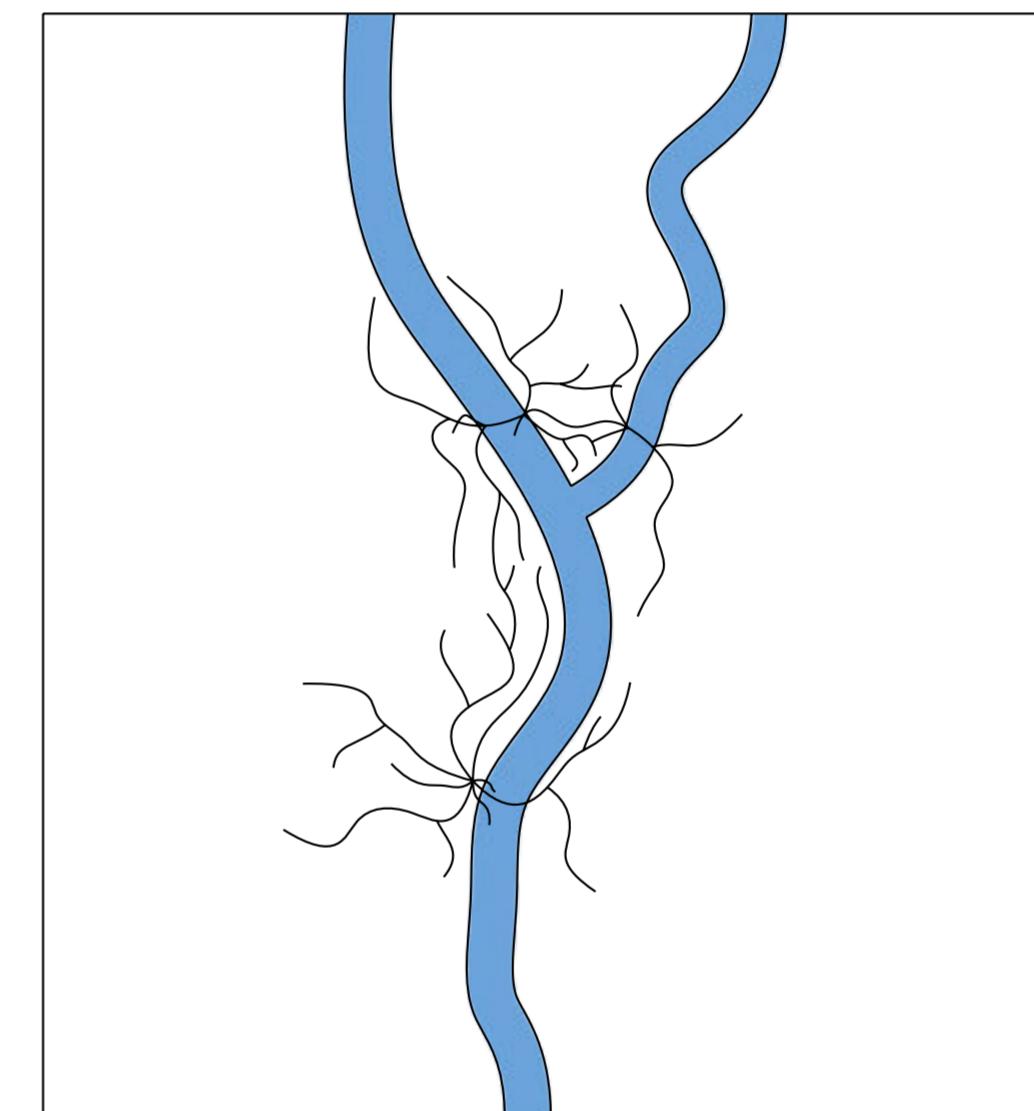
RICK PERSSON

SIMON WIKSTRÖM

Better use of the sheltered and often under utilized space under bridges. The natural slope of many bridges combined with the improved acoustics provided by a bridge has great potential for some kind of performance centre. Combining a performance pavillion/auditorium with some kind of park would help bring life to an otherwise dead space.



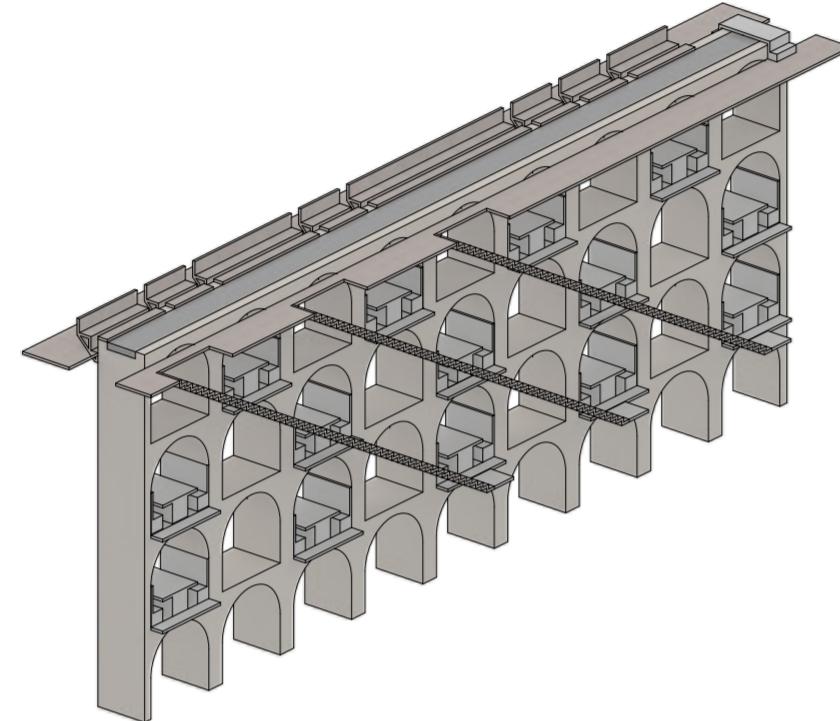
Similarly to how a neural network, braincells or ants grow into large networks, the park is imagined to stretch out and connect with other cultural hotspots in the city.



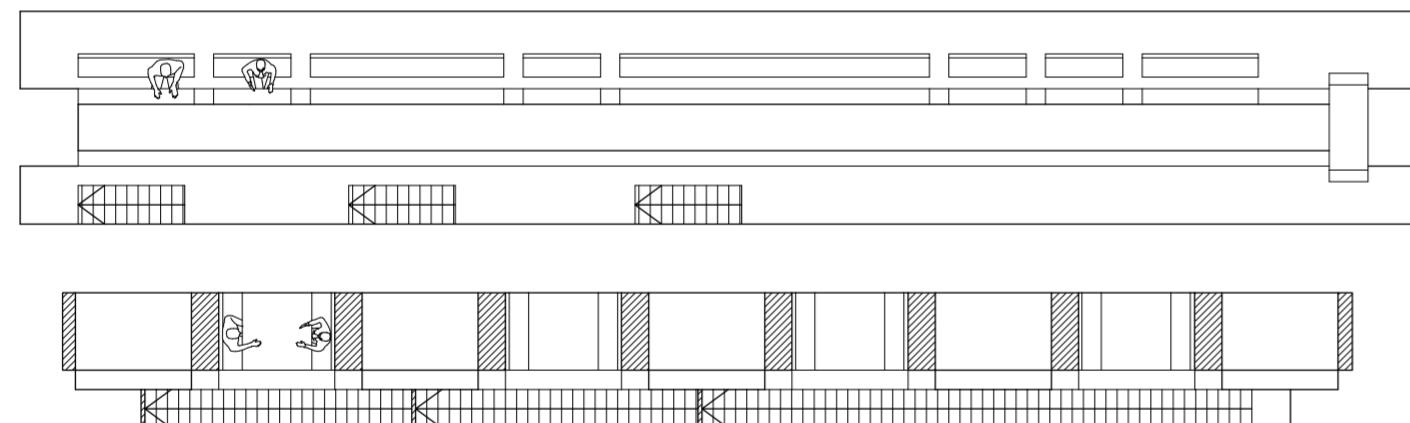
## AQUEDUCT + RESTAURANT = AQUA BUFFET

The Aqua Buffet is sprung from the combination between a classic aqueduct and a restaurant in the form of a belt buffet.

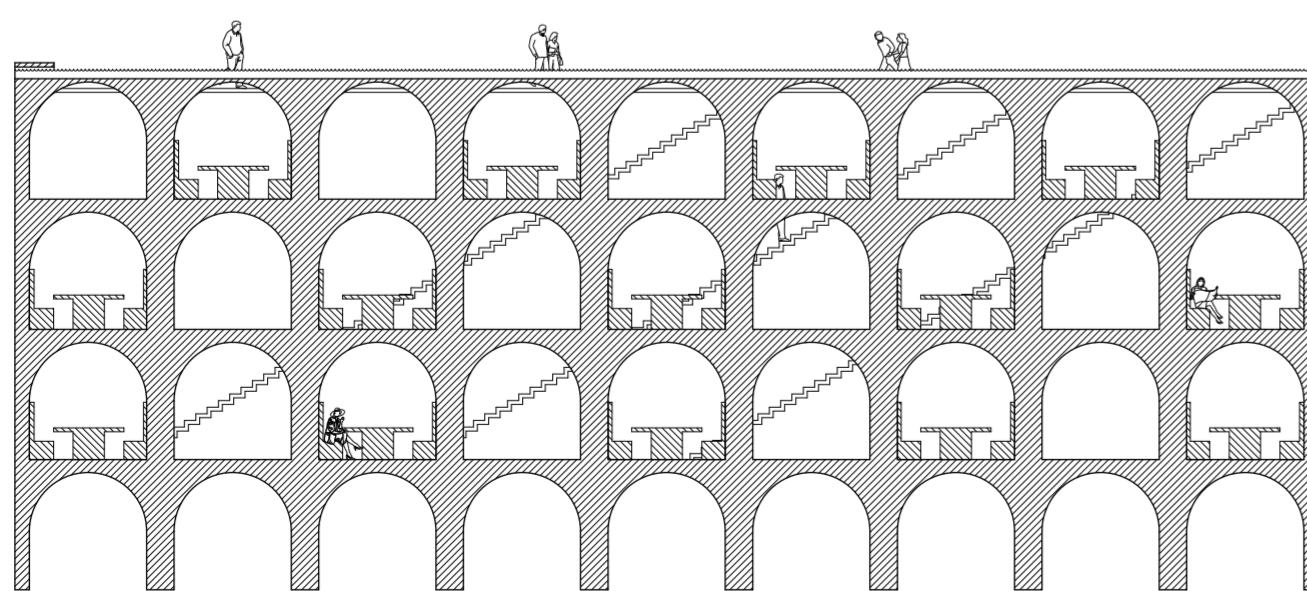
The result becomes a Hybrid Space System functioning both as an aqueduct as well as a restaurant with the function of a belt buffet on top and private tables below. Where the two concepts are joined together in harmony, utilizing each other in a peaceful way.



Axonometric view of one instant of the Aqua Buffet.

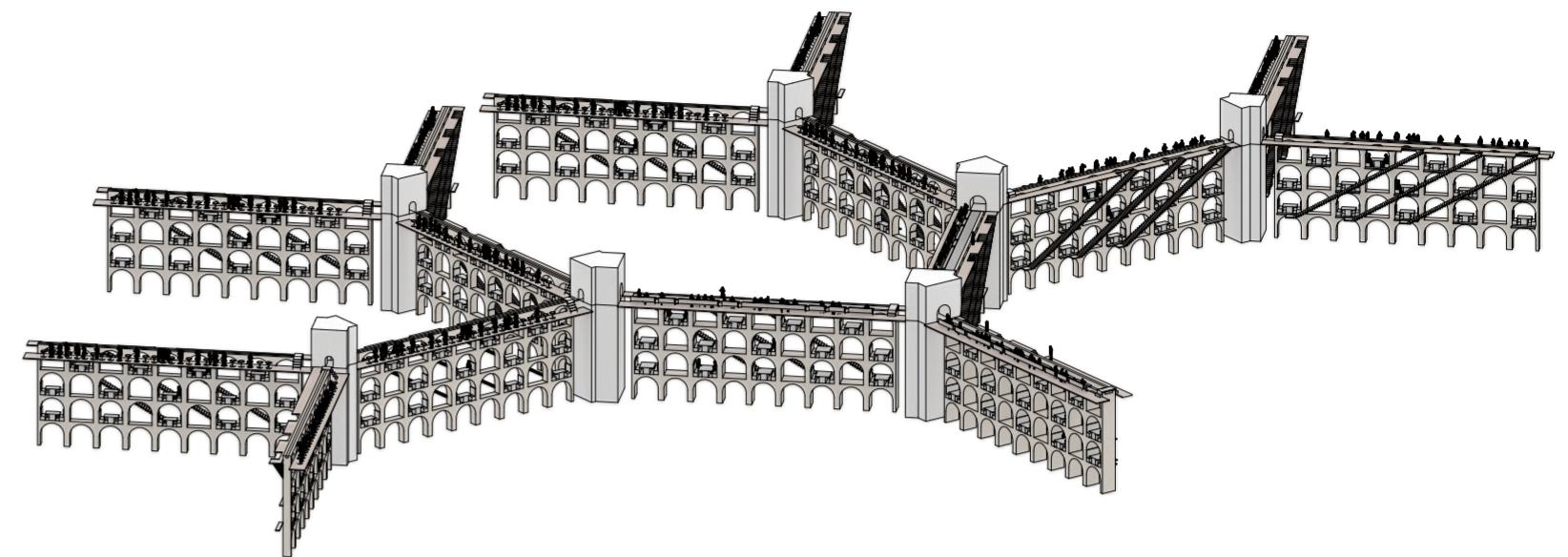


Plan 1:200.

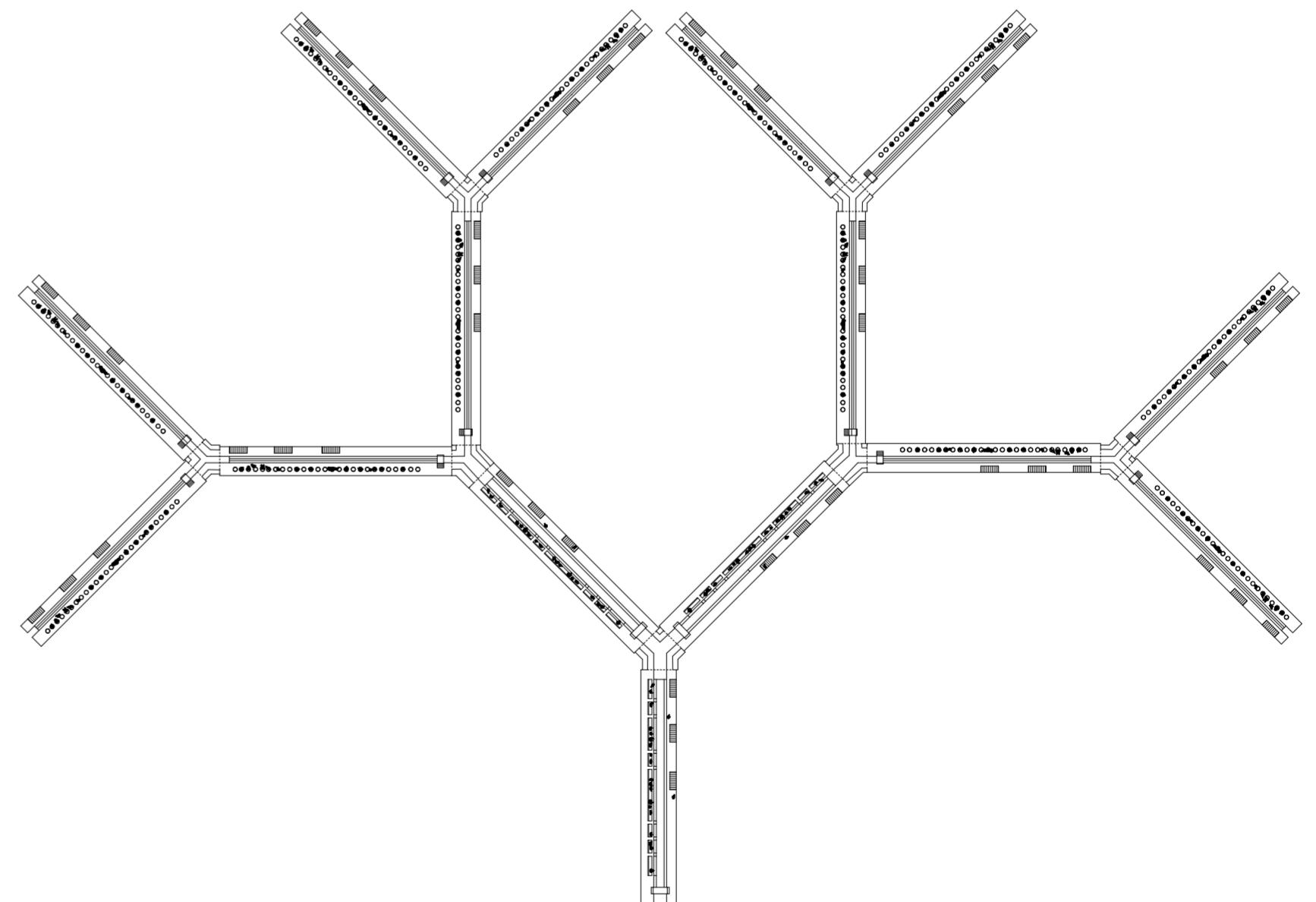


Section 1:200.

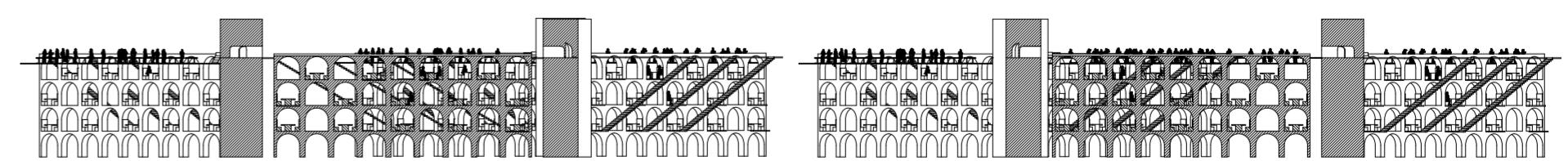
## AQUA BUFFET + RECURSIVE TREE = NETWORK



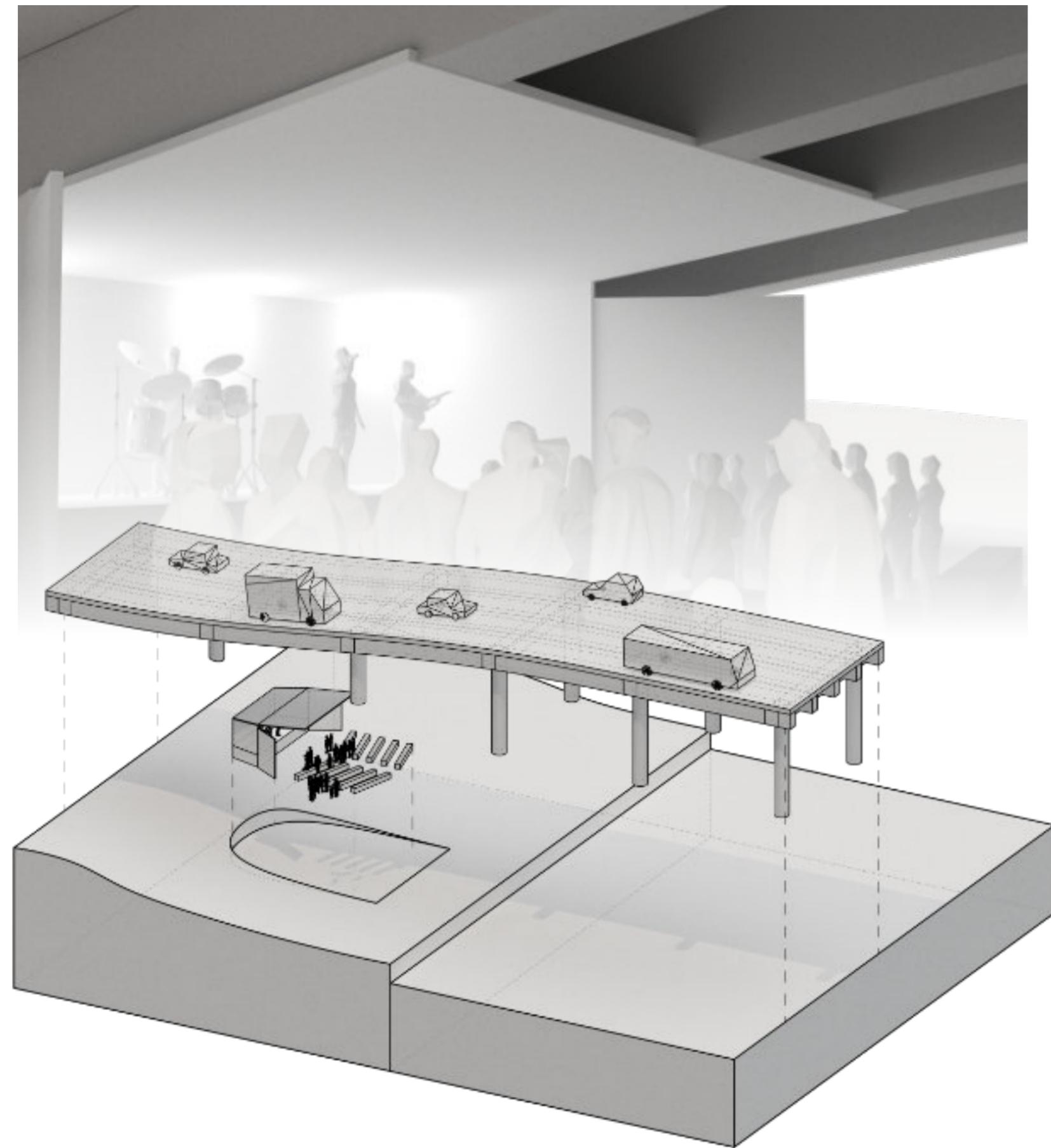
Axonometric view of a network of Aqua Buffets.



Plan 1:1000.

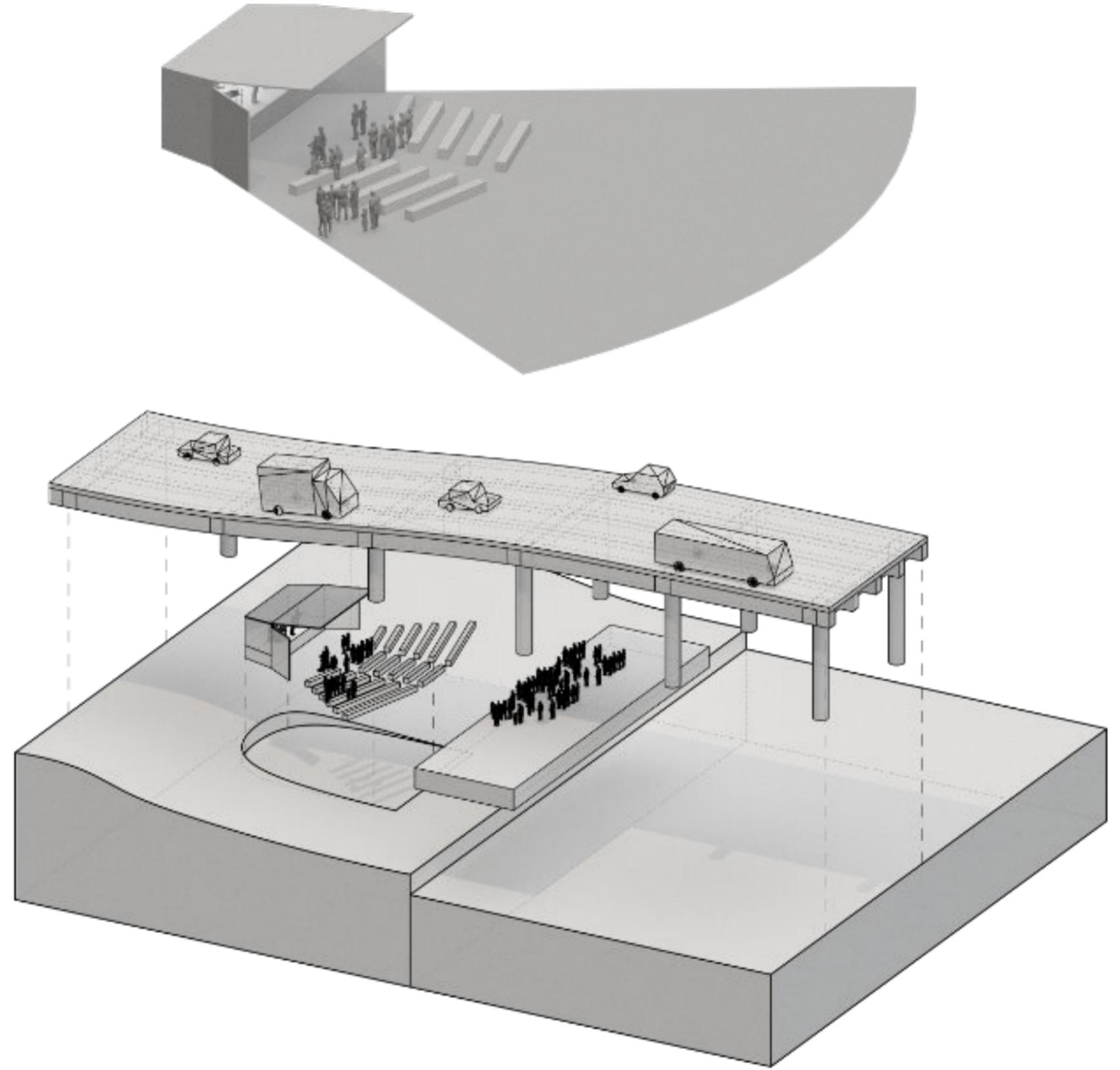


Section 1:1000.



Bridges are one of the most common infrastructures type and can sometimes be well integrated with human spaces, by making them attractive or utilized by pedestrians. The spatial volume beneath a bridge could serve unexplored usages as its shelter functions for much potential.

The core of the concept lies in the acoustic shell that captures early sounds, providing a baseline for decent acoustics.



The growth pattern is expanding outward to capture a broader socializing audience on land or floating islands of various social activities.



Panoramic view over the Göta Älv river showing how its massive width divides the city in two.

## 2.1 PROBLEMATIZED WATERFRONT

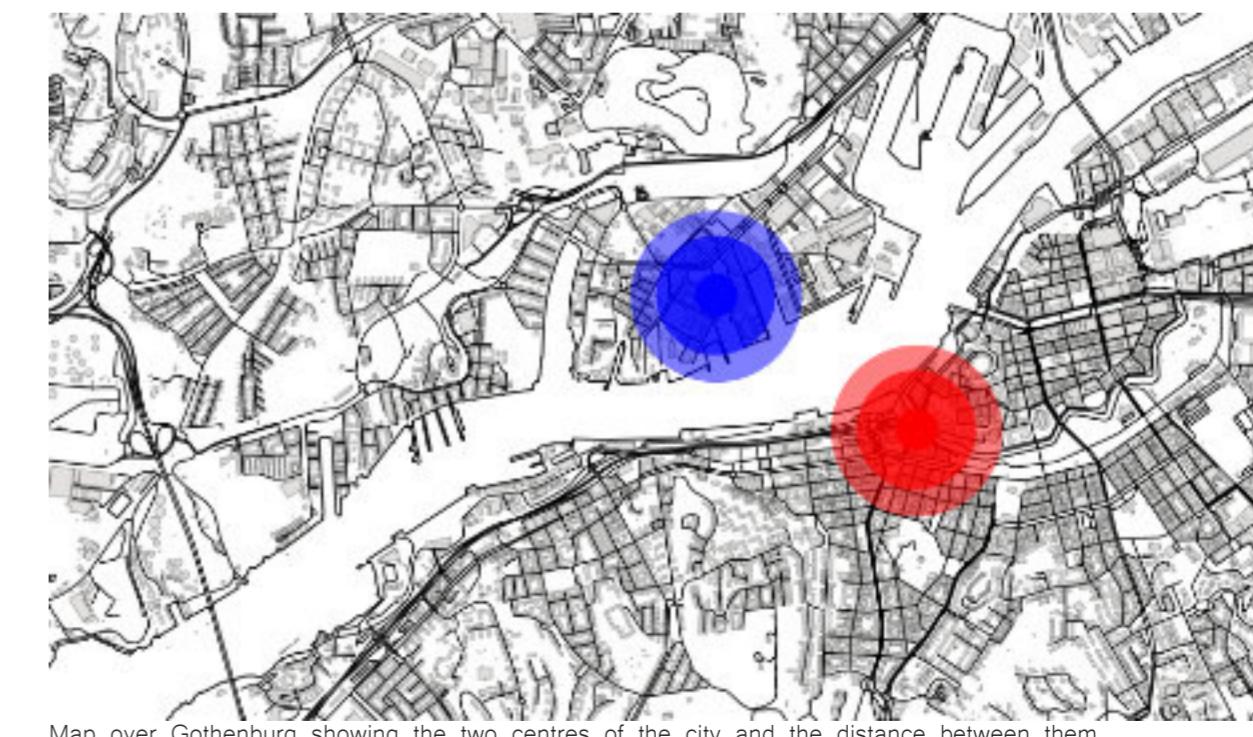
A major problem in the social landscape of Gothenburg today is the division done to the city by the river. Since Gothenburg is currently partitioned by the Göta Älv river, only connected by Hisingsbron and Älvsborgsbron, the city becomes divided into two different parts. These parts are not only divided physically but also socially since the bridges and the river today hardly offers any spaces for human interaction, focusing only on the transportation of vehicles. At the same time the river remains unused by anything but boats in the middle of the city, acting like a wall between the two parts. Can a creative solution between infrastructure, social space and the river be found to span the gap between the two parts and make the city come together as one?



Alvsborgsbron, a bridge for vehicles



Hisingsbron, another bridge for vehicles

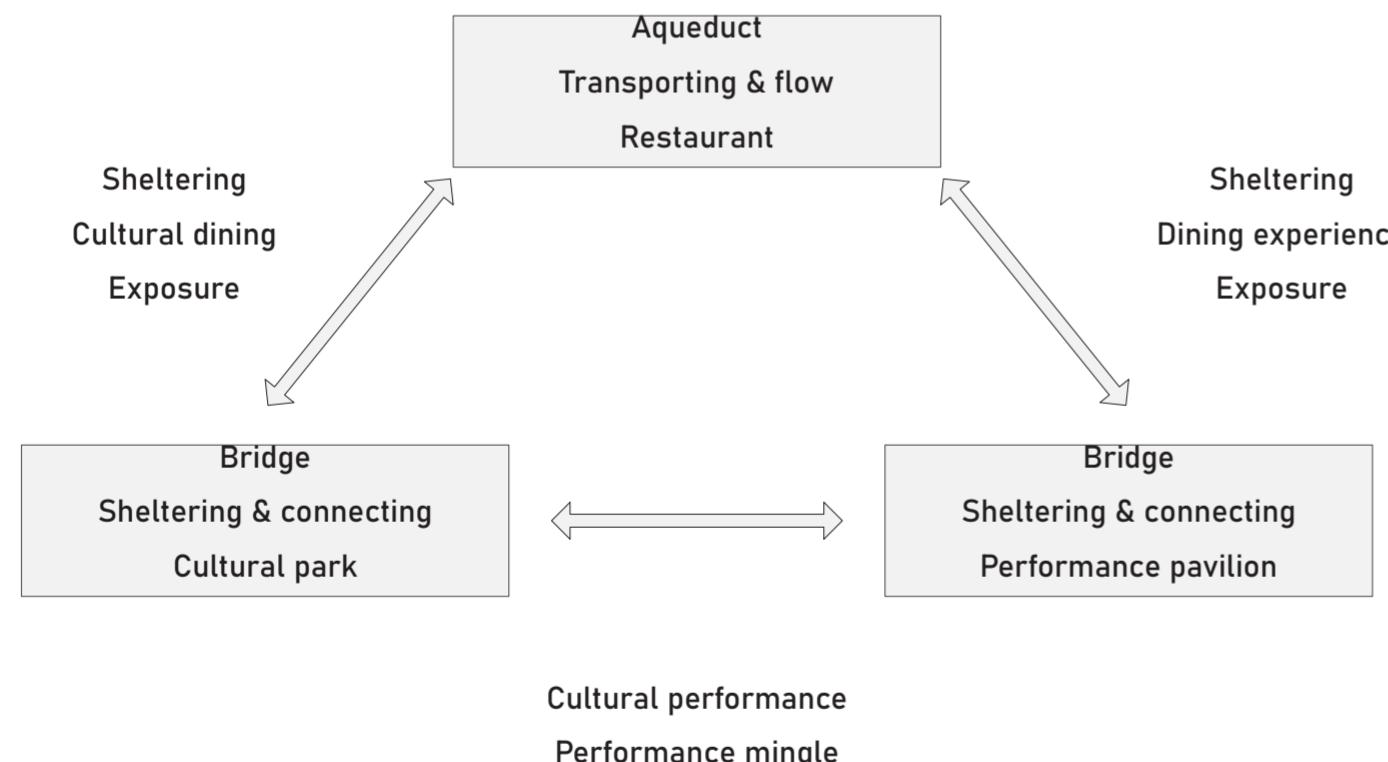


Map over Gothenburg showing the two centres of the city and the distance between them.

Hybrid Space Type	Infrastructure	Agent	Human space	Agent
x	Bridge	Vehicles	Cultural park	Socializing people
y	Bridge	Pedestrians	Performance pavilion	Dancing people
z	Aqueduct	Water	Restaurant	Dining people

In order to deal with problems arising from a divided city, social human spaces will be given the opportunity to assist in bridging the gap between Hisingen and central Gothenburg. Social spaces growing from two connection points are semi sheltered by a bridge infrastructure, giving birth to hybrid space. For the success of the hybrid space, a good relation between infrastructure and social space is needed, for a socially attractive and active space.

Hybrid Space Type	Potential	Hybrid with
x	Sheltering & connecting	Vehicles
y	Sheltering & connecting	Pedestrians
z	Transporting & flow	Water



A good set of connection points would be between two already considered social spaces, the social areas would give a good base of people flow. For context, open spaces with access to the waterfront is of importance for the concept.

The concept takes root in the collaboration between the three hybrid spaces, presented on the earlier page, in combination with the problematization. Since this problem implies the division of Gothenburg done by the river a solution is sought to penetrate this barrier and create a social connector as much as a physical one between the two parts.

The main concept of a social connector involves connecting the people of the two parts in every way possible. This connector spreads its roots out into the two landscapes on each side of the river leading the people to the centre of the city, dragging them in via a vast network coming together as one to connect the two parts of the city.

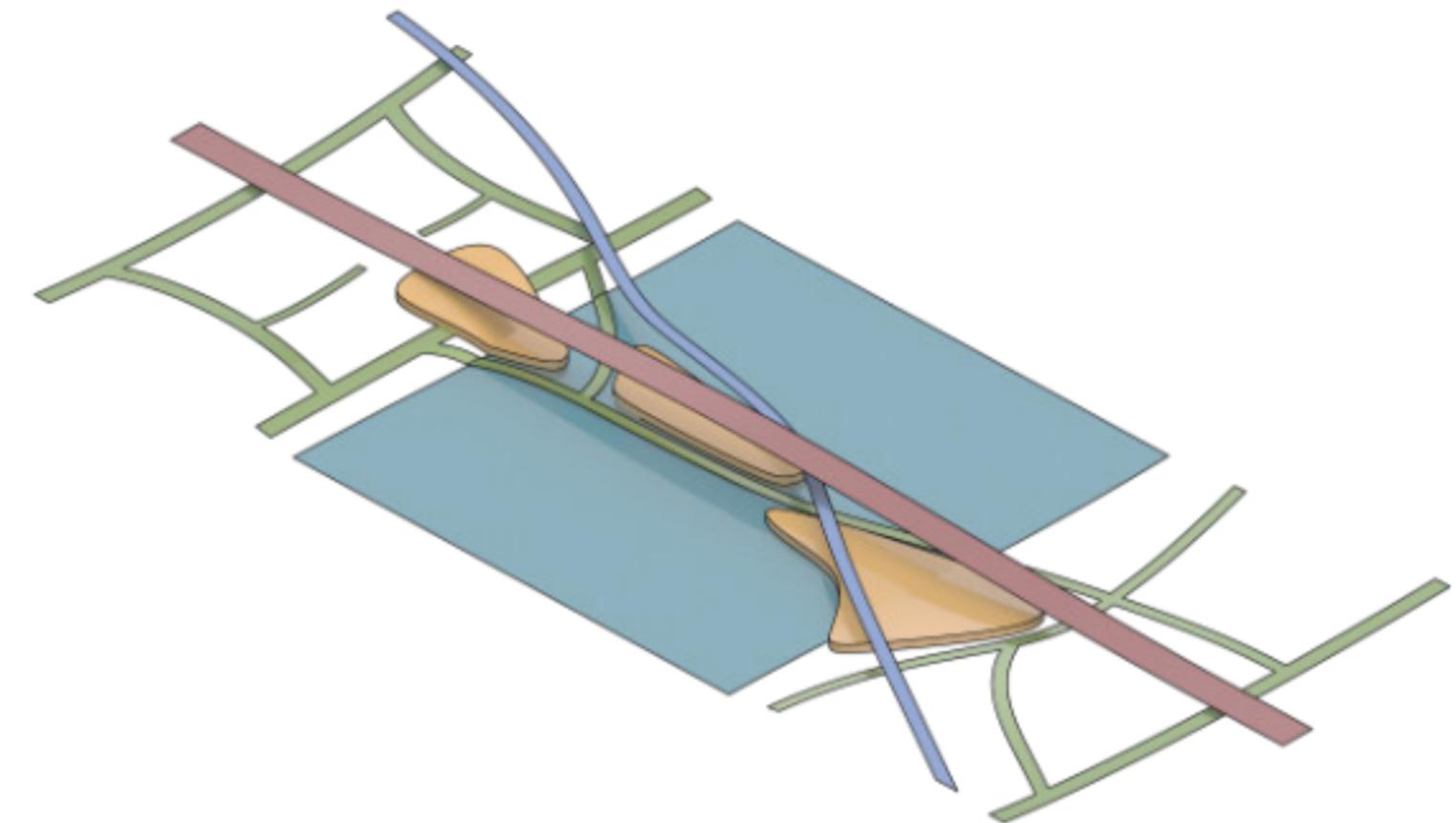


Diagram illustrating the interconnection between the Hybrid Space concepts as they meet in one location forming a social connector.

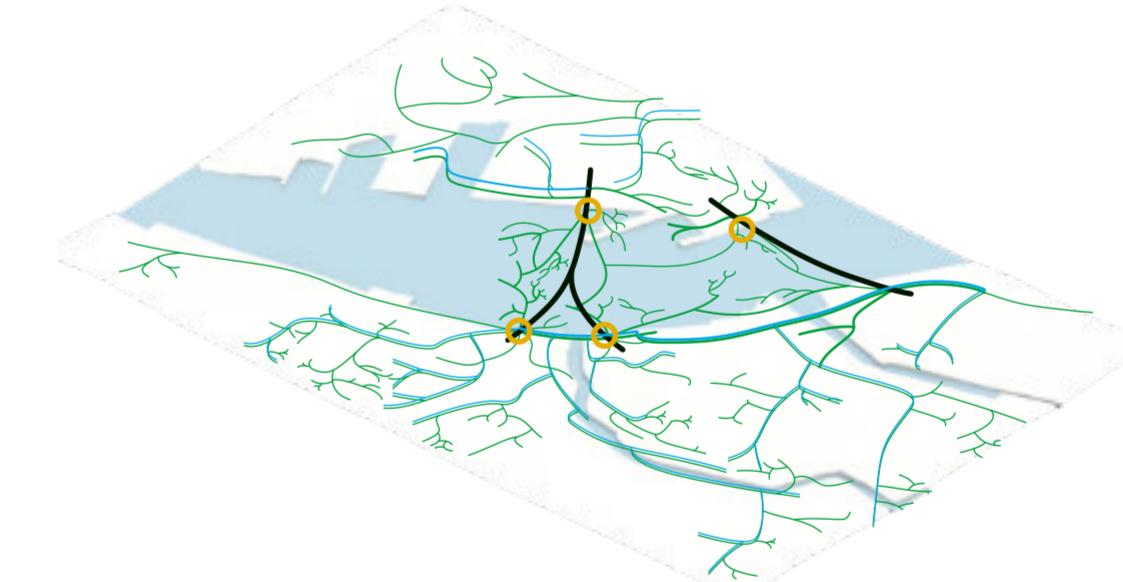


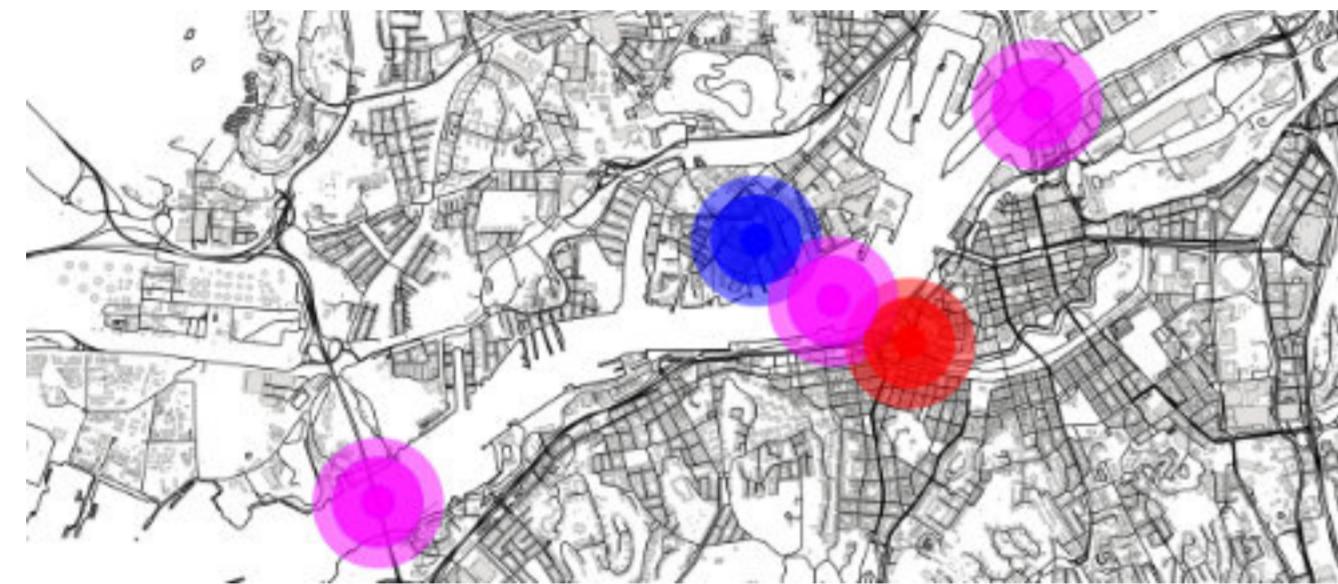
Diagram illustrating the macro network of parks and aqueducts spreading through the city interconnecting over the river.

In this central hub, where the entire network comes together, several massive bridges stretches across the river joining the city as one. Under these bridges the river is no longer empty and lifeless. A floating network of activities is stretched out from where the bridges touches land and out over the river. All sorts of activities can be found, from restaurants and performances to cultural parks and collaborative agriculture, imagination is the limit to what can happen on the water. Alongside the floating islands filled with activities another network reaches through the structure, providing the infrastructure necessary for the activities to work in an optimal way. A network of walking platforms in the form of jetties as well as aqueducts providing flowing water gathered from the city being used for different activities.

This structure, formed by the interconnecting networks, becomes an epicenter for activities in the middle of the city, with the flow of water in one direction crossing with the flow of people in the other, meeting in the middle of the river binding the city together as one both physically and socially. A Social Connector.

The spot most suited for the new social and physical connector of the city should be located between the two local centres of the city today, joining the city where social activity is expected to be high and with good growth opportunities. This spot should also be quite far from the already existing bridges, to spread the connectors over the river through the city. The two old bridges can however also be integrated in the concept and be turned into social connectors as the system is designed to be adapted by already existing bridges.

Taking these criterias into account the optimal location for the new social connector would be between the old centre of the city, eg "Järntorget", "Långgatorna" and "Within the moat", as well as the new centre of the city on Hisingen, eg "Lindholmen" and "Eriksberg".



Simple map over Gothenburg showing the polarized city today, in red and blue, as well as the possible spots for development, in purple.

#### LINDHOLMEN AND ERIKSBERG

The modern centre of the city, with new high tech companies, modern residential buildings and classy restaurants.



Lindholmen, waterfront



Lindholmen, waterfront

#### JÄRNTORGET AND LÅNGGATORNA

The traditional centre of the city, with streets beaming with life from the many cozy pubs and restaurants in the old buildings along them.



Järntorget



The moat surrounding old Gothenburg

The selected location for the context model is in general the entire central part of Gothenburg. This urban environment consists mostly of buildings four to seven stories high, as well as infrastructure in the form of roads for cars and bicycles and tracks for trams. As the main river separating the city in two is a mean for transportation both across, and through, the city it can be considered to be part of the cities infrastructure. For the purpose of this project, all rivers will be considered as "raw land". The selected area also consists of several smaller parks, as well as one big.



Axonometric view over the context area.



Plan 1:10000. Illustrating the interaction between buildings, infrastructure, parks and nature through the context area.

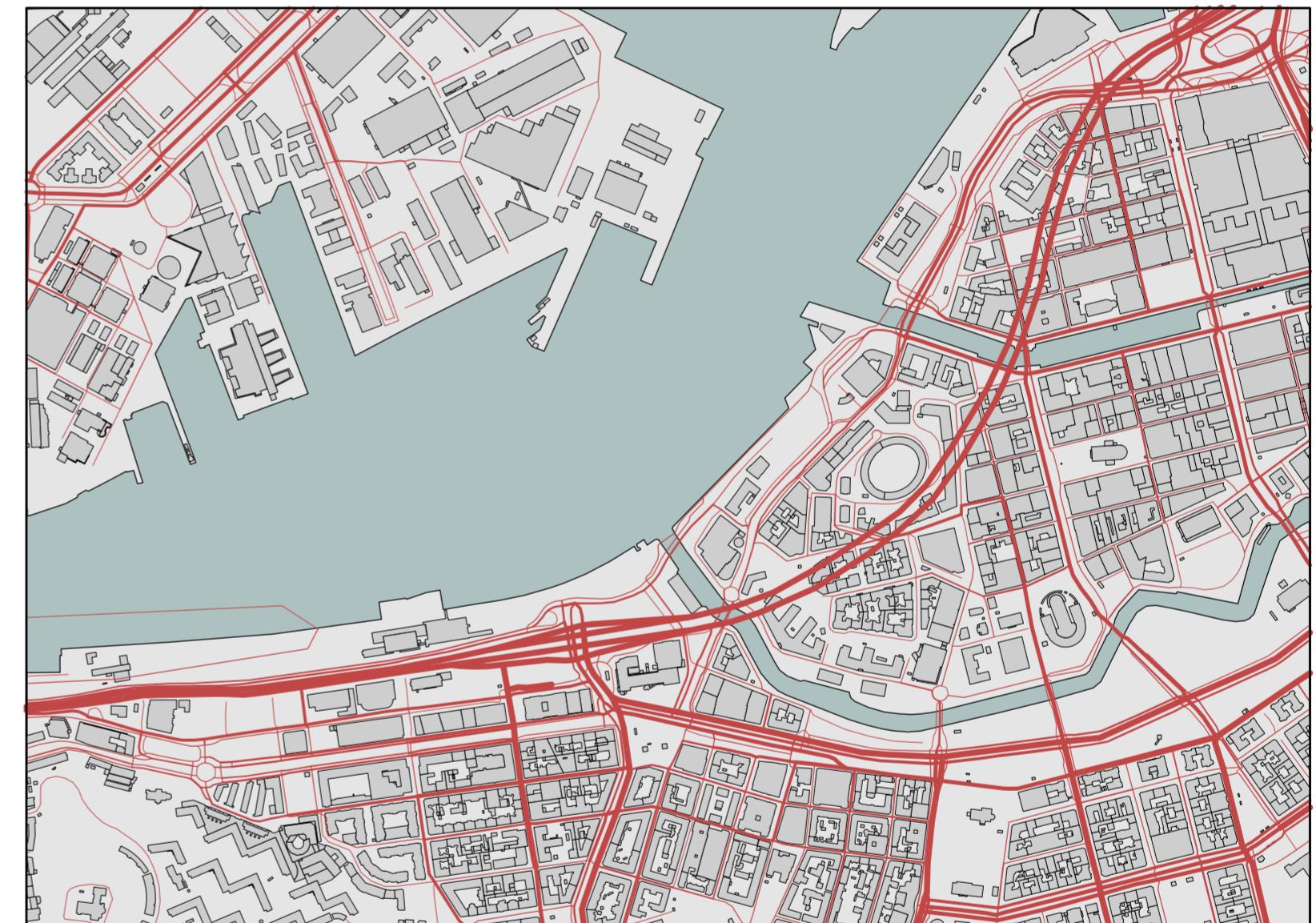
The infrastructure agents studied in this phase are those of the individual Hybrid Space concepts, being the users of the bridges as well the water running in the aqueducts. The bridges are in the hybrid concept being used by both vehicles, such as cars and trams, as well as pedestrians.



Plan 1:10000. Illustrating the movement of water from precipitation through the context area.

The water from precipitation in the city is at the moment totally unused. It travels downwards through the city, from the roofs of the buildings, to the streets ending up at local low points further down in the city, the river or in the sewer system under the city.

The vehicles and pedestrians travelling inside the city are today moving along the streets on either side of the city, when wanting to cross they need to get to the two existing bridges far away from the central part on either side. For the pedestrians there also exists boats ferrying people over from one side to the other.



Plan 1:10000. Illustrating the density of vehicles moving through the context area. Thicker lines equals more cars.



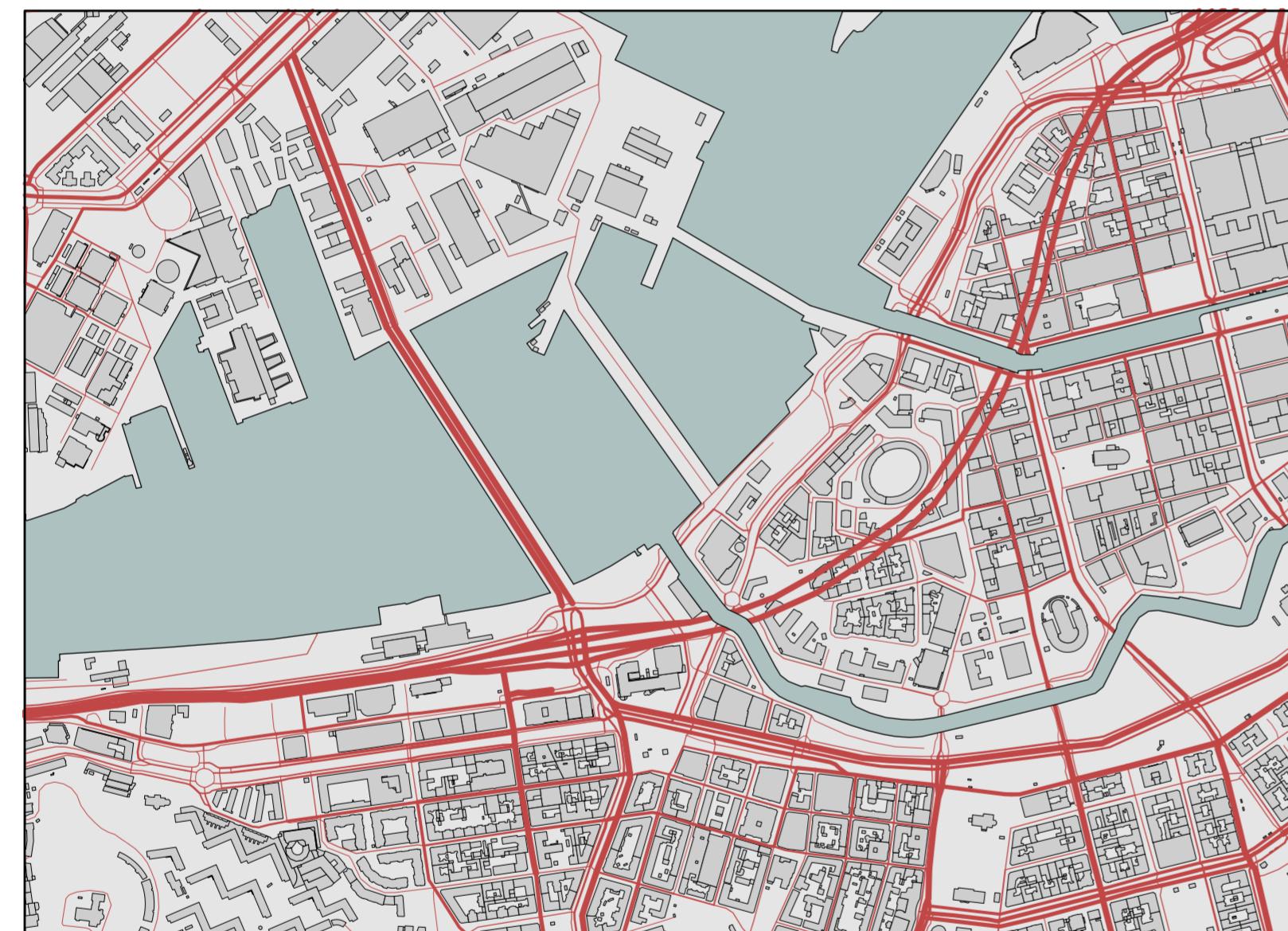
Plan 1:10000. Illustrating the locations for cultural experiences as well as restaurants in the context area.



Plan 1:10000. Illustrating the movement of water from precipitation through the context area after the installation of the Social Connector.

After the construction of the social connector in the center of the context area the infrastructure agents will start to behave in new ways. The excessive water from precipitation will be gathered from the streets by overflow channels and from the roofs of the buildings by aqueducts stretching in a network through the city, carrying it all down to the Social connector where the network comes together as one. Here the water is spread out again through the aqueduct system under the bridge via Aqua Buffets on the floating islands reaching in the end the islands for collaborative agriculture or running straight into the river.

Vehicles and pedestrians moving through the context area do no longer need to travel all the way to the old bridges to pass over to Lindholmen or vice versa. With several new bridges in the area, both for driving, riding and walking, both vehicles and pedestrians can now pass over the river at several locations in the center of the city.



Plan 1:10000. Illustrating the density of vehicles moving through the context area after the installation of the Social Connector.

After the construction of the social connector the cultural city is no longer divided into smaller hubs. Everything is connected via the aqueducts spreading out through the city collecting water as well as people and leads them to the new cultural centre of the city. People wanting to connect with each other and enjoy a social life can now do so on the social connector in any way imaginable. Restaurants, opera, theater, agriculture, dancing, drinking as well as many other activities are offered on the floating islands under the system of bridges stretching over the river.



Plan 1:10000. Illustrating the locations for cultural experiences and activities in the context area after the installation of the Social Connector.

---

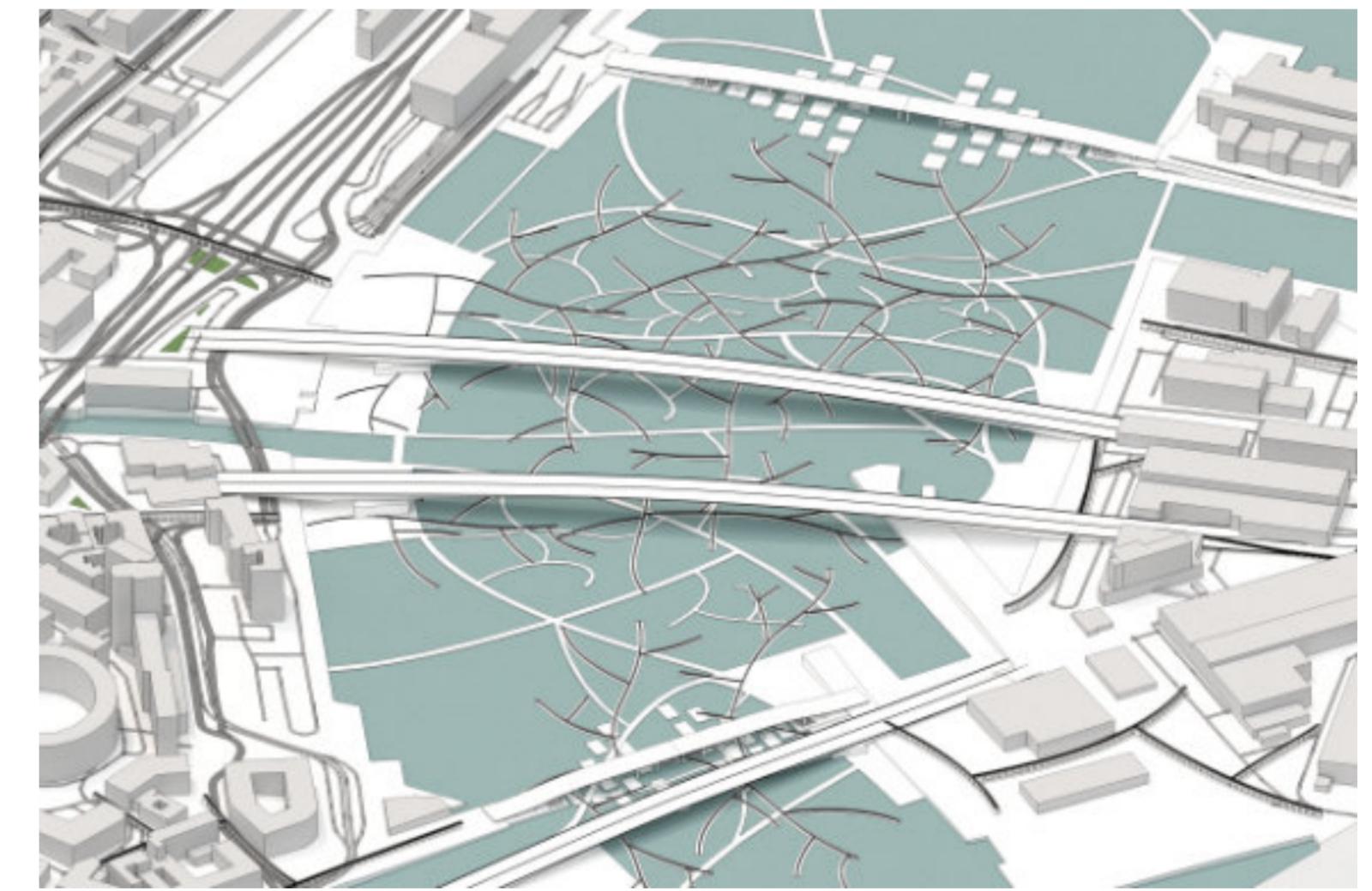
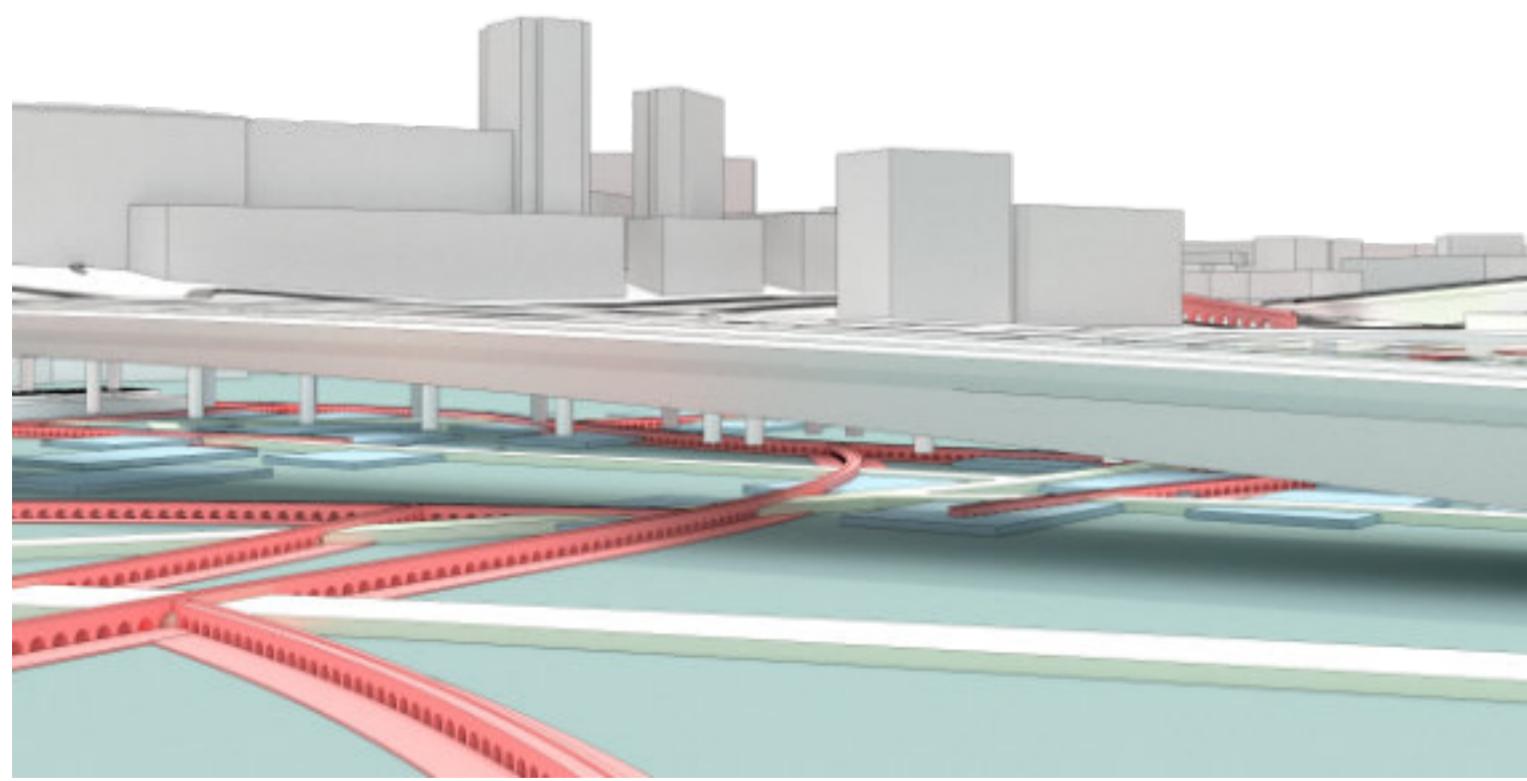
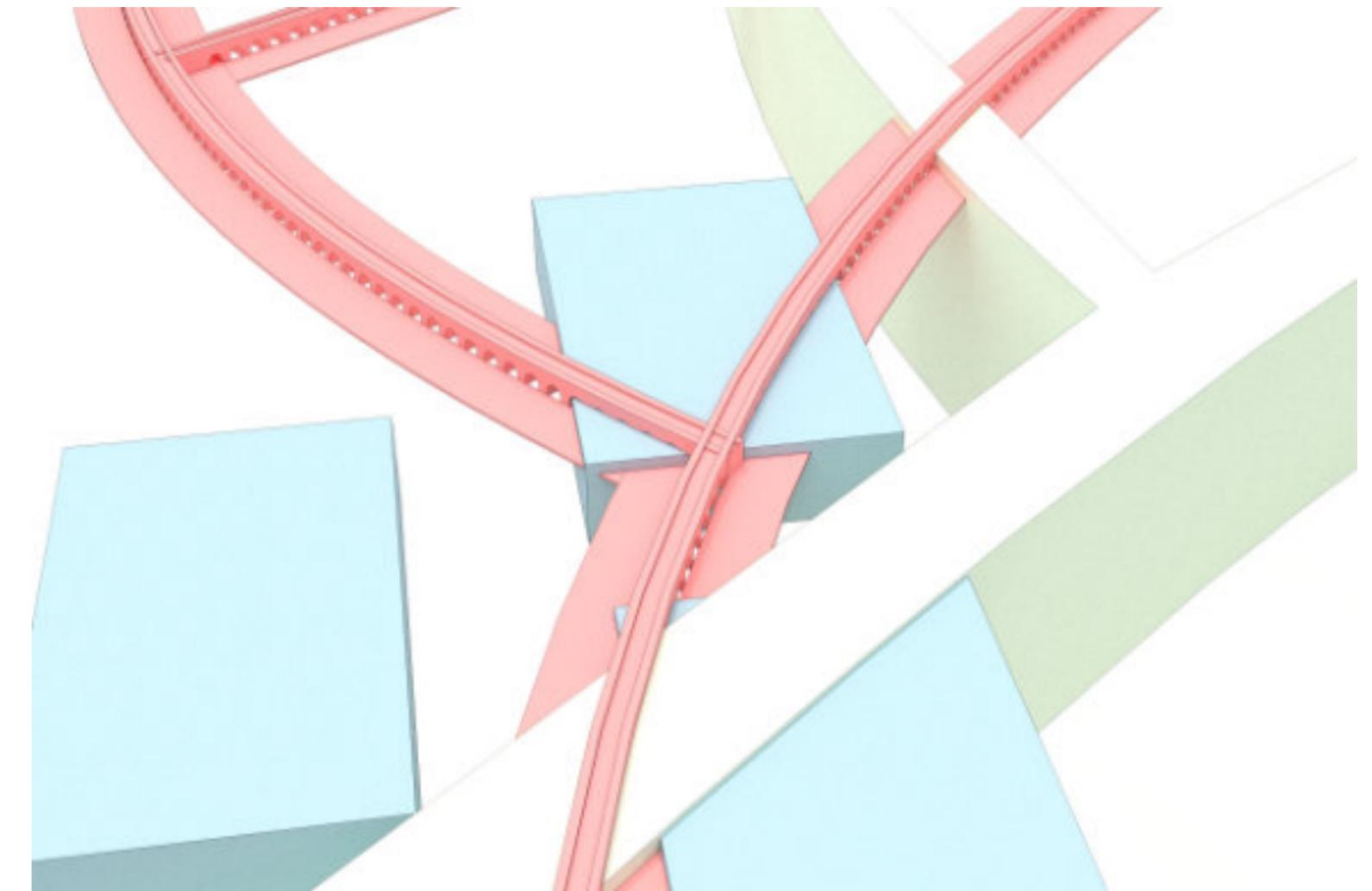
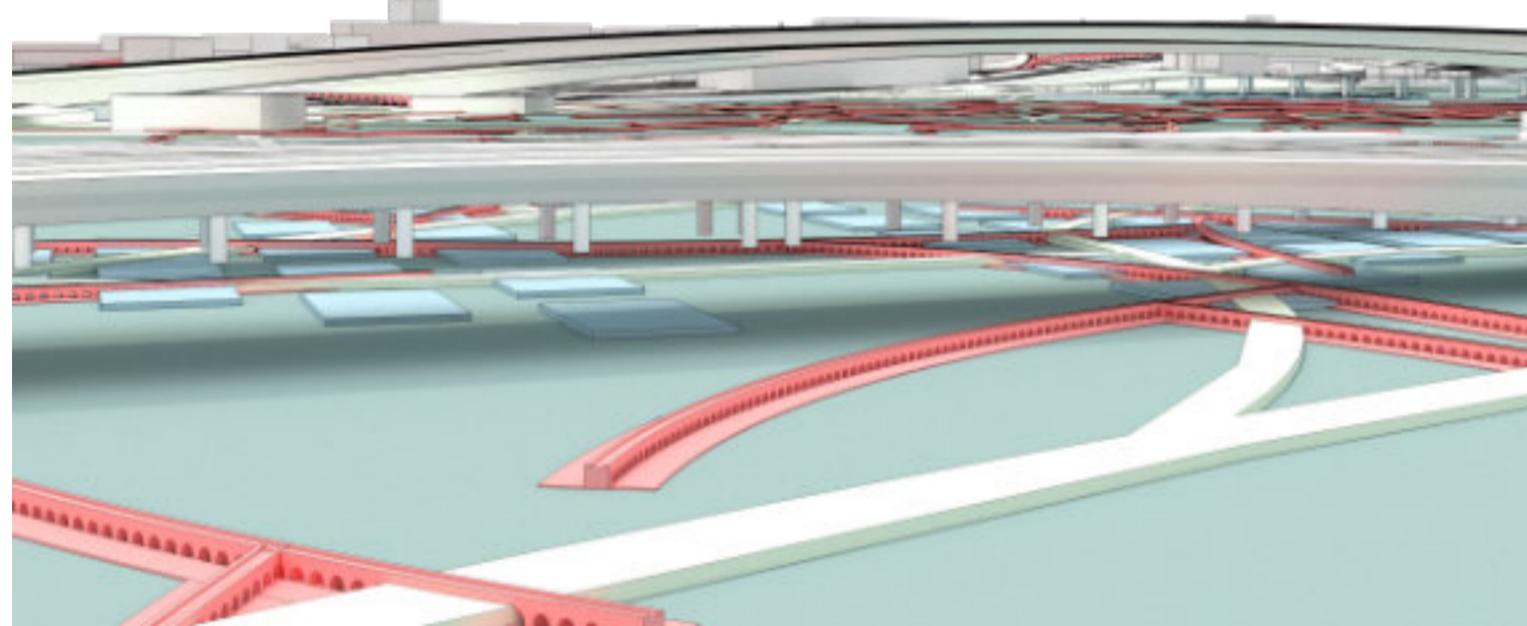
## 2.2 WATERSCAPE PROTOTYPE

---

When the three hybrid space concepts come together to form the social connector their roots spread out into the city linking the old culturally rich areas together with the new. Parks and aqueducts are spread out in vast networks gathering people together and pulling them towards the new bridges across the river. Under these bridges the networks continues, spreading out over the river in the form of floating islands connected by jetties and aqueducts. The islands are intended for social and cultural activities and experiences forming a new centre of the city, binding together the parts earlier divided by the river into one.



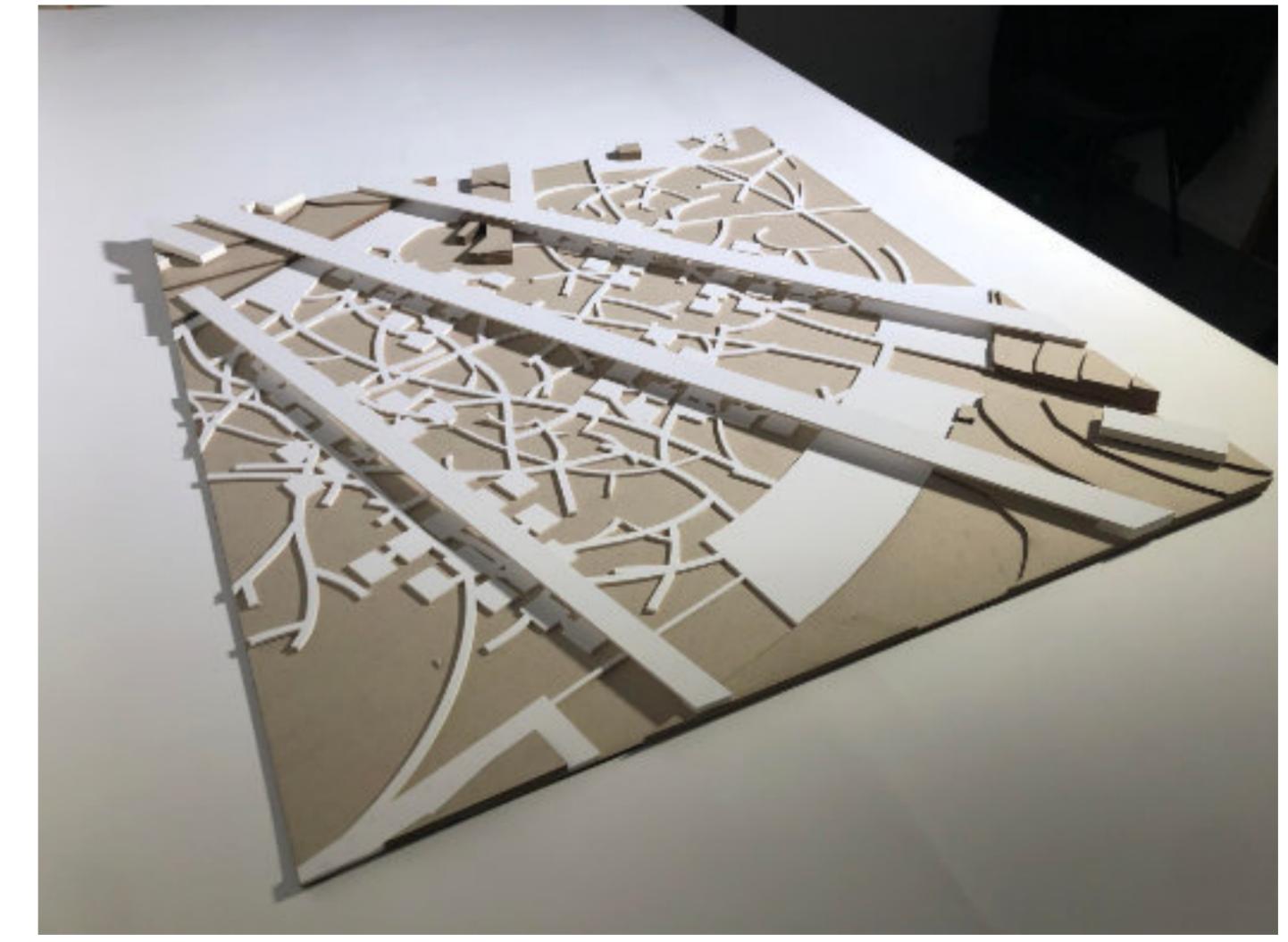
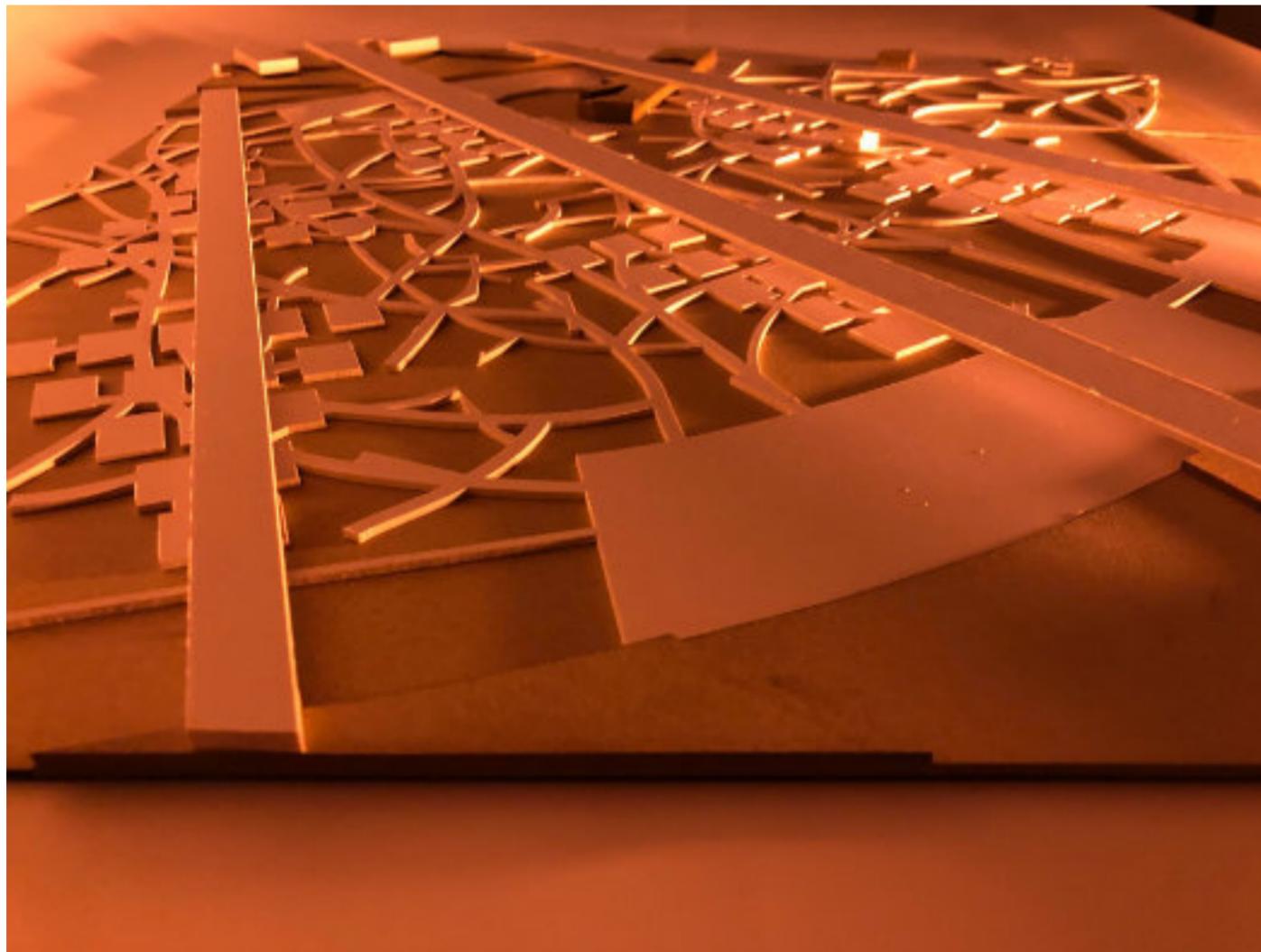
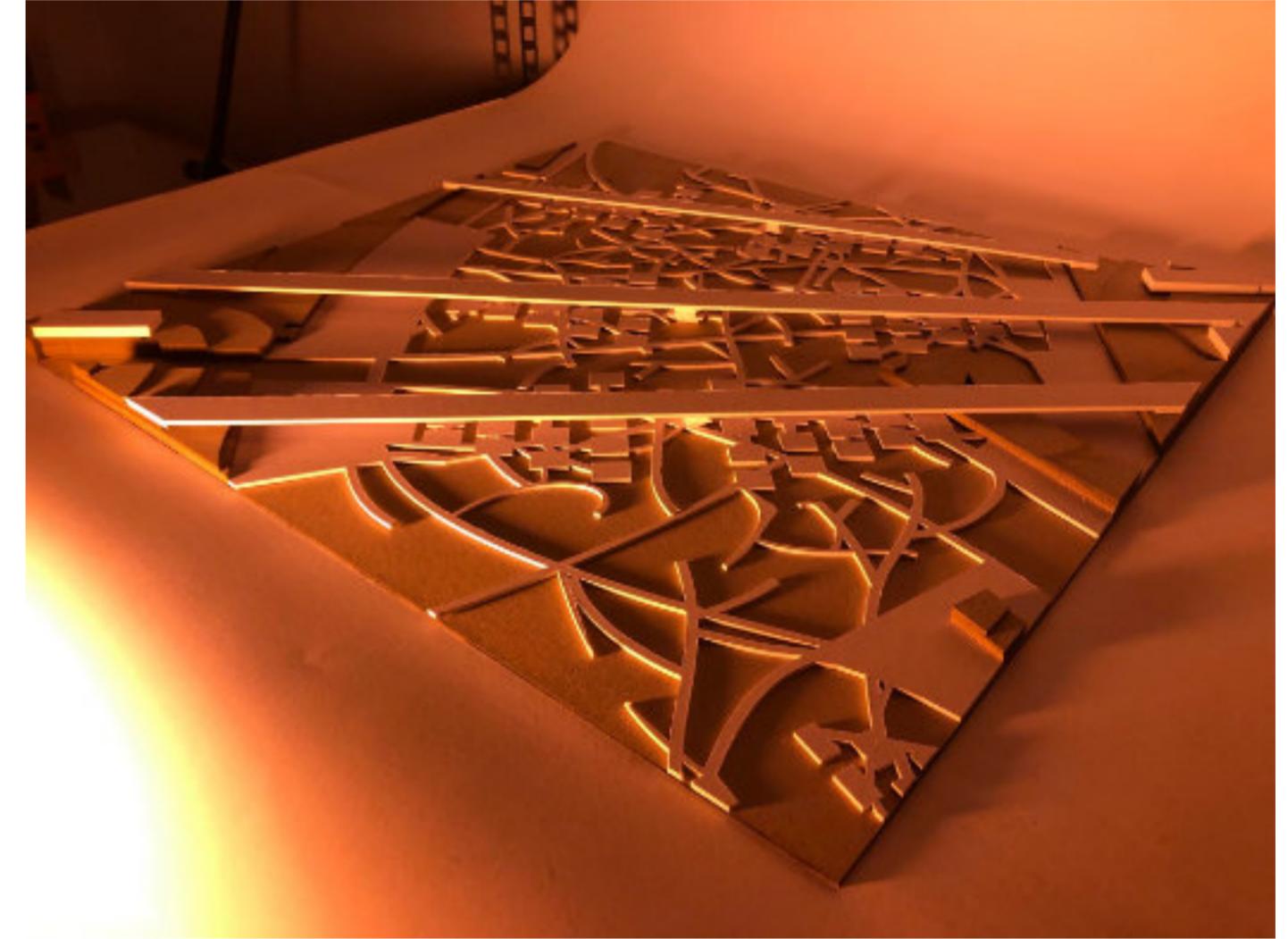
Social interactions are more diversified by the interacting networks, benefitting from each other to create unique social experiences.



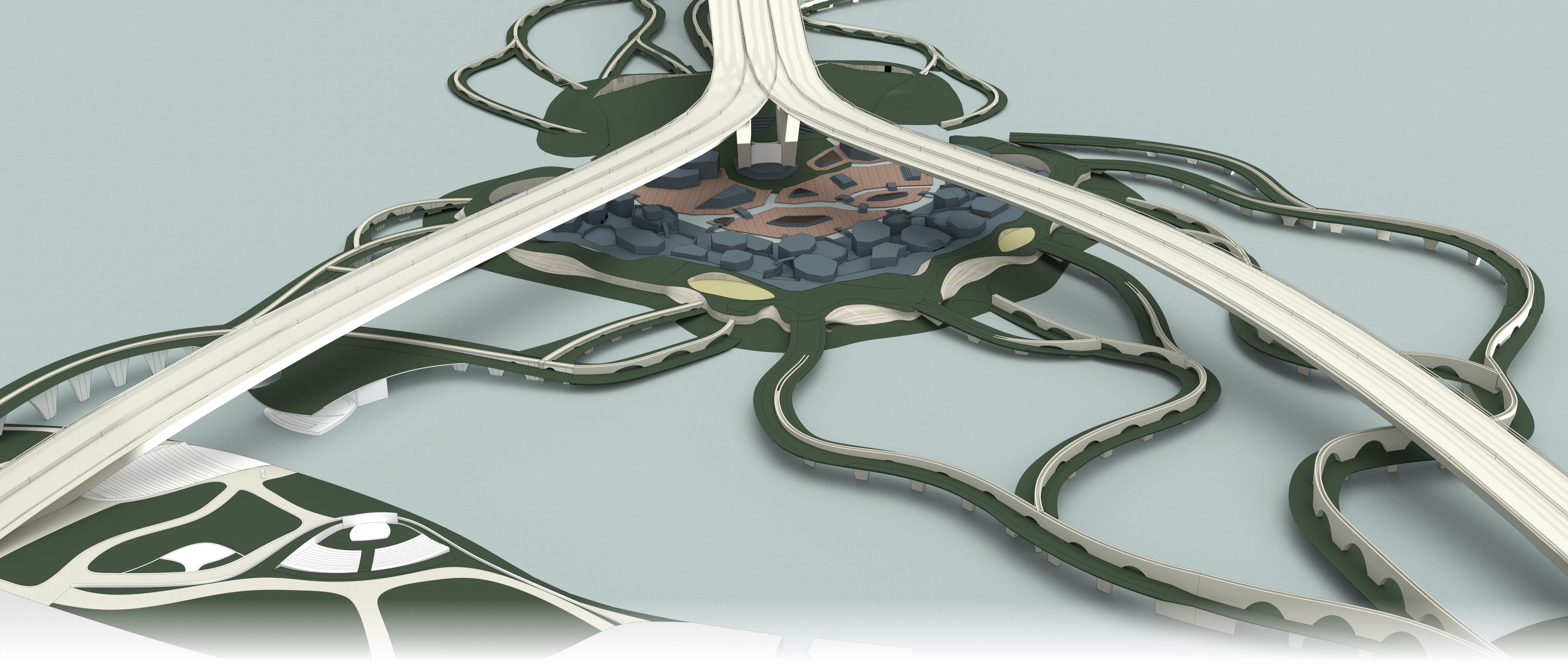
To further explore the spaces created when the three different hybrid space networks are joined together to form the social connector, a physical scale model was constructed over a specific part of the whole network. The interesting area studied was in the centre of the network where the river is at its widest point.



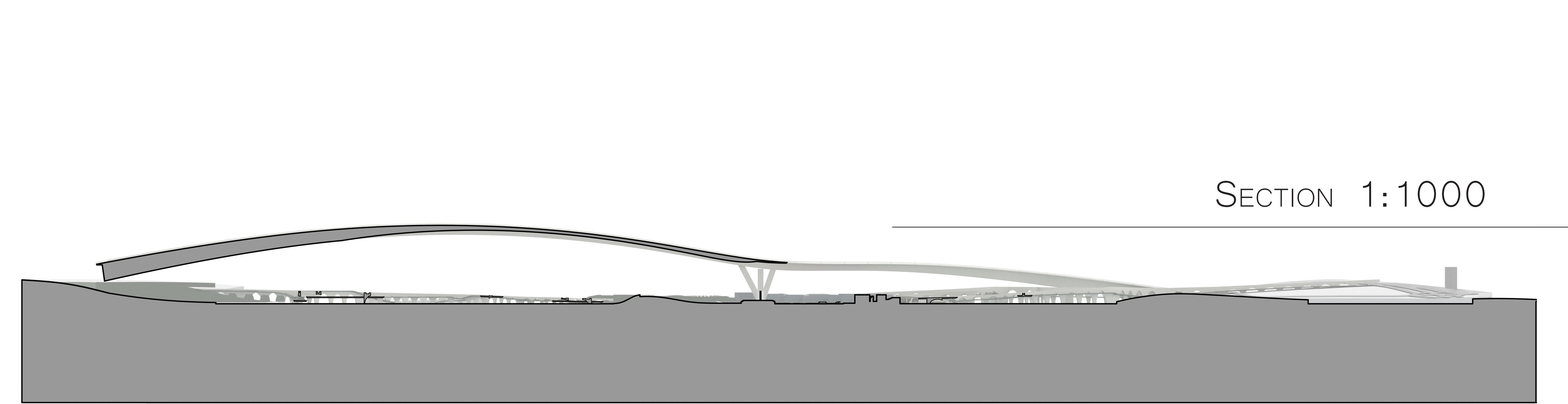
The new network formed by the interconnected hybrids creates many interesting spaces in a very organic pattern spreading out over the river.



Unfortunately one part of the model was printed in the wrong scale, resulting in a model not that does not accurately describe the spaces created in all three dimensions. What's missing is the height of the aqueducts spreading over the water which would have provided a difference in shelter between different spaces on the floating islands.



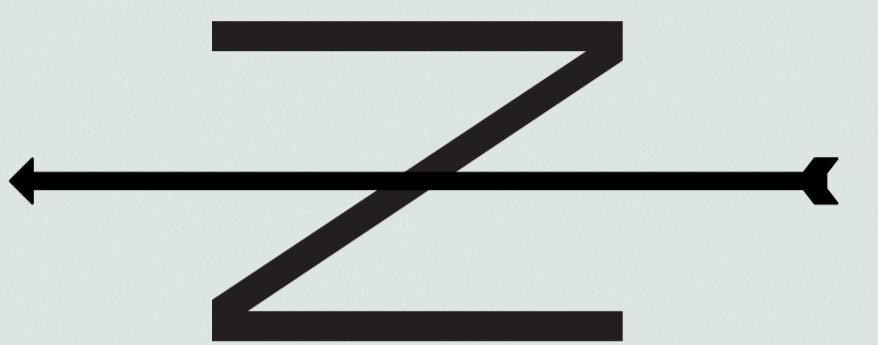
SECTION 1:1000



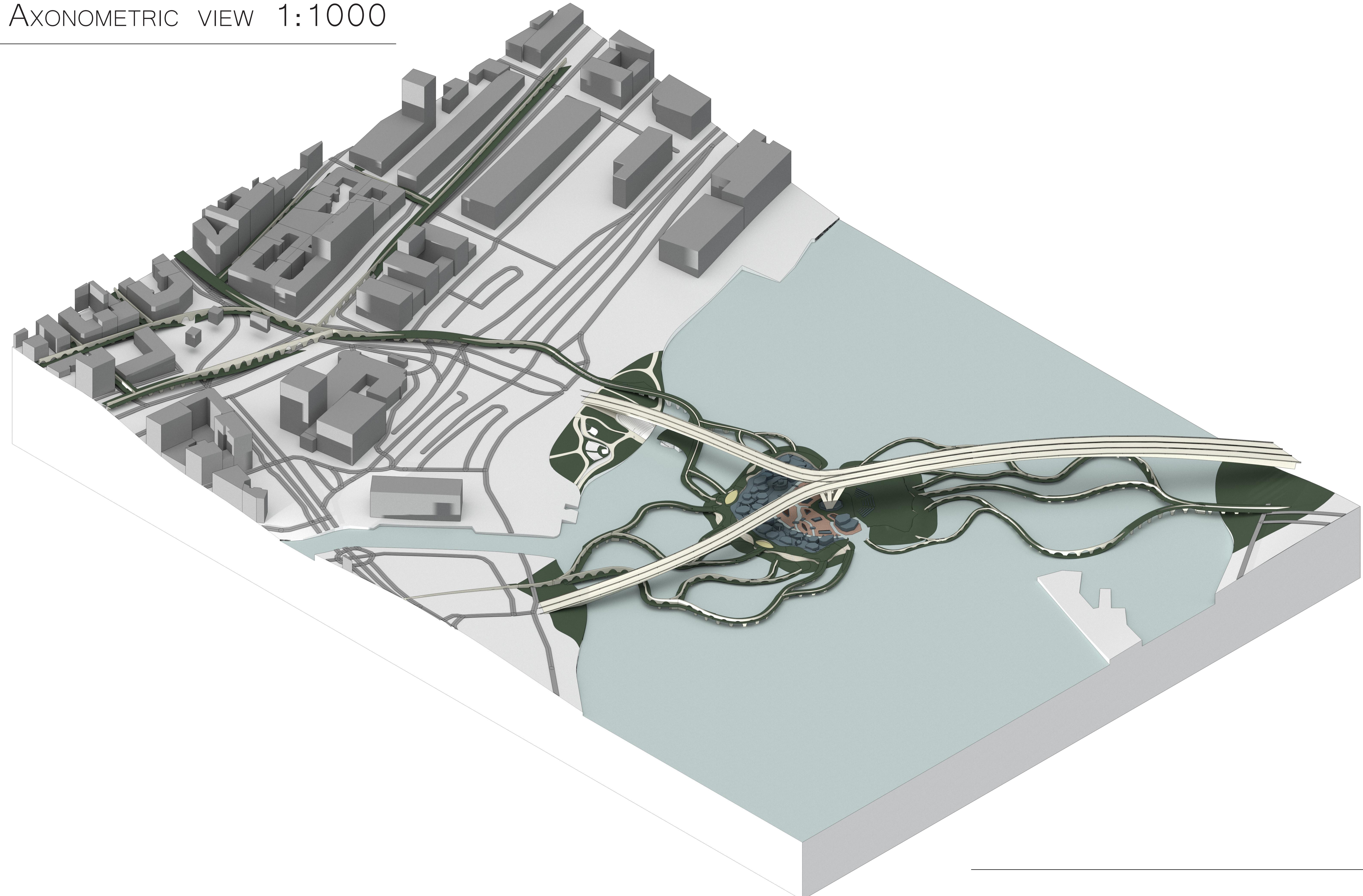
PLAN

1:1000

10 20 30 40 50 [m]

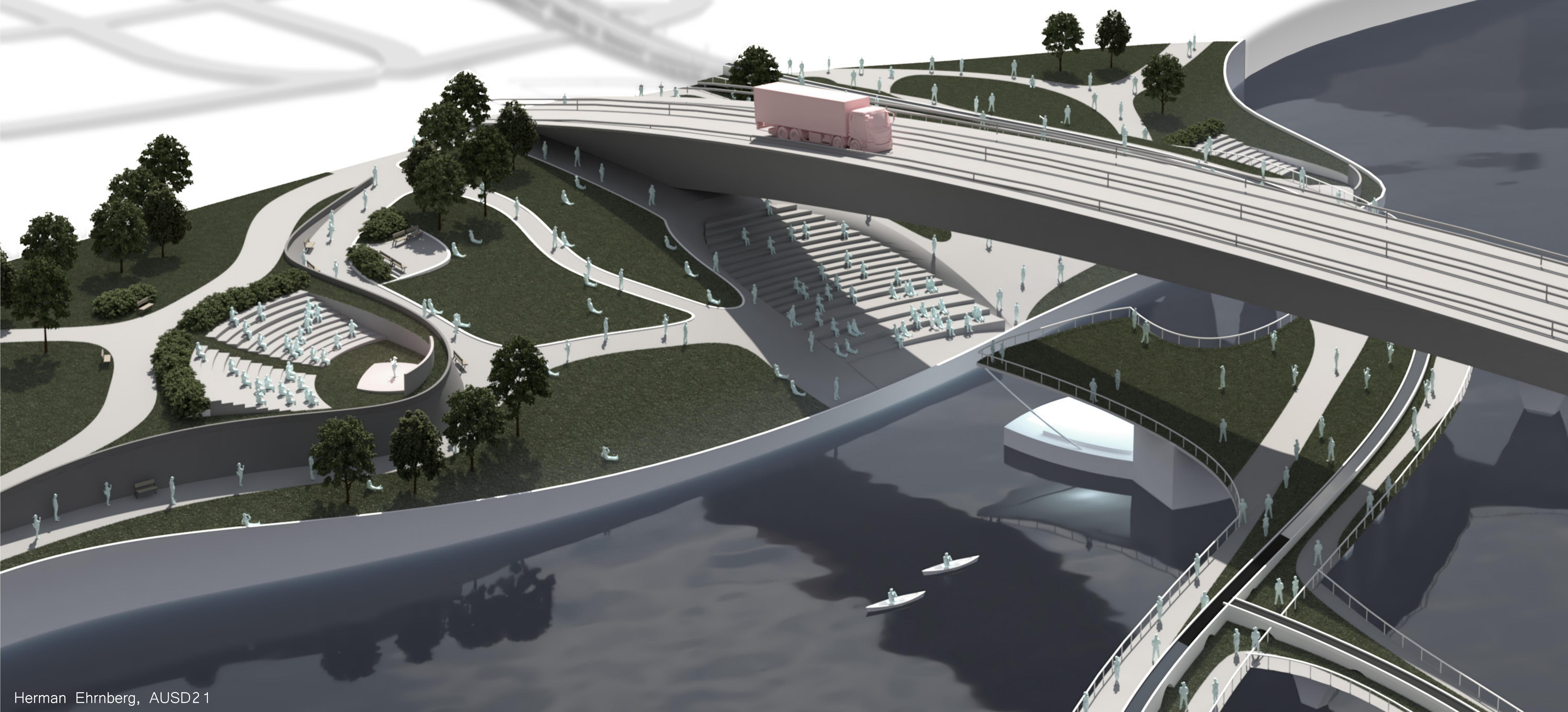


AXONOMETRIC VIEW 1:1000



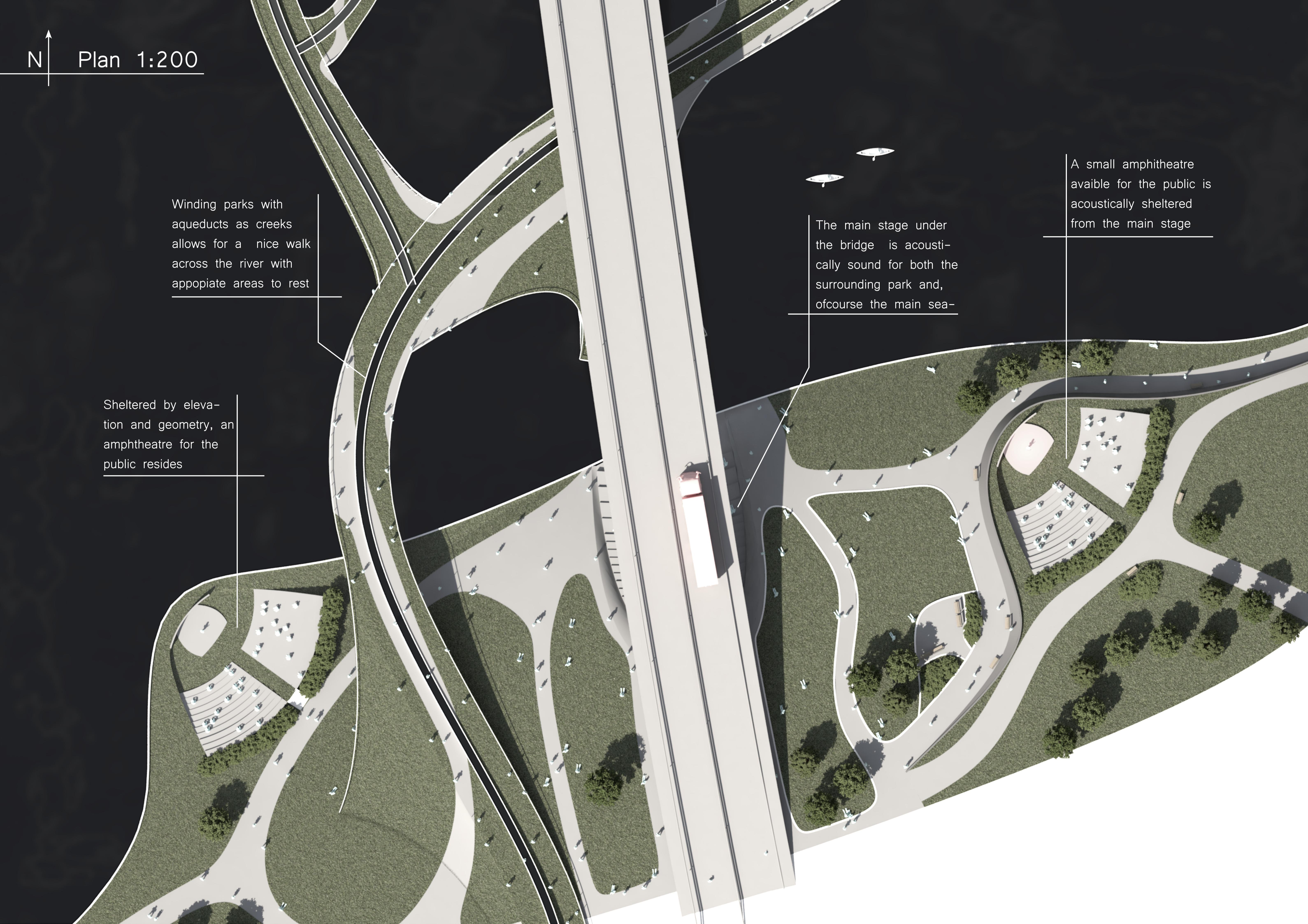
## 3.2 - Cultural Park

As the network of parks and aqueducts funnel people towards the central island it crosses one of three cultural parks with space for casual street performances or events. Following pages will be focusing on the park to the south east, both refining and defining its details and functions.



N

Plan 1:200



Winding parks with aqueducts as creeks allows for a nice walk across the river with appropriate areas to rest

Sheltered by elevation and geometry, an amphitheatre for the public resides

The main stage under the bridge is acoustically sound for both the surrounding park and, ofcourse the main sea-

A small amphitheatre available for the public is acoustically sheltered from the main stage



Axonometric 1:200

N

