

# Hybrid Space

ARK128

Architecture and urban space design

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## Infrastructure Space Type

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 Colorado Street Bridge carries the Colorado Boulevard and sits above a park landscape providing interesting scenery from beneath and above.

The space beneath the bridge gives a sense of scale to the park as the tall bridge cuts across it. The bridge is more designed towards human space than modern highway carrying bridges as seen by the level of ornaments.



Colorado Street Bridge, Colorado, US

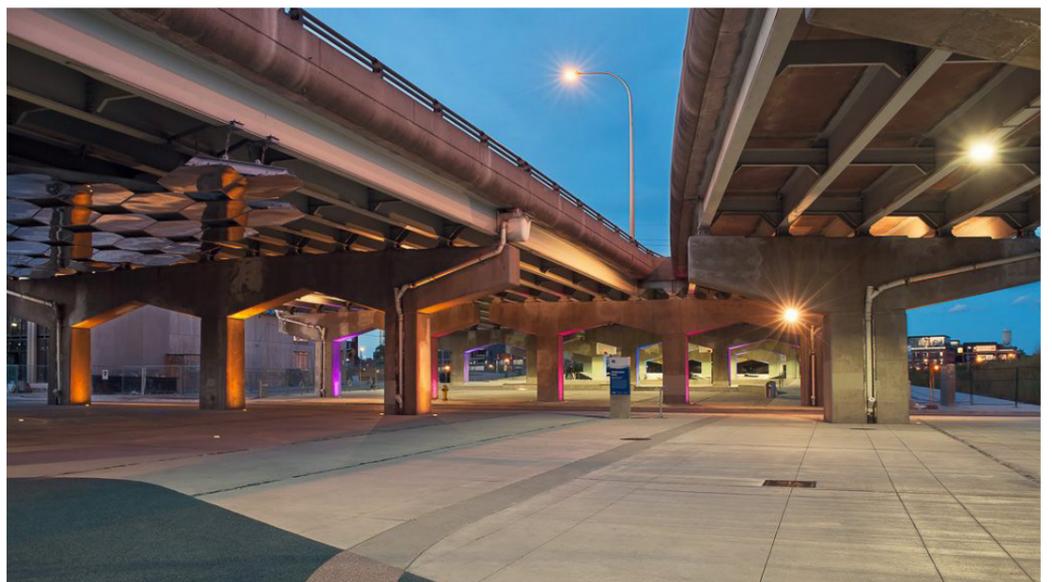
The Bernatek Footbridge is a footbridge which spans over the river Vistula. The height of the bridge is presumably due to boats, and on one end, space is freed up for pedestrians and grass patches. It cannot be fully seen from the picture, but the space beneath the bridge on walkway side is comfortably wide and could serve for high-resolution human space.



Bernatek Footbridge, Krakow, Poland

The Toronto Underpass Bridge spans over the Underpass Park, a city park with a playing ground interestingly incorporated between two intersecting roads. To elevate the space, effort has been put on lighting and mirror artwork underneath the bridge.

The space has this enveloped feeling to it as the bridges are wide with large structural elements obstructing the view from below.



Toronto Underpass Bridge, Toronto, Canada

## Human Space type

Performance halls have this duality to its design, where acoustics meets the needs of the performers and the audience. The spatiality is varying between the different aims between halls, with many modern ones being artistically expressive in their design.



Culture Palace, Tel Aviv, Israel

The culture palace in Tel Aviv has a philharmonic hall that has a beautiful spatial effect by the combination of angular shapes in combination with an amphitheater-like seating arrangement. The contrast of the acoustic metal-ceiling panels to the wooden interior creates some sort of openness spatially.



Crosby Theatre, New Mexico, US

The Crosby theater is an award-winning open-air theater that has a unique spatiality and atmosphere provided by the open sides and unique roof structure, as opposed to traditional enclosed theater halls. The shape of the theater also has a resemblance to ancient Greek's amphitheaters for acoustical and spatial effects.



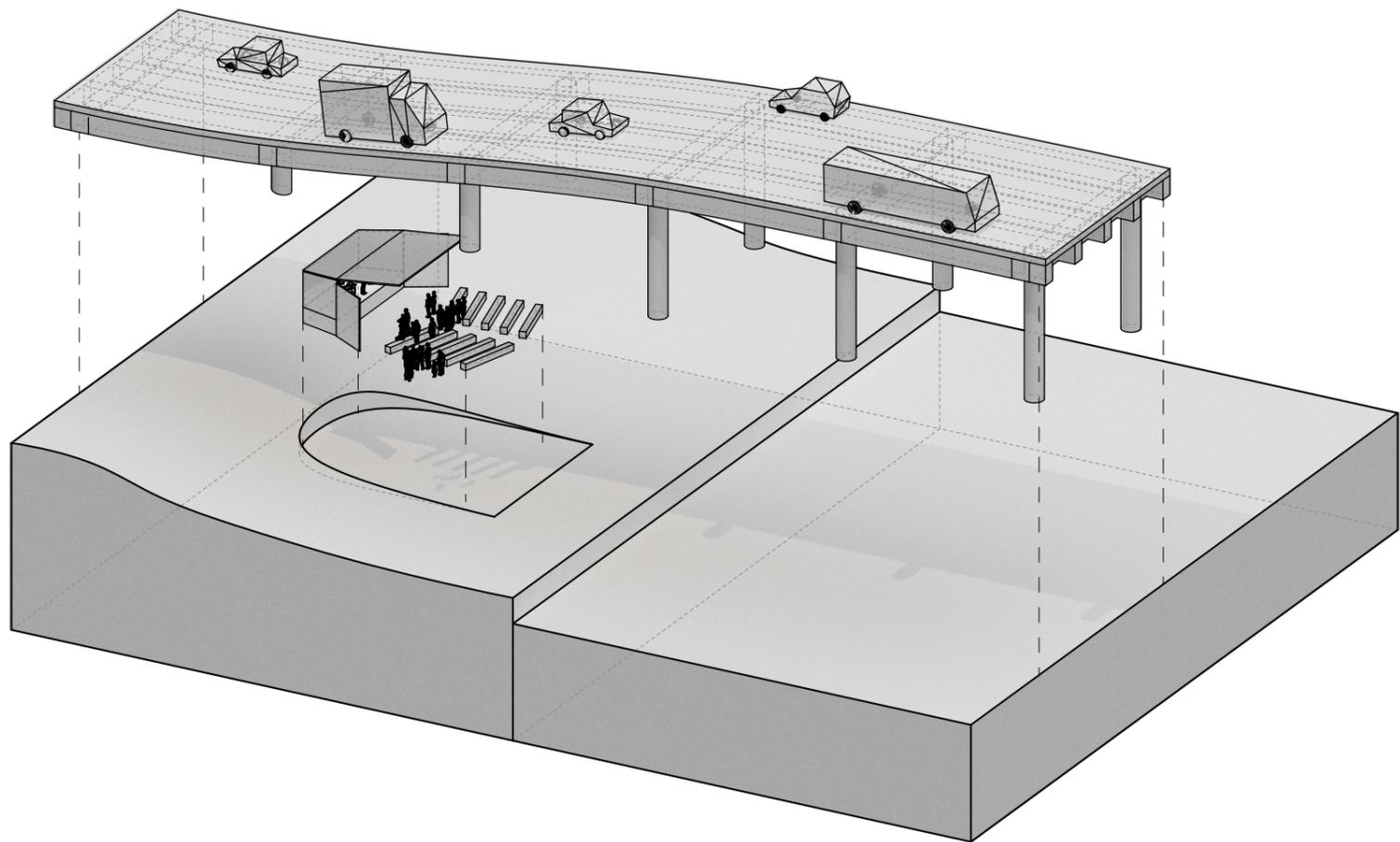
Memorial Maria Aragão, São Luís, Brazil

The Maria Arago memorial is a public square consisting of three buildings in honor of political activist Maria José Aragão. The most interesting building of the bunch in this context is the minimalistic acoustic shell consisting of basic shapes. The shell is interesting in its simplicity and how easy it is to reimagine elsewhere.

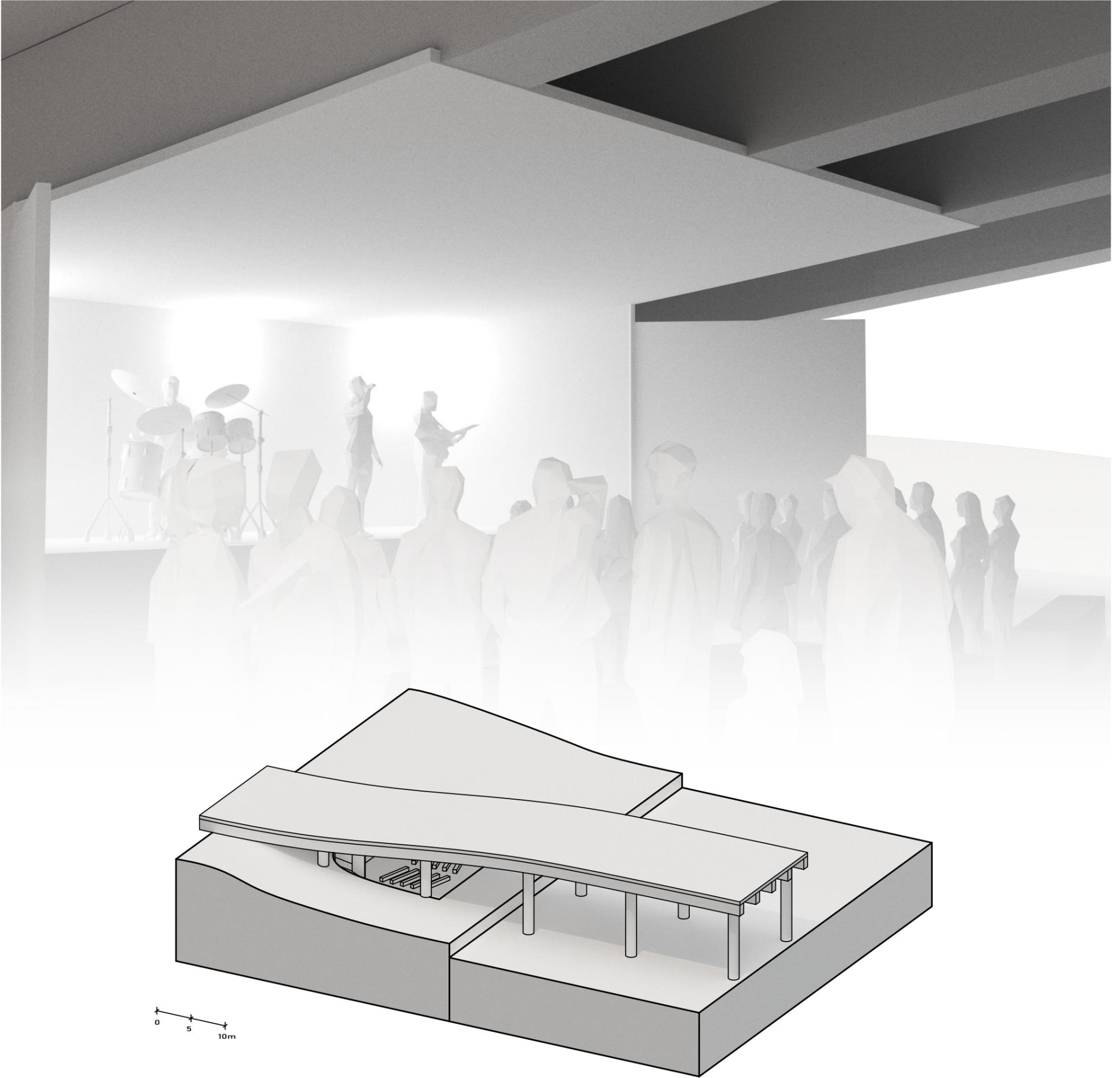
## Hybrid Space Concept

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. Seatings and audience logistics are determined by landscape, bridge type, and scale of performance of interest.

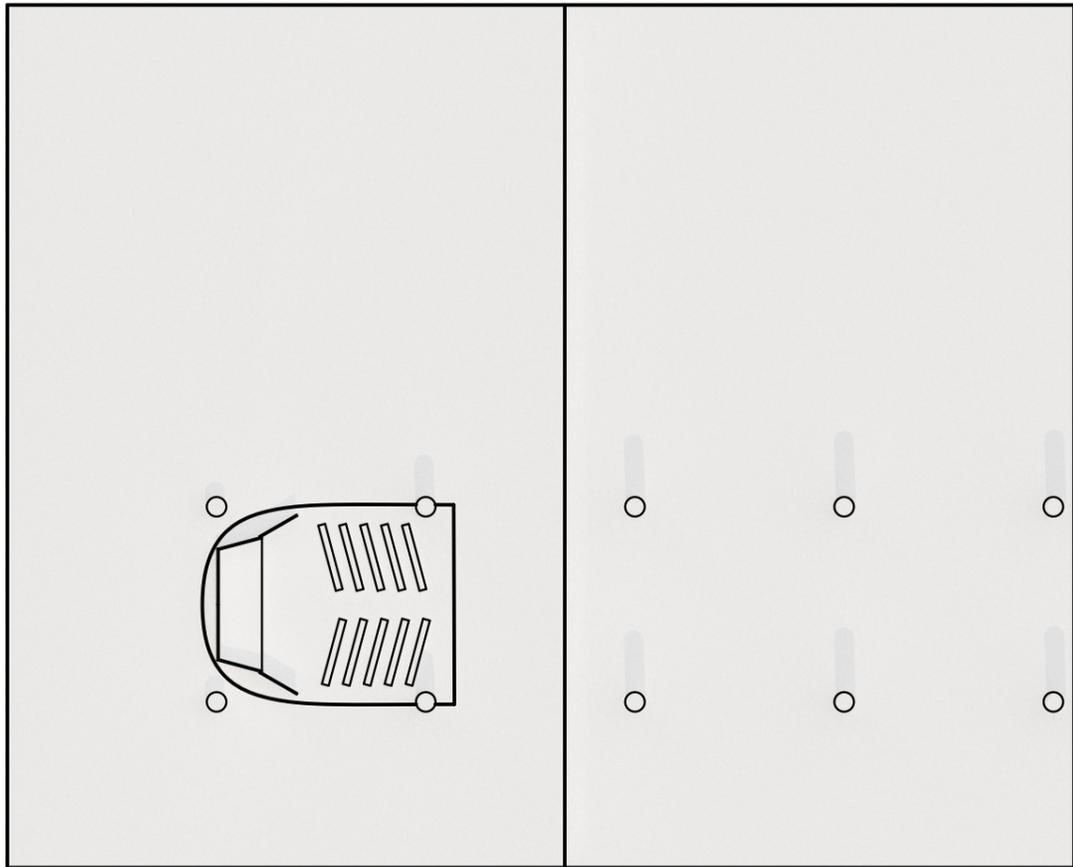


## Hybrid Space System



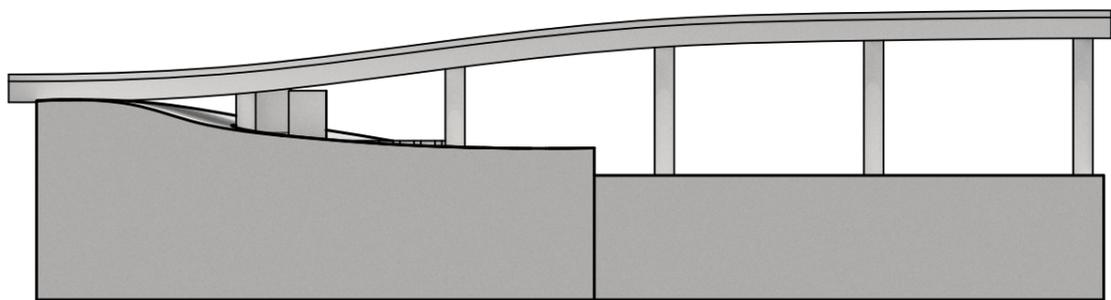
A simple perspective illustrating a small scale pavilion in action underneath a bridge structure.

The axonometric view illustrates a landscape with a bridge spanning over a river or a slanting landscape, sheltering a small excavated area for performances of moderate scale.



0 5 10m

Illustrative plan

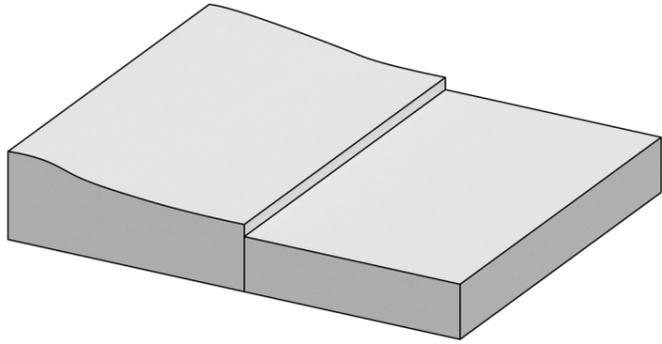


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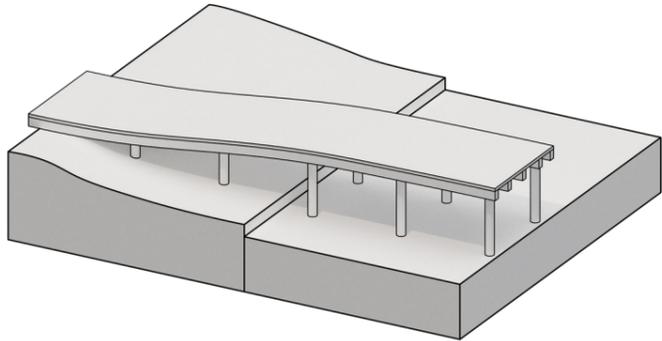
Illustrative section

## Hybrid Design Procedure

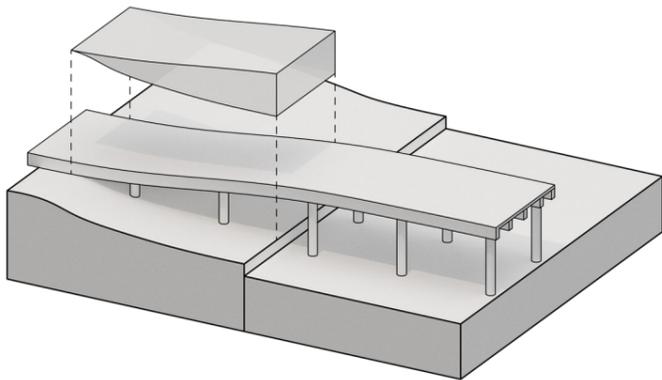
Conceiving this hybrid infrastructure can be thought of in four simple steps:



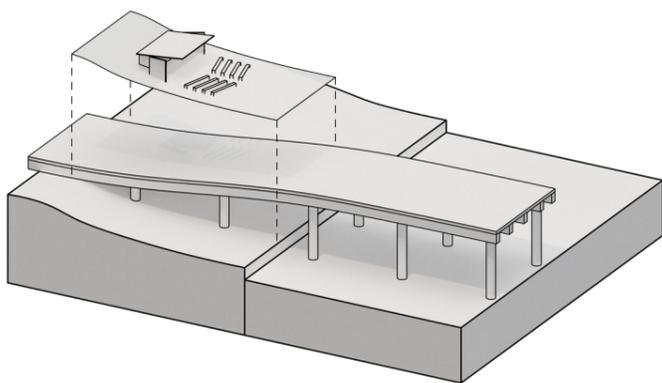
Two landscape volumes have to be connected for whatever reason.



A bridge is constructed for its purpose of transporting.



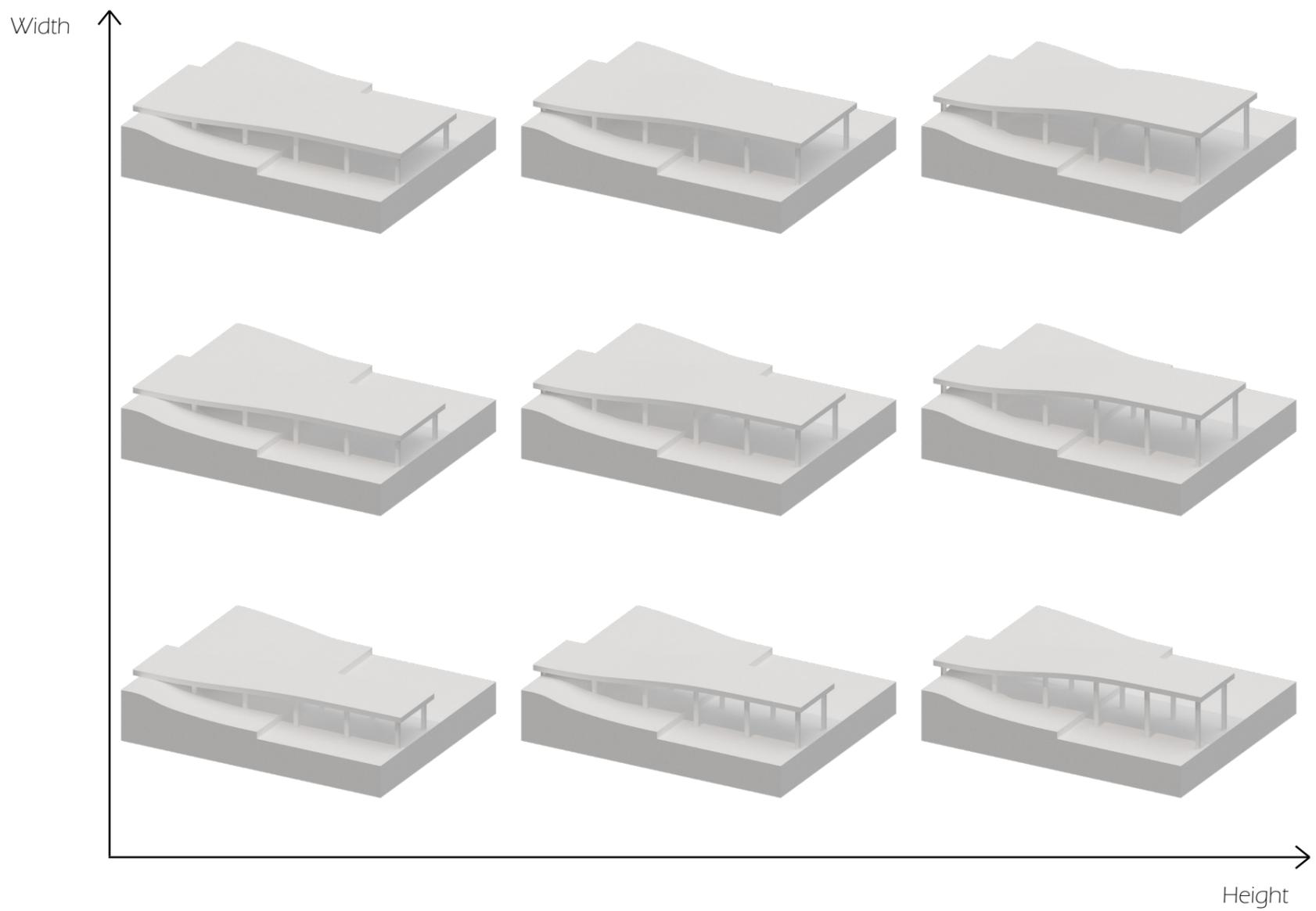
The bridge is connected to the landscape leaving a volume underneath.



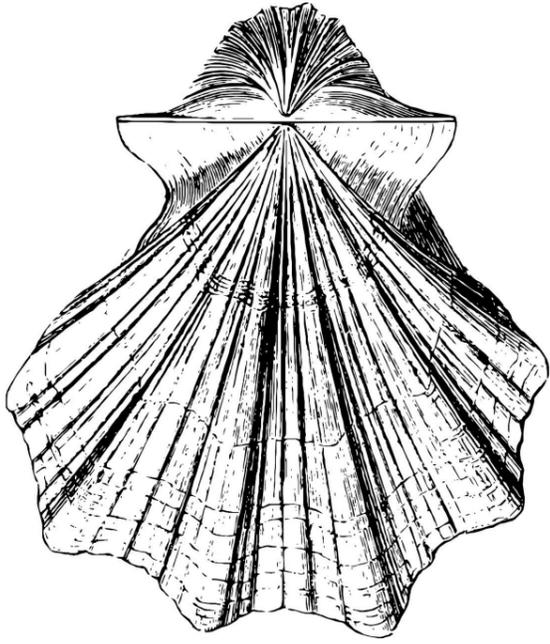
The volume is utilized by additions to existing structure.

## Hybrid Space Variations

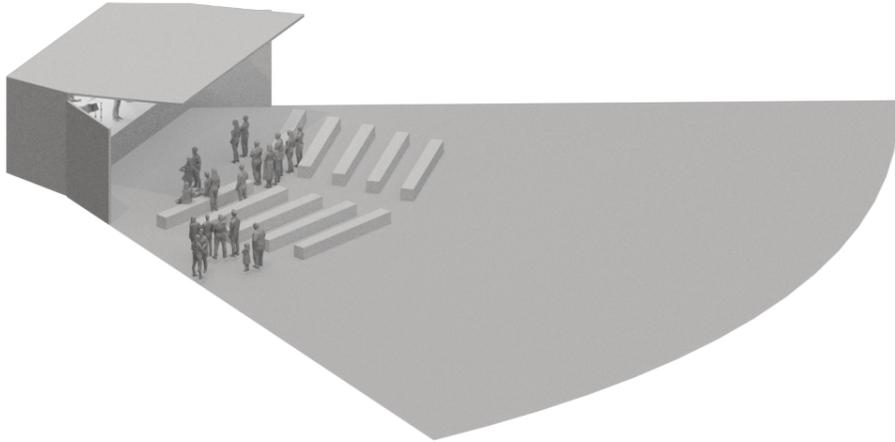
The matrix illustrates the relation between width and height of bridge, influencing the spatial effect beneath. Other largely depending factors are ofcourse landscape and bridge type which would make for a more interesting matrix



## Growth Network Type

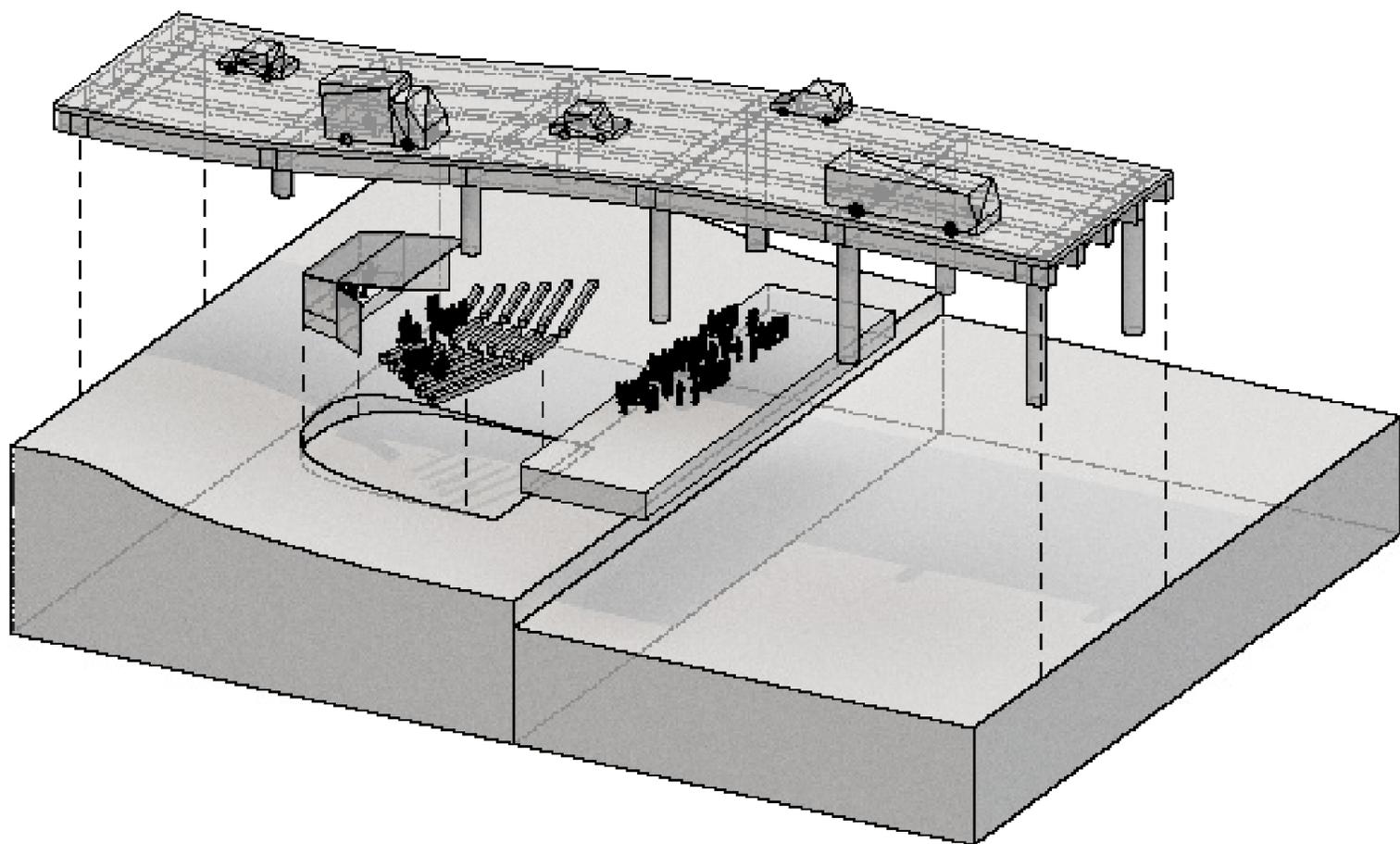


Seashells have an interesting growth pattern in that way that they expand outward much like sound that is semi contained. You can visualize the sound waves as the lines in the shell which are only constrained by the edges of the shell.

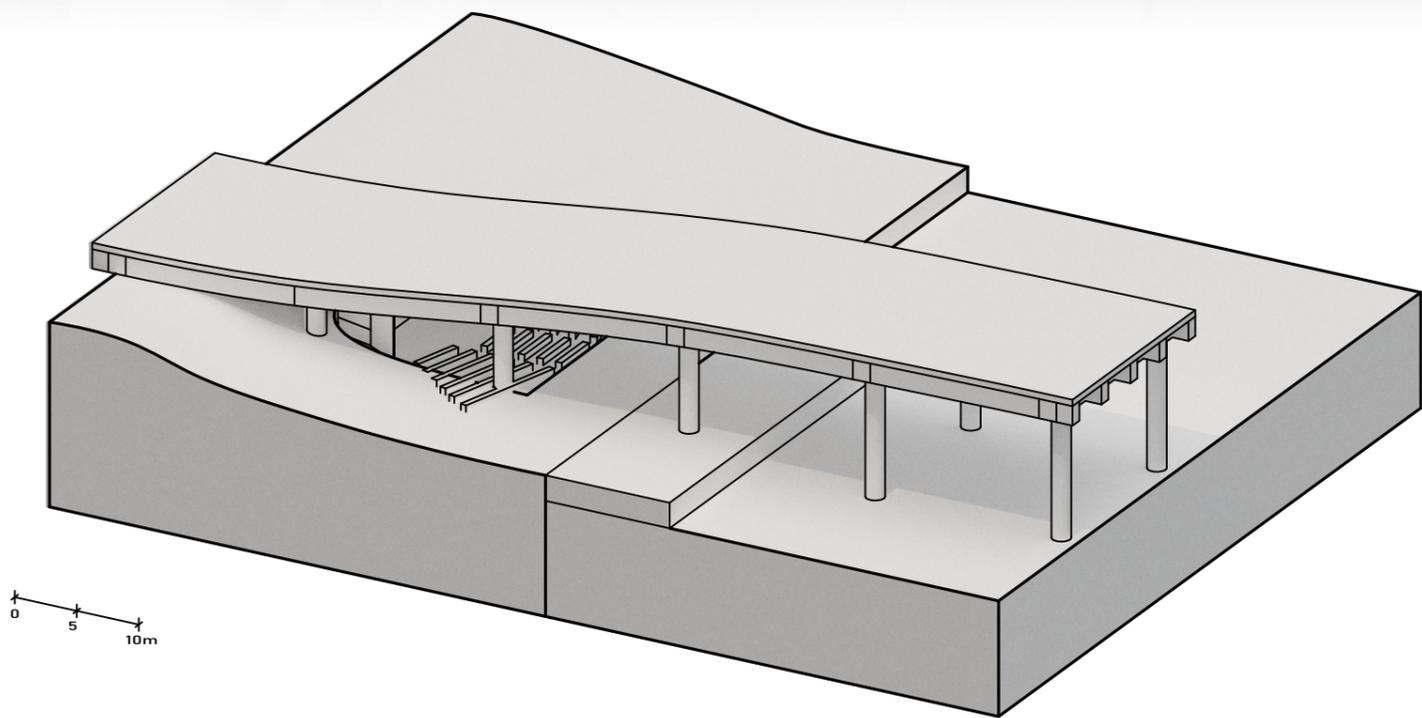


## Growth Network Concept

Like a seashell, the growth of the venue expands outward from the acoustic shell, in this illustration, and extension of the landscape is made by a wooden bridge structure, much like a pier following the border of the landscape volume.

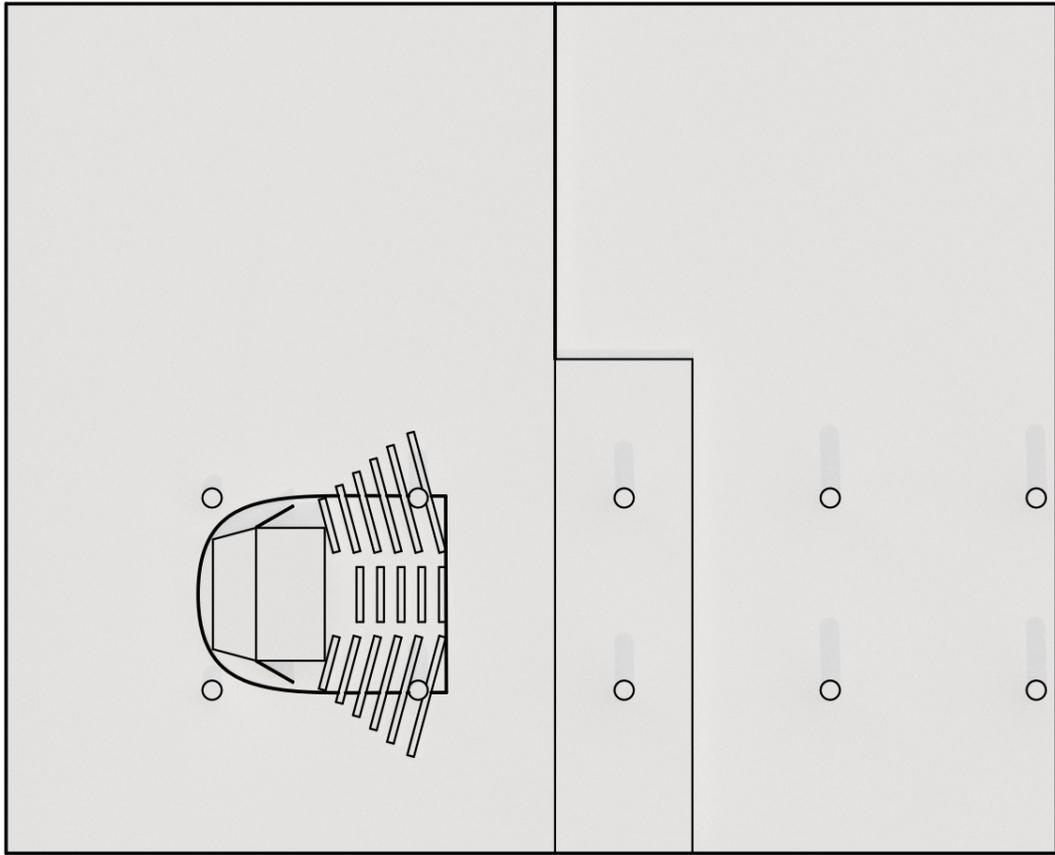


## Growth Network System

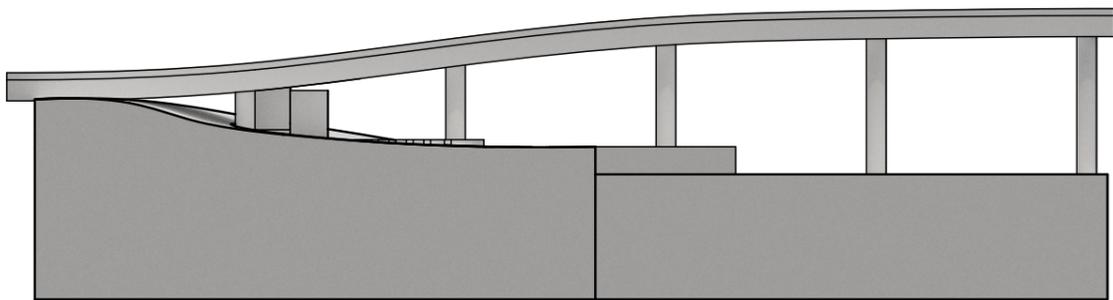


A simple perspective illustrating the view from an external pier structure.

The axonometric view showcases the spatial effect by the pier structure with seatings' arranged in accompanying fashion.

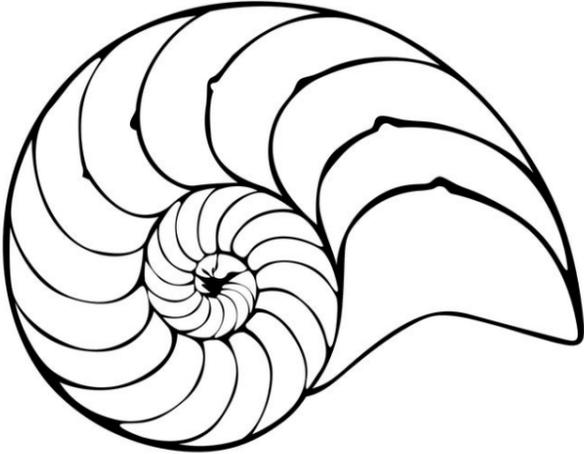


0 5 10m  
Illustrative plan

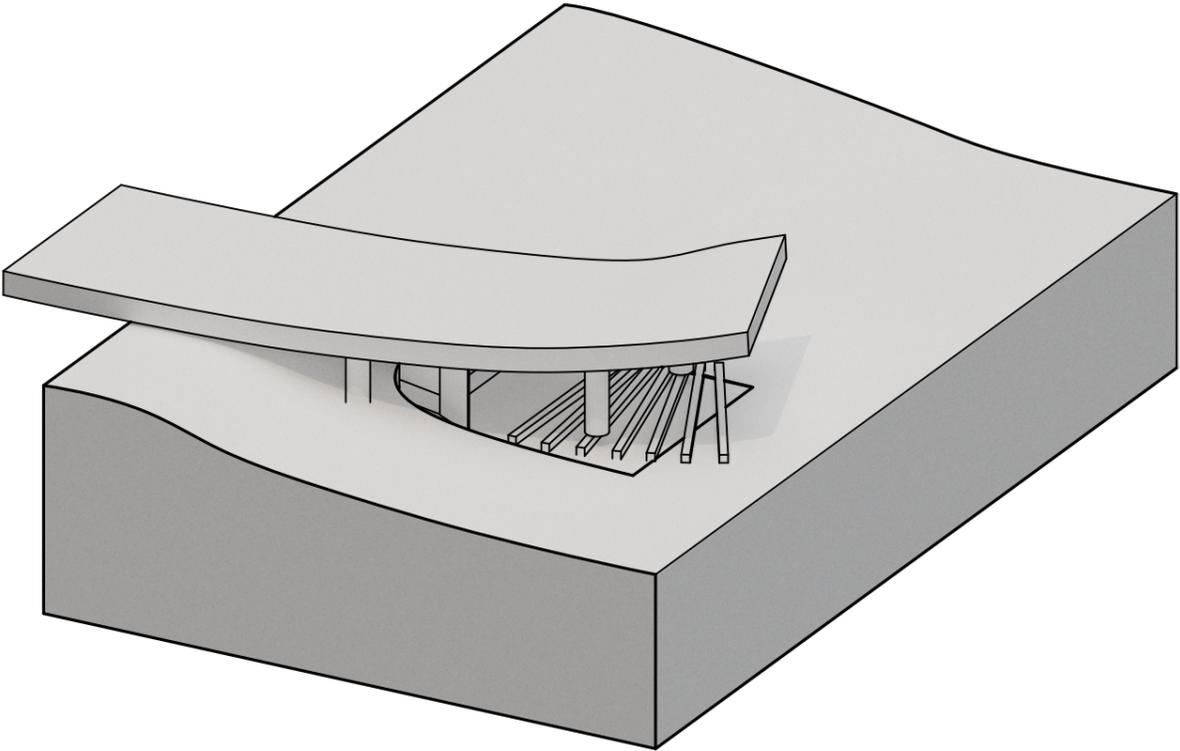


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# Growth Network Variations



Just like seashells has variations, the network can take shape of bridges of varying shapes, influencing the spatial effect and creating even more unique and interesting performances.





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# HYBRID SPACEJAM

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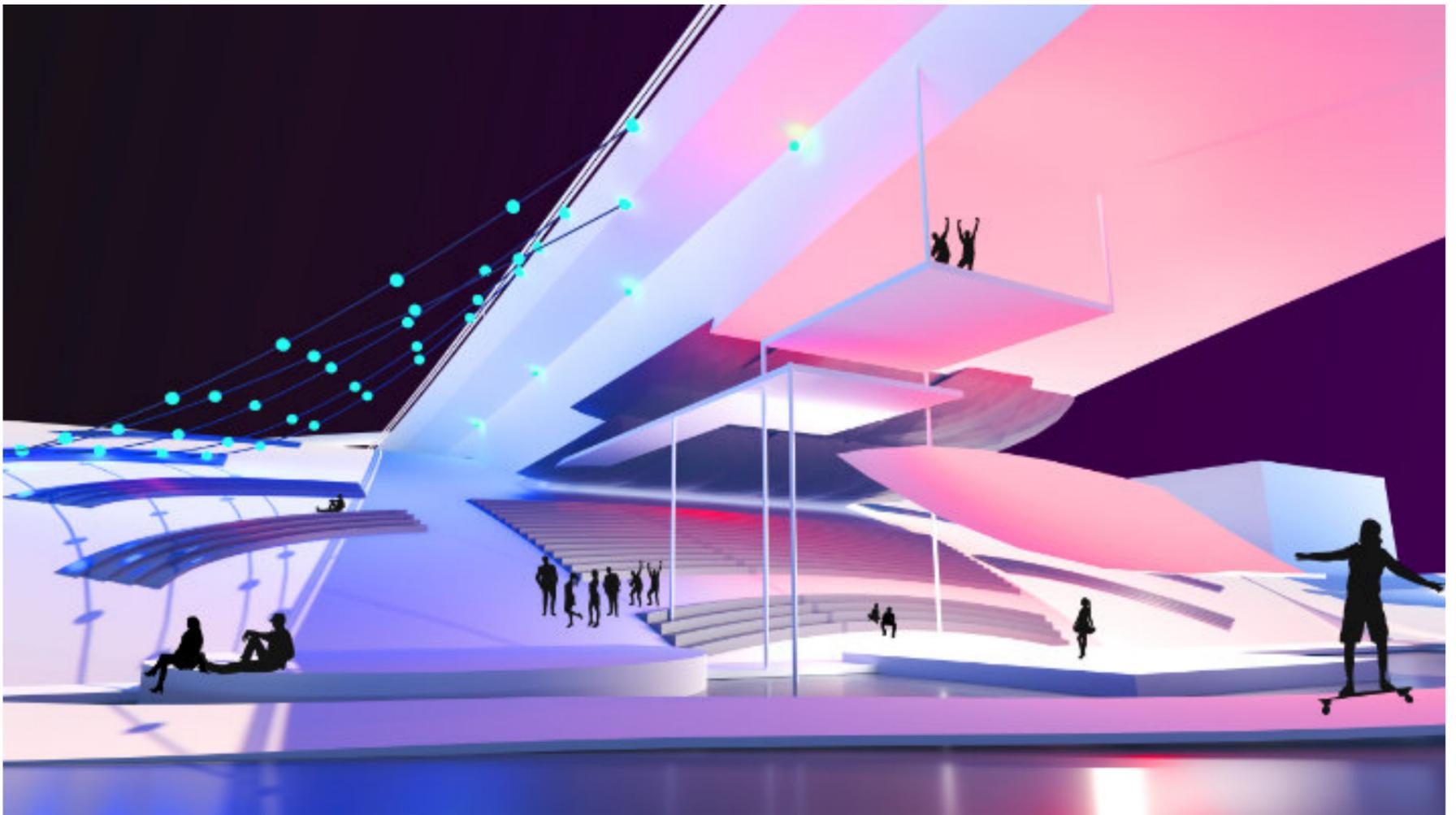
A PROBLEM SOLVING COLLABORATION BETWEEN THREE HYBRID CONCEPTS

HERMAN EHRNBERG

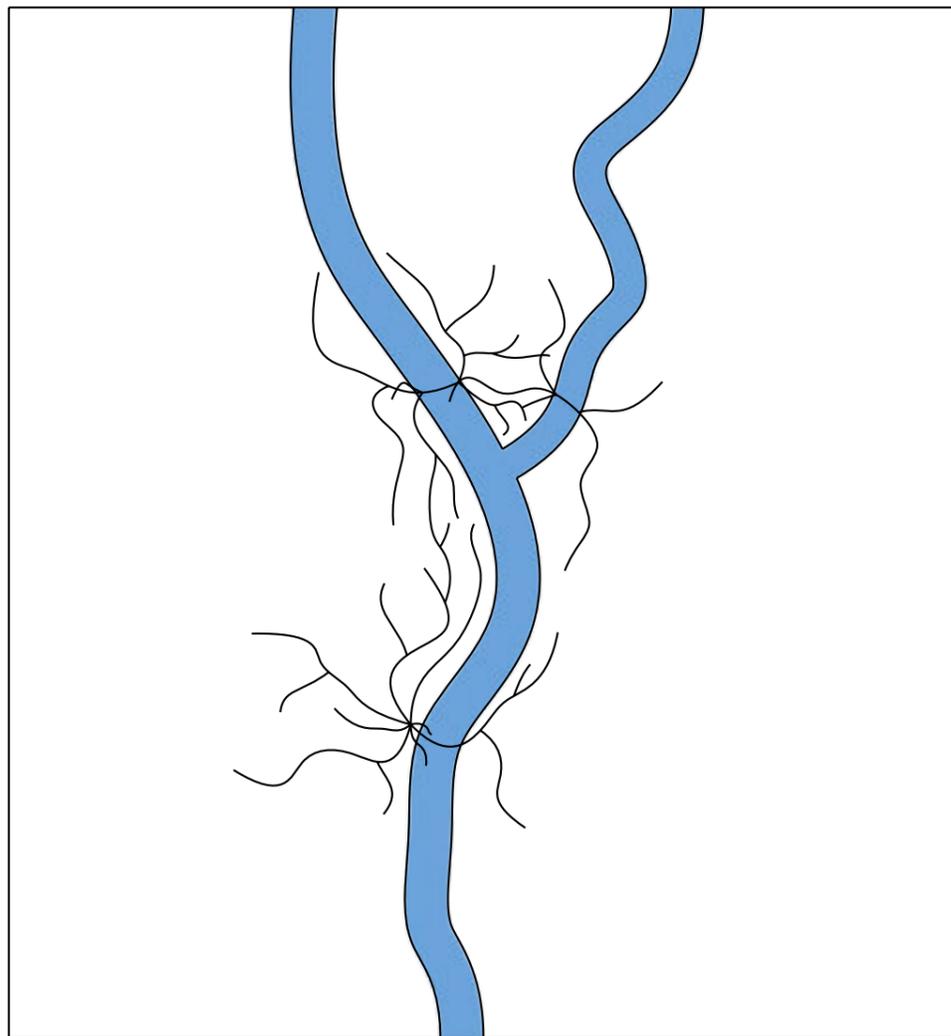
RICK PERSSON

SIMON WIKSTRÖM

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



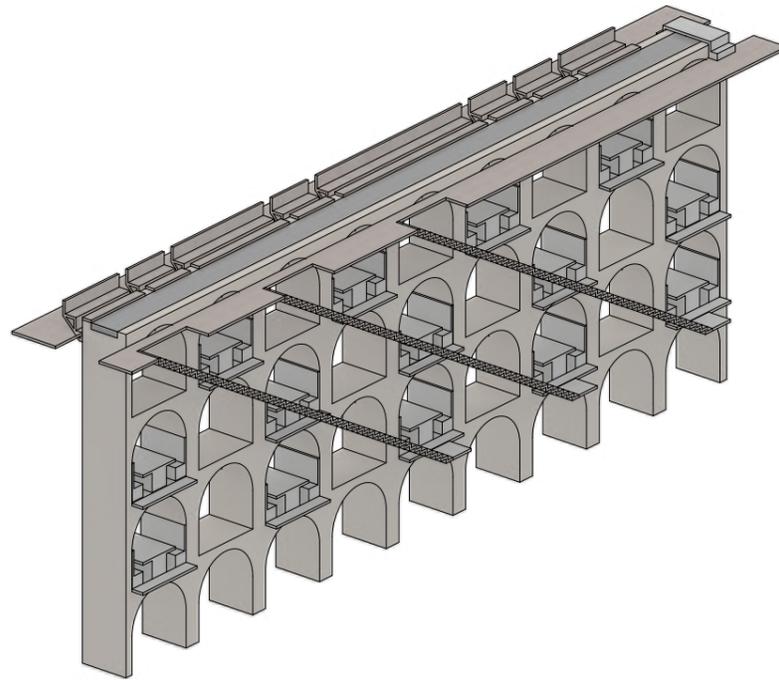
Similarly to how a neural network, braincells or ants grow into large networks, the park is imagined to stretch out and connect with other cultural hotspots in the city.



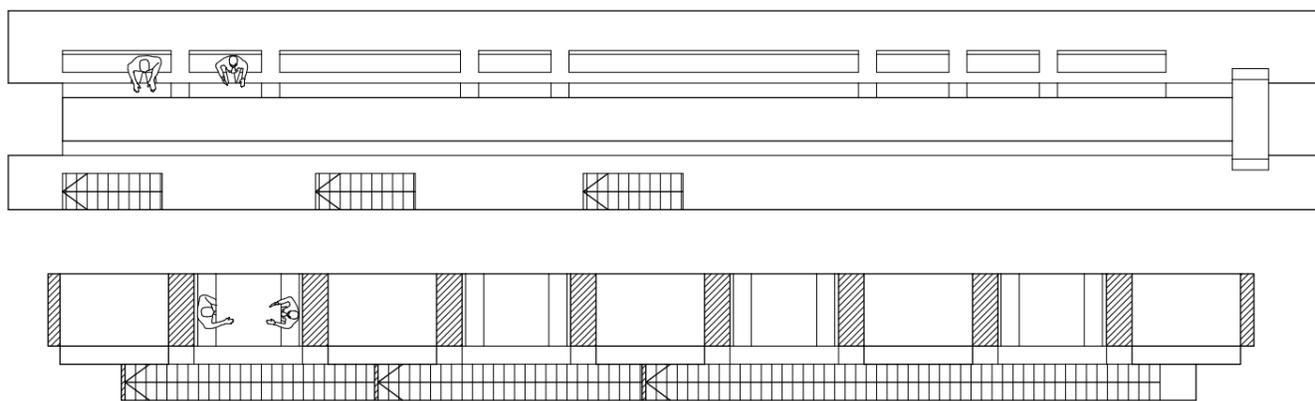
# AQUEDUCT + RESTAURANT = AQUA BUFFET

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

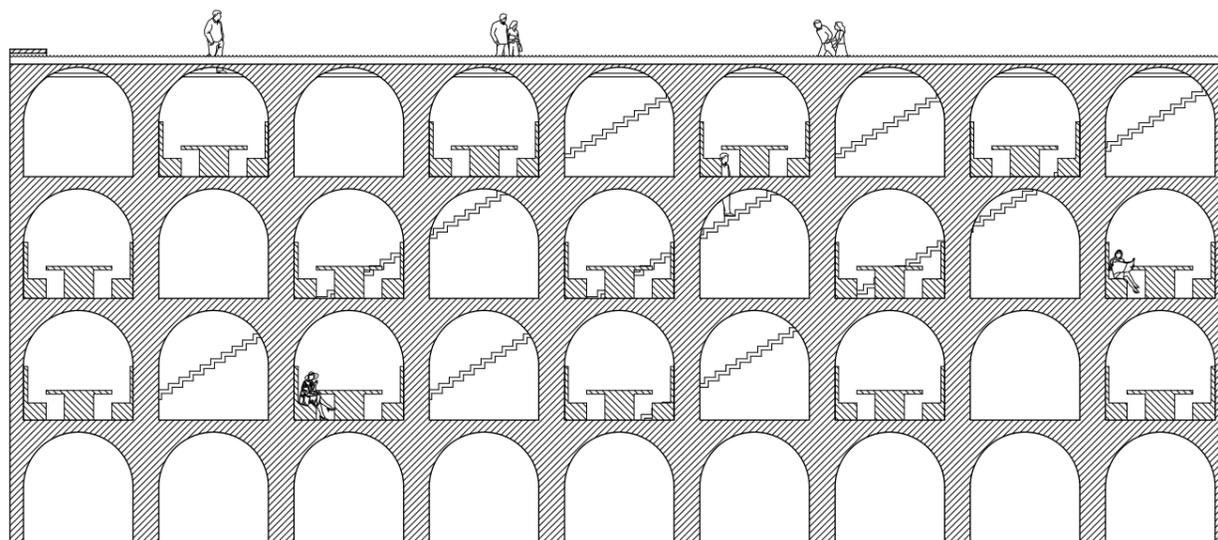
The result becomes a Hybrid Space System functioning both as an aqueduct as well as a restaurant with the function of a belt buffet on top and private tables below. Where the two concepts are joined together in harmony, utilizing each other in a peaceful way.



Axonometric view of one instant of the Aqua Buffet.



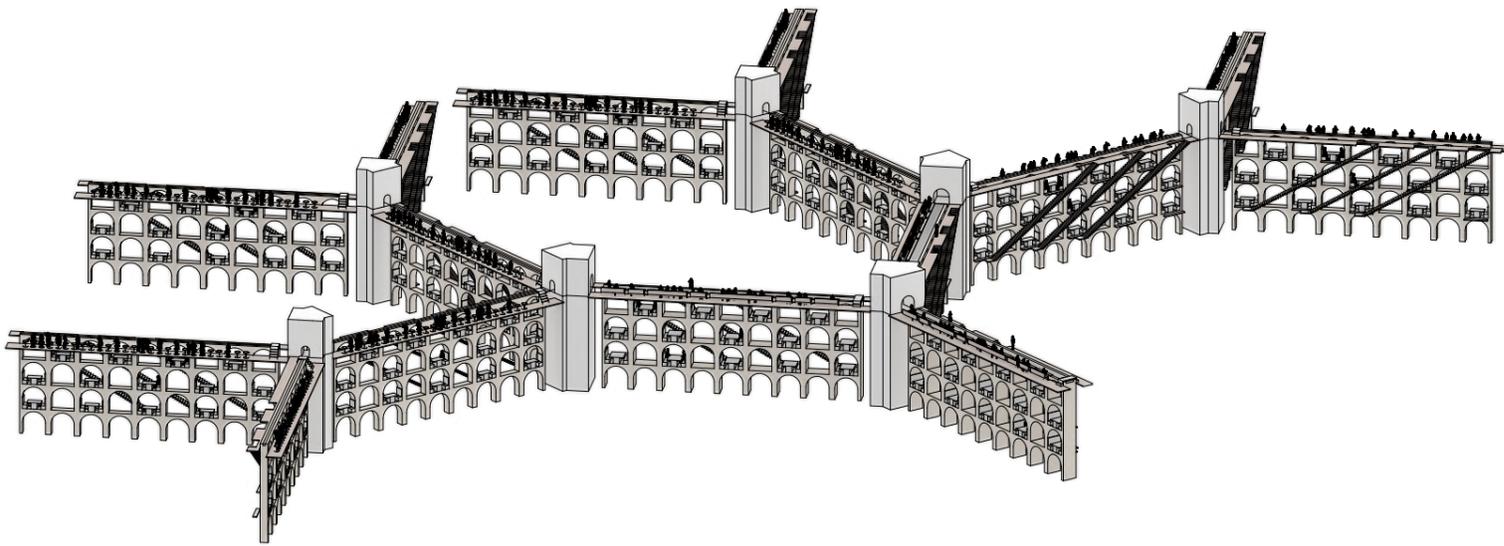
Plan 1:200.



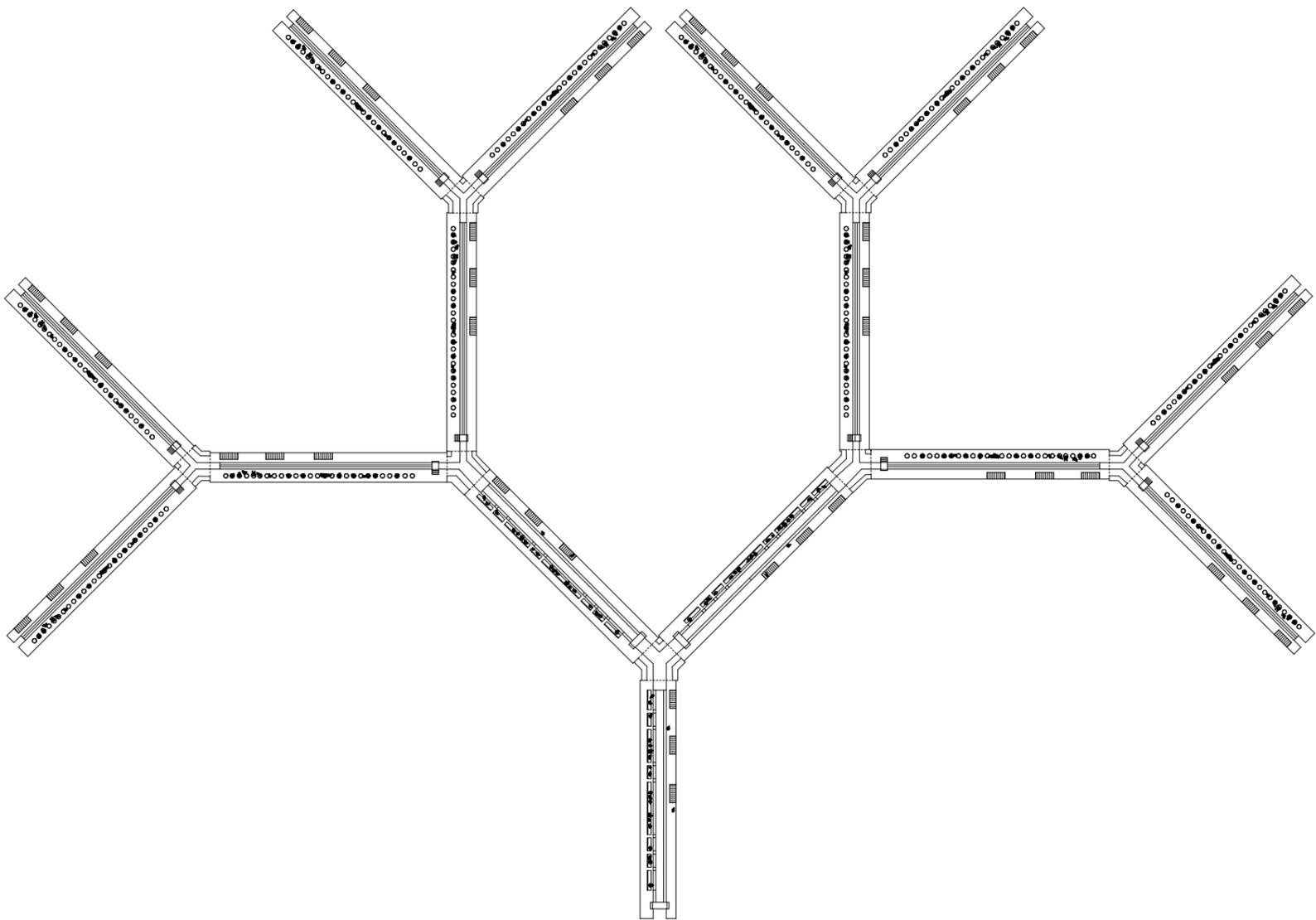
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# AQUA BUFFET + RECURSIVE TREE = NETWORK

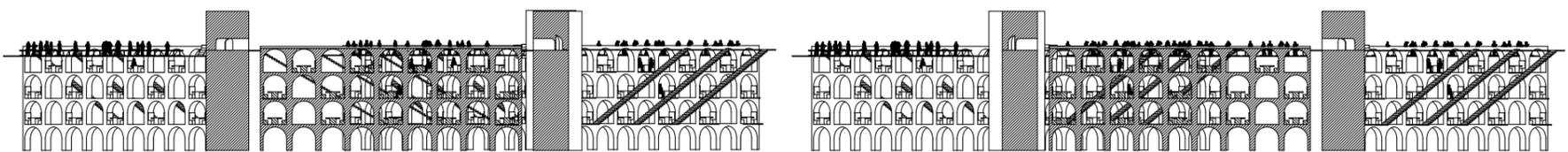
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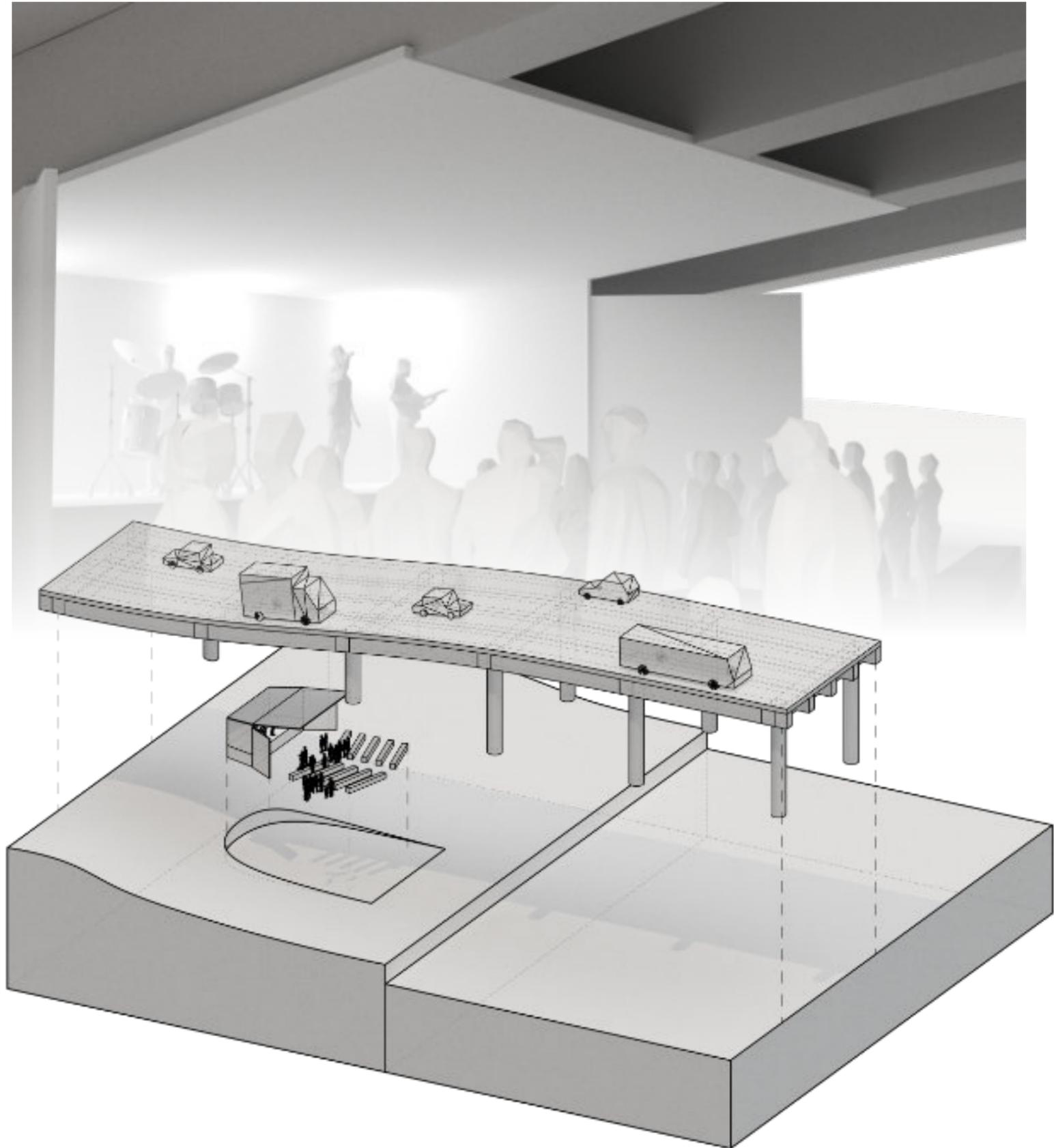
Axonometric view of a network of Aqua Buffets.



Plan 1:1000.

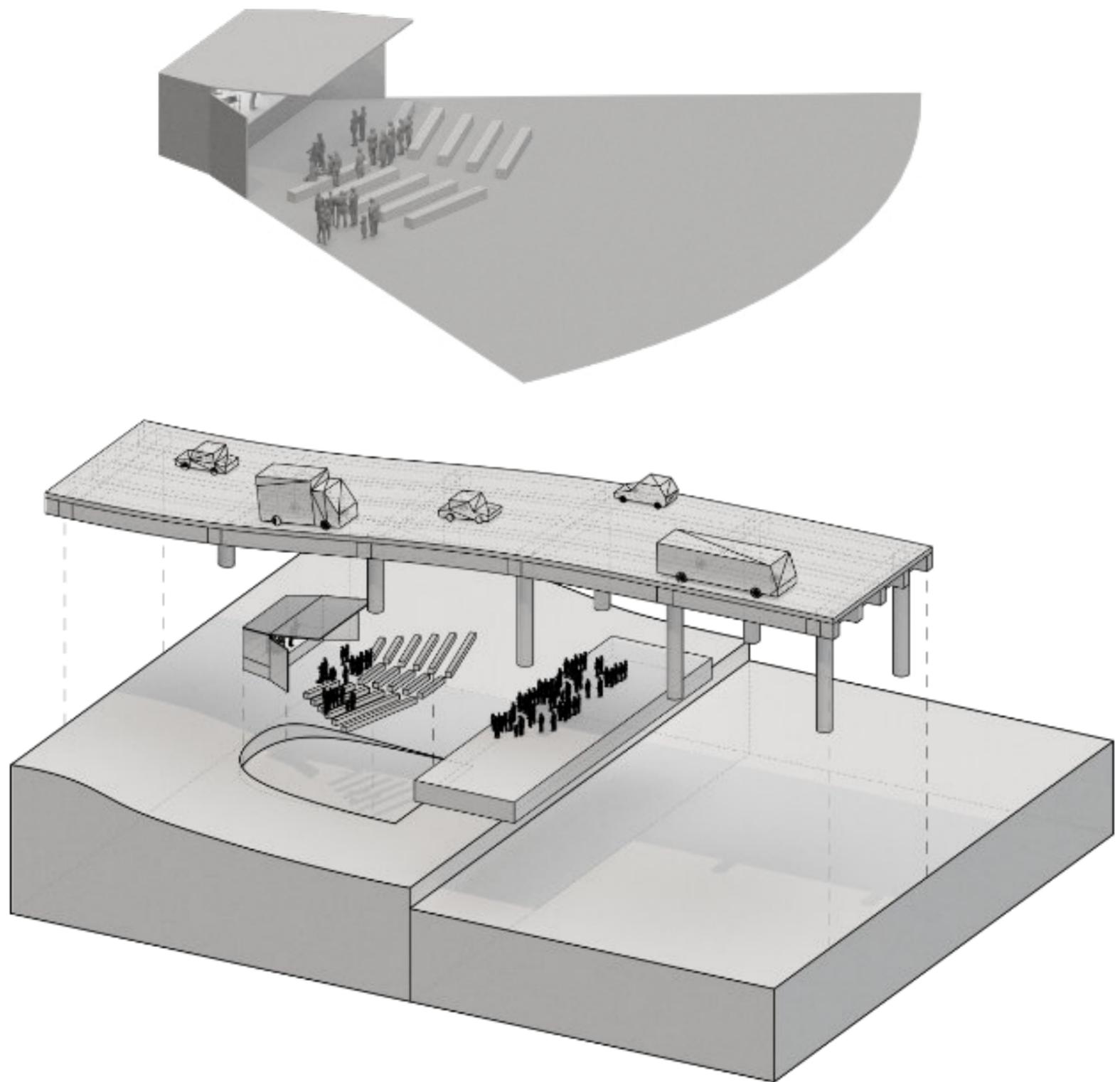


Section 1:1000.



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.

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# 2.1 PROBLEMATIZED WATERFRONT

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

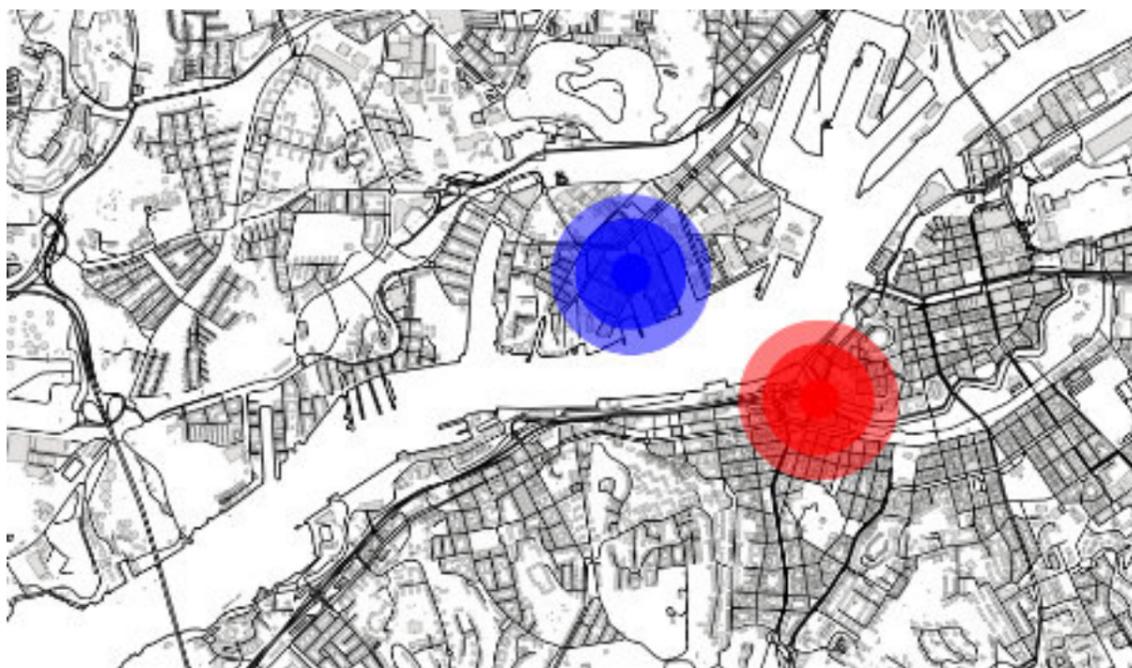
A major problem in the social landscape of Gothenburg today is the division done to the city by the river. Since Gothenburg is currently partitioned by the Göta Älv river, only connected by Hisingsbron and Älvsborgsbron, the city becomes divided into two different parts. These parts are not only divided 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?



Älvsborgsbron, a bridge for vehicles



Hisingsbron, another bridge for vehicles

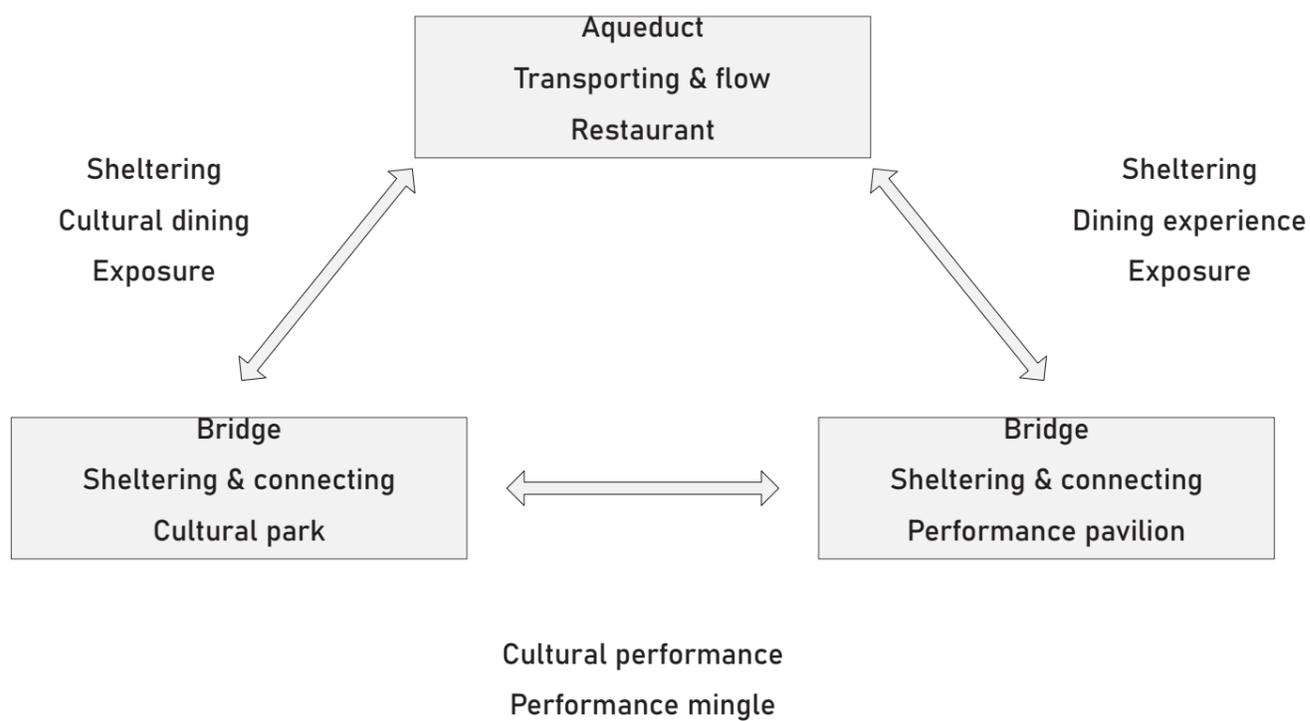


Map over Gothenburg showing the two centres of the city and the distance between them.

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.

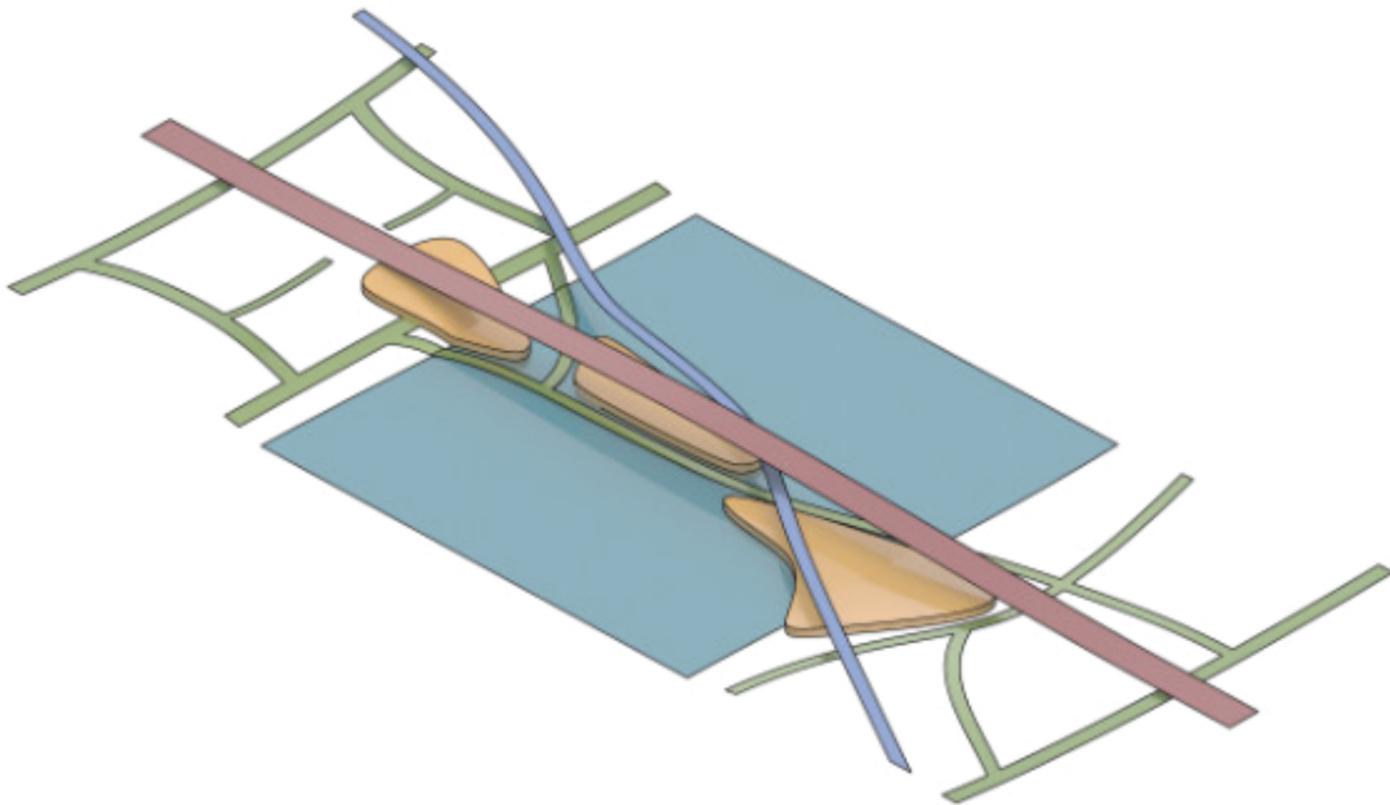


Diagram illustrating the interconnection between the Hybrid Space concepts as they meet in one location forming a social connector.

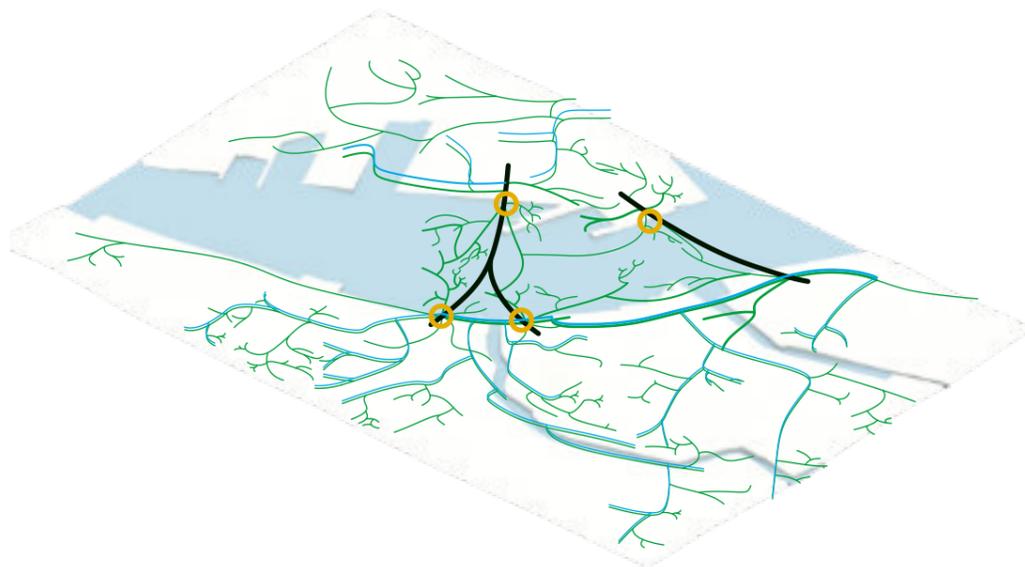


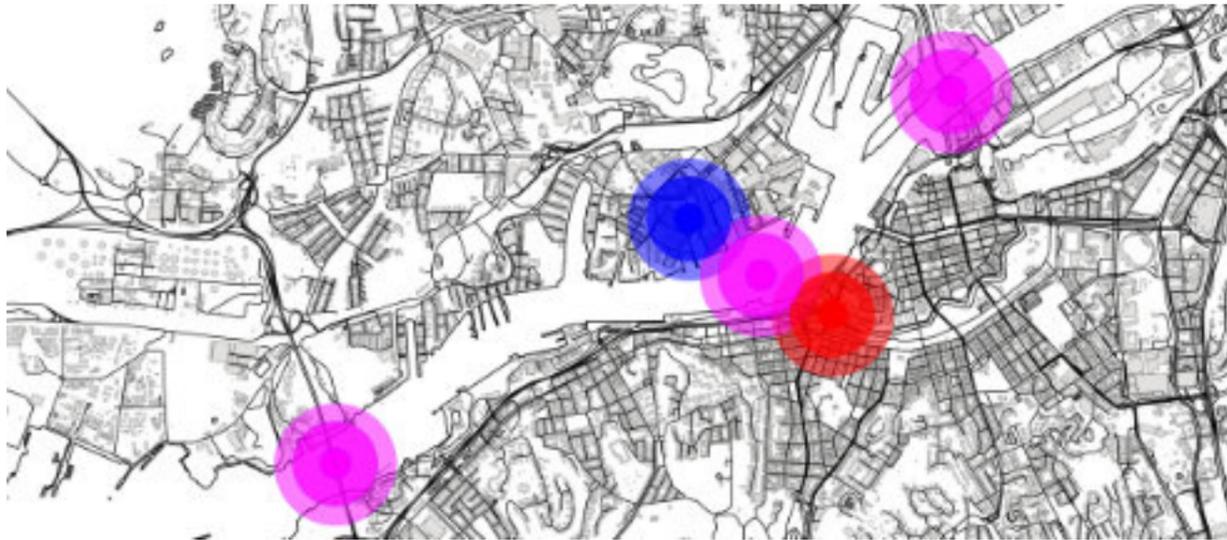
Diagram illustrating the macro network of parks and aqueducts spreading through the city interconnecting by the new connectors over the river.

In this central hub, where the entire network comes together, several massive bridges stretch 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 touch 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.

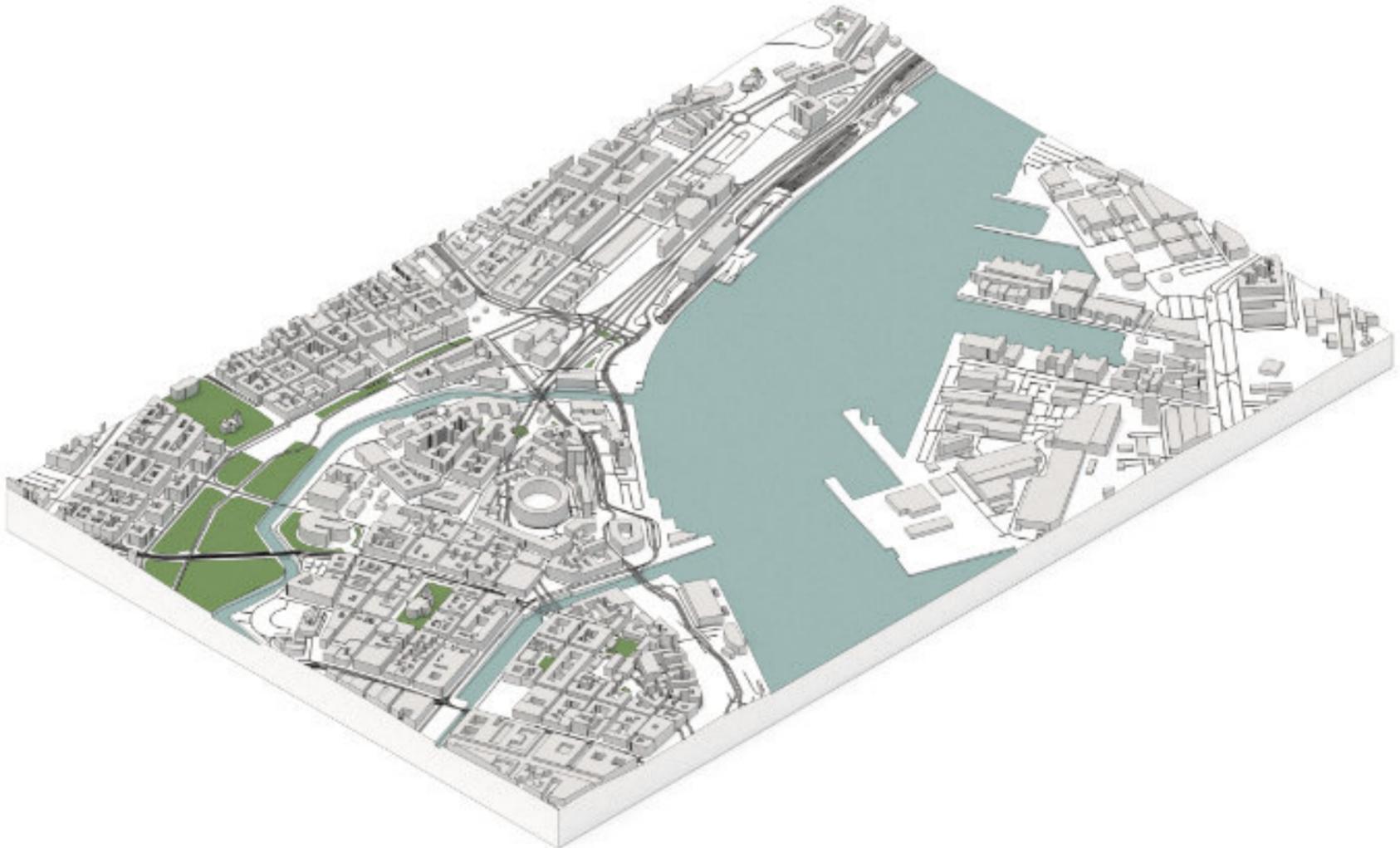


Järntorget



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.

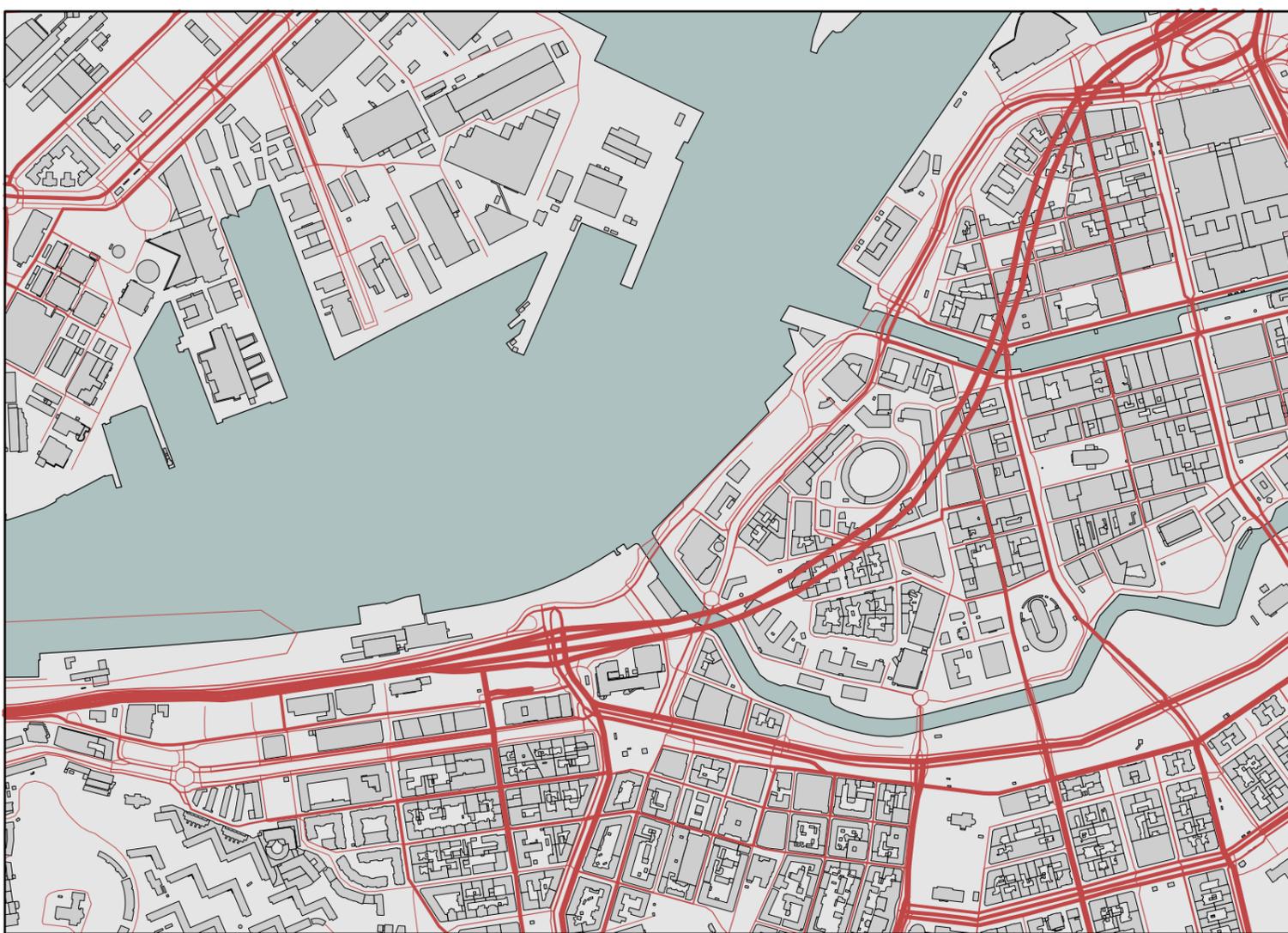
The infrastructure agents studied in this phase are those of the individual Hybrid Space concepts, being the users of the bridges as well the water running in the aqueducts. The bridges are in the hybrid concept being used by both vehicles, such as cars and trams, as well as pedestrians.

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.



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

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.

The human space agents studied in this chapter are all with the focus of cultural activities. With everything from restaurants and performance pavilions to cultural parks. The areas in the city today that fulfill the social needs of these human activities are located in pretty much the same areas, mostly on the south side of the river. The residents on the north side of the river does not have the same opportunities for social activities and would need to travel quite far by vehicles to reach the cultural center of the city.



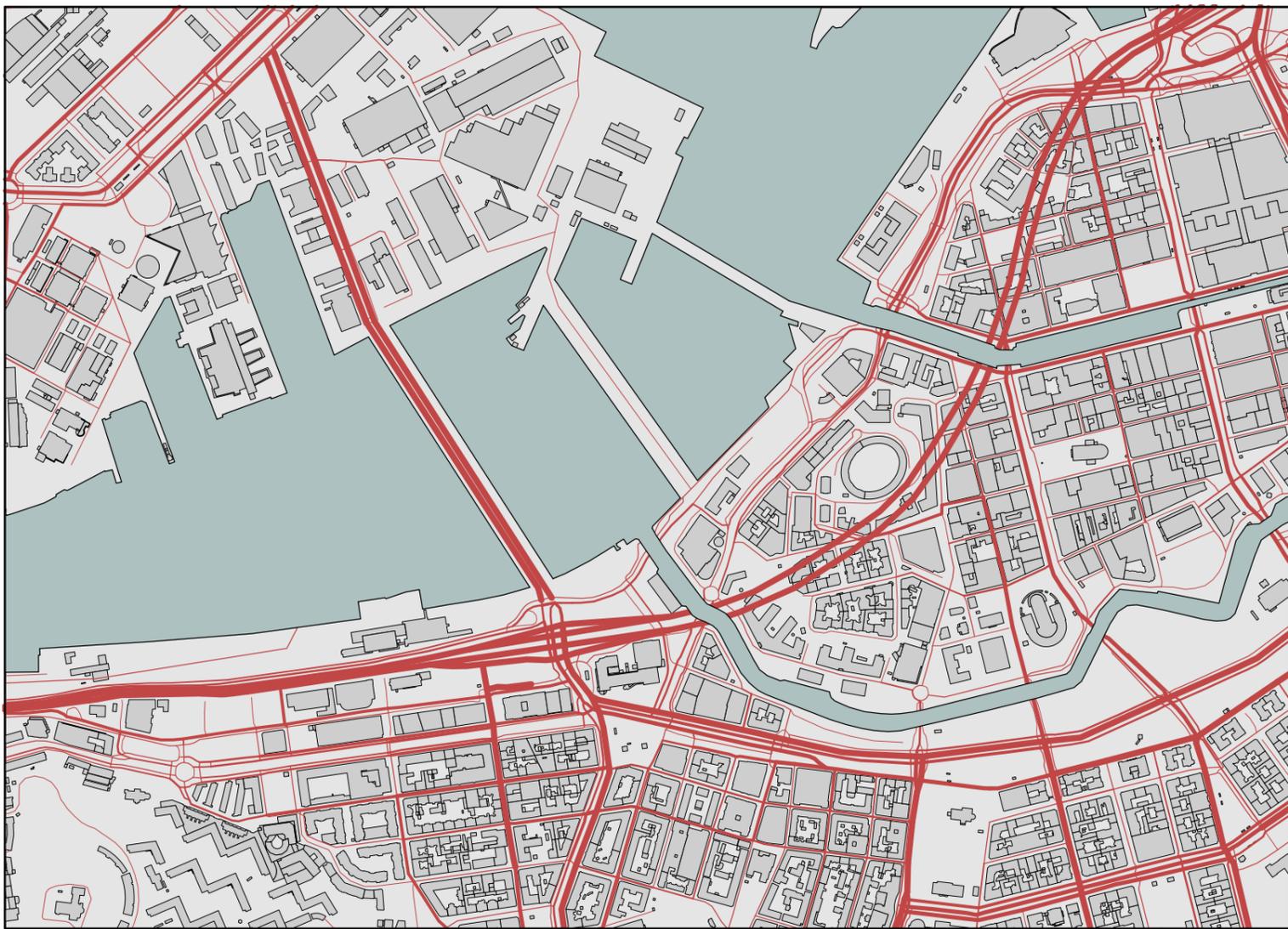
Plan 1:10000. Illustrating the locations for cultural experiences as well as restaurants in the context area.

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.



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

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.

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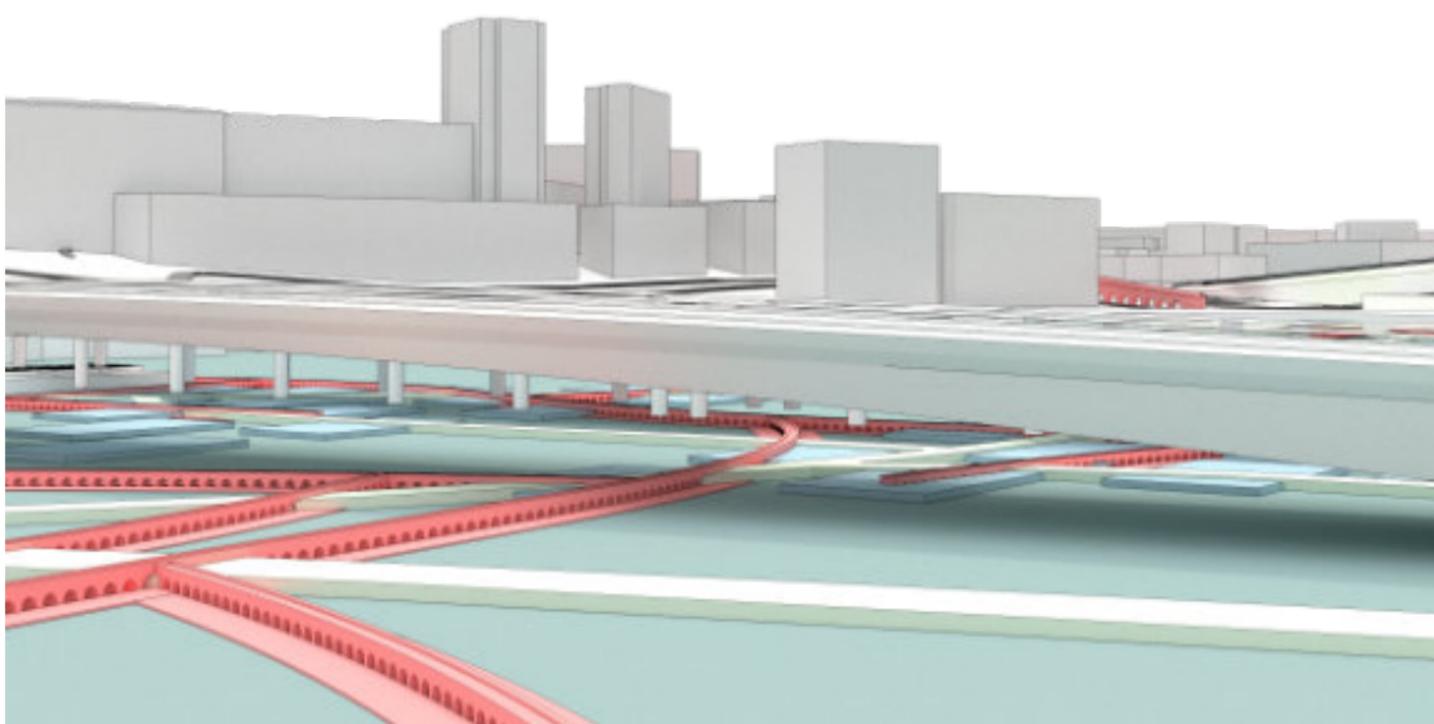
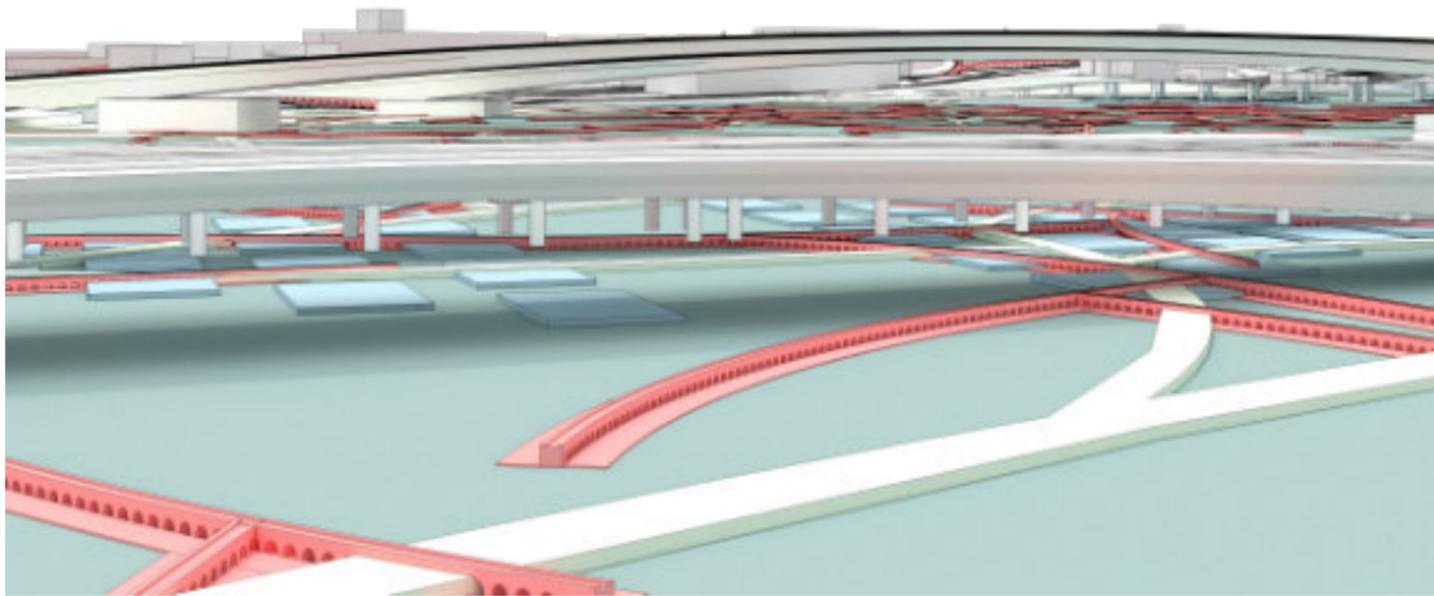
# 2.2 WATERSCAPE PROTOTYPE

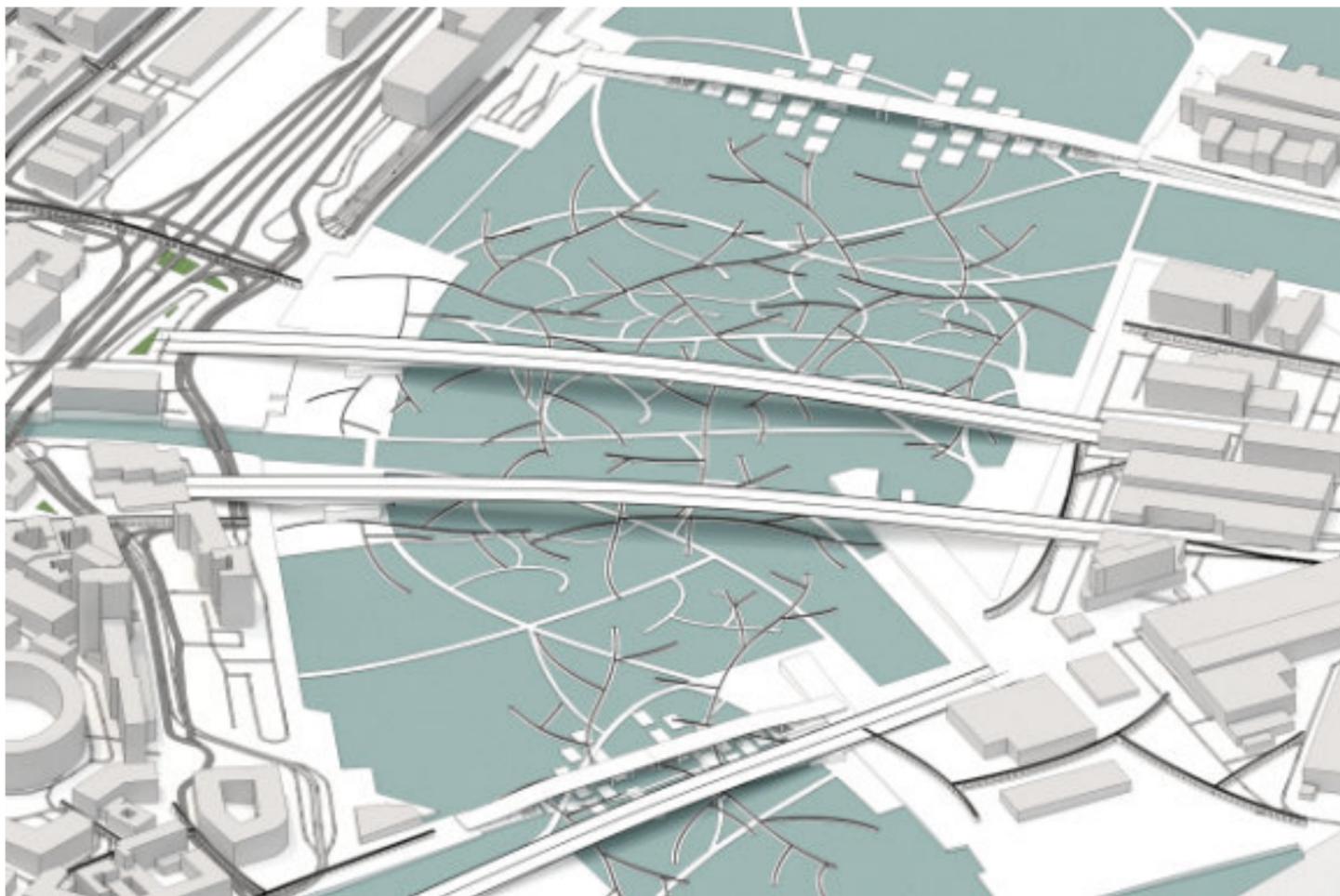
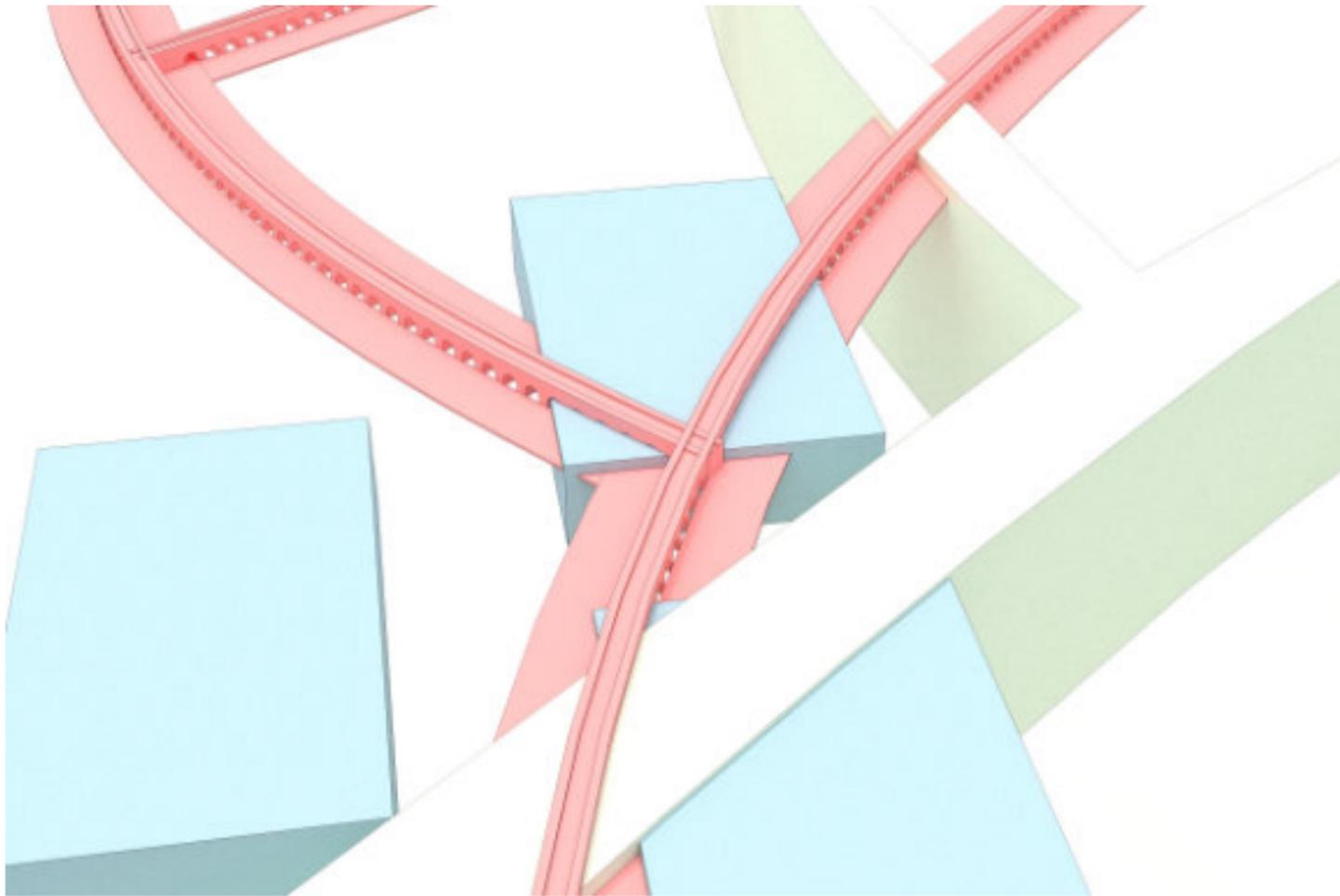
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When the three hybrid space concepts come together to form the social connector their roots spread out into the city linking the old culturally rich areas together with the new. Parks and aqueducts are spread out in vast networks gathering people together 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.

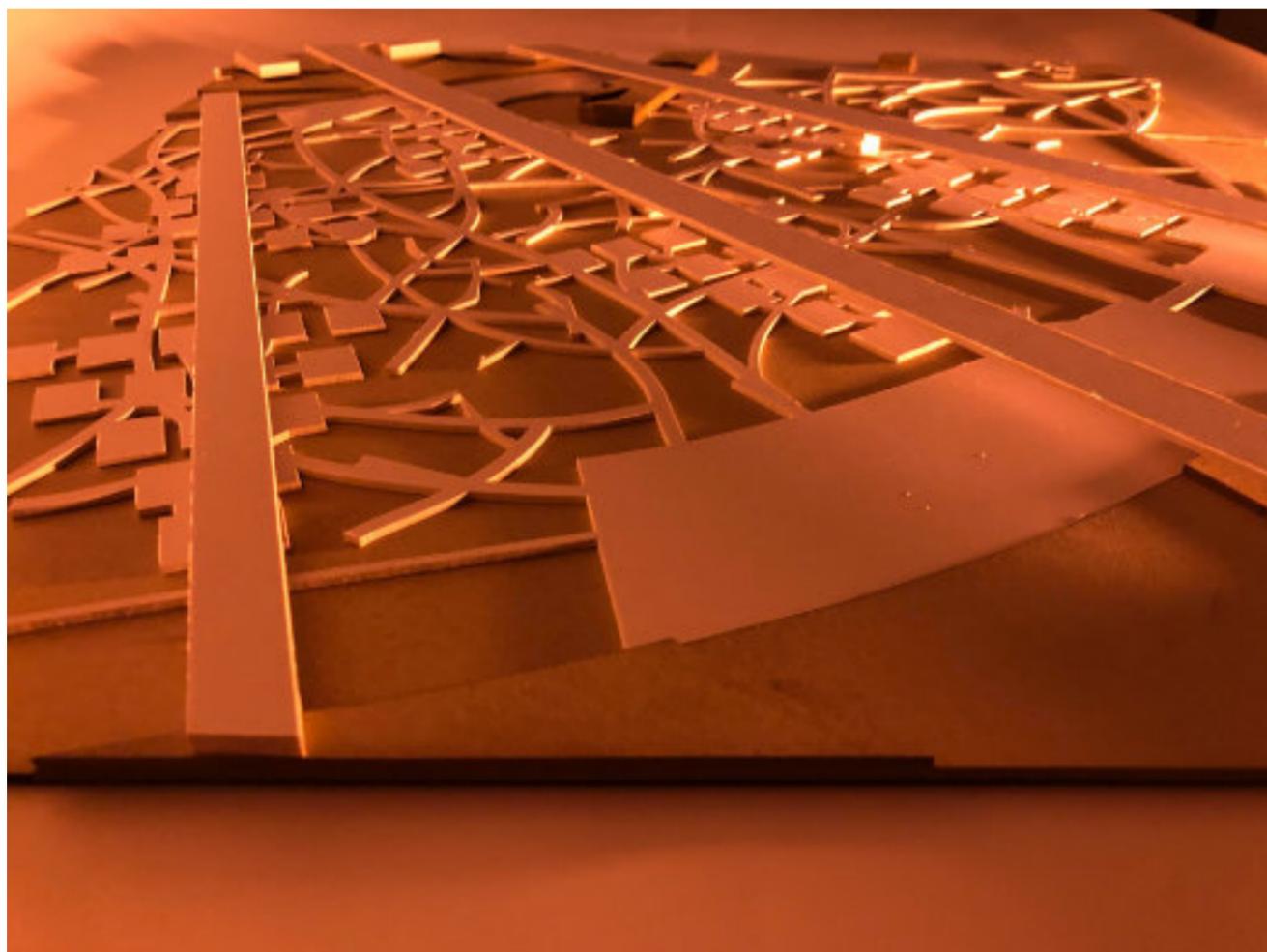
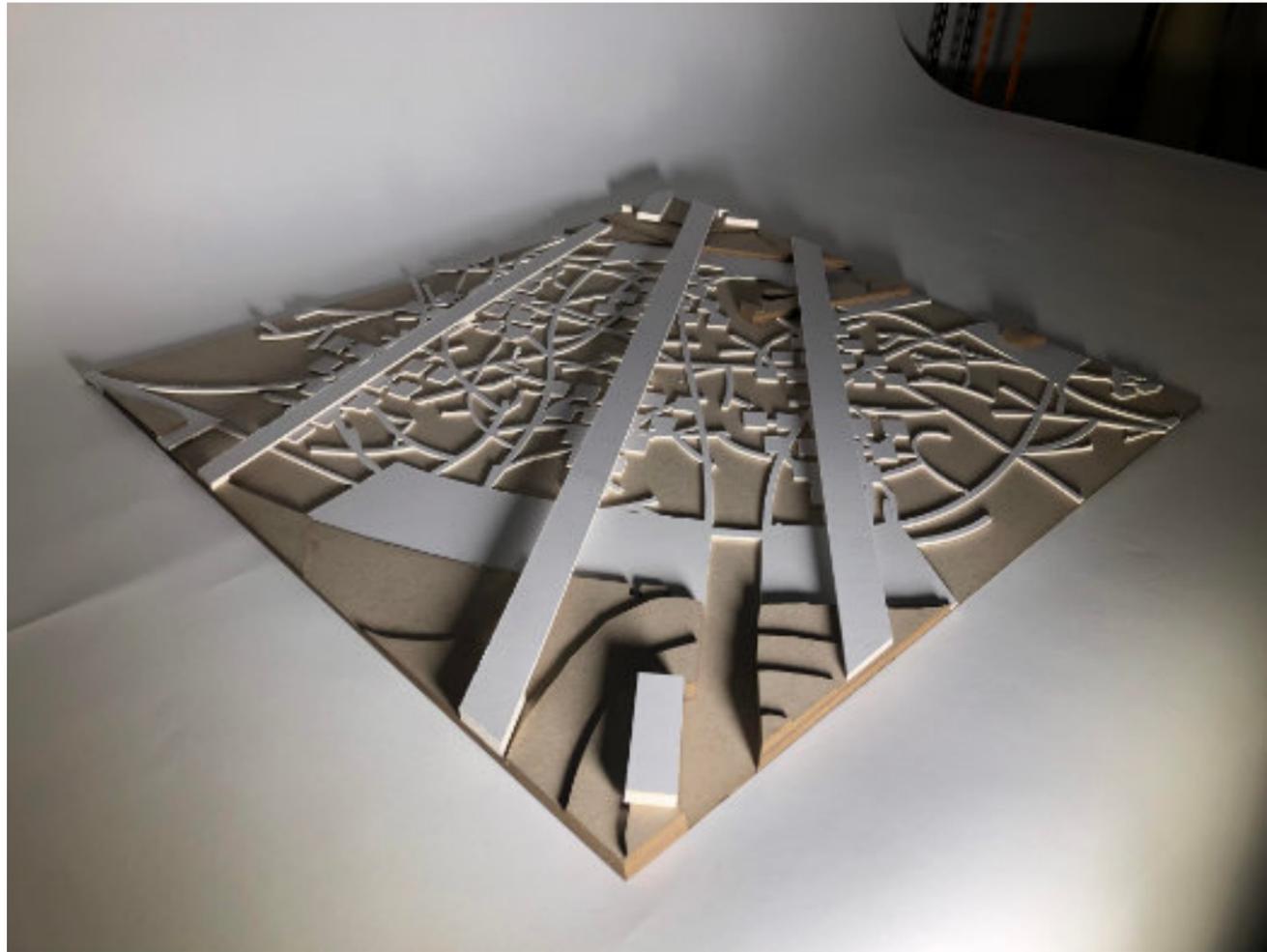


Social interactions are more diversified by the interacting networks, benefitting from each other to create unique social experiences.

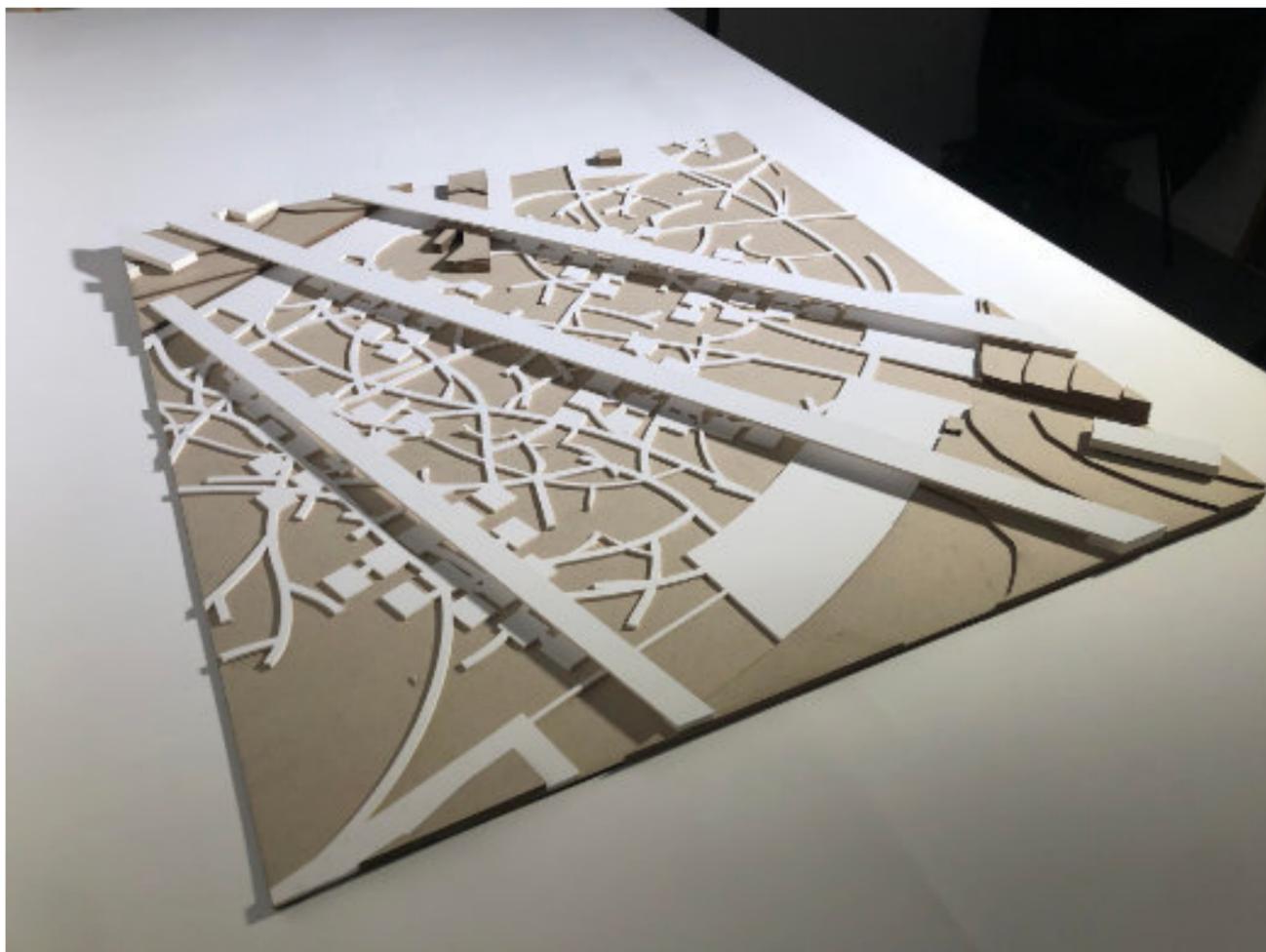
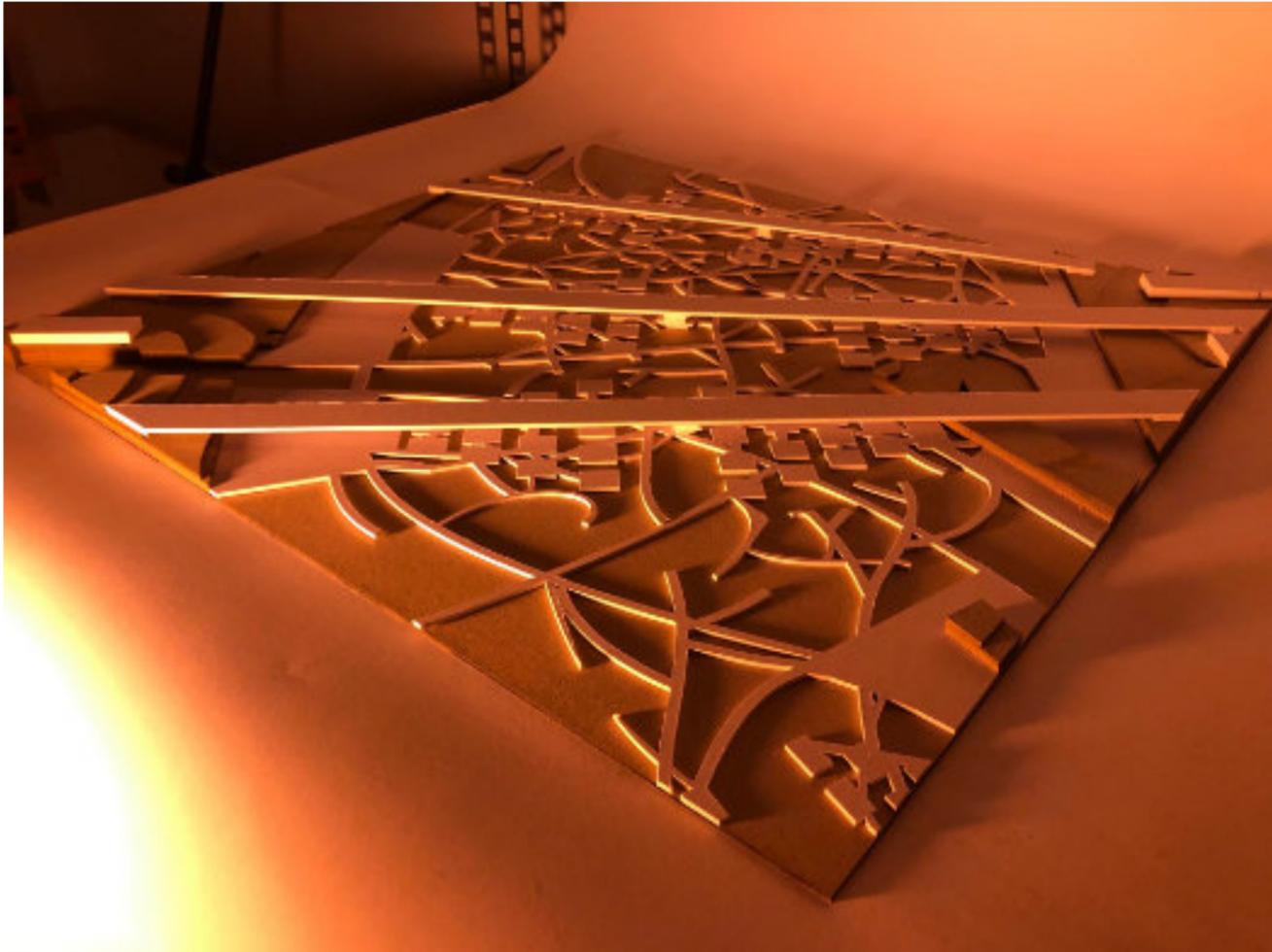




To further explore the spaces created when the three different hybrid space networks are joined together to form the social connector, a physical scale model was constructed over a specific part of the whole network. The interesting area studied was in the centre of the network where the river is at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

# Waterscape Project

## Social connector - Center

For the centre part of the social connector, islands are connected with a park theme for social activity with cultural aspects. The islands are connected to a larger park area for outdoors activity and concert-like activity and events.

The islands are decorated with vegetation and trees as a transitional aspect to the main park where visitors can enjoy park themed events and activities.

In the centre of the park two stages are situated, with the larger one facing the open park area, and the smaller one facing towards the floating platform area.

The stages aim to serve small and medium scale performances and events, ranging from busker performances to small orchestras or concerts. Besides the stages supporting facilities for local staff members and performers are located.

The park area is open and spacious as opposed to the more conformed activities taking place around it. The socialising here is decided by the visitor but could also serve for events like outdoor cinema showings.



Bird perspective



