

RECONSTRUCTING THE LIMIT

Urban Revival via Architecture and Landscape design
in war-damaged Mosul, Iraq

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INTRODUCTION

“Because there is nothing intelligent to say about a massacre. Everybody is supposed to be dead, to never say anything or want anything ever again. Everything is supposed to be very quiet after a massacre, and it always is, except for the birds.”¹

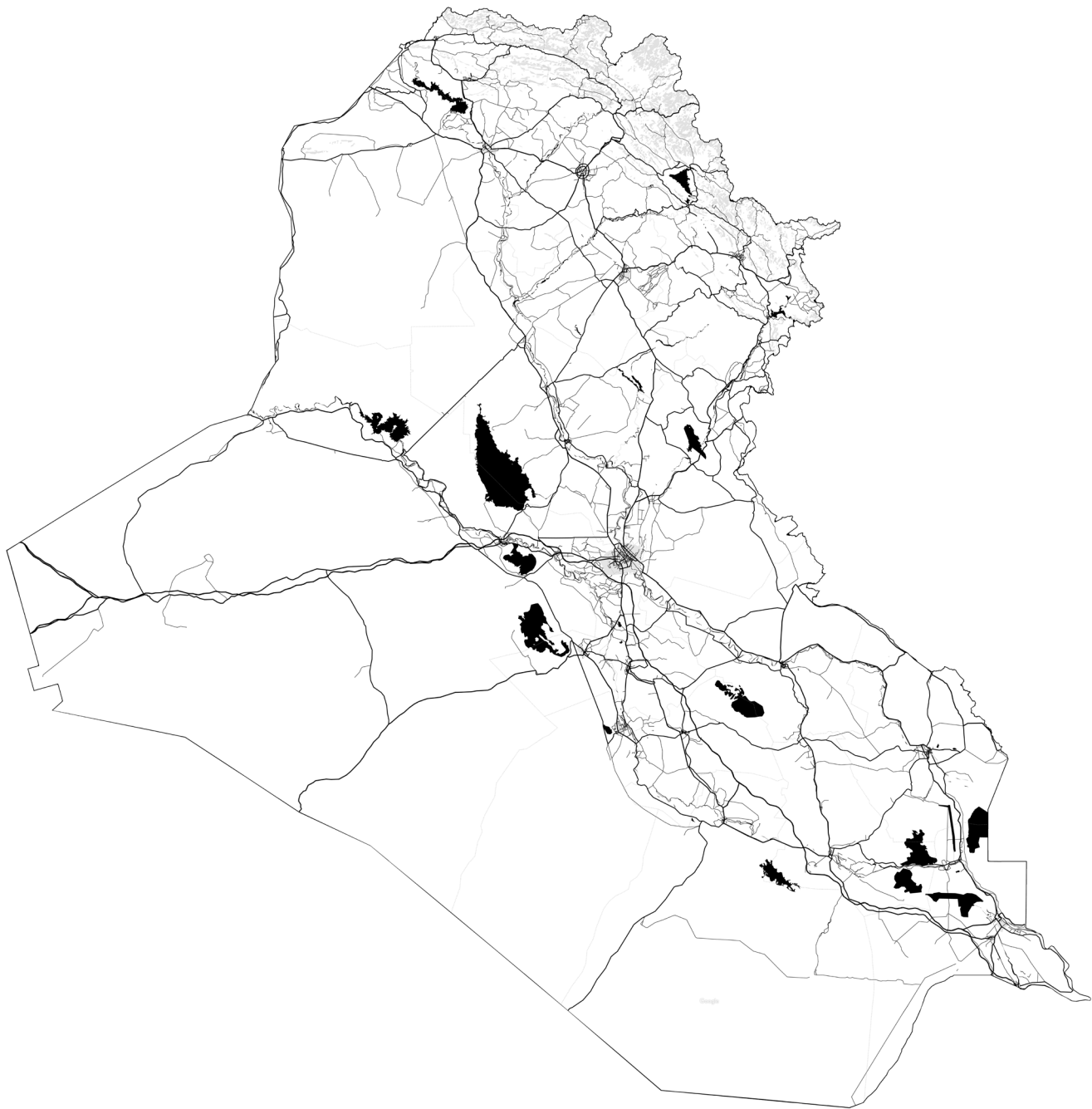
All wars are atrocious, and the task of incorporating such inglorious events into a nation’s collective identity becomes understandably hard. But it needs to be done, otherwise, the memory of the war might be trivialized and forgotten and, hence, are more prone to be repeated. War is bound to replicate itself without confrontation and awareness.

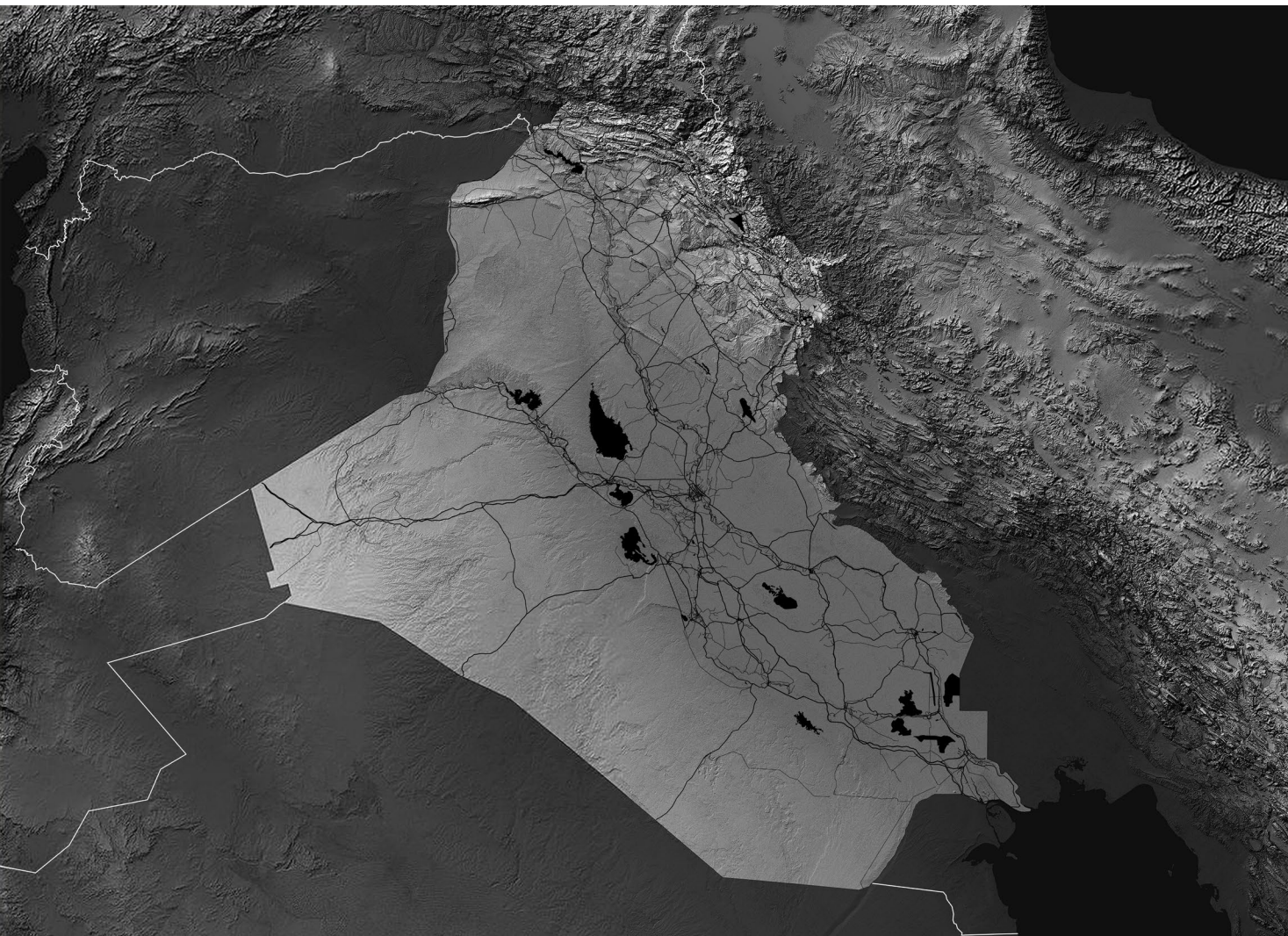
Mosul city was established on the western bank of the Tigris River in the 6th Century, just across the water from the ruins of the Assyrian city of Nineveh. The city flourished during the ancient era establishing itself as an epicentre of the Islamic world, therefore it is rich with ancient ruins and cultural heritage.

The war which erupted in Iraq didn't aim to destroy only its defence, but also its identity. Entire urban blocks of Mosul's city were damaged so severely, that when it comes to reconstruction it cannot simply restore the former fabrics, either of space or architecture. The war has changed everything, and most critically the structure of society itself. The spatial reconstruction will mostly require more than just physical rehabilitation and restoration of the cities devastated infrastructure and housing. In order to provide sensations for the need of diversity and unity, more urgent concern should be given to restoring public facilities and daily utilities. Architectural and landscape design can be judiciously used in healing the social structure. How can common spaces be rearranged to create conditions for a peaceful and creative coexistence among citizens which survived such horrors? How can the location and the design of such utilities be done in a way as to meet the needs for intimacy and peace?

This thesis study intends to recommend an urban and architectural regeneration project, to be taken upon during the redevelopment of the old city of Mosul. Furthermore, a set of strategies that may ensure the preservation of the urban identity of the area, while redeveloping and coping with the environmental, socio-economic and political changes have been identified for reclaiming the urban identity and promoting the sense of belonging.

TERRITORIAL ANALYSIS





— Frontières ■ Iraq ■ Water — Main Road

0 50 100 200 km ⓘ

01 Iraq Country | Geopolitical map and main infrastructure system. Retrieved from: Made by the Authors.

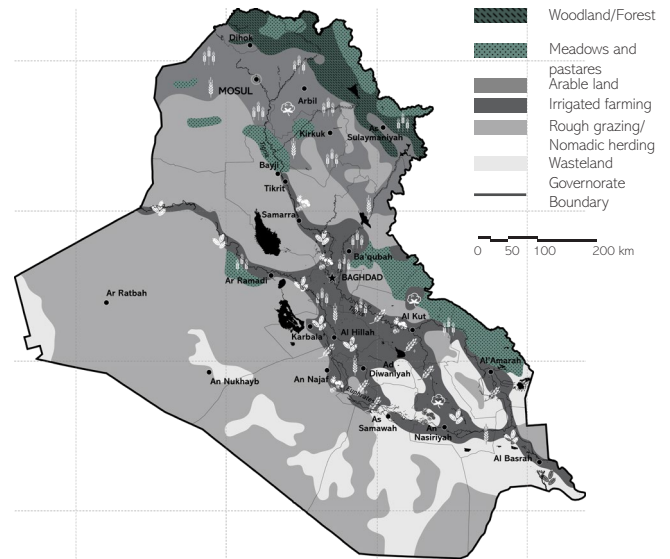
Territorial Analysis | Reconstructing the Limit: Urban Revival via Architecture and Landscape design in war-damaged Mosul, Iraq.

GEOGRAPHIC PROFILE

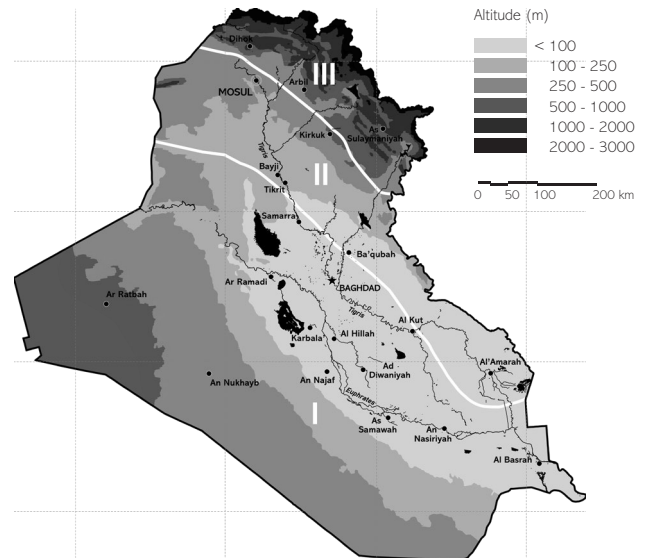
Iraq is one of the easternmost countries of the Arab world. The country is bordered to the north by Turkey, to the east by Iran, to the west by Syria and Jordan, and to the south by Saudi Arabia and Kuwait (Fig 01). The total area of Iraq is 437,072 square km, of which 432,162 square km of the land surface. Moreover, Iraq has a tiny sliver of coastline of approximately 58 km along the northern end of the Persian Gulf. For administrative purposes, the country is divided into eighteen governorates, of which three (Arbil, Dahuk, and As Sulaymaniyah) are gathered in an autonomous region in the north and the other fifteen governorates are in central and southern Iraq. This division corresponds roughly to the rainfed northern agricultural zone and the irrigated central and southern zone.

Four physiographic regions can be identified by analysing Iraq's topography. Wide sandy expanses lie in the desert zone of the country, towards its west and southwest regions being part of the Syrian Desert. The northern part is dominated by uplands, including the watersheds of the Tigris and Euphrates rivers to the Syrian border. The northern highlands constitute the third region, characterized by a series of elevation rises interspersed with steppes, giving way to mountains that reaches 4,000 m high near the Iranian and Turkish borders. Lastly, the fourth region unfolds along the lower Tigris and Euphrates rivers, the alluvial plain. The area, which is a large delta, includes lakes and marshlands, extending from north of Baghdad southward towards the Persian Gulf.

It is estimated that about 11.5 million ha, or 26 per cent of the total area of the country, are cultivable. Under current conditions, the remaining portion is unsuitable for agricultural use, and only a short strip at the extreme northern border with Turkey and the Islamic Republic of Iran is covered in forest and forests. The total cultivated area is estimated at about 6 million ha, of which almost 50 per cent in northern Iraq under rainfed conditions. Less than 5 per cent is occupied by permanent



02 Iraq Country | Land use map.
Retrieved from: Made by the Authors.



03 Iraq Country | Climate and elevation map.
Climate zones classification: I Subtropical desert; II Subtropical steppe; III Dry summer subtropical. Retrieved from: Made by the Authors.

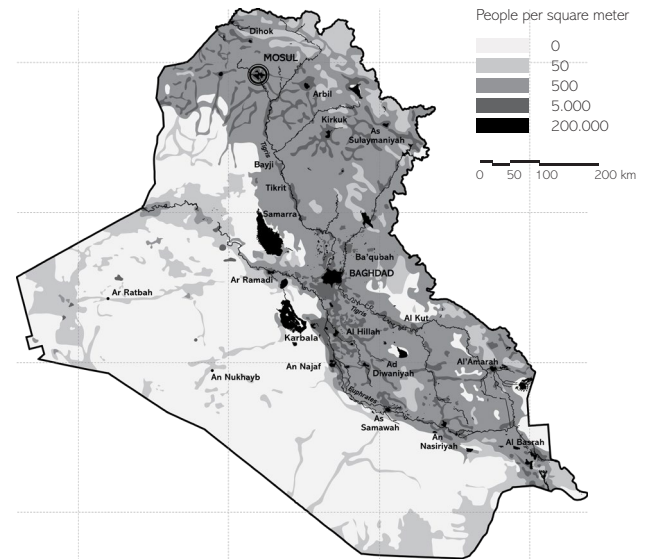
crops (Fig 02).²

The climate in Iraq is mainly of the continental, subtropical semi-arid type, with the north and north-eastern mountainous regions having a Mediterranean climate (Fig 03). Rainfall is very seasonal and occurs in the winter from December to February, except in the north and northeast of the country, where the rainy season is from November to April. Average annual rainfall is estimated at 216 mm, but ranges from 1 200 mm in the northeast to less than 100 mm over 60 per cent of the country in the south.

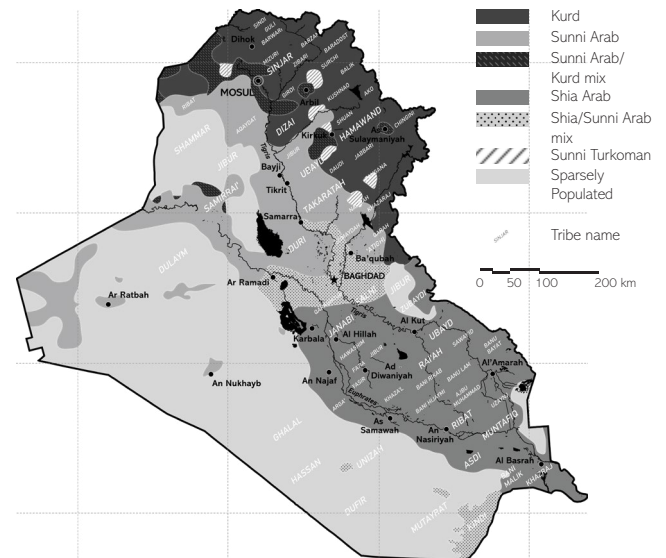
The current population of Iraq in 2021 is 41,179,350, with an overall increase of 2.97 per cent in the last ten years. The population is predominantly centred in the alluvial plain and the northeast, leaving the western and southern desert regions very sparsely inhabited (Fig 04). The two official languages of Iraq are Arabic and Kurdish, which in terms of ethnicity constitutes the majority. Ethnic minorities include Turkmen, Shabak, Chaldeans, Assyrians, Armenians (Fig 05).

Located in northern Iraq, Nineveh is the third largest and second most populated governorate, home to the ancient Assyrian city of Nineveh. The province is divided into nine districts: Sinjar, Telfafar, Tilkaif, Al-Shikhan, Hatra, Al-Ba'aj, Akre, Al-Hamdaniya, and Mosul (Fig 06). Agriculture, especially cereal production, is a key component of Nineveh's economy. The governorate produces sugar cane, sunflower, vegetables and herbs. Nineveh is an ethnically, religiously, and culturally diverse territory, with large populations of Arabs, Turkmen, Assyrians, Kurds, and Yazidis both in towns and cities and in their own specific villages and regions.³

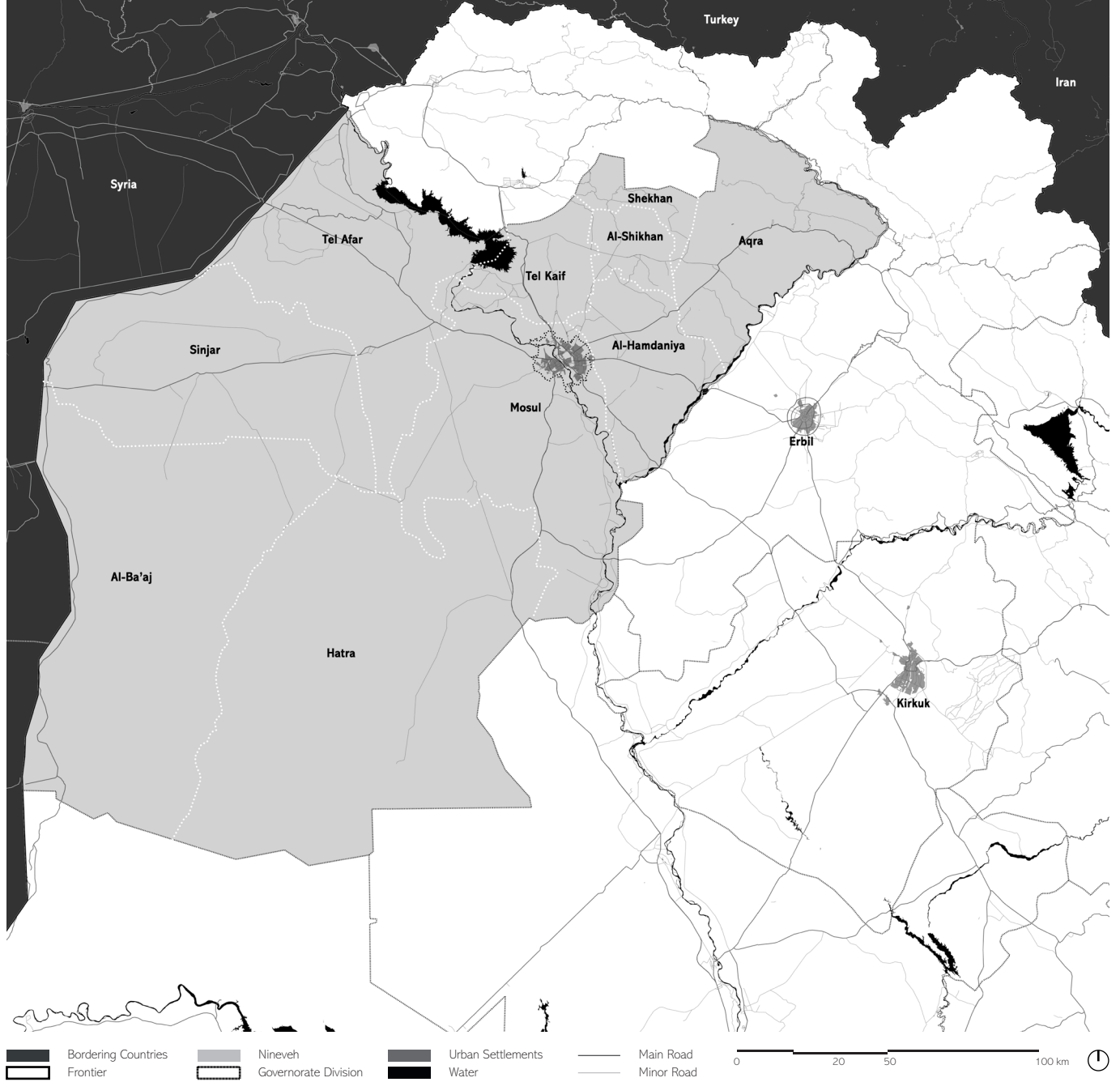
The city of Mosul is the provincial capital, one of Iraq's principal cities located approximately 250 miles north of Baghdad, and the second-largest city in Iraq in terms of population. Mosul District is the most populated of Nineveh's nine districts with a population of about three and a half million (Fig 07). The



04 Iraq Country | Demographic density and distribution map. Retrieved from: Made by the Authors.



05 Iraq Country | Ethnoreligious groups and major tribes map. Retrieved from: Made by the Authors.



06 Nineveh Governorate|Geopolitical map and main infrastructure system.
Retrieved from: Made by the Authors.

city has several titles known to it, such as 'um al-Rubaien', because of the mild weather in the spring and autumn, or 'Al Fayhaa', which means paradise or heaven. Located on the banks of the Tigris River, became notorious for the picturesque historic and religious sights, with relicts of centuries of ancient civilisations right outside the city borders. Due to its geographical position, Mosul has served as an outstanding commercial centre at various times in its history. The export of oil, agricultural, mineral, and industrial goods are the most recent sources of income, with oil as a primary contributor to local economic development since the 1920s. Mosul district is also particularly known for its pharmaceutical industry and sulphur extraction and manufacturing. Mosul has a hot climate with extremely dry hot summers (record high 49°C) and moderately wet, relatively cool winters (average low 12°C).

The city is officially divided into eight administrative sectors, however, the city is widely perceived to be divided into two distinct parts, a right bank and a left bank. Mosul has five bridges connecting the two banks of the city, the oldest of which dates back to the British Mandate, and the Directorate of Roads and Bridges of Mosul province has announced that it will begin building a sixth bridge soon. In 1940 the first train operated between Baghdad and Mosul, when Mosul was on the Berlin-Baghdad railway route. A train station was eventually built in the city, and the surrounding area was subsequently called the "Station District". Mosul has also an International Airport, about 5 km from the city centre, which was built in 1920 by the Royal British Air Force and operated by the Iraqi government and is one of the headquarters of Iraqi Airways. On the left coast of the city, the Mosul University was founded in 1967, opened the University of Hadba College in 1994. There are also several libraries in the city, including the Waqf Library, which contains many manuscripts and the Central Public Library, which dates back to 1921.

Mosul residents speak the Mosul dialect (or prayer) that is somewhat similar to northern Syrian dialects, and this Mosul dialect has the greatest role in preserving the city's identity. Mosul city is renowned for its cultural, social, religious, and

ethnic diversity. Historically, it had a mixed population of Arabs (mostly Muslim Sunnis); Kurds (mostly Sunnis); Turkoman (both Sunnis and Shi'ites); Shabak (Shi'ites); Assyrians, Arman, Chaldean (Christians); and Yazidis. Demographic information, however, is a sensitive matter in Iraq in view of the country's sectarian and ethnic conflict. There is a scarcity of accurate statistical evidence on the city's ethnoreligious composition. Currently, the city population is estimated to be 1.683 million in 2021. Like in other parts of Iraq, Nineveh suffered large-scale displacements of its population long before the wave of displacements inflicted by ISIL. Many Christian families were forced to leave as Iraq descended deeper into ethnic and sectarian conflict, especially in 2008, becoming a target for the city's armed militias. However, despite the migration flows, the city's population did not decrease and according to the Nineveh Directorate of Statistics, the people who moved to Mosul after the former regime's collapse (after 2006 particularly) outnumber the number of people who left. Local residents stated that some of the newcomers to the city became radicalized and later joined Al-Qaeda, participating in the ongoing sectarian conflict. A few even took on a leading role in the fight helping ISIL take over the city in June 2014.⁴






The living conditions of the citizens of Mosul declined dramatically with the rising costs of basic goods and services (particularly education, healthcare, gas, food and drinking water) which made everyday life extremely difficult. People spending is mainly reduced to food since they can't afford anything more, and unemployment has risen with the majority of the remaining jobs terribly low paid. Many facilities for education, health care, water, sanitation, electricity, and communications services are currently destroyed or significantly limited by ISIL. Between 50 and 75 per cent of the city's government buildings have been damaged, according to estimates. Mosul is today at the centre of one of the world's largest and most complex humanitarian operations with over one million displaced persons. This will exacerbate the challenges of future stability, rebuilding, and growth in Mosul.



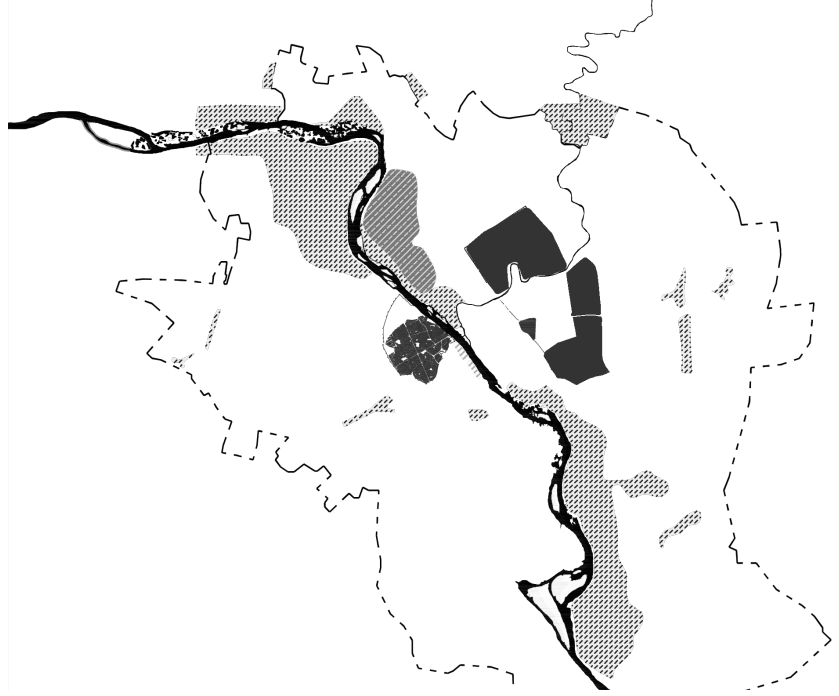
■ Mosul Old City — Main Road
■ Water — Minor Road

0 20 50 100 km ⓘ

07 Mosul Province | Map of Mosul city and surrounding settlements.
Retrieved from: Made by the Authors.

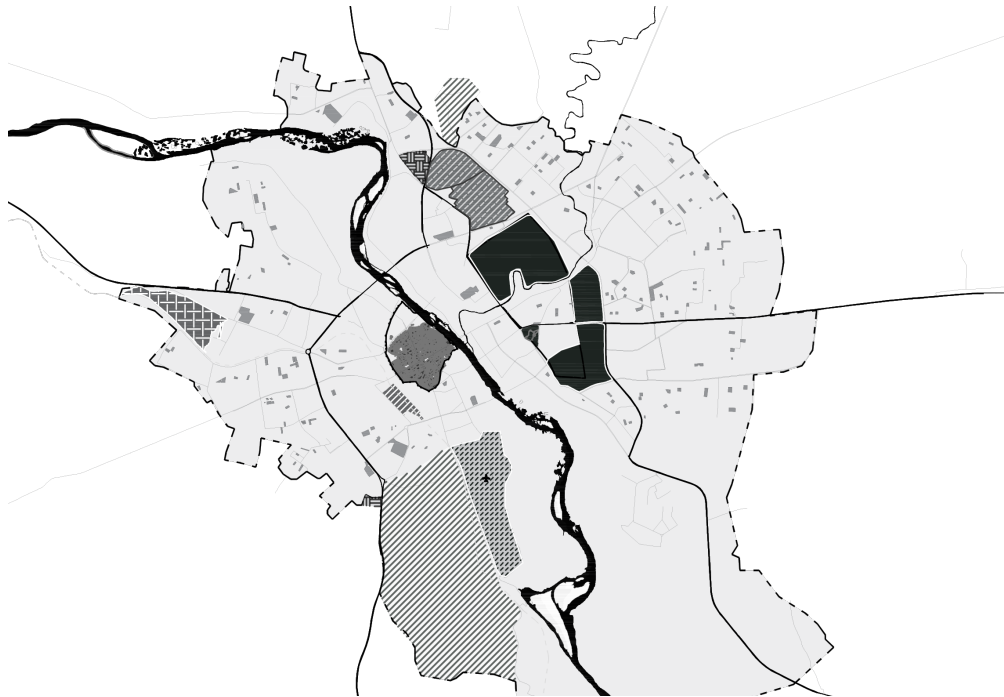
-  Forest
-  Green Aarea
-  River
-  Old City
-  Historic Herritage
-  Municipality Boundary

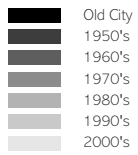
08 Mosul Municipality | Map of green areas.
Retrieved from: Made by the Authors.



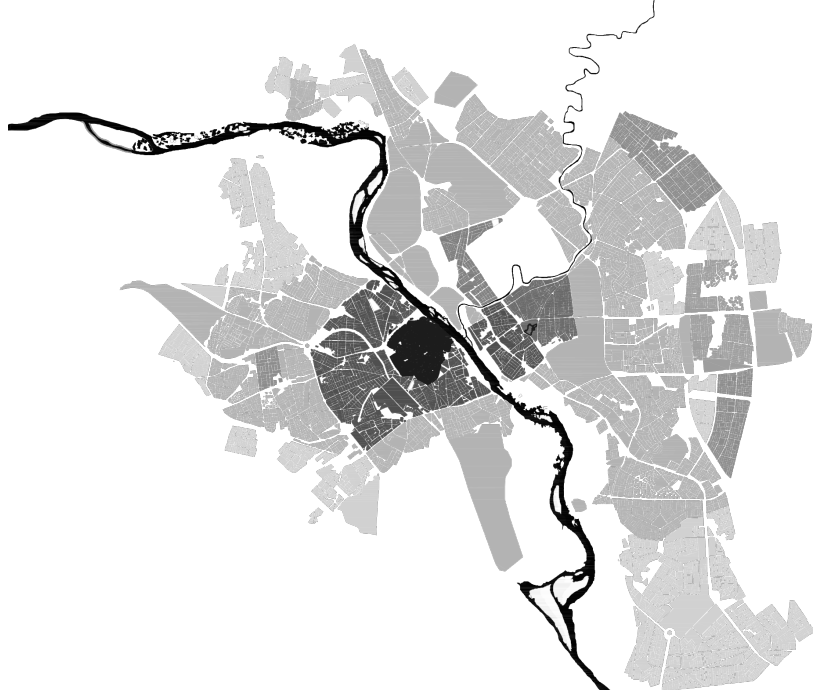
-  University
-  Schools
-  Government
-  Airport
-  Train Station
-  Military
-  Cemetery
-  River
-  Old City
-  Historic Herritage
-  Municipality Boundary

09 Mosul Municipality | Map of public facilities.
Retrieved from: Made by the Authors.

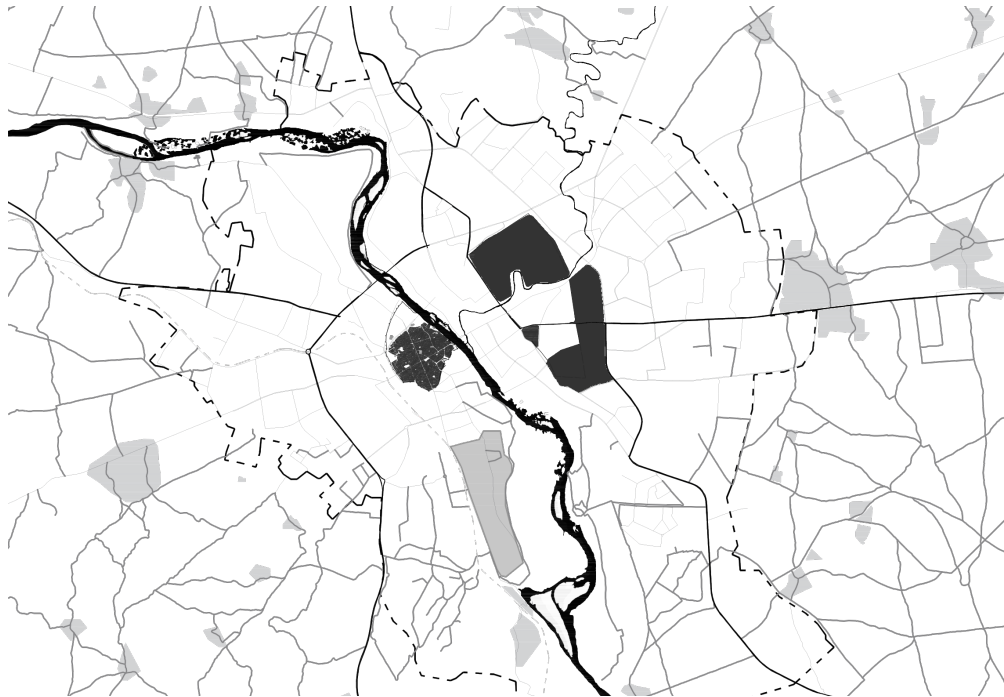




10 Mosul Municipality | Map of urban expansion.
Retrieved from: Made by the Authors.

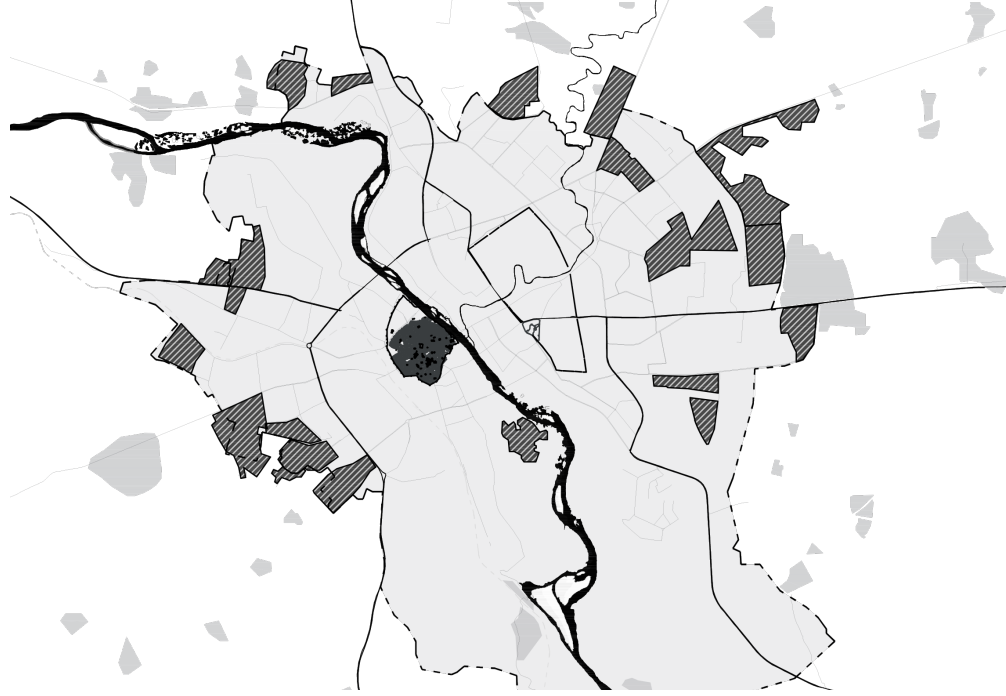











11 Mosul Municipality | Map of road infrastructure.
Retrieved from: Made by the Authors.



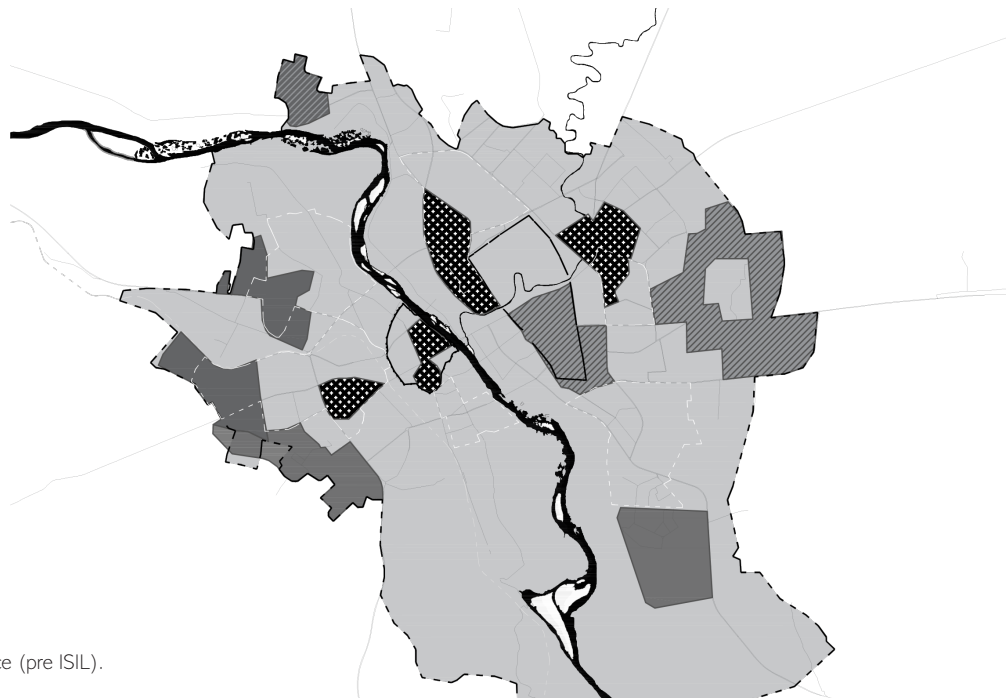
-  Informal Settlement
-  Surrounding Settlement
-  Old City
-  Main Road
-  River
-  Municipality Boundary

12 Mosul Municipality | Map of urban settlements.
Retrieved from: Made by the Authors.



-  Turkmen Shia
-  Christian
-  Kurdish & Shabaks Shia
-  Turkmen Sunni
-  Arab Sunni
-  ISIL Supporters
-  Historic Heritage
-  River
-  Municipality Boundary

13 Mosul Municipality | Map of ethnoreligious prevalence (pre ISIL).
Retrieved from: Made by the Authors.





14 Mosul Municipality | Morphological map.
Retrieved from: Made by the Authors.



LIFE ON THE TIGRIS RIVER

The region of Mosul receives its water provision from the Tigris River. The 1750 kilometres long river is created by the melt of the snow in Eastern Turkey and flows from South to North at an average discharge of 1,014 m³/s and a maximum of 2,779 m³/s at the level of Mosul region. This importance of the discharge and the periodic floods make the borders humid and auspicious for agriculture. Moreover, numerous smaller canals irrigate the fields located further from the river bed.

In a mainly arid nation, the Tigris has long been a vital transportation route. Historically it was an important commercial connection between Turkey, Iraq and Syria. This waterway was very important for the exchanges between Mosul and Baghdad, while mutual exports and imports from the two cities contributed to their economical expansion. Shallow-draft vessels can navigate on the river till Baghdad, but for transport upstream to Mosul rafts are needed.

With a distinctive urban panorama and exceptional skyline, the riverfront is the most ancient part of Mosul city. The river Tigris represents the main natural feature of the city, in both recreational, social, economical and environmental aspects, besides the historical memories and extensive heritage of its districts. The uses of the river are multiples: it is a source of drinking water, transportation routes, used for irrigation, laundry, fishing activities and a place for swimming and recreation in the hot summer period. The Tigris plays an important social role, especially for women. It is easy to understand the establishment of the urban fabric considering the flooding area. Mosul is built at the proximity of very fertile lands, in the precise area that does not risk being submerged by the water. The river provides water for all the activities of the city but does not represent a direct threat to the buildings and the habitations. The river banks always had a very important role in the city (Fig. 15).

With the drying of the climate in Iraq, the management of this resource has become even more important.



15 Mosul Municipality | Land use along the Tigris River. Retrieved from: UnHabitat, 2019.



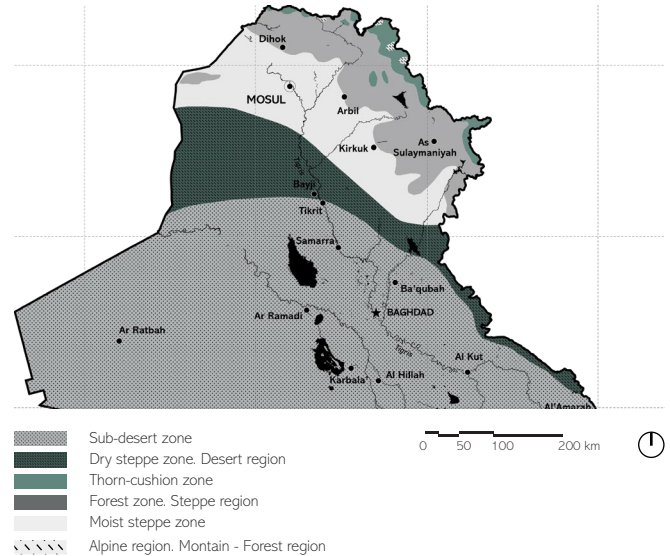
16 Mosul Municipality | Picture of a fisherman in the water of the Tigris River, Photographer Murad Al-Dagestani.
Retrieved from: Bayt al Mosul connector house, "Mosul's first photographer: Murad" (May 2013): baytalmosul.com.

VEGETATION

Vegetation in Iraq is characterized by drought. The arid climate and harsh terrain of Iraq are not satisfactory for wildlife. With the exception of minor Oak woods in the north and northeast of the country, there are few forests. Alpine plants grow in the cool, dry climate of the mountains. However, grasses and lush plants thrive along the Tigris and Euphrates rivers.

The Tigris is a powerful river that does not have a fixed contour. The banks are very fertile areas that also include temporary islands. The majority of this green lands is used for agriculture and the swamps are transformed into pools for aquaculture (Fig. 24). Mosul was recognized as «one of the most the most fertile cities in Iraq, and many scholars believe the legendary Hanging Gardens of Babylon were built near the city».⁵ Even if the war, and more specifically the use of chemical weapons, radically changed the situation, the agricultural production remains very diverse and important.

The five-stamen Tamarisk tree and Mesquite tree grow in thickets along with the lower and middle courses of the Tigris and beside irrigation ditches throughout the country. The Date Palm is native to the region. Two of the most prevalent lush plants are Licorice and the Date Palm. According to some estimates, Iraq has more than 22 million date trees, while Licorice is plentiful enough to allow exports. Poplar and some species of willow grow in small belts alongside the river and canals; the poplar supplies strong timber for construction and boat building, as well as handles for tools. Moreover, there are several reeds populating the water banks. Particularly the narrow-leaved Cattail is abundant, while the giant Mardi reed, which reaches a height of up to 25 feet (8 metres), has been widely used as a versatile construction material since ancient times.⁶ Furthermore, open grassland develops along the riverbed at the level of the Nineveh governorate, dominated by pistachio, almond, and other small species of trees.⁷

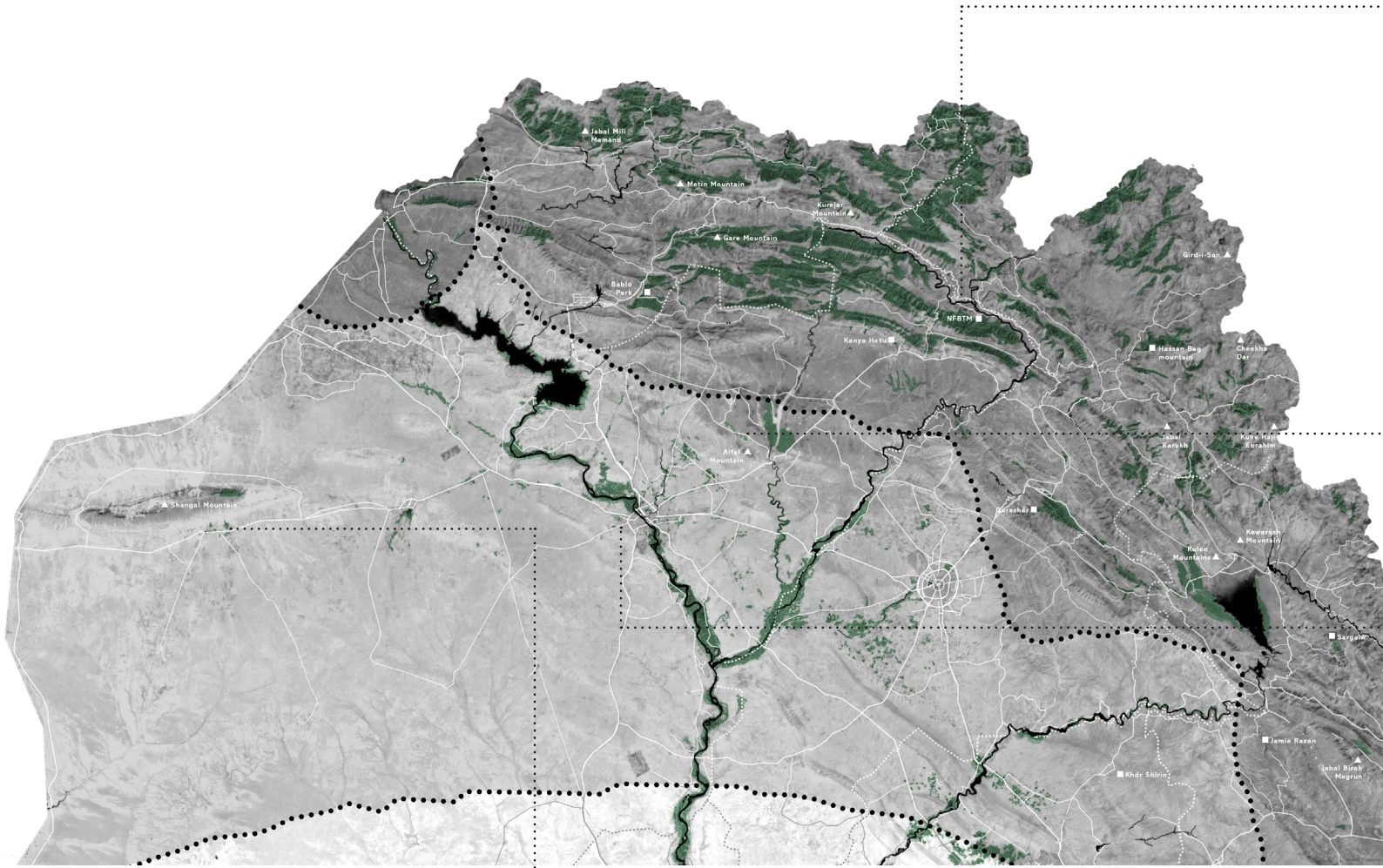


ZONE	ALTITUDE (m)	MAIN COMMUNITY	TYPICAL PLANTS
Dry steppe, Mesopotamian shrub desert	300–500 (200–350)	Sparse short grassland with scattered small shrubs	<i>Poa bulbosa</i> , <i>Carex stenophylla</i> , <i>Ranunculus asiaticus</i>
Moist steppe, Middle East steppe, all upper plain and foothills	500–700 (350–500)	Open grassland dominated by pistachio, almonds, and other small trees	Protected grassland: <i>Poa bulbosa</i> , <i>Hordeum bulbosum</i> , <i>Aegilops speltoides</i> , herbs <i>Anemone coronaria</i> , <i>Gundelia</i> , <i>Cousinia</i> , and <i>Hypericum</i>
Zargos forest steppes, all mountains of Zagros	700–1800 (700–1400)	Open to closed forest of oaks with hawthorn, pistachios, juniper, and others in the undergrowth	<i>Quercus</i> spp. <i>Quercus aegilops</i> , <i>Quercus brantii</i> , <i>Quercus infectoria</i> , <i>Quercus libani</i> with <i>Pistacia atlantica</i> and <i>Pistacia khinjuk</i> ; in the snow zone: oak-walnut forests with mulberry, sycamore, oriental, and maple as subdominants; forests of <i>Pinus brutia</i> var. <i>eldarica</i>

17 Iraq Country|The natural vegetation regions of Northern Iraq and table with typical species of plants. Retrieved from: A. S. Alhumaima, S. M. Abdullaev, 2020.



18 Tigris Banks|Women taking part in a race during the Green Festival, using traditional boats known as Mashoofs.
Retrieved from: Richard Porter, "Marsh flooding brings new life to Iraq's 'Garden of Eden'" (June, 2013): bbc.com/news/magazine-22706024



- Green areas
- Water
- Natural Park| Forest
- Mountain Peak
- Road Infrastructure
- Eastern Mediterranean conifer-sclerophy broadleaf forests
- Zagros Mountains forest steppe
- Middle East steppe
- Mesopotamian shrub desert
- Boundary line



19 Iraq Country| The vegetation of Northern Iraq and relative Eco-regions.
Retrieved from: Made by the Authors.

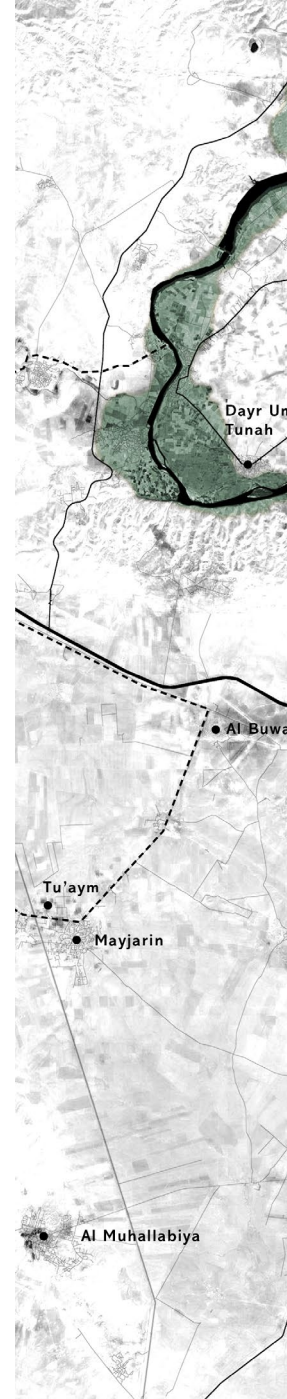


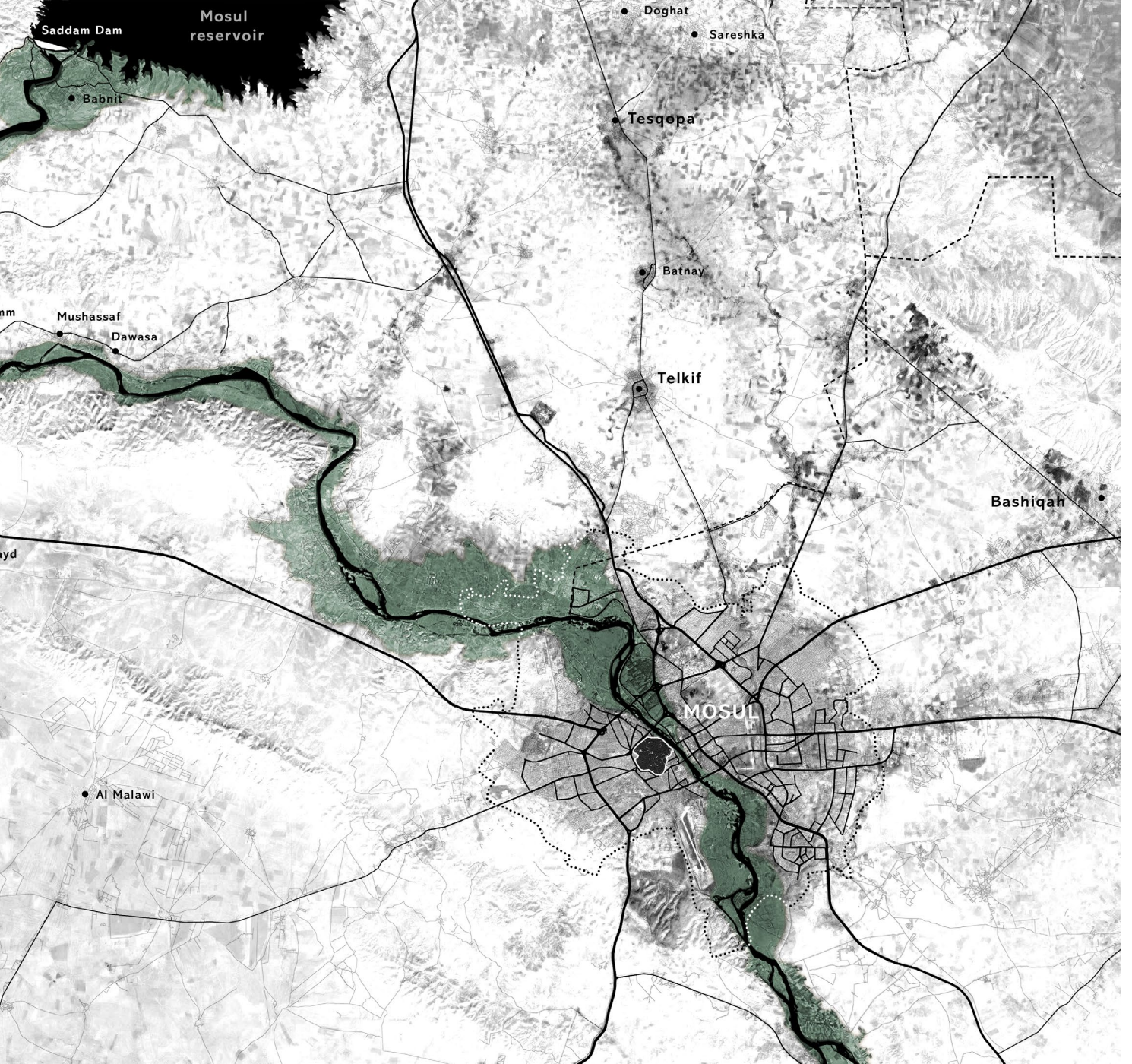
20 Nineveh Governorate| Panorama of the landscape in Nineveh region:
[a]The Great Zab river; [b]Mar Mattai Monastery; [c]Mosul city; [d]Sinjar town.
Retrieved from: Scratching the surface of Iraq: twitter.com/AlluviumIraq

- Flood green areas
- Water
- Main Roads
- Mosul municipality boundary
- Mosul old city



21 Mosul Province | Map of the green fertile areas created by the floods of the Tigris.
Retrieved from: Made by the Authors.





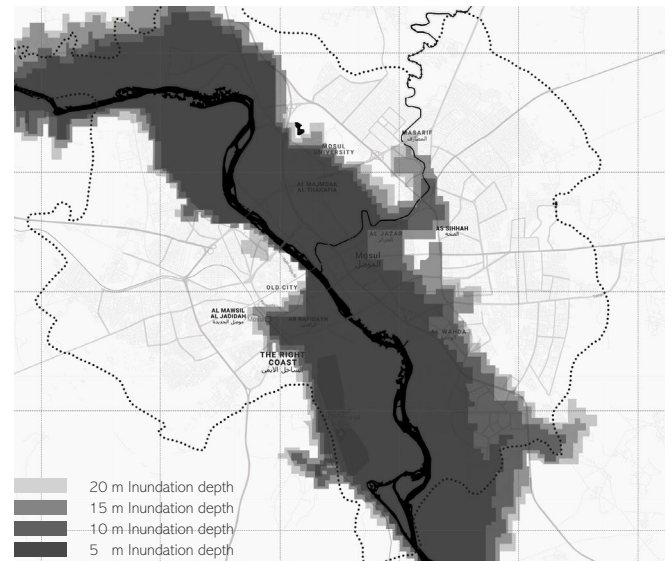
MOSUL DAM

Because of its uneven debit, the Tigris is dammed in multiples locations in Turkey and in Iraq. The largest reservoir in Iraq was established in Mosul, the Saddam dam (Fig 22). Built in 1981 and located upstream of the city of Mosul, the structure has a full capacity of 11.1 cubic kilometres and produces electricity for 1.7 million of inhabitants the region. For this reason, the infrastructure was a strategic element during the war with ISIL. In addition to the energetic problematics, the failure of the bam would represent a lethal danger for 1.5 million people. The wave would reach 54 m high and reach Bagdad within hours. Other two of the four dams located in Iraq are situated in the Mosul region. The dam is stabilizing the river and archives a more constant flood cycle, allowing a more permanent occupation of the land and a decreased risk of inundations (Fig 23). However, the Mosul dam gained the reputation of “the most dangerous dam in the world” and its potential collapse is considered as dangerous as “a nuclear bomb”⁸.

After a severe drought in 2018, Iraq experienced an unusually wet winter and spring during 2019 which has swollen the country’s rivers, lakes, and reservoirs. In many parts of the country, rainfall amounts were double or triple the norm. In northern Iraq, all that amount of water’s principal destination has been the lake behind Mosul Dam. According to data collected by the CNES/NASA Jason-2 and Jason-3 satellites, water levels in April 2019 at the reservoir reached the highest levels in at least a decade.⁹ The Operational Land Imager (OLI) published satellite images of the reservoir in April 2015 and April 2019 (Fig 24). In 2019, the land surface beyond the water levels had an exponential change, becoming noticeably much greener. Moreover, the amount of suspended sediment increased, flowing into the northern end of the reservoir through the Tigris River. Government officials and engineers are currently strengthening the dam injecting cement into the foundation to replace any gypsum and water-soluble rock sediments beneath that keep dissolving it.



22 Mosul Province | The Mosul dam.
Retrieved from: Alessandro Rota, Getty Images.



23 Mosul Municipality | Map of the flooding areas.
Retrieved from: A. Annunziato, 2017.



24 Mosul Province | Mosul Dam Lake: [a] April 25, 2015; [b] April 4, 2019. Images by Joshua Stevens.
Retrieved from: NASA Earth Observatory (May, 2019): earthobservatory.nasa.gov/images/145010/reservoir-swells-upstream-of-mosul

POLLUTION

Without any doubt, immediate life-saving measures take precedence under the circumstances of such a catastrophe, nonetheless, environmental concerns cannot and must not be overlooked. Neglecting the environment in rebuilding efforts will certainly produce long-term effects on people's well-being and result in future challenges that may demand costly remedial actions. That being said, environmental concerns represent a significant challenge within Iraq that are complicating the development of the country, such as: water resource management; decline in biodiversity; waste management; decades of war have wreaked havoc on the ecosystem through oil exploitation, industrial pollution, and environmental impacts.

A major challenge is represented by the contamination of the Tigris River, a serious concern for the city of Mosul that was already recognised by the government before the crisis. Every year, almost 100,000 tonnes of salt and chemicals were dumped into the river. With an estimated 1,250 tonnes of rubbish generated every day, solid waste management is another major difficulty the city has to confront. On the West Bank, the disposal site at Al Sahaji is inadequately managed, posing serious public health and environmental risks. Furthermore, the semi-engineered disposal site at Gogjali on the East Bank is nearly filled and has a limited operational life.

The waste in the water system is arguably the most significant pollution concern. According to the UNDP quarterly May 2018 report on stabilization, portions of the subterranean network and sewage infrastructure in West Mosul seen widespread. As stated in the National Development Plan 2013-2017, the absence of environmental concerns predates ISIL. Around 65 per cent of households use an unsafe sanitation method and 83 per cent of wastewater does not receive adequate treatment, resulting in serious environmental issues.¹⁰ These considerations are a threat to the health of the citizens and an obstacle towards achieving sustainable development. The data demonstrates the



25 Iraq Country | Large oil spills near the town of Qayyarah. In the background, oil wells burn. January 31, 2017.
Retrieved from: W. Zwijnenburg, F. Postma, 2017.

need to protect the river ecosystem and better integrate the city with its environment. The water of the Tigris River was once considered to be safe for residential and drinking purposes in Mosul, but recent hydrographic investigations have revealed that the conflict has had a significant influence on its quality,

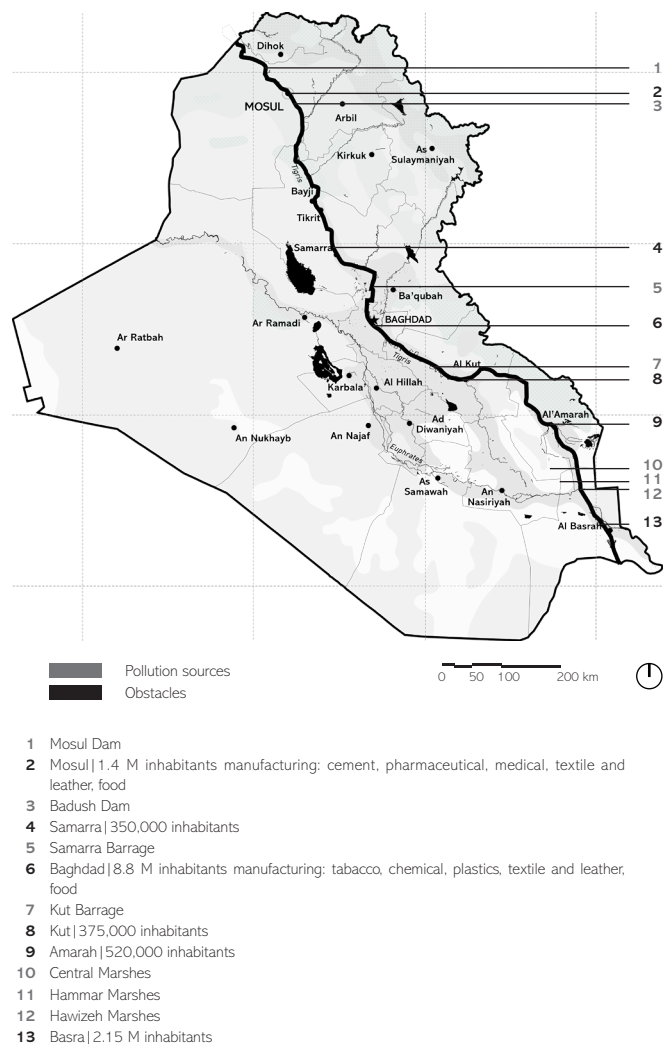
“This deterioration of the river water quality in the city of Mosul is due [...] to discharge of sewage and to hospitals effluents”.¹¹

The availability of water on a consistent basis is critical for the future of Mosul and for the rest of Iraq. Turkey, Syria, Iran, and Iraq are all connected via the watersheds and basins that make up the Tigris-Euphrates basins, thus any changes in these basins can have far-reaching, regional consequences. Many of these pressing water challenges are a legacy of economic

and political nature. Negotiations on transboundary natural resources, water quotas, and water rights between Iraq, Turkey, Iran, and Syria are a prerequisite for future water security. Within Mosul, the Khawsr River on the East Bank, which has nearly dried up and is being used virtually as an open sewer, could serve as a pilot river for a rehabilitation project that would considerably improve the city's natural capital.¹² Mosul's reconstruction has led and will continue to lead to an enormous demand for raw materials and aggregates, particularly sand, gravel and crushed stone. A considerable proportion of the required materials are extracted from the bottom of the Tigris River and cause changes in the turbidity levels in the water.¹³ Focusing on the pollution legacy the war leaves for the local population, it will hinder reconstruction efforts and have long-term health and economic consequences for communities. There were reports of suffocations, respiratory problems, rashes and an increase in allergy cases, due to oil wells set on fire in the summer of 2016 by the ISIS militants. The river has been contaminated with oil products, affecting the quality of the water for drinking and agricultural use. Contamination has also spread to cultivated and grazing lands, posing major threats to agriculture and livelihoods. (Fig 26)

"Although the journalists have moved on, the people living in areas where these toxic remnants of war are present will have to face the aftermath of the conflict's environmental legacy: air pollution from the burning wells; oil soot that spread over a vast area, covering soil and affecting livestock; groundwater pollution; and crude oil and wastewater spills".¹⁴

Many problems arise which demand intelligent planning solutions and represent a huge management challenge. Making the river a national planning project could become an important tool in streamlining interventions across ministries and administrative boundaries. Additionally, an integrated water management strategy for Iraq should be prioritized, addressing the demands for drinking water, agriculture, industry, tourism, and environmental preservation in an equitable manner.



26 Iraq Country|The trajectory of the Tigris River with the main sources of pollution and obstacles. Retrieved from: UnHabitat, 2019.

NOTES

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3. Inter-Agency Information and Analysis Unit, *Ninewa Governorate Profile* (Baghdad: IAU, November 2010), 1.
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5. Hassan Ali Ahmed, "Mosul sowing seeds post-Islamic State", *Al Monitor* (July 20, 2020), <https://www.al-monitor.com/originals/2020/07/iraq-mosul-agriculture-trees.html>.
6. The 4th National Report of Iraq, *Convention on Biological Diversity* (Ministry of Environment: Republic of Iraq, July 2010), 16-25.
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HISTORICAL EVOLUTION



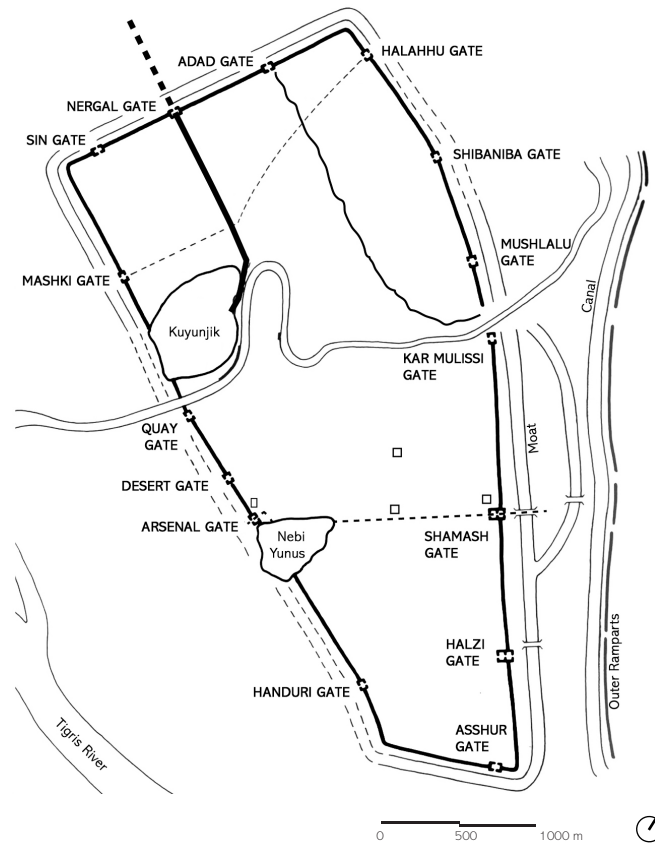
THE RISE

The land between the two rivers Tigris and Euphrates was called Mesopotamia in its upper part and Chaldea in its southern part. Human settlement in the region dates back to the pre-Stone Age (6,000 B.C.). People settled in the plains east of modern Mosul, especially the junction of the Al-Khosar and Dajla rivers, for the fertility of the area and the passage of commercial convoys. Many historians have mentioned that Mesopotamia, or today's Iraq, is the first home of urbanization. The land of Mesopotamia was the origin of the world's most ancient civilizations starting from the Sumerian, Akkadian, Babylonian, and till the Assyrian. Evolution in Mesopotamia has taken place many years before the birth of Christianity, becoming probably the first developed city in the history of civilizations. ¹

NINAVEH AND THE ASSIRIAN PERIOD

The exact date of the city's construction is not known; the first mention of Nineveh came around 1800 B.C., where the worship of the goddess Ishtar was known in that area, and the city became famous at the time due to news of Ishtar's miracles spreading in many parts of the ancient world. The Greek historian Qatisias, who was a doctor to The Achaemenid King Ahshiroush II, attributes the construction of the city to the legendary Assyrian leader Ninus, based on information he drew from his study of Assyrian royal documents. King Ninus established the city of Nineveh taking care of its architecture and decorations, and after he settled there, he began to launch raids on the neighbouring tribes. However, despite the expansions of the modern Assyrian Empire, the city remained virtually neglected because its kings preferred to reside in Assyria and then Bekal. ²

The situation changed with the arrival of Ashur Panibal II (ruled between 883 and 859 B.C.), the latter expanding the city urban structure, while his successor built many palaces and



01 Ancient Nineveh | Plan of the old city and its gates.
Retrieved from: N. Yoffee, 2017, p. 469.



02 Ancient Nineveh | Pictures of three standing gates: [a] Mashki Gate; [b] Nergal Gate; [c] Adad Gate.
Retrieved from: Madain Project; madainproject.com/gates_of_nineveh.

temples. Sanharib is the king who brought the city to its peak of glory around 700 B.C., building a huge 80-room marble and brick mansion in which more than 160 million pieces of bricks were used, decorated with statues of winged bulls weighing between 9 and 27 tons. Sanharib also designed canals to bring water to the city and tiled the streets with marble. Nineveh was about 7 square kilometres in size, with more than 100,000 inhabitants, making it the largest city in the world at the time.

During the reign of Sennacherib in 704 BC, Nineveh becomes the new capital of Assyria in the northern part of Mesopotamia. The city was enclosed within a great wall, along which were located 18 entering gates flanked with colossal human-headed bulls carved from blocks of gypsum alabaster (Fig. 01). The most important gates were Mashki Gate, Nergal Gate, Adad Gate, Shamash Gate and Halzi Gate (Fig. 02). The outer perimeter of the city was covering nearly eight miles and consists of the two great mounds, Kouyunjik (more than half a mile long by a quarter broad) and Nebi Yunus, the mound of the Prophet Jonah, considerably smaller in size. Toward east, along the Tigris river there was another large rampart outside the city walls, but seems it has never been completed.³

The Quynjiq mound in between the walls of Nineveh consists of several monuments that have been discovered during the excavations done by the British Museum. In the middle of the mound were five buildings, the temple of Nabu, the temple of Ishtar, probably Bit-nathi for Ashur-rabi II, the site of the palace of Ashurnairpal, and the vaulted tombs (Fig. 03). Apart from this group was the temple of Nabu, away to the southeast. Of this, across a little valley, lay the foundation of the temple of Ishtar, while in the valley itself from North to South lay the site of the Ashurnasirpal palace, the Bit-nathi, and the early vaulted tombs. In the southwest of the mound are located the great palaces of Kouyunjik which belonged to the great king Sennacherib. It has a dimension of approximately 200x190 m and it's decorated with many sculptures.⁴

The origins of the city of Mosul belongs to the Assyrian Empire. The Arameans called the city of Mosul by Al-Oboury Fort, meaning the castle on the other side of the Tigris River, as the current site of Mosul during the Assyrian Empire was an Assyrian fortress, in addition to a group of forts built by the Assyrians to block the attacks of the enemies from the western side.

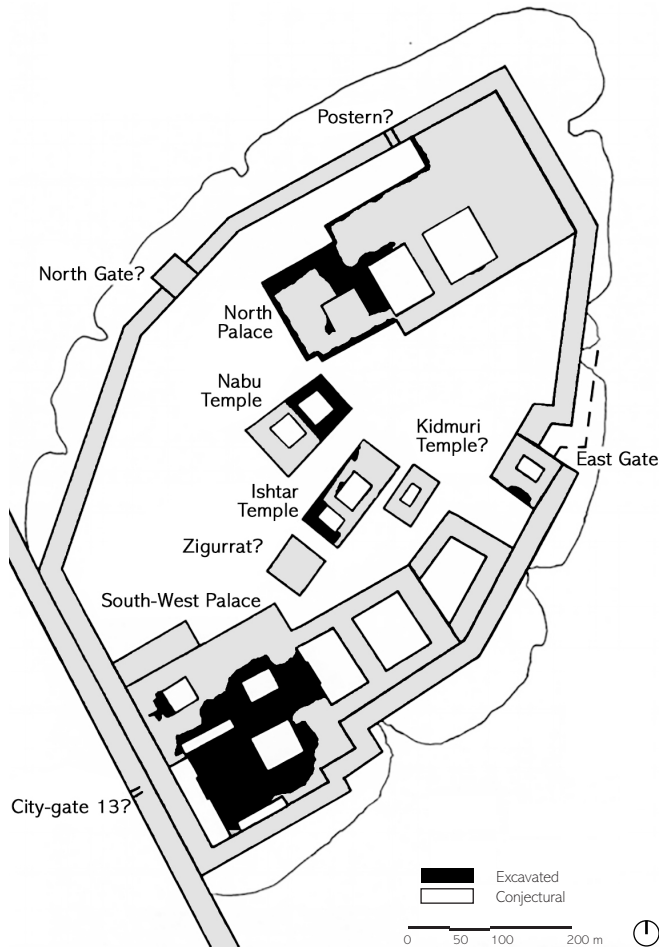
During that period, Jews and Babylonians were exiled and settled in the city, but the largest ethnic group that was deported was the Aramaic, with Assyrians settling more than 4.5 of them throughout the empire, especially in the plain areas around Nineveh, leading to Assyrians using Aramaic rather than Acadians in their native language. The Assyrian Empire began to weaken after the death of Ashur Panibal around 627 B.C., so civil wars broke out between his successors to take control of its reign, and the Babylonians and The Medi people took advantage of this weakness, forming an alliance, attacking Nineveh and dropping it in 612 B.C. after a two-year siege, killing most of its inhabitants and burning the entire city, leaving only some of its walls.⁵

PERSIAN AND HELLENIC PERIOD

With the fall and destruction of Nineveh, the city became ruined after its people abandoned it. However, the Assyrians continued to cultivate land east of the city. However, the city of Nineveh has not been abandoned for long; when he visited the region in 401 B.C., Xenophon recounts the existence of a town under the name 'Mebsele' at the site of present-day Mosul.

Alexander of Macedon gained control of the region after the defeat of the Achaemenids at the Battle of Gogmela in 331 B.C., succeeded by the Seleucids after his death. The Hellenic period was characterized by a great cultural exchange between its ethnic groups. Throughout this period, there was

no exponential change in the structure of the city of Mosul, as it was an empty land since the Assyrian era. During the Greek empire period, the ancient Citadel of Mosul was discovered by greek armies sifting along the Tigris River, finding the demolished castle and fortress.⁶



03 Ancient Nineveh | Plan of the excavations on Quynjiq. Retrieved from: J. Reade, 2005, p. 348.

The rule of the Seleucids ended at the hands of the Archaic (also called Parthians) in 250 B.C. which were tribes of Persian origin. During the rule of the Archaic, there were great wars and conflicts between them and the Romans who controlled part of Mesopotamia. With regard to Mosul, it has been mentioned that the Archaic were the first to build the city of Mosul, as it was part of the Adiabene district. The Parthian kingdom was divided into provinces or small kingdoms, and each of whom had a king to rule it. In the year 208 AD, a dispute occurred between the king of the Archaic empire, Olghash IV, and the king of the kingdom of Adiabene, which led to the destruction of Mosul, which at this time was called Nawardshire, and remained in ruins until the Sassanid Persians seized power. However, the nature of the planning and structure of the destroyed city has not been recognized.

With the Sasanian Persians, there were still many conflicts with the Roman Empire. During the rule of the Sassanid Persian Empire, the Christians took the city of Nineveh as their home, because of its agricultural location and the desire to be adjacent to the Monastery of Yunnan, which has existed since the fourth century AD. Historians also reported that most of the inhabitants of the city of Nineveh at this time were Christians, Nineveh being part of the Adiabene cities at this time, and it was very well built. However the Sasanian rule was full of persecution, often resorted to massacres to punish the city's Christian population. With the displacement of monks in Jabal al-Alfaf, about 25 kilometres east of Mosul, the area became famous for its many monasteries built since the fifth century.⁷

According to a novel in the 10th-century Sert manuscript, the first to settle west of the Tigris was a Nestorian monk named Rabban Isho'-yahbh. According to the novel, Ishoyab vowed not to eat meat, but he reneged on his vow when he was invited to eat meat by shepherds while travelling, so he be small in the eye of his fellow monks and crossed the Tigris by throwing his coat on the river and walking on it with other monks and building a monastery for him on the West Bank next



04 Imaginary view for Nineveh by Austen Henry Layard.
Retrieved from: A Second Series of the Monuments of Nineveh Collection, 1853

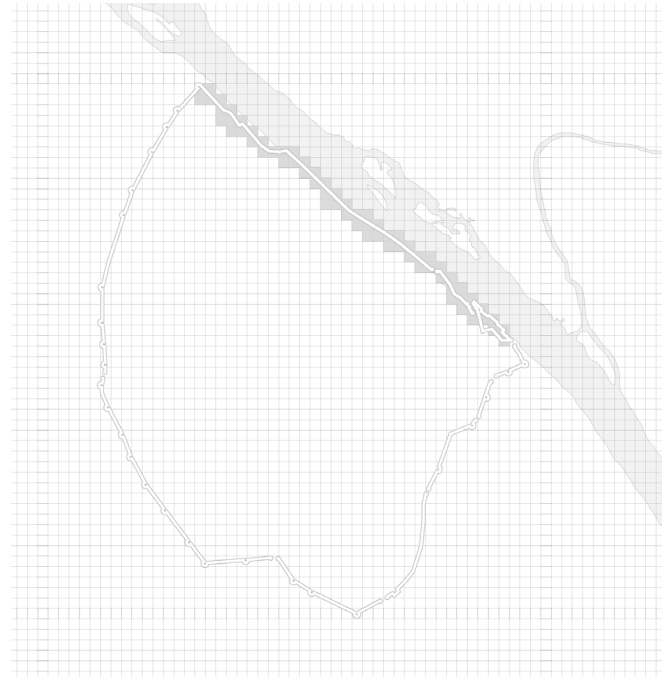
to one of the couriers. The monastery grew up and flourished after several families took refuge there to escape bedouin raids. Khusraw II also built buildings around Geneina. ⁸

The origins of Mosul appeared through the Christian settlements in which they grew up, as Rabban Isho'-yahbh establishes his monastery in the year 570 AD on the site of the nowadays Mar Isaiah Church. When Kasri the Second took over the Persian Empire, he built other houses besides the monastery area. The population increased and the city structure at this time was extending on the Tigris River's bank, with the main axis of the city running parallel to the river. (Fig 06) ⁹

MOSUL ISLAMIC CITY

The Arab tribes appeared in Mesopotamia since ancient times during the rule of the Assyrians and what followed, but their numbers increased significantly during the reign of King Nebuchadnezzar, as he relied on them to build palaces. Babylon was probably one of the greatest countries in the world during the reign of the king. The Arabs used to live in the city of Al-Hirah, which was located near Baghdad, but the conditions of the Arabs were not stable, as they were frequently invaded and displaced even after their numbers increased. The Kingdom of Al-Hirah lasted until the Islamic conquest, when it was destroyed by Khalid bin Al-Walid. ¹⁰

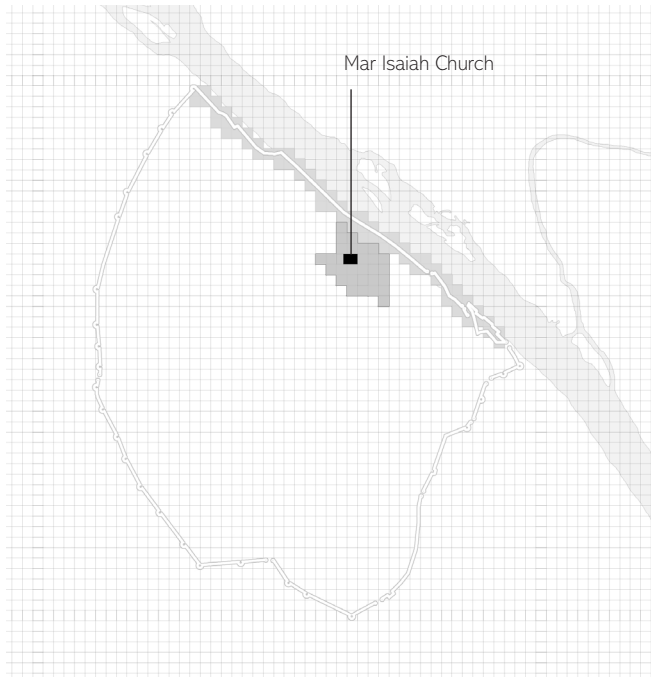
After the victory of the Muslims in the Battle of Qadisiyah, some of them launched a siege on Tikrit, which was controlled by the Byzantines and managed to enter it, and the quarters of ibn Al-Afkel went to Mosul (known in Islamic sources at the time). Historical sources mention the year 641 when Mosul was conquered, but there is a difference in dates between sources, as well as about the name of its first ruler. Regardless of the identity of its conqueror the year, it is recognized that



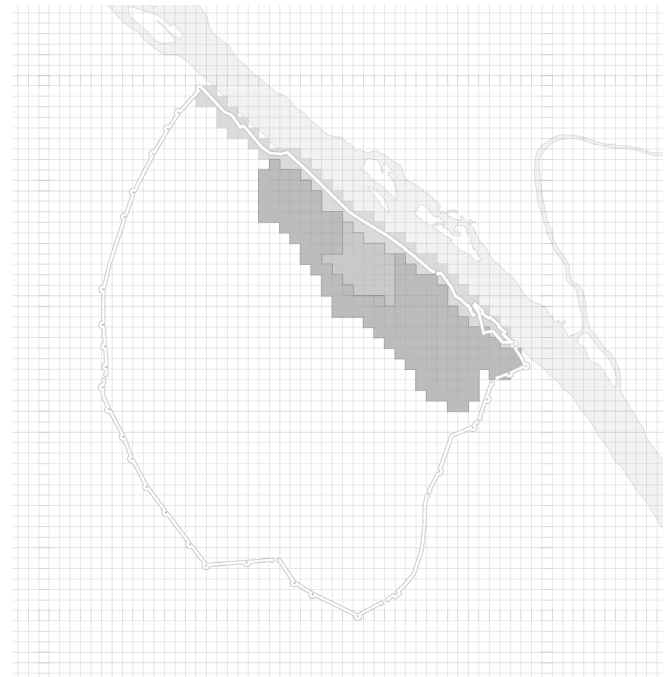
05 Ancient Mosul | The Assyrian fortress for defending Nineveh.
Retrieved from: Made by the Authors.

Mosul was only one of the outposts of Kufa city and remained subordinate to it throughout the period of the caliphs, with no important settlement on the western side of the Tigris. ¹¹

Therefore, the city of Mosul is considered an Arab city of foundation. The Arabs were the ones who launched the name Mosul, which in Arabic means “the site that connects one place to another”. The Arab settlements began in Mosul after the tribes that inhabited the city of Hatra relocated there, complementing the already established Christian settlements. The structure of Mosul City was subsequently affected by the types of urban settlements that were inhabited by the Arabs before the founding of Mosul. A sort of convergence between the city of Mosul and the city of Hatra can be noticed, and this confirms its Arabic origins. (Fig. 07)



06 Ancient Mosul | The position of first Christian settlements.
Retrieved from: Made by the Authors.



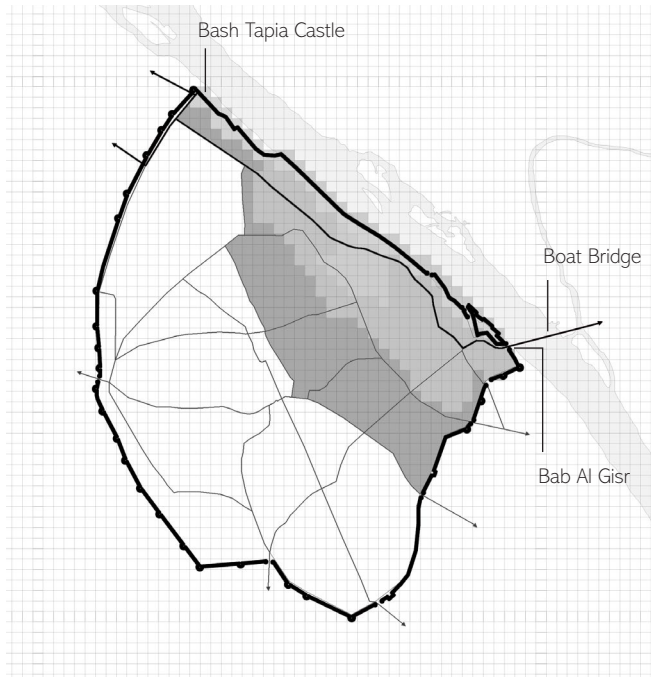
07 Ancient Mosul | First Arab settlements at Mosul alongside the Tigris river.
Retrieved from: Made by the Authors.

OMMAYYAD CALIPHATE

After the Muslim conquest, the settlement became a garrison town (Misr) under the caliphate of Omar ibn Khattab's caliphate and was given a Friday mosque. The term "garrison town" was formulated because it served as a settlement focal point for the Arabs/Muslims, separating them from the indigenous population. The historic Islamic city is traditionally a walled city with a citadel (Qal'at) located outside the city centre, usually on a hill or near water. The main Friday mosque (Jami) is located in the heart of the city, and the bazaar (souq or qaysaria) surrounds the mosque and extends along the main streets leading to the city gates. It almost corresponds to the structure of Mosul at the time of the Umayyads. The streets of the city were paved, and fortified walls were built

around them "surrounded an approximately 300 ha town in an irregular semi-circular shape, attached to the elevated bank of the Tigris" during the brief rule of Marwan II (744-750 AD). Mosul in this period was less than half the size of its east bank neighbour in ruins, ancient Nineveh, when Carsten Niebuhr visited it at the end of the 18th century AD. "¹²

Moreover, during the reign of Marwan II, known as the Master "Builder" of Mosul, the city had "around 50,000 inhabitants, twice as populous as modern Rome but ten times less populous than Baghdad".¹³ The Ship Bridge, which was the only bridge over the Tigris until the 20th century AD, the Qaysaria (covered market), and the Umayyad Mosque, from which the Al-Nouri Mosque inherited, are all attributed to this era. At this time, towns like Mosul typically had only one congregational mosque,



08 Ancient Mosul | The city's structure in the Omayyeh period.
Retrieved from: Made by the Authors.

the Friday Mosque, which could have housed the entire male population of the city. The main entrance was from the northern Bash Talbiyah. Main streets ran parallel to the river. (Fig. 08)

ABBASID CALIPHATE

Due to the growth of the city as one of the most important trading hubs in Asia and the immigration of more Arabs, the structure of the city began to expand from east to west during this period, with the main road extending from Bab Al Girs to Bab Al Bayd (Fig 09). Mosul "is the metropolis of this region," according to al-Muqaddasi, a tenth-century geographer. "It is a splendid city, beautifully built, highly renowned, and of great antiquity, it is possessed of excellent markets and inns, and is

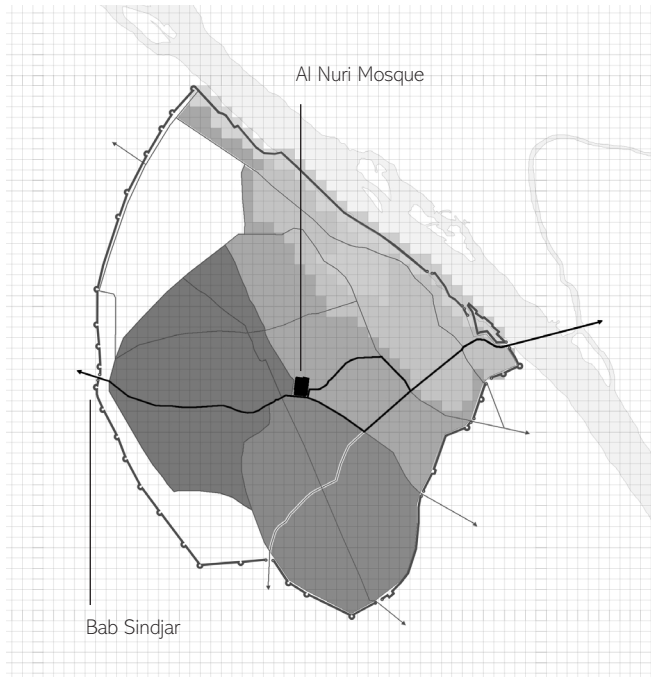


09 Ancient Mosul | The city's structure in the Abbasid period.
Retrieved from: Made by the Authors.

inhabited by many personages of account, and learned men; nor does it lack a high authority in the traditions, or a celebrated doctor of the law. From here come provisions for Baghdad, and thither go the caravans of al-Rihab. It has, besides, parks, fruits, very fine baths, magnificent houses, and good meats: all in the entire town is thriving." ¹⁴

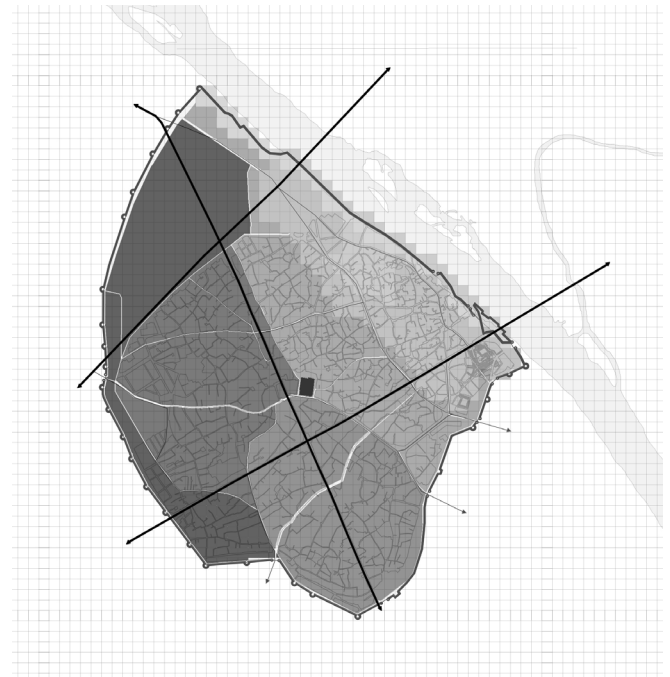
ZENGID DYNASTY

Mosul reached the height of its power during the rule of the Zangid Dynasty in the 12th century AD. During this period Bab Sindjair became increasingly influential as the city's main gateway, shifting the city's main axes. Imad al-Din Zengi rose to power and established himself as the Atabeg of Mosul and



10 Ancient Mosul | The city's structure in the Zengid period.
Retrieved from: Made by the Authors.

Aleppo. His reign is considered the golden age of Mosul. During this period, numerous mosques, shrines, schools, ribats - Sufi huts - and hospitals were built in Mosul. He also strengthened the city walls by doubling them, adding large reinforcing towers, building the citadel Bash Tabyia (the northernmost point of the city), and deepening the trenches. (Fig. 10) According to Ernst Herzfeld and Nikita Elisseeff, Nur al -Din's son continued his father's work and had the new Grand Mosque of Mosul, the Al-Nouri Mosque, as well as a madrassa and the Al-Hadba minaret built in 1170 AD. The oldest and most visible layer of architecture in the old city of Mosul probably dates from the 12th to 13th centuries AD. In the 13th century, Mosul had 3 congregational mosques, 36 souqs, 28 schools, and 18 dar-hadiths - madrasas, 8 churches, and an astonishing number of 210 hammams.¹⁵ During this time got more importance Bab



11 Mosul City | Contemporary city structure.
Retrieved from: Made by the Authors.

Sindjair as the main gate of the city, so changing the main axes of the city.

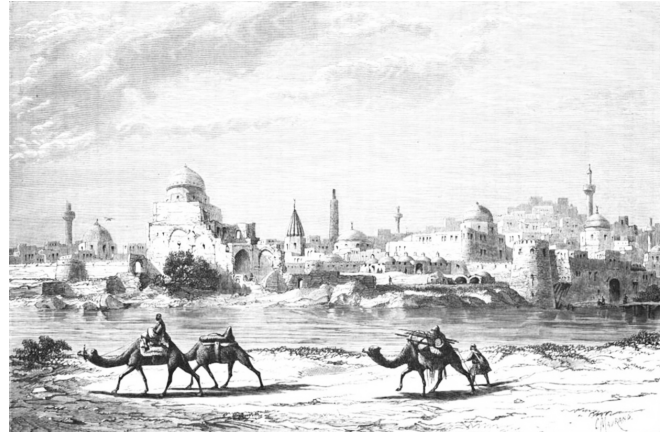
Mosul was conquered and sacked by the Mongols in the second half of the 13th century and was later ruled by the Ilkhanate and Jalairid Sultanates. The Mongol invasion of the region decimated Mosul's population, and the city's urban expansion was stifled. Mosul was plagued by political insecurity for centuries, and its once-thriving trade markets and rich hinterland were destroyed. During the Atabeg period, the population that lived outside the southern city walls retreated inside them. The north of the city was deserted, the only inhabited neighbourhoods being those around Al Nouri and east of the river.

OTTOMAN EMPIRE

Despite being conquered by the Ottomans in 1517, Mosul was considered mostly a garrison city therefore no investment was made, until another hundred years later when the city saw a period of growth and revival. The Ottoman Mosul, which had shrunk significantly during the Mongol invasions, expanded once more outside the city walls, this time to the southwest and southeast. As a result, Mosul was rebuilt and refurbished as the region's commercial and administrative centre. Furthermore, the old city, surrounded by a wall until the nineteenth century, retained its medieval architecture and layout, to which Ottoman buildings were added. Nonetheless, all the improvements and structures constructed during this period were merely political acts undertaken to gain prestige and influence.

"By 1820, Mosul had about 25 Friday mosques, the most of those had been established under the Jalilis, either from scratch or on the site of an old masjid – smaller mosque".¹⁶

It was most likely during the Ottoman period that the Bazar around Al Nouri mosque lost its importance and gradually subsided to the streets in the vicinity of the new Sarai neighbourhood, which became the main qaysaria of Mosul. The Sarai appears to have moved within the Islamic city over the centuries. During Ottoman rule, the Islamic city's urban spatial organization required the Sarai to be located on the defensive wall's border, either inside the city's precinct, as in Antalya, or outside, as in cities throughout the Middle East and North Africa. Mosul's Sarai was located within the city walls until the late 1800s, when it was relocated to the far south, outside the city. The first Ottoman Sarai, as seen for a brief period, was located on Citadel (Qal'at) Island, with its maiden facing the island. The Sarai was relocated to the city's south during Jalili's rule. This is when Suq al Sarai – the qaysaria next to the Sarai – became the city's main qaysaria, where one could find the most important inns with construction dating back more than 900 years.



12 Ancient Mosul | General view of Mosul, on the bank of the Tigris. Retrieved from: E. Flandin, 1861.



13 Mosul Old City | View of the city with the pontoon bridge across the Tigris River. Retrieved from: De Agostini, Biblioteca Ambrosiana, Age Fotostock.

CONTEMPORARY MOSUL

After World War I and the defeat of the Ottoman Empire, Mosul became part of British rule from 1918 to 1926, including Baghdad and Basra. The British carried out major infrastructure projects throughout Iraq, such as building roads, bridges, and railways. but eventually halted developments for lack of sufficient revenue. During this time, Mosul received a water supply and electricity system, the railroad and railway station were completed, and the main street of Mosul's Old City, Nineveh Street (a commercial street with many shops and multi-story buildings) was cut through the historic bazaars. A new bridge was built over the island of Qal'at, which was completely levelled and connected with the city. (Fig. 11)

Mosul became the capital of the province of Nineveh after it joined the newly formed country of Iraq in 1926. The city expanded during the royal rule, which lasted until 1958, and the defensive wall was demolished around 1933. New districts were built within the old city, in the abandoned northern section, and outside in the southwestern and southeastern sections. Al Shaziani and Al Farooq Streets, which were created by structuring and enlarging existing roads between the 1930s and 1950s, became the Old City's north-south artery.

"The opening (or the widening) of these roads didn't affect the morphology of the urban fabric, but certainly created a new system of relation with the Old City, its hinterland, and the wider urban area that expanded outside the wall and beyond the river." ¹⁷

With the establishment of the Republic of Iraq and the regime of Saddam Hussain Mosul grew and modernized, expanding along the eastern bank of the Tigris. The most significant period of Mosul's expansion was after the 1970s, when many works were conducted under the French Master Plan of 1975. The 5th Bridge, connecting the East Bank to new trends west of the Old City, was considered the only major change the Old

City experienced before the recent conflict. This highway cuts through the northern part of the Old City, separating it from its citadel Bash Tabyia and other important iceberg structures from the 12th and 13th centuries, such as Shaykh Fathi mosque, madrassa Al-Nuriyya, and Mashhad (shrine) al-Imam Yahya ibn al-Qasim.

In recent decades, many modern buildings in concrete and other modern materials are built within the Old City, whereas many historical houses have been decayed or destroyed mainly because of the inability of the owners to restore them or because of a desire for modernity.



14 Mosul City | The National Insurance Company building, 1966-69.
Retrieved from: Architecture of Doom; architectureofdoom.wordpress.com.

THE FALL

In July 2014, Abu Bakr al-Baghdadi, leader of the so-called Islamic State in Iraq and the Levant (alias Daesh), made a public appearance in Mosul, inside the Al-Nuri mosque, to pronounce “caliphate” in Iraq and Syria. Mosul was taken by ISIL, and for two years they ruled the city.

During the occupation of the city, the population decreased from 2.5 million inhabitants to 1.5 million. Most of the refugees that escaped the city fearing the upcoming siege of Mosul stayed in camps or were trapped in fighting lines between the Iraqi army and the ISIL combatants. The ones who stayed «lived through hell on earth, enduring a level of depravity and cruelty that is almost beyond words»¹⁸ declared the United Nations high commissioner. A massive destruction of the building heritage has been caused by the battle for the liberation and the bombing, but the occupation of the city had also a great contribution. ISIL began, almost immediately after they took control of Mosul, to destroy hundreds of historical monuments such as mosques, tombs, churches, and even non-religious ancient sites. Besides the ideological reasons behind these destructions, those actions were an easy way to capture the world’s attention.

The Al-Mufti mosque, the Nabi Yunis Tomb-Mosque, or the Al-Nuri Minaret and great mosque have all been parts of this deliberate destruction and theft of the cultural heritage. However, the monuments were not their only targets, some of the most important artefacts of the museum of Mosul have been destroyed or stolen to be sold in order to finance the war. In the library of the University of Mosul, 3 million of books have been burnt. This loss of knowledge, artefacts, and artworks is immeasurable. (Fig. 15)

“The first step in liquidating a people is to erase its memory. Destroy its books, its culture, its history”¹⁹

In October 2016, almost two years after the capture of the city, the movements to liberate Mosul began to emerge. Different Iraqi forces participated in the liberation of Mosul, (Iraqi Security Forces, Peshmerga fighters, Popular Mobilization Forces), helped by the U.S. and its allies, providing soldiers and airstrikes support. After five months of war, the eastern side of the river was liberated. After April 2017 the area controlled by ISIL decreased exponentially as they were surrounded in the historical city. Because of the maze shape of the historical centre, the liberation had to be made house by house, street by street. On the 22 June 2017 in a last provocation, ISIL organised the explosion of the Al-Nuri mosque. One month later, the Iraqi prime minister declared the liberation of Mosul.

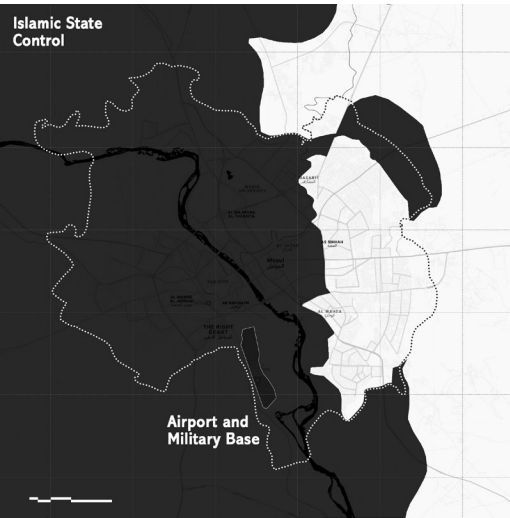
In July 2017, after 8 months of warfare between ISIL and the Iraqi forces, Mosul was liberated. The conflict left the city with very severe damages, mostly in the historical centre and on the side of the Tigris River. IS forces were pushed back into the dense area of the Old City after being encircled by pro-Iraqi government forces. As the battle raged, many of the area’s residents became trapped inside their own homes. When they were finally able to emerge, most of them were malnourished, injured and traumatised. It was stated that almost half of all the casualties in Mosul were civilians. Since October, at least 2,463 people have been killed and 1,661 injured in Nineveh province. UN human rights officials said in June that they had received credible reports of hundreds of civilians being shot dead by IS militants as they attempted to flee the fighting in western Mosul, with reports of others being used as “human shields”.²⁰

The urban identity and the history of Mosul have been irremediably endangered by the war.



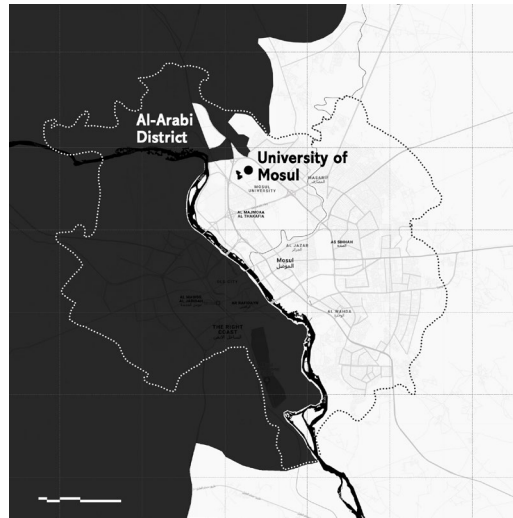
15 Mosul City|Inscription of the ancient city of Nineveh that survived after the ISIL destruction. Photographer John Beck.
Retrieved from: O. Jarus, "Historic Iraq Sites Reclaimed in Mosul Offensive", Life Science (December 08, 2016): livescience.com.

■ Zones controlled by ISIL
..... Mosul City boundary



As of January 3, 2017

After a pause to regroup, the Iraqi security forces (ISF) announced the “second phase” of operations in Mosul’s city limits on Dec. 29, recapturing five major neighbourhoods and pushing further towards the eastern bank of the Tigris River, putting Mosul Airport and adjacent military base in range of ISF artillery.



As of January 18, 2017

The ISF rapidly consolidated control over eastern Mosul following a major push. They extended control along the Tigris and recaptured the University of Mosul, once Islamic State’s major logistical hub in the city.



As of January 23, 2017

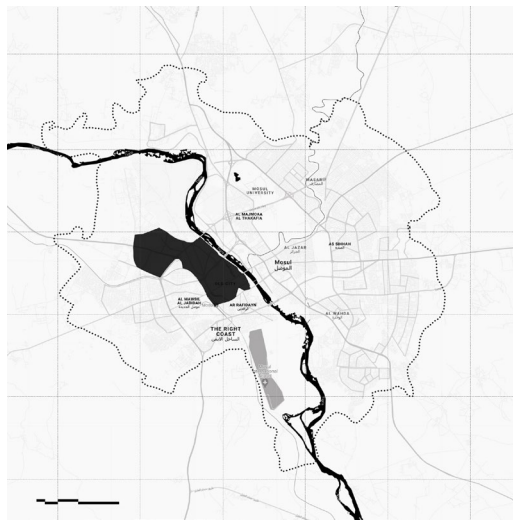
The last neighbourhood in eastern Mosul is was retaken on Jan. 23, nearing the end of a nearly three-month-long battle to clear that side of the city. The Counter Terrorism Service (CTS) expanded control along the Tigris.

16 Mosul Province | Maps showing the spatial progress of the campaign to retake Eastern Mosul: Iraqi government forces retook the eastern side of the city in January after 100 days of fighting and two and a half years of Islamic State occupation. Retrieved from: D. Lamothe, “Battle of Mosul: How Iraqi forces defeated the Islamic State”, The Washington Post (July 10, 2017): washingtonpost.com/graphics/2017/world/battle-for-mosul/.



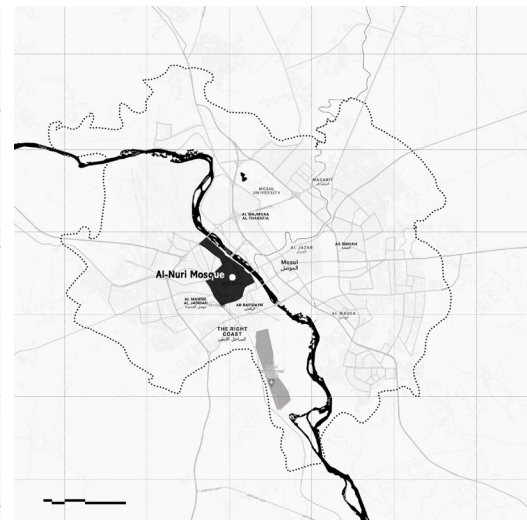
March 1, 2017

The increased involvement of US advisers, with the ability to call in air strikes without going through a joint operations cell in Baghdad, saw the ISF isolate Mosul completely as units advanced within the city boundary towards the government centre.



May 11, 2017

In a bid to clear the city prior to Ramadan, the ISF and combined forces recaptured districts in northwest Mosul. Islamic State promised to continue to defend the Old City, concentrating its defences around the Grand al-Nuri Mosque.



June 21, 2017

Islamic State militants blew up the Grand al-Nuri Mosque of Mosul and its famous leaning minaret, as Iraq's elite Counter Terrorism Service units reached within 50 metres of it, according to an Iraqi military statement.

17 Mosul Province|Maps showing the spatial progress of the campaign to retake Western Mosul started on Feb. 19. On May 27 Iraqi forces announced the start of operations to capture the remaining enclave under Islamic State control, covering the Old City and three adjacent districts along the western bank of the Tigris.

Retrieved from: D. Lamothe, "Battle of Mosul: How Iraqi forces defeated the Islamic State", The Washington Post (July 10, 2017): [washingtonpost.com/graphics/2017/world/battle-for-mosul/](http://www.washingtonpost.com/graphics/2017/world/battle-for-mosul/).

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URBAN ANALYSIS



A TYPICAL ISLAMIC CITY

Mosul is fairly representative of medium-sized cities in the Middle East with a long urban tradition playing a considerable role in the region. Mosul has an architectural and urban identity that distinguishes it from other urban environments, characterized by a compact urban fabric with narrow and tortuous alleys and the prevalence of the inner courts as a response to climatic, social, and cultural circumstances. This is also because it followed the Islamic ideology, being a city of Islamic foundation, and therefore displays typical characteristics of this kind of settlement.

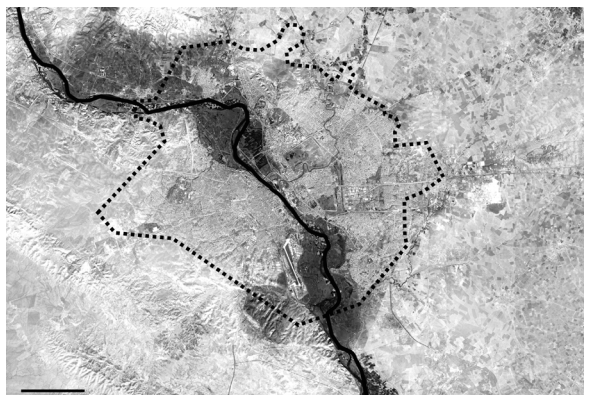
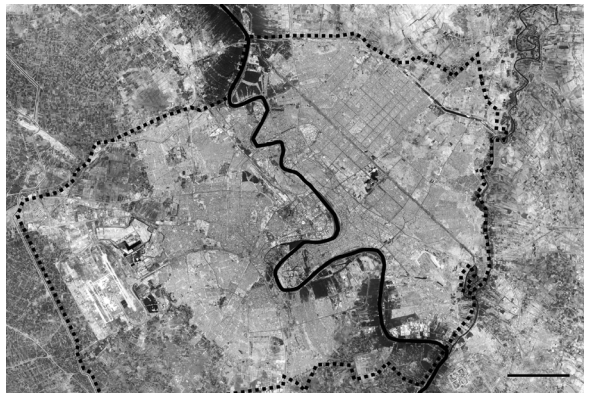
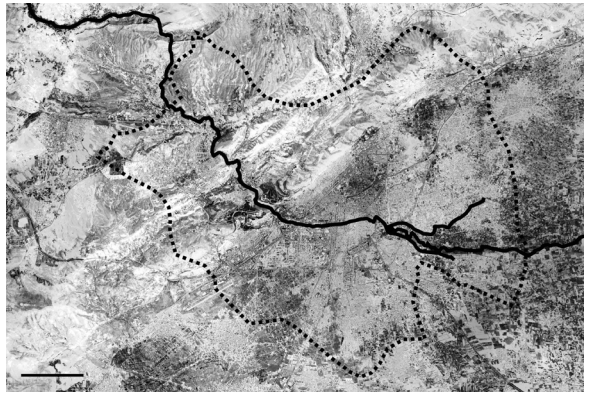
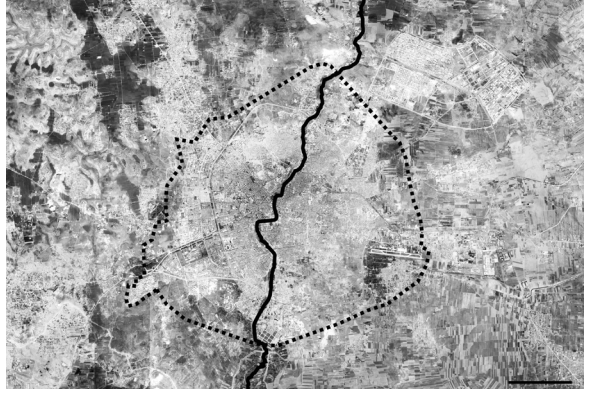
“The physical form and functional structure of historic madinas (cities) in Iraq, generally resemble those in other Islamic countries but particularly Arab ones. The evident consistency in their overall character was achieved and maintained over centuries largely because of the existence of a strong sense of religious tradition and social conformity.”¹

This leads to the fact that even though the characteristics of the urban fabrics changes according to specific environments, cities built during the early Islamic ages had followed similar principles in any part of the Islamic world. It is argued that the characteristics of the urban space configuration have a big role in making these cities successful environments. To better understand these recurrent features and relate them to the specific case of Mosul, a comparison with three other Islamic cities will be further made. The study will cover the cities of Aleppo, Bagdad and Damascus, in order to highlight similarities in their urban structures related to the city Mosul.

The first aspect that can be observed is the location of the urban implantation. Usually, it depends on the disponibility of natural resources, such as water, and the topography, which is relevant from a strategic point of view. (Fig 01) Another key aspect is the intersection with relevant commercial routes and the proximity to other major cities.

On the urban, level it can recognize an uniformity in the construction of the urban settlement. From a morphological point of view, the main principle that characterizes the urban form in the Islamic world is the organicity of its urban structure. The organization of these structures can be related to the idea of subtraction, in which spaces seems to be sculptured from a huge mass. Following this principle, it results in a structural continuous space working as a skeleton for the whole structure. According to this concept, open spaces of the traditional Islamic city become an organizational element.

On the typological level, it can be identified a recurrency of architectural elements. Traditionally, the historic Islamic city is a walled city with a citadel (Qal'at), which usually takes its place on a hill or near the water, situated outside the city's centre. The main Friday mosque (jami), occupies the heart of the city and represents the most important elements. Their location reflects the spatial logic of the urban area, which derives from the natural pedestrian movement and generates the network of the urban infrastructure.² Historically, the commercial neighbourhood and buildings dedicated to the learning of the Quran were built around the mosques, becoming a convergent point between the religious, educational, social and commercial network of the city. Therefore, the spatial configuration is a result of the interaction between the human and his environment. As the bazaar (souq or qaysaria) surrounds the mosque, it extends on the main roads leading to the city's gates. Markets always occupied a prominent position in the city centre. The strong interaction between religious and commercial activities was explicitly endorsed by Qur'an, and it became one of the hallmarks of the traditional Muslim cities.³ The palace (Sarai) is another requiring feature, it takes place inside or outside the city, close to the surrounding defensive walls. Other aspects of the Islamic cities are the Maidan, an open space used for public events or open-air markets, and the gardens.



O1 Satellite view of: [a] Aleppo; [b]Damascus; [c]Baghdad; [d]Mosul; and its surrounding.
Retrieved from: Google Earth Images.

ALEPPO

The city of Aleppo is the second-largest city in Syria after the capital Damascus, and one of the oldest continuously inhabited cities in the world. Founded on the left bank of the Queiq river, its strategic geographic location on a high plateau halfway between the Mediterranean coast and the Euphrates River marked it as the crossroad of several important trading and pilgrimage routes, including the Silk Road.

“Aleppo is characterized with mixed architectural styles, having been ruled by, among others, Romans, Byzantines, Mamluks and Ottomans.”⁴

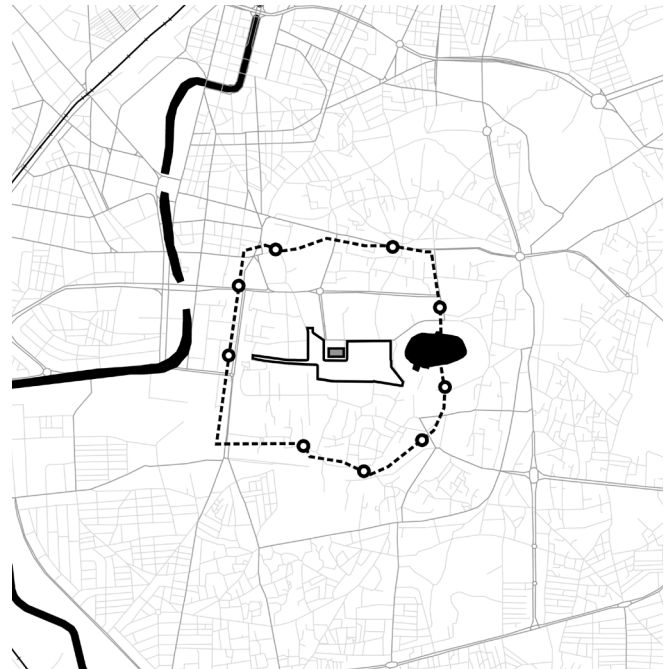
The monumental Citadel of Aleppo, rising above the suqs, mosques and madrasas of the old walled city, stands out as evidence of the ancient civilization. Mosques and madrasas from the Ayyubid and Mameluke periods, as well as later mosques and palaces from the Ottoman period, may be seen in the walled city that rose up around the citadel. (Fig. 02)

“Various types of 13th and 14th centuries constructions, such as caravanserais, caeserias, Quranic schools, hammams and religious buildings are found in the old city. The old city is characterized with its large mansions, narrow alleys and covered souqs.”⁵

Like many historic cities in the Middle East, the urban fabric is dense, with narrow passages allowing restricted vehicular traffic access. The limestone courtyard house is the prevailing residential typology. Organized next to each other, the courtyard houses share supporting walls generating an organic pattern. Residents walk across these districts through tight narrow corridors that lead to individual houses. These semi-private areas open up to wider passageways that link to the commercial and public service areas of the souqs.⁶



02 Aleppo City | Qal'a Halab, the cities' citadel.
Retrieved from: ArchNet, Built Environment of Muslim Societies.



03 Aleppo City | Map of the old city and its main traditional Islamic features.
Retrieved from: Made by the Authors.

DAMASCUS

Capital of Syria, Damascus is a significant historical city and a major cultural centre in the Middle East with around 2 million inhabitants.

The Barada River flows in Damascus and provides water to the metropolitan area. The city is located at the intersection of large commercial routes, the North-South that links Egypt with Asia and the East-West that connects Lebanon with the Euphrates valley. Situated at the Goutha Oasis, the urban core of Damascus flourished as an oasis surrounded by dry, infertile land.

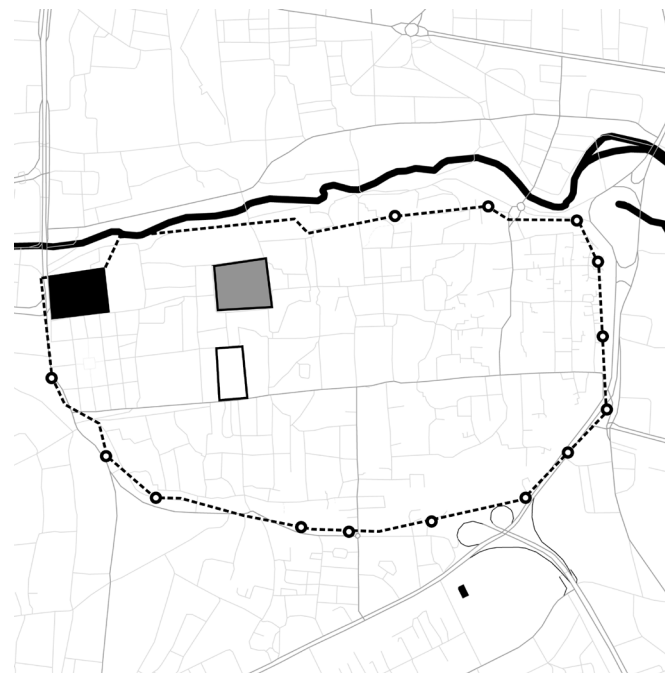
“Thus the city today is based on a Roman plan and maintains the aspect and the orientation of the Greek city, in that all its streets are oriented north-south or east-west and is a key example of urban planning.”⁷

In 635 AD Damascus began its transformation into a Muslim city. The Umayyad Mosque, a lasting Islamic emblem, was erected over the ruins of the Roman temple of Jupiter, adding yet another layer to Damascus' multi-textured urban and architectural fabric. The mosque incorporates the architectural influences of previous empires (Aramaic, Roman, and Byzantine) while also serving as a model for a mosque typology that would emerge in the centuries to come. (Fig. 04)

The old city of Damascus is protected by walls and gathered the traditional elements of the Islamic architecture such as mosques, madrasas, khans, citadel and souk. Because of its diverse history, the city also hosts numerous churches.



04 Damascus City | Aerial view of Umayyad Mosque, 2003.
Retrieved from: ArchNet, Built Environment of Muslim Societies.



Legend:
Grey rectangle: Friday Mosque | The Great Umayyad Mosque
White rectangle: Souq | Al Madina
Black rectangle: Citadel
Dashed line: The wall defence system

05 Damascus City | Map of the old city and its main traditional Islamic features. Retrieved from: Made by the Authors.

BAGHDAD

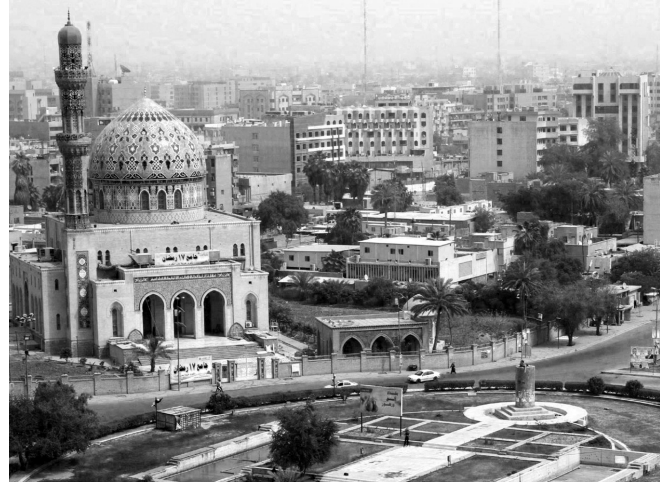
Baghdad is located in Iraq, near the Tigris river, close to the ruins of Babylon. Founded in the 8th century, the city has always been a very important in the region for its political, economical and cultural influence. It also plays a central role in the Islamic world and has a very diverse population.

Bagdad produces 40 per cent of the country's gross domestic product and its population varies around 6 to 7 million even if the recent Iraq war reduced significantly this number and destroyed a lot of built heritage.

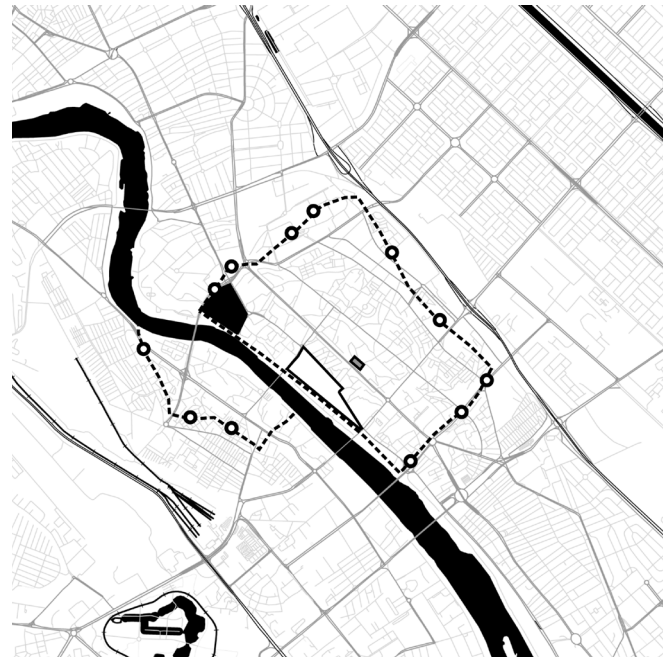
Its "antique buildings are located in the heritage area, surrounded by old suqs, narrow alleys and traditional Baghdadi houses that were largely built during Ottoman times. Old Rusafa has a long historical span of well over a thousand years, and it has become a complex urban organism."⁸

The city's architecture ranges from two- and three-story brick dwellings to modern steel, glass, and concrete constructions. The traditional Baghdad house, usually located on a crowded narrow street, has latticed windows and an open inner courtyard; a few fine specimens from the late Ottoman period are tucked away in traditional quarters of Al-Karkh, Ru-āfah, and Al-Kā-imiyah. The typical modern middle-class dwelling is built of brick and mortar and has a garden and wall.

"The complex urban structure and form in the city centre of Baghdad has provided an example of how to create privacy and a healthy environment for its people."⁹



06 Baghdad City | Mosque of the 17 Ramadan.
Retrieved from: northampton.ac.uk news



Friday Mosque | The Great Umayyad Mosque
Souq | Al Madina
Citadel
The wall defence system

07 Baghdad City | Map of the old city and its main traditional Islamic features.
Retrieved from: Made by the Authors.

MOSUL

Mosul is located in Iraq, on the Tigris River, close to the ruins of Niniveh in an area that was regularly flooded, creating a humid and very fertile soil. Historically, the city is an important producer and exporter of marble and oil. The surrounding region is also rich in fields and agricultural productions.

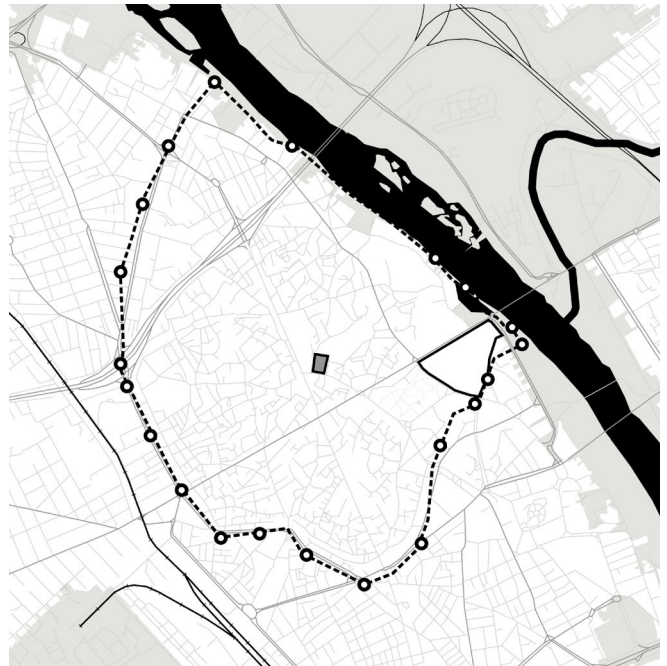
The location of the city, at the intersection of important trade routes and the diversity of its culture, promoted the city as one of the most important of the Islamic world. The old city is extremely rich in historical buildings such as mosques, castles, churches, monasteries, and schools. (Fig. 08)

“The Old City of Mosul, with its various historical building and sites, may be considered as the result of interchange of values throughout hundreds of years, and is a testimony to Iraq’s rich cultural diversity in its tangible and intangible forms..”¹⁰

The peculiar features of Mosul involve mainly the disposition of elements in its urban layout and the subsequent relationship with the river. Mosul’s panorama along the Tigris was rounded off at the beginning of the 20th century by the ruins of the ancient Bash Tabiya citadel, the buildings of atabeg Badr Al Din Lu’lu (mashad of Imam Yahya Ibn al-Qasim), and the ruins of Qara Sarai palace, the Ottoman building of Shaykh al Shatt (incorporating remnants of the ancient Madrassa Kamalyia) and al-Aghawat and Atabeg Al-Mujahidi (Al-Khidr) mosques.

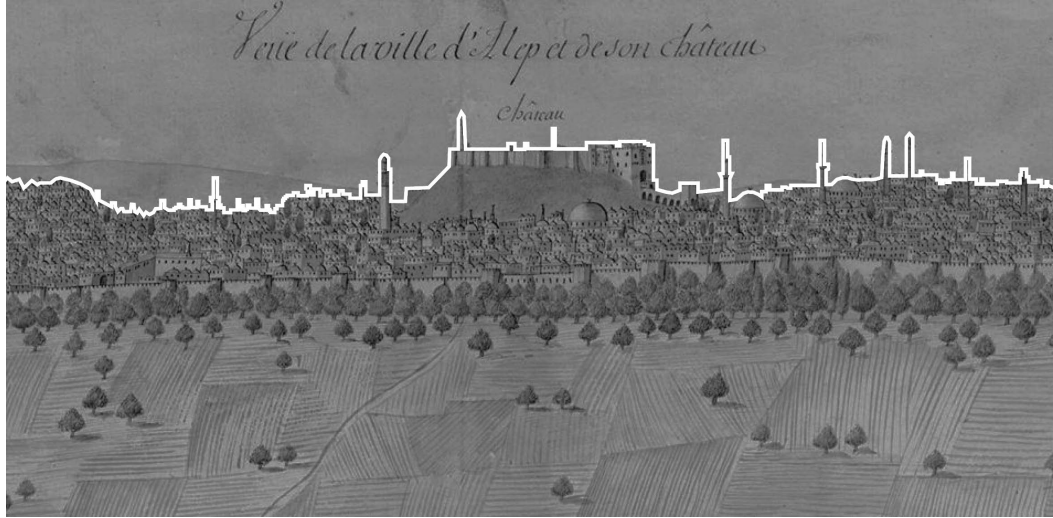


08 Mosul City | The city from South East, with the river in the distance, 1932. Retrieved from: G. Eric and Edith Matson Photograph Collection.

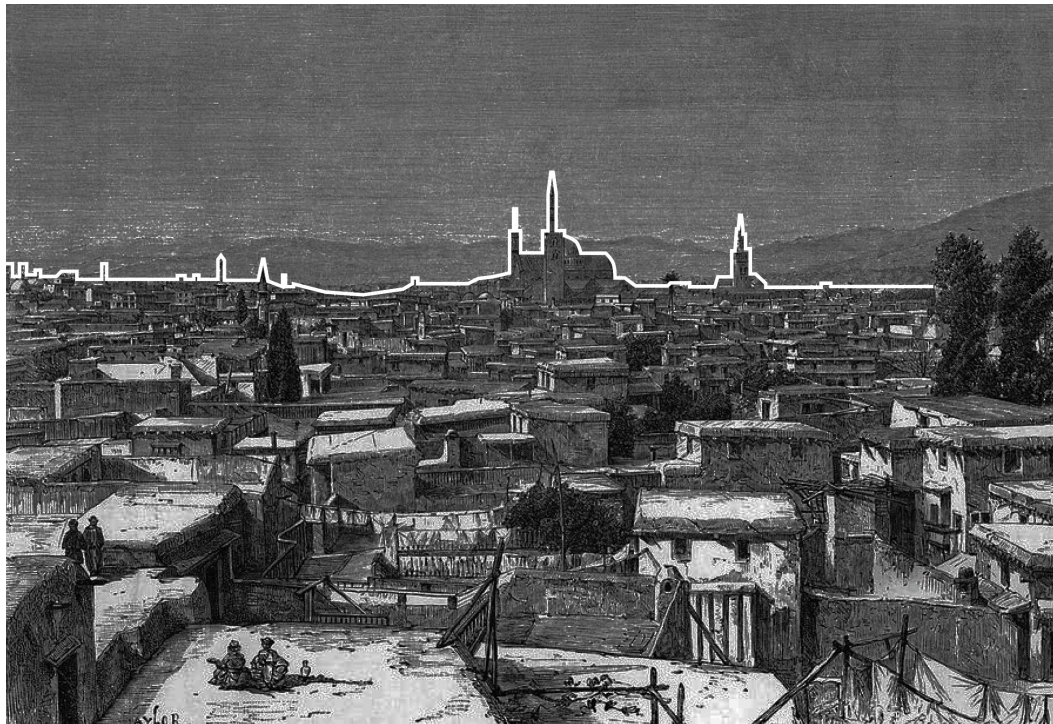


Friday Mosque | The Great Umayyad Mosque
Souq | Al Madina
Citadel
The wall defence system

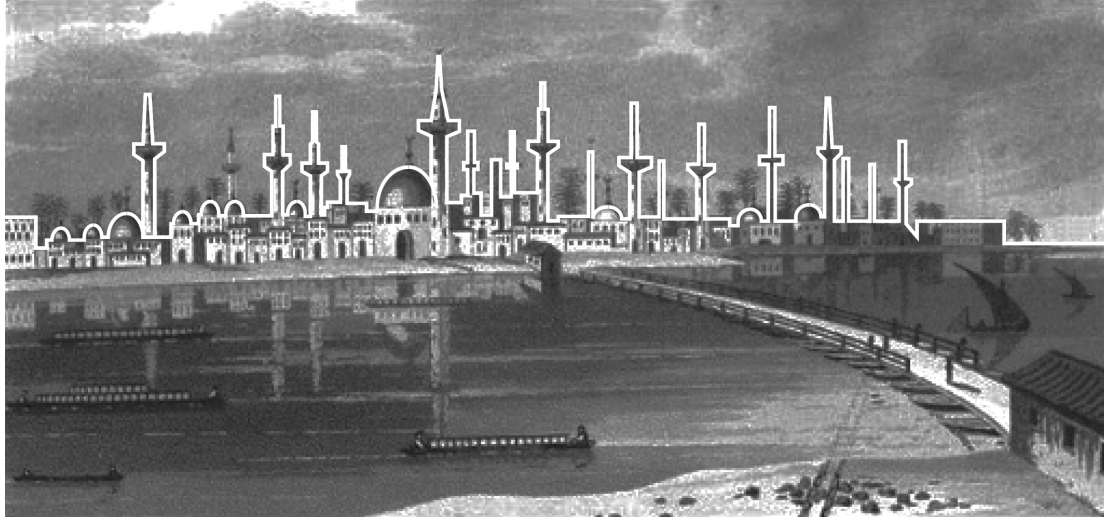
09 Mosul City | Map of the old city and its main traditional Islamic features. Retrieved from: Made by the Authors.



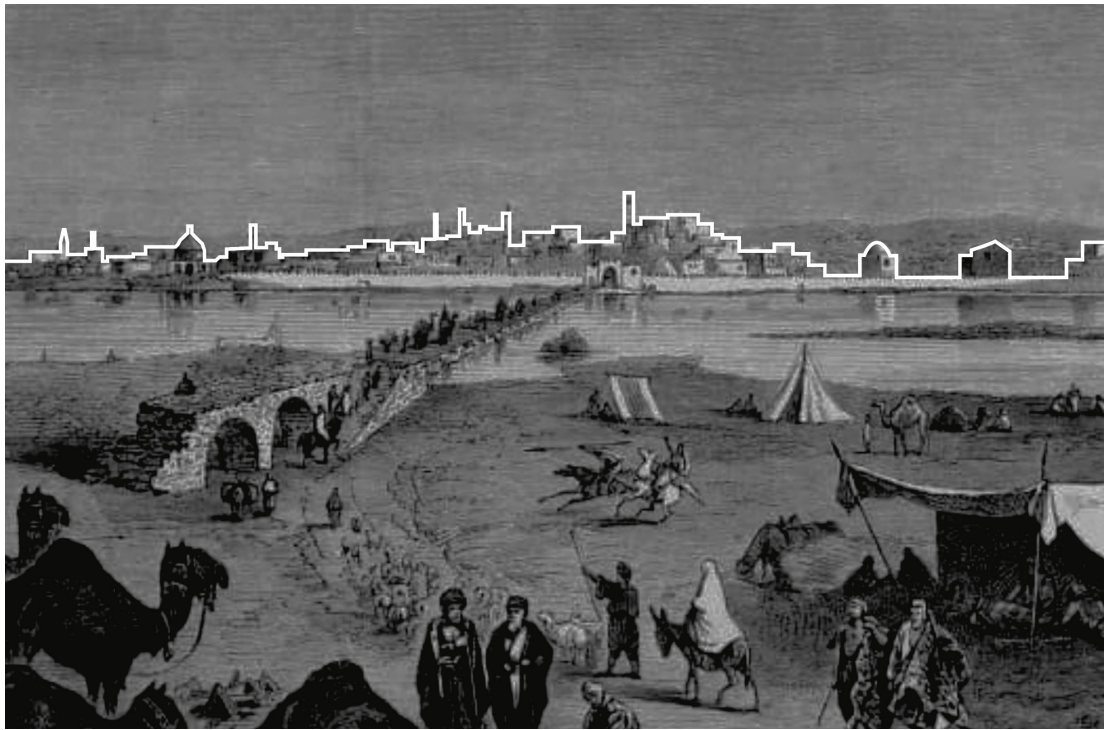
10 Aleppo City | The old city in the Ottoman period (Osmanlı Halep'i, Suriye, 1685). Retrieved from: Ottoman Imperial Archives.



11 Damascus City | General view taken from the Christian Quarter Date 19th century Retrieved from: Mary Evans Picture Library.



12 Baghdad City | The old city and the Tigris river.
Retrieved from: Abraham, 1808.



13 Mosul City | The old city riverfront from the opposite bank, 1932.
Retrieved from: G. Eric and Edith.

URBAN FABRIC

Mosul has a traditional urban core known as the old city, which coexists with a modern fabric adopted by municipal authorities since the city's rapid urbanization in the 1950s. The urban fabric of the traditional one is defined by a compact and organic tissue, a representative from the Arabic-Islamic architecture.

The city has two important historical poles, the ruins of Niniveh, on the right river bank, and the historical centre of the left river bank. The total area of the Old City is approximately 250 ha and it is composed of 251 quarters (mahala) on both sides of Tigris, with 91 neighbourhoods on the west bank comprising of the Old City and surrounding quarters.

"In subsequent centuries, the old city, surrounded by a wall until the 19th century, retained the medieval architecture and layout of its historic nucleus to which Ottoman buildings were added. Until very recently, Mosul was one of the most populous urban centres of the region, and, it was known for its places of knowledge and learning, commerce and exchanges. Its Old City was distinguished by its medieval city plan, the concentration of Islamic buildings spanning the 12th to the 19th century, religious buildings of other religious communities (particularly Christian), Ottoman domestic architecture and an extraordinary multifarious ethnic and religious mixture of inhabitants." ¹¹

The old city's urban fabric is characterized by Introverted courtyard buildings in two to three stories surround the narrow streets, which cut deep ravines through the city. The street network is irregular, which means that the buildings shade each other, there is a great variation of traditional building elements and a large number of building details provide shade at street level. ¹² The evident consistency in the overall character was achieved and maintained over centuries largely because of the existence of a strong sense of religious tradition and social conformity.



14 Mosul Old City | View of an old alley in the historic city.
Retrieved from: Mosul Eye (@mosuleye), Twitter, March 27, 2020.



15 Mosul Old City | The different layers of the urban fabric: [a] Courtyards; [b] Build space; [c] Urban voids; [d] Implantation; [e] Tigris river.
Retrieved from: Made by the Authors.



16 Mosul Old City | Build spaces map.
Retrieved from: Made by the Authors.



17 Mosul Old City|Urban voids map.
Retrieved from: Made by the Authors.

NEIGHBOURHOODS

The historical centre of Mosul is divided into historical neighbourhoods that traditionally correspond to the different corporations of workers. Nowadays these divisions are not effective anymore but the identity of each of them remains. Historically the neighbourhood of the city was administrated separately, giving them a lot of autonomy and independence.

The independence and the introversion of each neighbourhood were reinforced during the war with ISIL. The instability of the spatial occupation and the progressive liberation "neighbourhood by neighbourhood" encouraged the auto-sufficiency and the isolation. During the war the neighbourhoods of the centre were the first ones to be evacuated, only 10 % of their inhabitants were not displaced. This area also suffered the worst damages during the war.

During the Iraq war against ISIL, the religious diversity of the old city was compromised. The most drastically touched areas were the ones occupied by Christians and Jewish. "ISIS gave Christians in Mosul four options: leave, convert to Islam, pay a tax or be killed." ¹³

"That's because we gave concessions and lived as Dhimmi second-class citizens. This is no longer valid today, especially since the view of the Muslim neighbours is inferior towards the Christians in the land that we have been living in for 2,000 years. We still use Aramaic, the language of our ancestors. It is difficult to feel that you are not welcome in your land."

Dhimmi is the Islamic term used to refer to Christians and Jews. It means "protected person" someone tolerated as a second-class citizen." ¹³

These events created a lot of tensions and fractured the agreement between the communities, re-inforcing the spatial boundaries. (Fig. 18,19)



18 Mosul Old City | Map of the historical neighbourhoods division.
Retrieved from: Made by the Authors.

SATELLITE VIEW

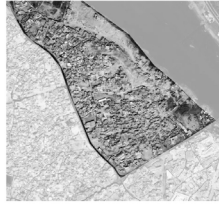
URBAN FABRIC

STREET

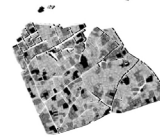
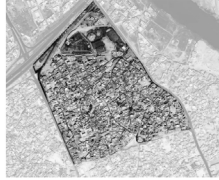
DESTRUCTION

MONUMENT

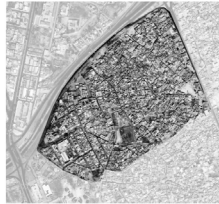
1 | Al-Maidan



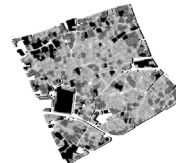
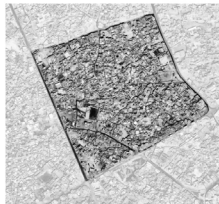
2 | Al-Khatoneia



3 | Ammo Al-Bakal



4 | An Nabijarjis



5 | Shaikh Fathi



19 Mosul Old City | Analytical matrix of the neighbourhood blocks.
Retrieved from: UN-Habitat, 2019.

SATELLITE VIEW

URBAN FABRIC

STREET

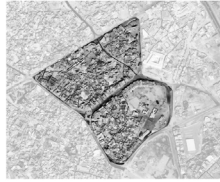
DESTRUCTION

MONUMENT

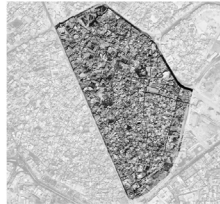
6 | Souq Al Mosul



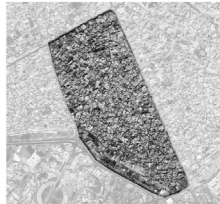
7 | Sheikh Abu Al Ula



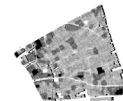
8 | Al-Mansorya



9 | Al-Mayasa



10 | Khazrag



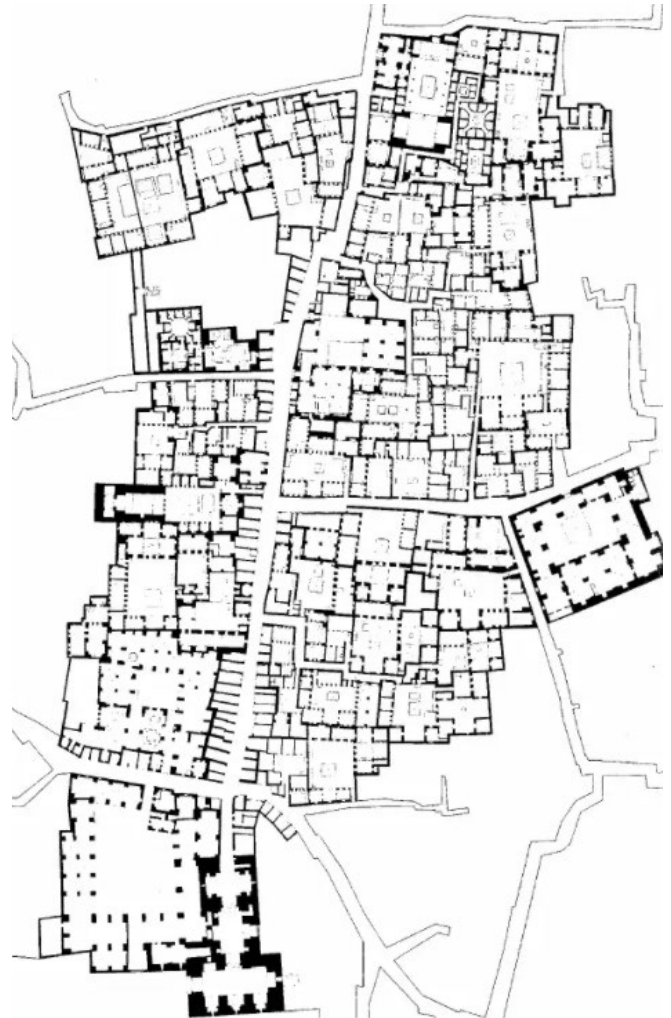
RESIDENTIAL BLOCKS

In the city of Mosul as in the historical Islamic cities, residential blocs occupy the largest surface. Those blocks were composed of an agglomeration of housing units built next to each other. The houses, built wall to wall, created wide introverted urban elements that composed the urban fabric. The residential blocks were extremely dense and inward-oriented. The houses were accessible through a network of narrow streets and dead ends created by the residual space available between each unit. The morphology of the residential blocks and the tortuous access ensured the maintenance of privacy.

These cul-de-sac streets that leads directly to one or more courtyards are an essential component of Islamic cities generally. Indeed from a typological point of view, the courtyard plays a fundamental role in the organization of the space in the urban structure. The element is repeated in the urban structure and becomes an organisational tool for the spaces. Therefore, around the courtyards develop a series of different functions with various complexity modules.

ROAD SYSTEM

The road system follows an extraordinary structure in the Old City, perceiving an organic pattern which might seem to be chaotic but actually pursue a very natural thrive. The Mosul city streets net is composed of differed levelled streets, classified in four typologies according to the width and on which kind of transportation routes pass. On the first level, we find the important larger streets, from 100m width, degrading till the internal streets with a width of only a few meters. Particular streets have high commercial use according to the occupancy of different shops on its side. Moreover, Mosul incorporates a high degree of servicing streets. The layout of roads, streets and alleyways forms an integral part of the identity typical of historic middle-eastern cities.



20 Aleppo City | Ground floor plan of a residential neighbourhood.
Retrieved from: S. Bianca, Thames and Hudson, 2000.



21 Mosul Old City | Aerial view of the Tigris river as it flows through Mosul, February 27, 2021.
Retrieved from: Z. Al-Obeidi/AFP via Getty Images.

As previously mentioned, four levels of streets can be identified in the Mosul's roads system ¹⁴(Fig. 23):

- First Level: 100 - 60 m (Highways)
- Second Level: 60 - 40 m (Arterial Streets)
- Third Level: 40 - 25 m (Secondary Streets)
- Fourth Level: 25 - 15 m (Tertiary Streets)

Moreover, most of the streets typologies overlap with each other becoming transitional among themselves. The city's paths are intertwined according to a complex organization of serving areas to form a system of movement of the population. The main axes link the historical city with the surrounding neighbourhoods of Mosul city, as well as connecting the two sides, East and West, over the Tigris River.

The secondary streets serve to identify the urban structure, delimitating the building blocks, becoming an essential driver of the social and commercial life. Most of the shops of the city are located along their course (Fig. 22). Due to the high density of the urban structure, a relative scarcity of open areas occurs, with the streets themselves becoming a daily stage for the community life representing the main public spaces.

Proceeding innards the city blocks, the tertiary streets are more narrow and intricated, providing more reclusive spaces. The most ancient part of the historical city, located on the East side, has the highest street density as a result of the spontaneous expansion of the urban fabric toward the West. This development did not follow any legal planning and resulted in a very complex arrangement. The key aspect is the distribution of land uses within the urban structure and the location of the mosques, as it is directly associated with people movement and the distribution of their activities.

Lastly, the cul-de-sac organization, streets that lead directly to one or more courtyards, represents a traditional feature of the Islamic cities. They are very widespread within the housing

neighbourhoods, often very narrow, generating cloistered paths towards a more private level of urban life. The historical centre of Mosul has multiple examples of this configuration.

"The Old City of Mosul, with its intricate labyrinth of small streets used to be a very well preserved heritage environment. In contrast to other towns in Iraq, it had been little affected by modernization, and retained much of its traditional ethnic and religious heterogeneity. The network of streets, alleyways and cul-de-sacs represented one of the best examples of the spontaneously-grown pattern of cities in the Middle East." ¹⁵

It is possible to classify the street network also functionally, as there are commercial, industrial, residential, recreational and multi-functional streets.



22 Mosul Old City|Location and extent of more than 1,200 damaged commercial properties in streets that are indicated as commercial by the urban planning department.
Retrieved from: UN-Habitat, 2018.



23 Mosul Old City | The structure of the roads network subdivided in the four different levels of categorization.
Retrieved from: Made by the Authors.

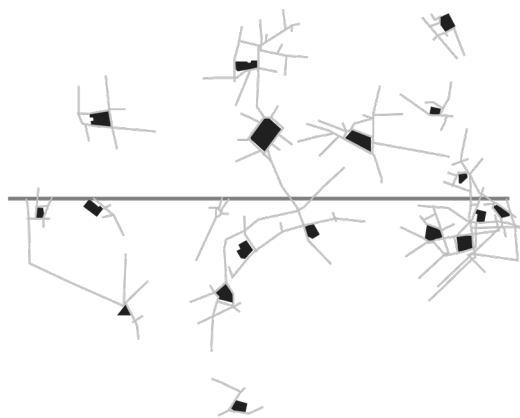
On an urban level, the principle that seems to be constant in the organization of the residential units in the urban structure seems to be an organic matrix. The residential units are arranged in groups of settlements that seem not to follow any apparent hierarchy. However, it can be observed that the mosques, for example, are distributed in the areas that attract a high movement and social interaction in the system. This is because, in addition to the religious tasks, Friday mosques are the places for many other tasks for the Muslim society, such as cultural and political activities.¹⁶

In the earliest Islamic ages, there was one main Friday mosque in the Islamic city, which had been typically occupying the centre of the urban fabric (Figure 24). In the centuries afterwards, Islamic cities have grown including a bigger number of Friday mosques in addition to the main one.¹⁶ It was claimed that the locations of these mosques are related to the characteristics of the spaces surrounding them and the activities these spaces contain. For instance, the main mosque was surrounded by rings of varied activities such as clean markets, houses, and polluted markets respectively. In addition, the majority of great mosques was located in the public areas of the city overlooking the expansions of its paths.¹⁷

According to Zaidan, the qualities of Islamic urban spaces of the cities allow them to function as both links and places at the same time.¹⁸ These two features play an important role for the people by detecting and interpreting space positively. This case was linked by Hiller to the notion of a natural movement, which states that the spatial configuration acts as a generator of pedestrian movement (theory of natural movement). On the other hand, buildings become entities with different degrees of attraction due to their functions and ability to encourage people to move towards them.¹⁹ This case, according to Hillier, refers to the Attraction theory. One of the most notable purposes of this theory is to adjust the sizes of pedestrian walkways to match the degree of buildings attraction. As a result, the characteristics of the urban structure have a considerable



24 Mosul Old City | Location of the Friday Mosques in the urban fabric. Retrieved from: Made by the Authors.



25 Mosul Old City | Schematization of the network surrounding the mosques. Retrieved from: Made by the Authors.

impact on the distribution of land uses (as attractive places) within the city environment. They went on to say that this interpretation is based on the functional logic of the traditional organic structures of the Islamic cities.²⁰

Therefore, with this study, it can be demonstrated that the infrastructure of Mosul's Old City follows an organic spatial structure that is strongly interconnected with the network of the Friday mosques and the location an important attractive point of the urban environment. Particularly the Friday mosques, from a physical point of view, are considered the most important components of the urban fabric and have been the most notable and memorable landmarks as main architectural elements in the urban structures of Mosul.



26 Mosul Old City | Map of the courtyards and their relation with the city.
Retrieved from: Made by the Authors.



Main street

Minor road

Entrance

Courtyard

27 Mosul Old City | Spatial organization of the urban fabric.
Retrieved from: Made by the Authors.



28 Mosul Old City | Market street in West Mosul with a lot of commercial activities.
Retrieved from: IMPACT, 2017.



29 Mosul Old City|Street view of an old alley, documentary photo dating back to 1964.
Retrieved from: Getti Images.

COMPONENTS OF URBAN FORM

RESIDENTIAL ARCHITECTURE

The residential urban fabric of the old city is characterized by meandering streets and courtyard houses, mostly from the 18th and 19th century, constructions that project jetties, arched passageways (Al Sabat), and decorative gates. The Old City was densely built and crowded, with no green areas or vegetation excluding a few garden-like courtyards in the largest houses.

The ethnic-religious diversity of Mosul is one of its main features, the city has been inhabited by many religious and ethnic diverse people (Arabs, Kurds, Turkoman, Shabak, Assyrians, Christians, and Jews) distributed in a mixed way on the quarters that compose the city.

The residential quarter's unit is the house, which faces inwards and has few or no apertures to the outside at street level. The structure and organization of the units demonstrated a kind of genetic regularity, mostly square-shaped forms (Fig. 32). The traditional Moslawi house structure is based on a number of major cellular units that are built around a central distribution space, usually a courtyard, which is one of the fundamental elements in the organization of the urban structure in Islamic cities. Each one of these sub-units tends to have an individual access, also reflecting the need to subdivide larger family groups into several smaller independent units. Moreover, within the urban system the spatial articulation of the house is integrated within a greater articulation chain between included and excluded spaces, between inside-outside or private-public: For example, the courtyard is outside with respect to the rooms, but inside with respect to the house itself.²¹

The residential architecture in Mosul clearly shows very old Iranian influences, especially with regard to some particular typological elements as the Iwan and Tarma, a system of served spaces in form of a colonnade that links the rooms of the

house on the first floor. This last element can be reassembled also in several configurations, and it can also appear as a covered terrace on the ground floor. Other peculiar elements of the Islamic house are the *Ursi* which represents the main public room of the house; the *Kabishkan*, which is a mezzanine from where the women can observe and participate in the activities taking place in the courtyard and other spaces of the house without being seen; the *Sirdab*, which is the basement; and the flat roof, another essential element, frequently used as an open room especially during the hottest days of summer. Distinguishing features of the facades include an extrusion of the upper floors on the inner streets and the system of colonnades.²²

In many houses, the first upper floor contains the main rooms of the house while the ground floor only service rooms, and occasionally shared recess which is used for open-air sitting and informal reception at the courtyard level. The Abduni House is an example of late 19th Century Ottoman vernacular architecture in Mosul (Fig. 30). The property served as an aristocratic residence, with iwans and exterior and internal courtyards, among other traditional architectural features.

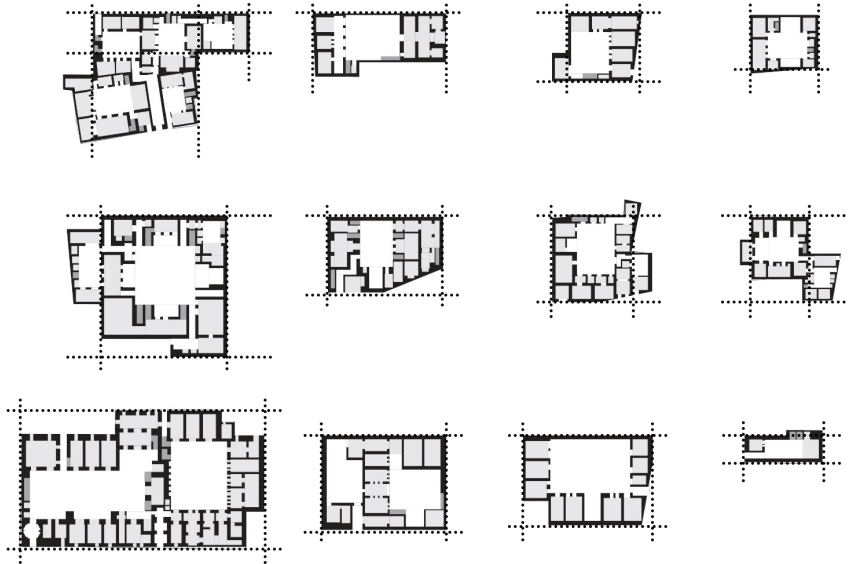
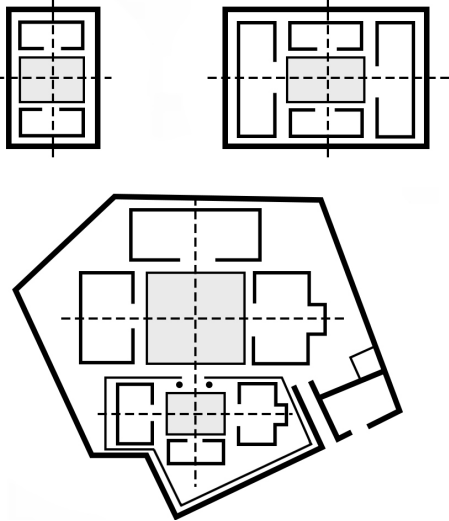
In terms of space utilization, the traditional Moslawi dwelling is quite versatile. Seasonal and everyday movements can be found in all of the places. Only a few functions, such as restrooms, toilets, and occasionally kitchens, are fixed and remain thus throughout the year. The functionality of all other places can be swapped. Seasonal changes are primarily vertical. Due to the low rays of the sun in the winter, the family can use the rooms on the first level of the house, while in the summer, it goes to the ground level due to the high sunbeams. Both vertical and horizontal movements occur on a daily basis. These are The Moslawi people's movements that were natural and traditional adaptations.²³



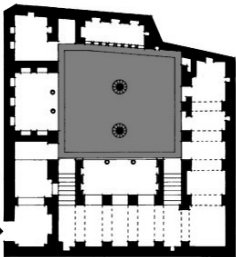
30 Mosul Old City|Abduni House on Hayy Al Mansur street.
Retrieved from: ArchNet, Built Environment of Muslim Societies.

C

Basic Residential Module (beit)

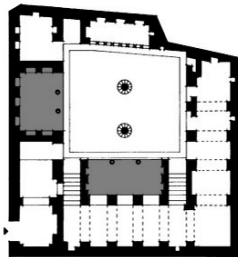


31 Iraqi House Typology | Geometry
Retrieved from: Made by the Authors.



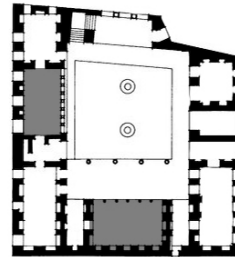
COURTYARD

A private, located in the centre, outside space of the inhabitants



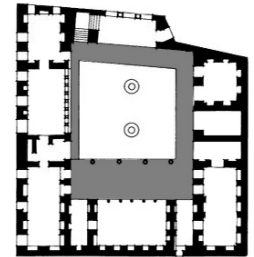
TALAR

A room facing the patio with two columns in the front



URSI

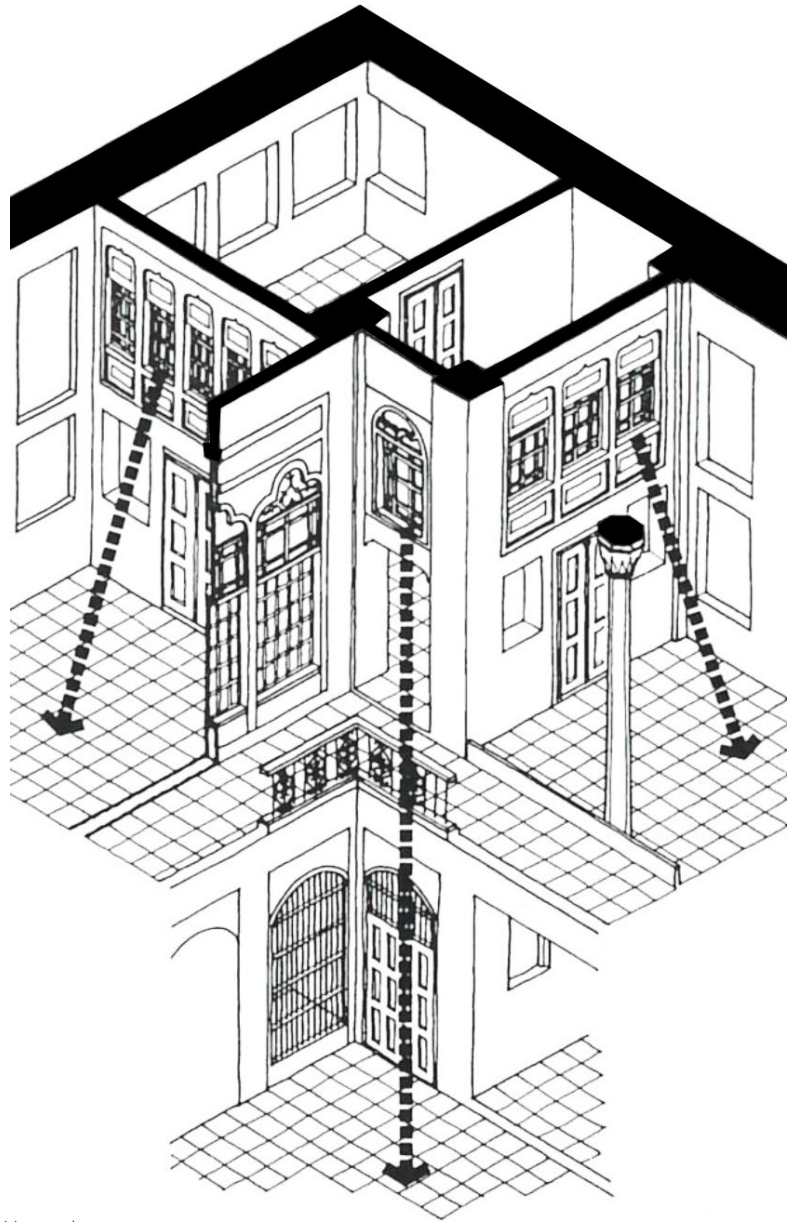
The main representative public room of the house



TARMA

Mezzanine surrounding the courtyard linking the rooms

32 Iraqi House Typology Structure of the Iraqi house which summarizes the main elements of the Islamic residential architecture.
Retrieved from: Made by the Authors.



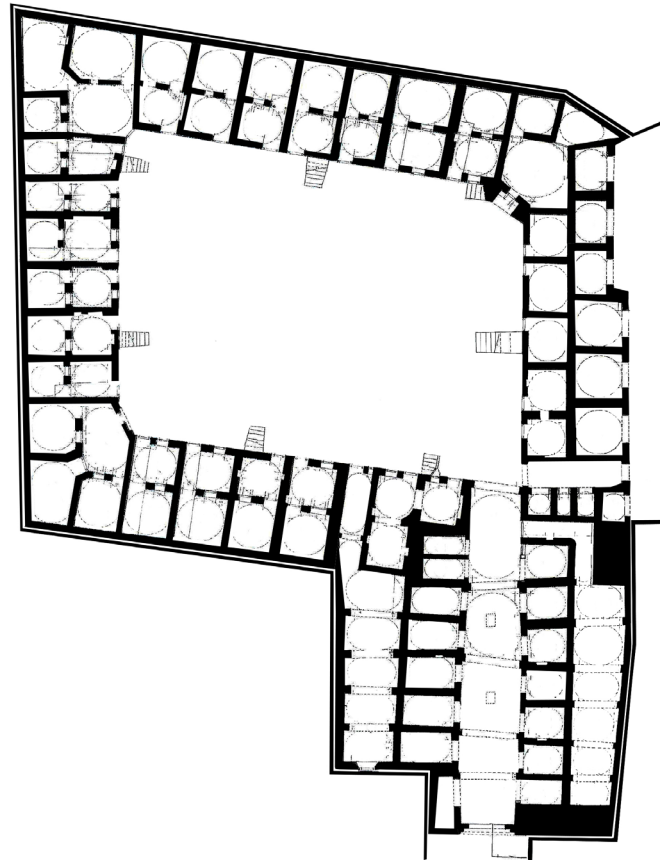
33 Iraqi House Typology | Axonometric section showing strategic position and views from the ladies' Karbishkan on the mezzanine of the upper floor.
Retrieved from: B. Stefano, 2000, p. 93.

THE SOUQ

Bazaars are a characteristic feature of Islamic cities, usually appearing as a result of the establishment of a mosque or vice versa. With the establishment of the Al Nouri mosque as the main Friday mosque of the city, a large covered market with more than 299 shops grew around it. However, during Ottoman rule the Bazar lost its importance and slowly subsided to the streets in the vicinity of the new Sarai neighbourhood which became the main Qaysaria of the city: a bazaar of goldsmiths, shoemakers, perfume and spices, cotton spinning, dyers and pack saddles for mules.

The markets of the Islamic cities were also often divided into areas according to the type of goods. The central market of the city, for example, was dedicated to international export, while a more local market provided merchandise for the inhabitants. In the early decades of the Islamic cities, the markets were more informal and the products were directly displayed on the ground. Ambulant vendors were moving around the most dynamic areas of the city such as the mosques or the gates. After some years, informal markets evolved into permanent structures providing separation between each shop. The morphology of the souq grew to become an urban element where small partitions of the space create an economic network in the city.

An example of the transformation of those informal markets into permanent structures is the khan. Mosul khans are considered the most considerable Islamic service buildings during the Ottoman era. A khan is a commercial place for selling and purchasing goods and a place for merchants' dwelling (Fig 34). The term is also used as referred to as the place for receiving passengers and commercial caravans. This building, organized around a central courtyard, is composed of a series of shops. Each unit is connected to the courtyard by an entrance and is generally composed of two rooms: one as a display area for the products and the other for storage and production purposes.²⁴



34 Mosul Old City | Khan Al-Kurq plan.

Retrieved from: Hisham Al-Madfa'i, The urban renewal project for the city of Mosul, Section E and F (Report proposals and directives), 2008.



35 Mosul Old City|A traditional souq in Mosul, 1932.
Retrieved from: G. Eric, E. Matson, Photography Collection, Library of Congress's Prints and
Photographs division LC-DIG-matpc-13267

THE MOSQUE

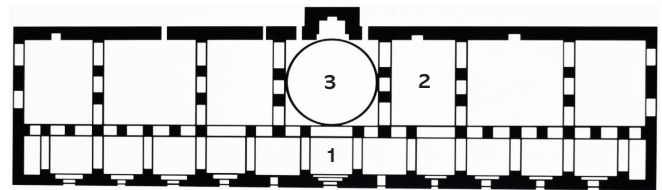
The main mosque of the city plays a specific role in the religious system of Islam. There are not a lot of architectural requirements in the construction of a mosque except for a clear demarcation of the interior space, no need for an enclosure, and a frontal element marking the direction of the Mecca. However, there exist some particular features which make these buildings recognizable as specific Islamic architecture.

The main space is the prayer hall where the Muslims meet on Fridays. A characteristic of the early mosques for this space is the basilica plan, with the main difference being the rotation of the main axes in the horizontal direction, so that the prayers can sit in rows and pray on the longer side. A feature of the prayer hall is the *Qibla Wall*, which is the main direction of the mosque leading towards the Mecca. The *Mihrab* is a niche in the wall set to emphasize this direction. Moreover, inside the mosques, men and women are separated. If the men use the main prayer hall, women have to pray in the *Makhphil*, which is a dedicated space for a woman usually located on another level, separated by a fence from the main prayer hall and accessible from a separate entrance. ²⁵

As for external features can be identified the Minaret, a slender element that can be located in one of the corners of the mosque or beside; the dome, which usually covers the centre of the prayer hall; and a courtyard where can be located the ablution fountains that represent an essential part of the ritual towards the prayer hall. The Madrasa is another specific external element, a building combining social, religious, and educational purposes. Traditionally this building was composed of study rooms, prayer halls, and dormitories as a student were generally living in the madrasas.

In the context of Mosul, the Al-Nouri mosque represents the main Friday mosque of the city, standing as an unadoptable landmark in the urban structure. Built in 1172, its main

recognizable feature is the 45 meters tall Minaret, called Al-Hadba'. a "remarkable structure in its way. It is several feet out of the perpendicular, though it starts fair from the ground, and at the top, before putting on its gallery and dome, it regains an erect posture. Its attitude is that of a man bowing." ²⁶



- 1 Prayer Hall
- 2 Minbar
- 3 Mihrab

36 Mosul Old City | Al Nouri Mosque Complex, plan showing reconstruction of the original prayer hall by Yasser Tabbaa, 2002.
Retrieved from: Y. Tabbaa, "The Mosque of Nur al-Din in Mosul 1170-1172," *Annales Islamologiques* 36 (2002): 339-360, fig. 14.



37 Mosul Old City | Remaining structure of the Al Nouri Mosque façade after the explosion.
Retrieved from: UNESCO, 2021.

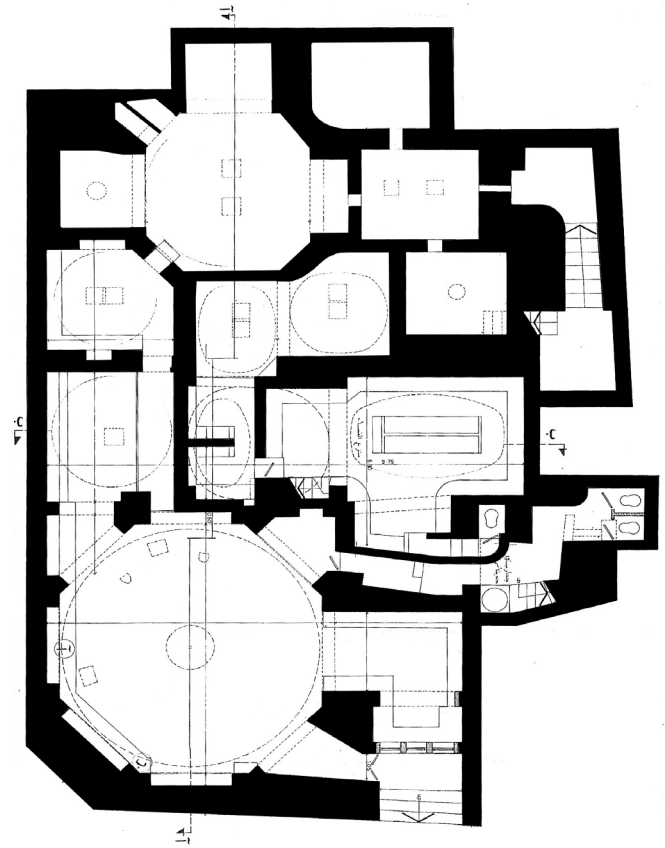
THE HAMMAM

The tradition of the hammam was born in the seventh century and spread across the Islamic society, where it played an important role until the first half of the twentieth century. The baths are a typical element of the ottoman culture, during which period were spread all around the empire. Nowadays, the remains of hammams can be found in the Middle East and North African countries.

The hammam is a complex hosting various activities linked to the care and cleansing of the body. Their architecture changed during history depending on the cultural environment. If the first hammams were only composed of the three rooms and baths at different temperatures, they evolved in larger structures.

The concept derives from a reinterpretation of the Roman model of the public baths. While the classical roman typology is organized in a sequence of spaces composed by *apodyterium* (dressing room), *frigidarium* with swimming pool, *tepidarium*, *calidarium* and *laconicum* (steam bath), in the Islamic baths there is no frigidarium and swimming pool. Moreover, the entrance, where users may undress and relax after a thermal treatment, has a significant symbolic value. Called *Cemekân*, assumes generally a squared shape and it's covered by a dome and equipped on four sides by lofts, with benches and niches to guarantee guests' privacies. The entire environment evolves around a fountain set almost exactly in the centre in order to maintain the centrality of the compositional genesis of the space.²⁷

Although the types of hammam may vary according to the different regional traditions, they inevitably reflect strict technical distribution principles, with the higher-temperature rooms in direct contact with the cistern and boiler technical rooms. The oldest known hammam was found in Bassorah in the South of Irak.²⁸



38 Mosul Old City | Attarine Hammam plan.

Retrieved from: Hisham Al-Madfai, The urban renewal project for the city of Mosul, Section E and F (Report proposals and directives), 2008.



39 Mosul Old City|The historic Hammam Alii sulphur spa located in south Mosul was reopened after the area was liberated from the Islamic State group in April 27, 2017.
Retrieved from: Bram Janssen Photography, AP Images.

MONUMENTS

The cultural heritage of Iraq, specifically its archaeological and historical heritage, is of major significance. Moreover, Mosul is one of Iraq's richest cities in terms of cultural heritage and contains numerous archaeological, historical, cultural, and religious sites, monuments, and landmarks.

Due to its ethnically diverse profile, Mosul holds a multiplicity of heritages and monuments dedicated to different religious entities. Therefore, the majority of the city's monuments include valuable Islamic religious structures, followed by the Christian heritage. There are about 486 Islamic monuments and historic Mosques, as well as 32 ancient churches and 6 monasteries in Mosul City.²⁹ These historic buildings represent a testament to Mosul's rich cultural background in Iraq.

"The Old City of Mosul was a physical reflection of this diversity due to its abundant shrines dedicated to various religious figures, some of whom are revered by the three monotheistic religions, as well as its numerous, churches, mosques, madrassas and cemeteries."³⁰

The city is also recognized for its abundance of shrines, dedicated to religious figures like Jonah, St. Georges, and several Shi'ite Imams. A distinguishing feature of these shrines is the dome, which appears a simple conical or pyramidal form from the outside, but reveals exquisite muqarnas ornamentation from the inside. These forms spread beyond shrines and were adopted by many local churches. Several decorative patterns and techniques that developed in Mosul, such as brick decoration and marble mosaic work, spread throughout the Muslim world.

Regarding Mosul's heritage of secular houses, along the riverside especially at least 5 large houses can be classified as excellent examples of late Ottoman urban

domestic architecture which created a distinctive Mosul river bank panorama.³¹ The Sarai was the palace residence of the governor, which appears to have shifted its location inside Mosul across the centuries. Originally, the urban spatial organization of Sarai in the Islamic city during Ottoman rule required it to be located on the border of the defensive wall. Otherwise, Mosul was an exception among the Middle Eastern cities, its Sarai was located inside the city's walls until the end of the 19th century when it was relocated to the south, outside the city. Later, other changes were presented moving the Sarai to the Citadel area and the city's south again.³²

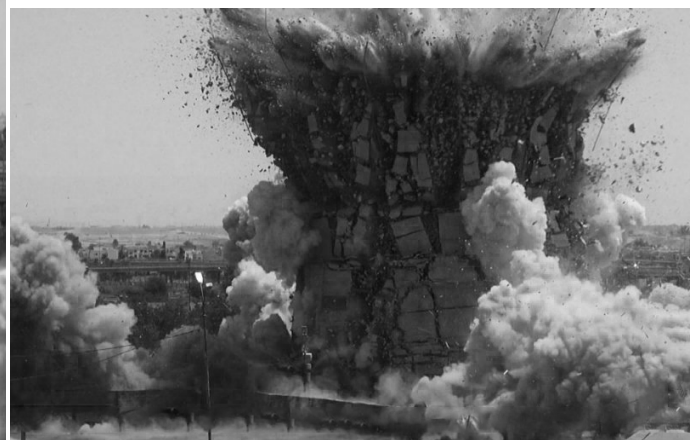
Mosul's defensive walls built by Marwan II, "surrounded an approximately 300 ha town in an irregular semi-circular shape, attached to the elevated bank of the Tigris."³³ This wall is nowadays partially destroyed and only visible in some parts of the city, however its influence on the urban development remains impactful. Five isolated sections of the wall, as well as two small riverside gates, remain still intact.

"Additionally, Mosul still has the remains of the so-called Citadel of Bash Tapia that is also thought to have been built sometime during the 12th century AD, though various sources attribute earlier possible dates to the site (Fig XX). Bash Tapia is known to have played an important role in the various invasions and sieges of Mosul." The doors also played an important role in the economical and social life of the city, they were key locations for shops and commercial trades.

On June 20, 2014, bulldozers razed to the ground the first monument in Mosul, the grave of the Mosul historian Ibn Al-Athir. Further waves of destruction in Mosul were carried out, with 47 architectural sights in total completely destroyed by ISIL. Mosul has lost its most precious sites, which had once provided its panoramic skyline and distinctive appearance, and this relates to an act of *urbicide* which must be addressed.³⁴



40 Mosul Old City | Destruction of the Shrine of Yahyā ibn al -Qāsim.
Retrieved from: ISIS propaganda video.





41 Mosul Old City | The Bash Tapia castle facing the Tigris river.
Retrieved from: ArchNet, Built Environment of Muslim Societies.



42 Mosul Old City | Map of the religious monuments.
Retrieved from: Made by the Authors.

RUINS

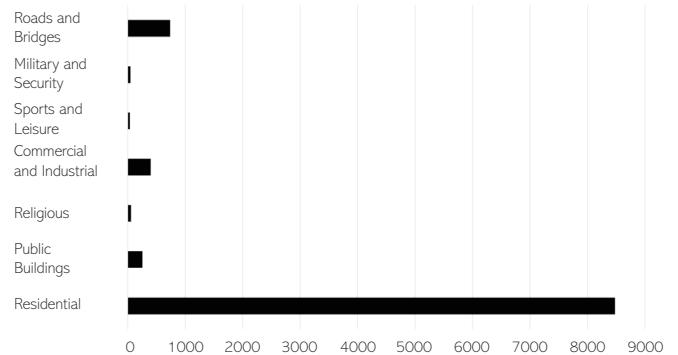
The death toll has ranged from hundreds to tens of thousands, and more than one million people have left their homes since the onslaught began in October, almost comparable to the population of Dublin. Whole communities have been destroyed, victims remain buried beneath the debris, while streets are littered with unexploded weaponry, landmines, and booby traps. Since IS occupied Mosul in June 2014, much of it has been reduced to rubble. The operation is now widely recognized as the most significant urban battle since World War II.

The destruction of a World Heritage Site is a prime example of the human and cultural costs of armed conflict. The loss of this heritage "is defined as a war crime against the people of Iraq, whose heritage is a symbol and medium of identity, history and memory. These destructions are linked to the suffering and violence on human lives, and weaken the society over the long term."³⁵ All parts of Mosul have experienced some kind of damage, according to the latest UN assessments. However, the western half of the city, retaken in July, has suffered more than in the east - won back from IS six months earlier. More than half of Mosul's 54 western residential districts have been significantly affected. The UN describes 15 as "heavily damaged," meaning most buildings are uninhabitable. A further 23 districts are "moderately damaged," meaning up to half of the buildings have been destroyed or are structurally unsound, and 16 districts are "lightly damaged" (Fig 47).

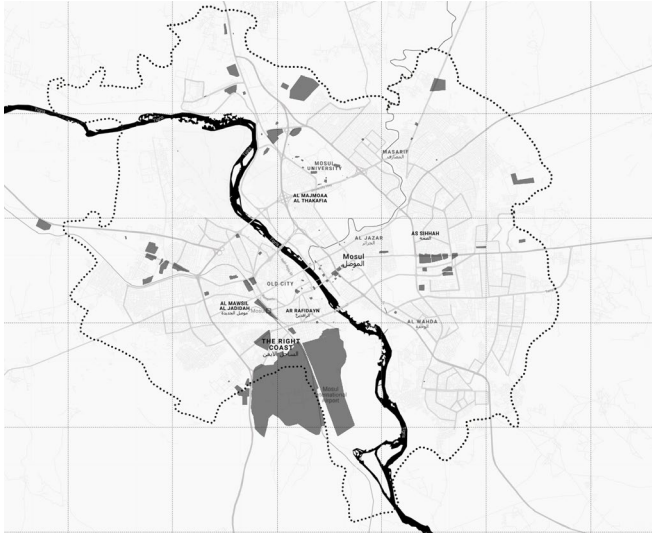
While UN satellite analysis suggests about 10,000 buildings have been severely damaged or completely destroyed, the real level of destruction is believed to be higher (Fig. 43). Taking into account damage to multiple floors of buildings, not seen via satellites, the UN now estimates the real number of damaged buildings to be more than three times greater - about 32,000. The quantity of conflict debris in Mosul is estimated at 11 million tonnes, equivalent to three times the Great Pyramid of Giza or four times the Eiffel Tower.³⁶

Lise Grande, the UN's humanitarian coordinator for Iraq, stated it will take years for affected areas to return to normality. Reconstructing the city and returning civilians to their homes will be "extremely challenging", with an estimated cost of \$1bn (£760m).

The UN's initial satellite analysis suggests housing has been the most heavily hit, with at least 8,500 residential buildings severely damaged or completely destroyed, most of them in the Old City. The historic urban fabric has been severely damaged, particularly along the Tigris River. This figure is sure to increase when comprehensive damage assessments are conducted on the ground. About 130km of roads have also been damaged overall - 100km of those are in the west. Coalition airstrikes also destroyed all bridges linking the east and west of the city across the Tigris river, in order to obstruct Islamic State movements across the Tigris and the group's ability to resupply its fighters on the eastern side of the river. The city's airport, railway station and hospital buildings are also in ruins. Iraqi

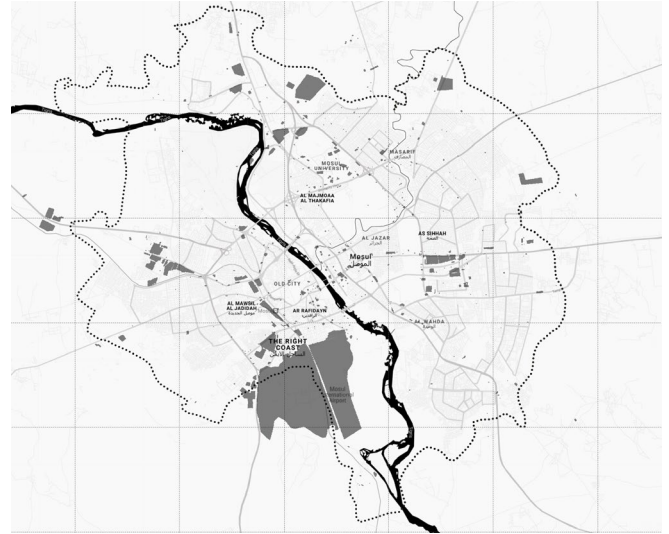


43 Mosul City | Types of buildings destroyed: 9,925 sites damaged. Retrieved from: L. Rodgers, N. Stylianou, D. Dunford, "Is anything left of Mosul?", BBC News (August, 2017): bbc.co.uk/news/resources/idt-9d41ef6c-97c9-4953-ba43-284cc62fdd0



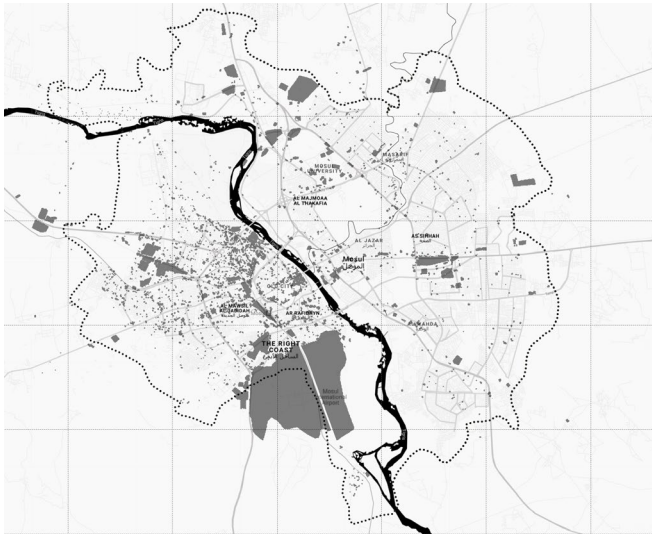
Before offensive

135 buildings damaged (50% public, 21% homes)



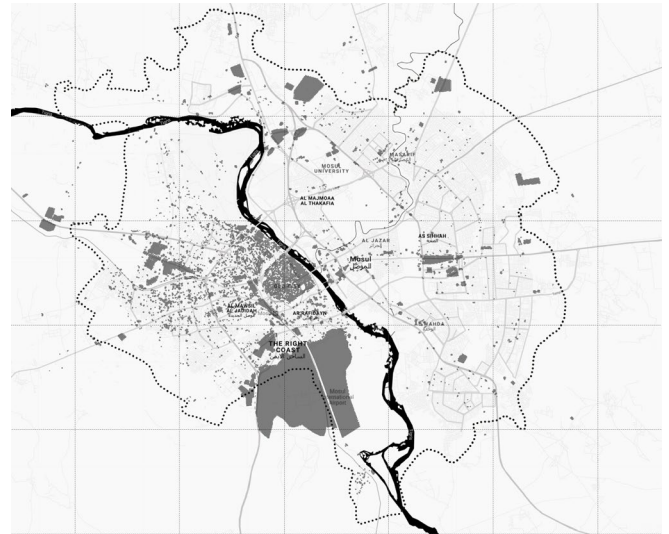
First five months of offensive

1,240 buildings damaged (47% homes)



After eight months

4,356 buildings damaged (70% homes)



After almost nine months

9,519 buildings damaged (85% homes)

44 Mosul City | Building damage, October 2016 to July 2017.
Retrieved from: UN satellite analysis.



45 Mosul Old City | Bridges damage assessment via satellite imagery. Retrieved from: DigitalGlobe Satellite Imagery.

officials estimate that nearly 80% of Mosul's main medical hub has been destroyed. The area was the largest health facility in the Nineveh governorate, housing several hospitals, a medical school and laboratories.

The impacts of the conflict on the eastern and western sides of Mosul are incomparable. Indeed, in terms of the level of destruction, it is more appropriate to speak of two cities. The distribution of debris across the city of Mosul is displayed in Fig. 92, showing a strong concentration in West Mosul, around 75 per cent of the estimated total debris (~8.1 million tonnes), and in particular in the Old City. The remaining 25 per cent (~2.7 million tonnes) is in eastern Mosul.³⁷

But the challenge is immense, especially in the west. To turn the gains of the military victory into stability, security, justice and development, the government will have to do everything possible to give the people back their lives in society and dignity.³⁸

Both for international cultural heritage and for Mosul's urban integrity, the destruction of the Islamic historic architecture in Mosul has catastrophic and irreversible consequences. Almost all of the city's architectural monuments that provided a formerly distinctive panorama have been demolished (e.g. the Mosque of the Prophet Yunus in Nineveh, the Shrine of Imam Yahya ibn al-Qasim, the Mosque of the Prophet Seth and the Mosque al-Khidr). Almost the complete complex of mosques and shrines established under the reign of Badr al-Din Lu'lu' (d. AD 1259) and embodying the 'Mosul School' of medieval architecture have been demolished. This collection offered a combination of Christian and Shi'ite architectural forms unique in the Islamic world. Several noteworthy examples of the rare Early Ottoman mosques (16th-18th century AD) have also vanished. The city, which was once one of the most appealing historical centres in the Near East, has lost many of the characteristics that generated its authenticity. In the continuous ideological conflict with local communities and



OLD BRIDGE

Disabled in December 2016

FREEDOM BRIDGE

Disabled in October 2016

FOURTH BRIDGE

Disabled in November 2016

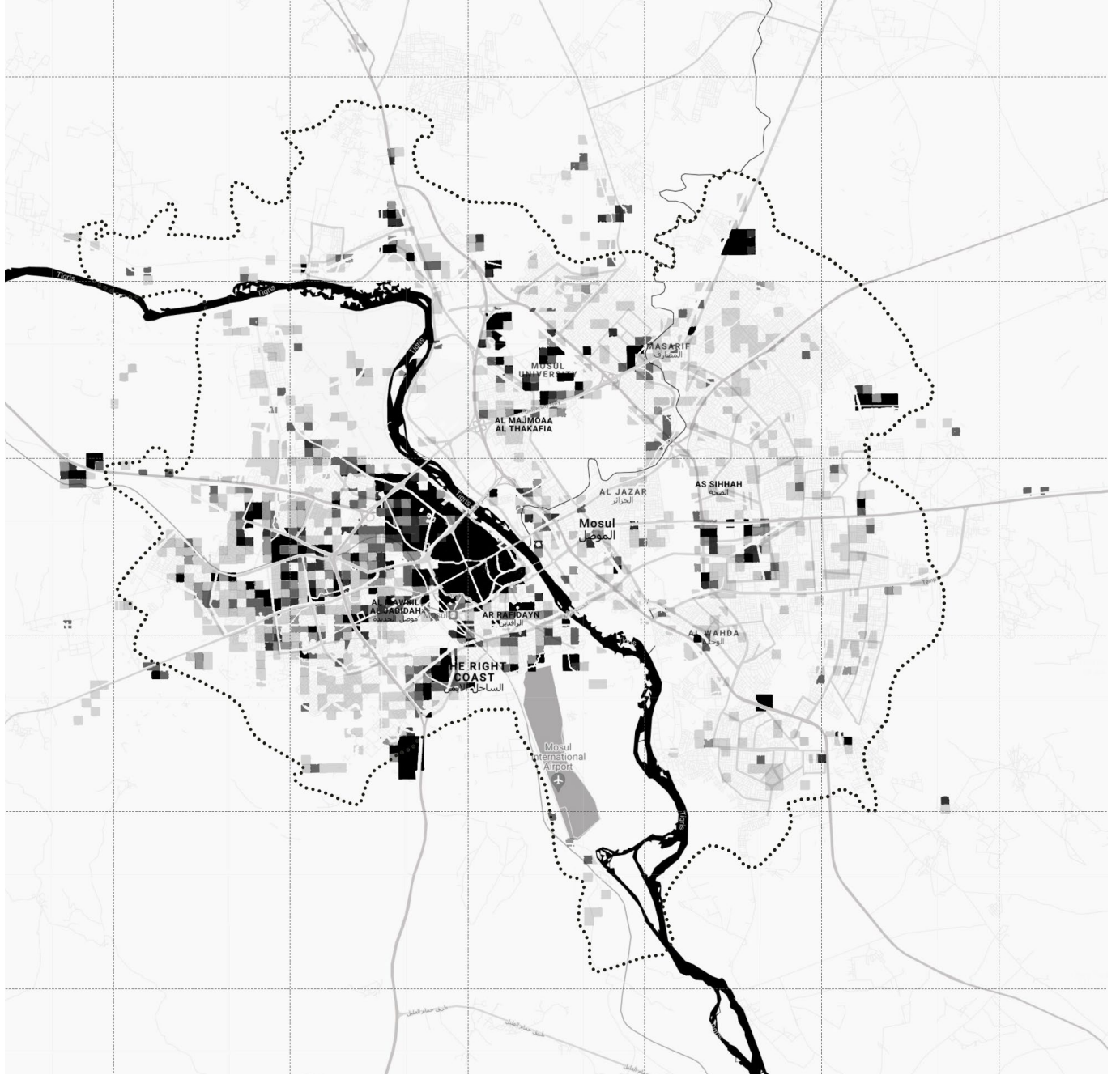
the broader world, the methodical demolition of graves and places of worship, which have been venerated for centuries, is employed as a tool of humiliation and cultural disintegration.³⁹

While rebuilding is likely to take years and billions of dollars, the Iraqi authorities are, for now, focussing on making the city safe enough for residents to go back. That means removing bodies, eliminating IS sleeper cells, criminal gangs and militias, reinstating essential services and clearing explosive devices. Months of heavy combat and airstrikes have littered the city with unexploded ordnance, including artillery shells and hand grenades. Large sections of Mosul have also reportedly been mined and booby-trapped by militants.

However, Mosul's physical needs are definitely not the only ones that must be addressed. More than reconstructing devastated buildings, bridges, and roads, efforts are required in the reconstruction of Iraqi society as

well. Communal cohesiveness and peaceful cohabitation coexistence among diverse ethno-sectarian groups are among the first casualties of armed conflict and the development of violence. The cases of sectarian and ethnicity-based injuries are more common. Nobel Peace Prize winner Nadia Murad, a member of the Yazidi community in northern Iraq, told an audience in Doha, Qatar, in December 2018: "The surrounding villages supported ISIS and said we were infidels and were a stain on our village and were not to be in Iraq."

People from the town of Tal Afar in Nineveh recounted as well positive stories about their pre-ISIS life with their neighbours and were unable to explain why everything fell apart upon the arrival of this terrorist group, and why their neighbours turned against them. These relations do not automatically return to the pre-conflict status quo. These communities need comprehensive reconciliation efforts to heal and to regain their mutual tolerance and coexistence.⁴⁰

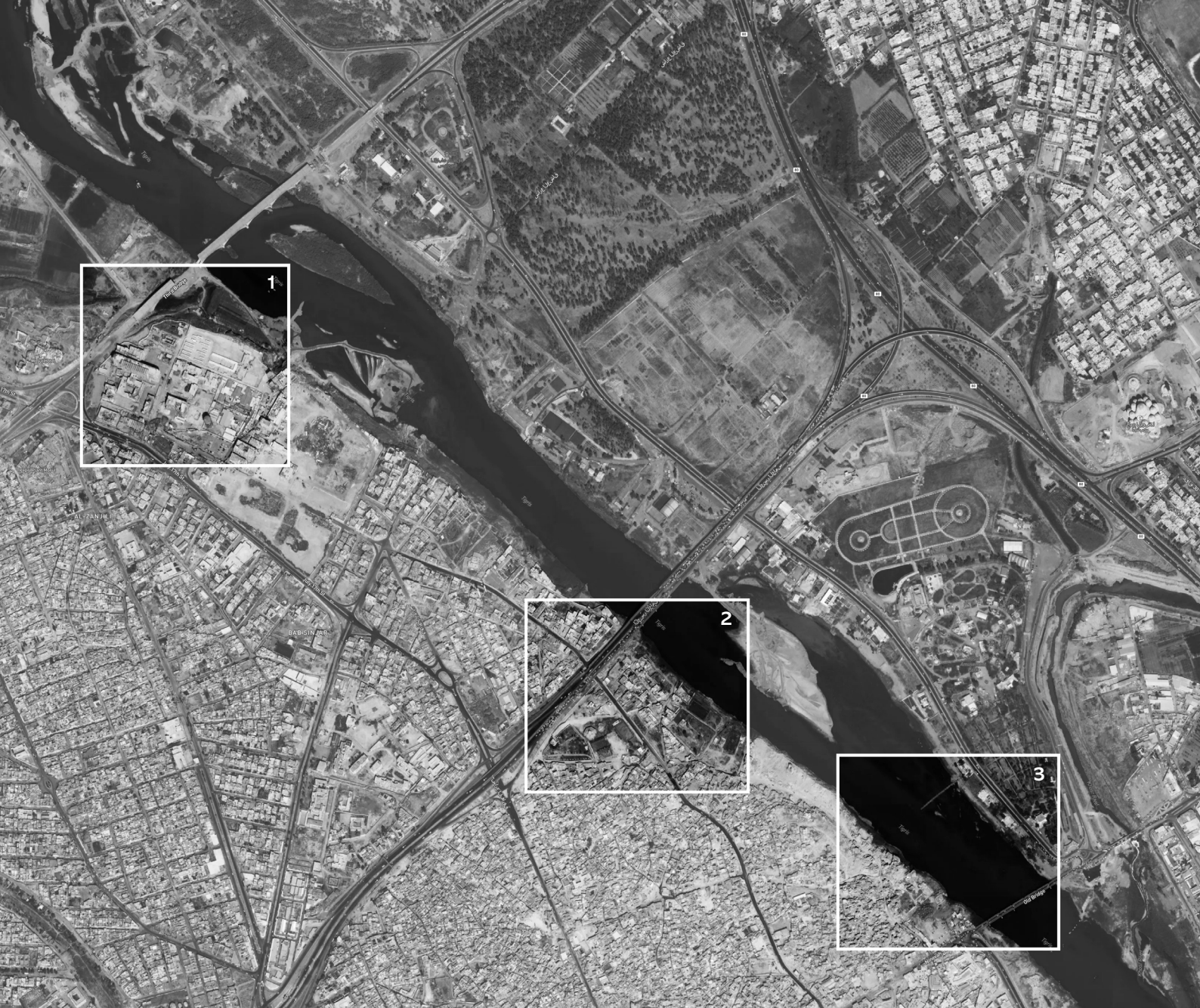


46 Mosul City | Debris assessment.
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47 Mosul Old City|Damage assessment map.
Retrieved from: UN-Habitat, 2019.



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Retrieved from: DigitalGlobe Satellite Imagery.

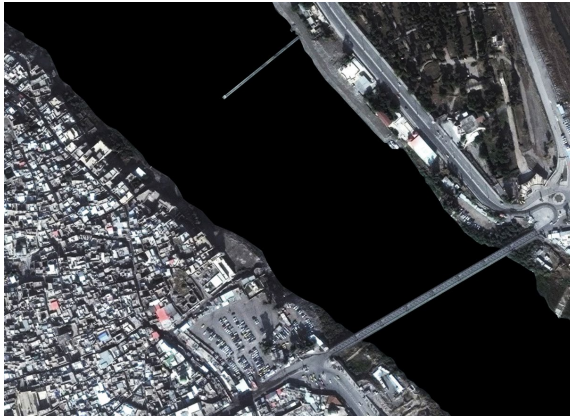
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METHODOLOGY



The destruction of cities during armed conflicts must be regarded as assaults not only on buildings and people, but also on memory, and in Mosul the annihilation of culture is certainly visible. War destroys memory, but it also creates it, and post-war urban reconstruction must deal with either addressing or removing these new memories. ¹

In the architectural field, the subject of reconstruction is crucial. The complexity of modern life, as well as changes in physical and climatic realities, necessitate ongoing involvements and improvements in cities. Every city in the world today displays the results of yearly rehabilitation projects. Cities nowadays are showing signs of losing their urban uniqueness in favour of the standardization of forms and spaces. As a result, the issues of how to convey the memory and values of places, as well as how to preserve the place's identity during the restoration process, are becoming increasingly important in contemporary debates. Establishing prior strategies for conveying the memory and values of these places becomes a necessary requirement for preserving and transmitting this intangible heritage.

The establishment of a new relationship between the new urban fabric and the historic one, between the urban fabric and monuments, and other aspects that characterize the settlement-related approaches of various contexts must be addressed by methodological design approaches used in architectural reconstruction or transformation processes of cities after armed conflicts.

"A city (especially a historic centre) contains the 'spirit' of a culture because it acts as a collective memory for its own society and it shows the attitudes and common patterns of life, hence becoming the source of identity. If the urban fabric is destroyed, the sense of wholeness disappears, especially in traditional Islamic cities, where single buildings were always conceived as part of a comprehensive fabric."

The instance of Le Havre in France (Sheet 01) is an interesting

example of deliberate reading and understanding of the urban structure followed by critical modifications and alterations. The former urban fabric and earlier volumetric compositions are used as models as well for the newly incorporated elements in Florence (Sheet 02). The precedents set the bar for subsequent designs that rigorously conform to them. Initially based on certain replicas, the goal was to reproduce rather than rebuild exactly what was existing before. The goal was therefore to reproduce the space where inhabitants might recognize themselves. The proposals, evoking the former cityscape in terms of volumetric arrangement, familiar typology, and shapes, but with the introduction of new modern design elements, were able to combine traditions with modern social aspects due to this refusal of "how it was, where it was" but accurate respect of the historical urban structure.

Moreover, an important example of the involvement of the community in the reconstruction process and management is represented by the case of Lebanon (Sheet 03). By the implementation of the CURE framework (Culture in City Reconstruction and Recovery), UNESCO and the World Bank are committed to placing culture at the heart of city reconstruction and recovery processes in the wake of crises. This is done by raising awareness of the value of culture and encouraging the integration of cultural heritage, creativity and diversity of cultural expressions into city reconstruction and recovery strategies and interventions.

Peter Eisenman's Romeo and Juliet project (Sheet 04) makes a substantial contribution to a remarkable architectural investigation process and design. The architect achieves a self-reflective project upon the meaning of complex concepts such as union, division, and their interrelation by using a succession of site scalings and formal registrations by means of markers in the existing cityscape. If built, the project would represent a physical fiction using more complex and less literal forms.

However, a valuable lesson can be learnt from one of the

first examples of architectural reconstruction in history: the Parthenon (Sheet 05). The building rises from the ruins of Athens in the aftermath of a great defeat against the Persians. As a result, the site is rich in memory and serves as a symbol of revival for the city, adopting a new architectural style which is an evolution of the previous traditions.

Its accomplishment in overcoming supposedly insurmountable challenges using previously unproven natural methods, as well as the undeniable visual power of the resulting forms, make New Baris a valuable lesson for all architects (Sheet 06). The architect chose natural systems as the constructive impact on the new town, due to the arid climate and necessity for cold storage of the community's fruits and vegetables prior to shipping and the difficulties of supplying air conditioning. Moreover, particular attention was given to analysing and preserving the area's architectural formal traditions. Another essential lecture can be extracted from the urban settlement developed in Algeria (Sheet 07), which highlights how the elementary qualities of the city can be manufactured into the design. The analogy is evident in the treatment of urban space, by means of using the same type of approach for both ground and facades, the establishment of a continuous sequence without rupture, and by the sophisticated use of hierarchy which incorporates both the dimensional contrast and the centrality. Furthermore, the play of shadows and lights, the materials and elements of the facades, the decoration, all make a significant contribution to the overall balance of volumes, harmonies, and contrasts.

Lastly, a significant study and attention were given to the concept of memory preservation through museums and memorials, in order to transmit the history to future generations while also allowing people who are directly connected to a traumatic event to find peace and regain dignity. The National Museum of Roman Art (Sheet 08) is an excellent example of honouring the past by means of appropriate architectural design. Large arcades of modest, semi-circular arches combine

historicity and contemporary design to provide a stunning yet delicate and respectful point of access to the ruins of one of the Roman Empire's greatest cities. A subterranean space under the ground level immerses visitors in an immaculate Roman-era excavation of the old city, allowing the museum to preserve and exhibit the site's antiquities while also interpretively reproducing its architectural traditions.

The World Trade Centre memorial (Sheet 09) dedicated to the commemoration of the victims and those involved in the rescue and recovery efforts following the Twin Tower's destruction combines landscape design together with architectural forms to give shape to an incredibly peaceful environment. White oaks fill the Memorial plaza while waterfalls are used to mute the sounds of the urban life, emphasizing the site's introspective nature. The towers were rebuilt anew on a different location in order to preserve the memory of the tragedy, living space for the symbolic reconstruction of the footprints where they stood before the destruction.

A final contribution is represented by the memorial to the abolition of slavery in Nantes (Sheet 10). With its beautiful spacing and clean lines, the memorial consists of a long compact chamber that reflects the very narrow ships used to transport slaves throughout the Middle Passage. By doing so, the architects were able to create something more sophisticated on the urban landscape in the form of a private, instrumental representation of an African symbolism: the Kalunga line, part of the KaCongo-Bantu spiritual tradition. The Kalunga line marks the boundary between the living and the dead and separates the past from the present. By its location along the river, water being the one leading to both physical and social death of enslaved Africans, the memorial becomes particularly meaningful.

01 | LE HAVRE, FRANCE 1946, Auguste Perret

At the end of World War II, Le Havre was recognized as the most severely destroyed city in France and the most heavily damaged port in Europe. Nonetheless, its reconstruction is notable for its unity and integrity, as well as being a milestone in the integration of urban planning traditions and a pioneer in the application of modern architecture, technology, and town planning.

Auguste Perret blended the reflections of the previous urban fabric with new concepts in town planning and building techniques, with particular use of prefabrication and a modular construction grid. Two pre-existing main axes have been preserved, and the new modular grid is built using pieces of the historic urban fabric and isolated structures that have been saved from demolition.

“The main remaining routes that create the basis of the axis and frame the general layout.”²

Pursuing the objective of combining a new urbanity and monumentality essential for the port city, Perret’s team was able to adapt the town’s urban fabric to the new demands while not totally disregarding the historical component of the town’s development. The core of Le Herve has grown into a magnificent monumental city marked by the equilibrium between architectural entities and public spaces. From the experience of Le Havre, a new concept is emerging: the idea of enlightenment on the organization process of city planning as a single process of cascade design, starting from urban requirements to interior constructive and formal elements.³



01 Le Havre City | Aerial view of the city in 1939.
Retrieved from: P.K.M. van Roosmalen, 1998, p. 266.



02 Le Havre City | Postwar reconstruction plan for Le Havre by Auguste Perret, 1946.
Retrieved from: P.K.M. van Roosmalen, 1998, p. 268-269.

02 | FLORANCE, ITALY 1950's

Florence was not subjected to systematic bombing, but the Germans caused significant damage at the end of the war when they decided to destroy five of the six bridges over the Arno (sparing only the Ponte Vecchio) and establish clear 'fields of fire' on each side of the river in the old city. A long dispute regarding the style of reconstruction in Florence took place within a wider Italian debate about recovery in a planned versus a free-market economy. Some argued that the demolished buildings' exteriors should be restored as replicas of what had existed before the war, while others contended that such a precise restoration would be a kind of fakery and fraud, causing inhabitants and tourists to doubt the city's legitimacy and authenticity. ⁴

In the end, a compromise was reached: one of the bridges, Santa Trinita, was rebuilt following its historic appearance but using traditional materials, otherwise, the majority of the reconstructed buildings were new but designed in a style intended to harmonise with the old. The definitive project considers as well several corrections, such as removing the traffic in the north-south axis in anticipation of pedestrianization. The building mass is structured in such a way that the long continuous building curtain along Por Santa Maria street is restored, while the new structures around S. Stefano's church and other locations re-establish and restore the original spatial equilibrium.

The space between the buildings is one of the architects' focal areas in their quest to recreate the city's traditional atmosphere and experience. The relationship between heights, volumes, enclosures is also maintained in the new proposals. Traditional and modern social features were merged, recalling the former cityscape in terms of volumetric composition, recognizable typography, and forms, but with the addition of new current design elements.



03 Firenze City | Plan of the areas foreseen by the reconstruction.
Retrieved from: E. Morici, "The Reconstruction: A Missed Opportunity", *Arte e Arti* (January 2011), http://www.arteariti.net/magazine/articolo/la_ricostruzione_un_occasione_mancata/.



04 Firenze City | Definitive project.
Retrieved from: *Il Piano urbanistico Comunale*, Edizioni dell'Autonomia, Roma (1979).

03 | TRIPOLI, LEBANON

2005 - 2016, UNESCO, World Bank

The Cultural Heritage and Urban Development (CHUD) Project in Lebanon was implemented in the aftermath of the civil war, in a context of fragility and violence, with the purpose of protecting, rehabilitating, and revitalizing the quality of urban life of the local residents in and around the old city of Tripoli. ⁵

The instance of Lebanon demonstrates how ancient landmarks, buildings, and marketplaces may help foster urban regeneration and cohesiveness among various factions of society. Culture and heritage could become the common factor to restore peace and bring together conflicting groups. The Framework places culture at the core of rebuilding and recovery processes by integrating cultural heritage and creativity at the basis and junction of place-based and people-centred policies. People-centred methods promote community ownership and social inclusion, improve the livability of the built environment, and expedite the socioeconomic recovery of cities, whereas place-based strategies focus on the reconstruction of physical assets.

The supervised construction contracts included Souks rehabilitation, comprising infrastructure and shops and upper floors facades; improvement and landscaping of Burtasi Mosque courtyard; painting of Facades; three residential buildings to house displaced Khan-al-Askar squatters; rehabilitation of historic Khan al Askar caravan serial. ⁶

The sense of identity, the sense of place, was constantly aiming the process, with a place-based approach the centre of the interventions engaging the community in the design, implementation, and even in the monitoring. Parts of the city have been regenerated and restored, resulting in more inclusive communities. The concept connected public space, cultural heritage, and private business to create a space for inhabitants to live and enjoy.



05 Tripoli City | View of the city on the Nahr Abu Ali in its post conflict conditions and after the Cultural Heritage and Urban Development (CHUD) project interventions.

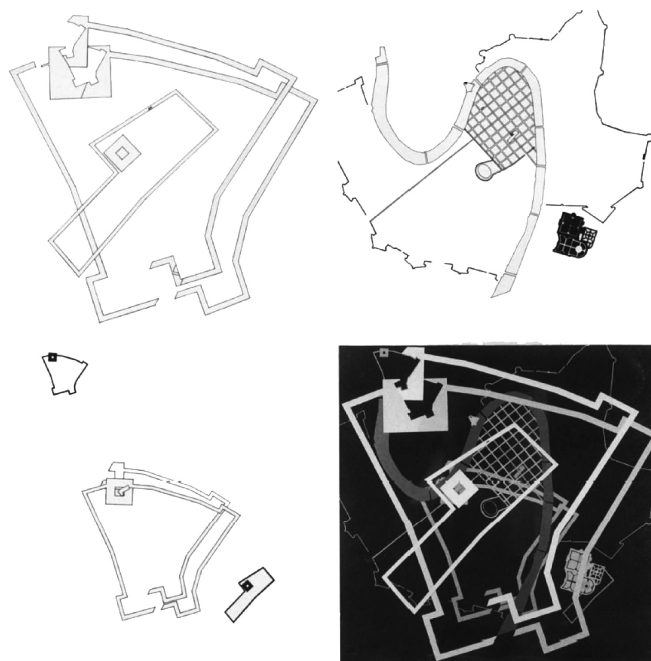
Retrieved from: Team International website: <https://www.team-international.com/projects/the-cultural-heritage-and-urban-development-chud-project-supervision-of-construction-contracts-for-urban-development-conservation-and-engineering-study-for-traffic-and-road-improvement-i/>.

04 | MOVING ARROWS, EROS AND OTHER ERRORS 1985, Peter Eisenman

The project is Eisenman's entry for the 4th International Exhibition of Architecture for the Biennale of Venice '85. The given site is in Verona and the castles of "Romeo and Juliet", and in his proposal, Eisenman rewrites the three Romeo and Juliet texts in a new textual and formal narrative. Its conceptual framework and representational format, which consisted of a collage of texts and drawings, were ground-breaking, and it represented a significant mental exercise in architecture.

Eisenman employed the "scaling" approach in his project, which involved selecting or isolating particular objects from their environment and transposing them to a new location with a different scale in contrast to the new setting. Scaling is not a metric for determining the position of any representation in reference to a known and fixed reality. By switching scales and by introducing fiction into real life through the device of scaling, By altering scales and using the mechanism to introduce fiction into the real world, Eisenman achieved a sequence of juxtapositions that, if erected, would act as subtle reminders in a city. The question revolves around the concepts of presence and origin. The quality of spaces in the two cities Montecchio and Verona are juxtaposed with the fictional narrative of Romeo and Juliet, and by treating "the site" as non-static by considering it as both a palimpsest and a quarry, holding traces of both memory and immanence.⁷

The notion of division that appears in all three texts is revealed in the first superposition. The walls of Romeo's castle are superimposed on the walls of Verona's ancient city, the three elements of the site of Montecchio are split in relation to the walls of the real castle of Juliet; a simulated Juliet castle falls within the walls of the actual Juliet castle, a simulated church falls within the walls of the real castle, and a simulated Romeo castle falls outside the walls of the real Juliet castle, thus the concept of division.⁸



06 Biennale of Venice | Peter Eisenman, the first superposition diagram.
Retrieved from: V.E. Koukoutsis, 1989, p. 41.

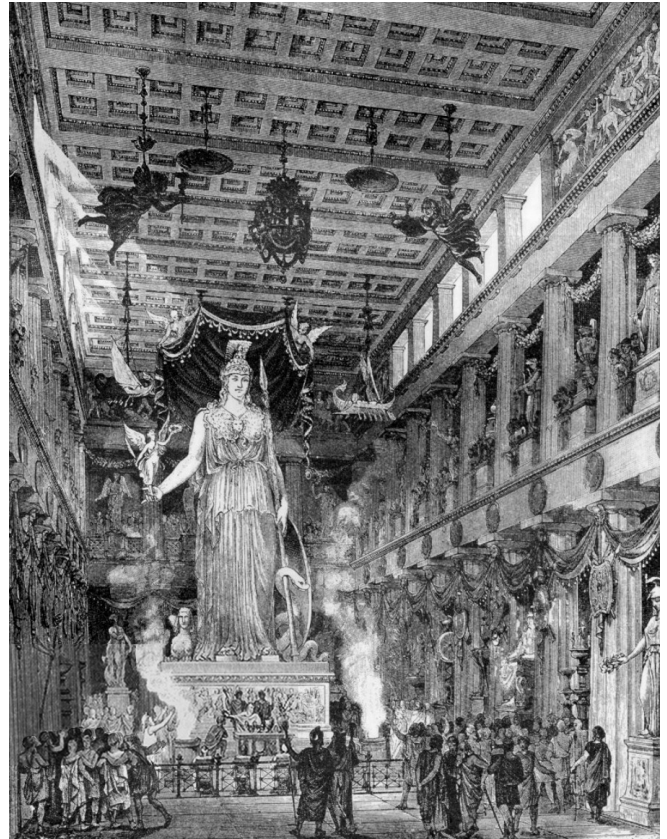
05 | PARTHENON

447 B.C., Ictinus, Callicrates, Phidias

The Parthenon can be considered the first and greatest European example of reconstruction. Built on the rubble of a great defeat the Athenians suffered at the hands of the Persians in 480 B.C., the Parthenon was part of an ambitious building campaign on the Acropolis that began around 450 B.C. and was completed by 438 B.C., when a massive gold-and-ivory statue of Athena Parthenos was installed inside. Its design is credited to two architects, Ictinus and Callicrates, as well as the sculptor Phidias.

For the Athenians, the Parthenon was a radical departure in religious architecture, combining architectural elements that had traditionally been kept apart. Its theological iconography, as well as depictions of human beings on its bas-reliefs, constituted a considerable change from the city's architectural tradition before the conflict and its destruction. Yet, in the way it was made, it provided to its viewers a constant reminder of that pre-war past, and of the devastations of war itself; it was a structure in which the present and the past entered into a dialogue. Most durable, if not necessarily great, buildings possess exactly this power of expressing differences of time in a dialogue, the departures of the present reflecting upon what existed before.

By expanding the scale, an unprecedented amount of sculptural decoration could be included. The columns support an entablature consisting of a plain architrave and a frieze of alternating triglyphs and metopes. Including a bas-relief frieze around the entirety of the temple's inner chamber (cella), an element more typical of the Ionic order, this was a radical departure from previous architectural tradition. The metopes depict scenes from mythic battles; gods strike down giants on the east front, Greeks triumph over Amazons on the west, Trojans on the north, and men fight centaurs on the south.⁹



07 Athens City | The great ivory and gold statue of Athena in the Parthenon, as it would have looked in the ancient times.

Retrieved from: J.A. Hammerton, A.D. Innes, 1908.

06 | NEW BARIS, EGYPT 1965, Hassan Fathy

In 1963, a large water source was discovered 60 kilometres south of the Kharga Oasis. This remote and forbidding wilderness outpost, located near Egypt's geographic centre, was designed to house 250 families at first, with more than half of them intended to be farmers and the remainder to be service personnel.

Fathy investigated the communities in the area in preparation for the design, where people were building their houses close to each other in order to shade the street, due to the climate conditions. In the project, he altered this technique by using a variant of the initial model to create a neighbourhood that is split apart and then rebuilt to preserve the inner rules. The basic model is compared to the reality of the location and modified, according to precise criteria that meet the intention of the project itself. Analogy is the tool that Fathy uses to assign a role to each architecture within the larger system. A similar process was adopted for the design of public buildings. The Souq is the epicentre of the project, together with other administrative and social buildings. These collective spaces are the consequence of topological operations, which gives shape to memory. In addition, the materials, construction, and technological selections have a similar relationship to their beginning models, as well as their interpretation.

"Baris was an interesting problem in which I was to create all the parts of a community, to bring together in the best manner possible people whom I did not know. All that I had at my disposal were demographic, geographic and climatic surveys. I had to provide the aesthetics, the sense of man in a space constructed by man."¹⁰

New Baris is an experiment in a community-oriented design as well as aesthetic investigation, using an almost unique material in a hostile universe for building naturally ventilated buildings.



08 New Baris City | Exterior view of the village in the desert.
Retrieved from: ArchNet, Built Environment of Muslim Societies.

07 | DIAR EL MAHÇOUL, ALEGRIA 1956, Fernand Pouillon

"A space is surrounded by walls, grass, trees, pavings. Everything takes on importance: materials, proportions of openings create the complement of an indispensable harmony. The architect, the urbanist, must think like a sculptor, not like a surveyor who distributes buildings alongside a street." ¹¹

In 1953, on the eve of the War of Liberation, Jacques Chevallier, the mayor of Algiers at the time, called on Fernand Pouillon to carry out large-scale housing projects for indigenous people in order to alleviate the country's socio-political crisis. The city, as a place of emergence of public space, will be at the heart of Pouillon's architectural dilemma. He saw the city as a network of public spaces, each with its own distinct characteristic that could not be synthesized in simple typologies. The architect's main concern was therefore to establish the proper link between buildings and public spaces, as each determined the other. ¹²

The Islamic traits were more strongly emphasized in the neighbourhoods , where the placement of blocks and the small apertures accentuate the image of a fortification, with a larger number of public squares, some of which were planted with palm trees.

To distinguish the market from the residential area, the architect employs the element of the arch, but in a less emphasized, less "vernacular" manner: it is a stylized low arch that stands on an orthogonal arcade. On the other hand, the church St.-Jean-Baptiste was placed in the European section.

Those who believed in the power of social reforms to overcome the problems France faced in Algeria applauded the proposal as well. "According to this view, Diar el-Mahçoul could even serve to pacify its inhabitants." ¹³



09 Algiers City | Picture of Diar el Mahçoul housing project from a brochure from the beginning of 1957 presenting the achievements of the Town Hall in the field of housing.

Retrieved from: Afrique Française du Nord 1830 - 1962; afn-1830-1962.jlbweb.fr/al_alger_1957.php?id=2.

08 | INTERNATIONAL MUSEUM OF ROMAN ART 1986, Rafael Moneo

In Emerita Augusta, archaeological findings revealed a great national treasure: a resettling site for troops released from the Cantabrian Roman wars in 25 BC. The entire site where the remains are located was once a major historical and cultural component of what Rome used to be. Rafael Moneo was therefore commissioned to develop the National Museum of Roman Art, with the primary goal of preserving the ruins while also connecting the museum to the theatre and amphitheatre.

“The task at hand was to build on what had been built on, to build a museum on a site densely occupied by ruins. A direct, immediate, and evident allusion to Roman civilization was practically inevitable, and it was clear that the most respectful way to coexist with the ruins would be by using the same means of construction and techniques that the Romans had.”¹⁴

The museum is built across the street from the theatre and is composed of a series of Roman brick arches. On the upper stories, a central space is surrounded by exhibition rooms on the sides. Above the narrow brick arches, integrated skylights allow the filtration of natural light, which blends with the brick material to create a natural glow. Visitors approach the Roman-era archaeological section of the city through an underground space that feels like a cellar. The arches are modelled after the brick arches of the old Roman Theatre, which served as a major inspiration for the museum’s design.¹⁵

The most crucial aspect of the project is the use of materials. A single material was created to meet the requirements of both context and space. Under the dramatic natural lighting, the entire composition of thin, long brick walls, columns, and arches creates an atmosphere devoted to simplicity and magnificent work of art.



10 Mérida City | Picture of the international museum of Roman Art portraying the main hall.

Retrieved from: Michael Moran, OTTO; rafaelmoneo.com.

09 | 9/11 MEMORIAL AND MUSEUM

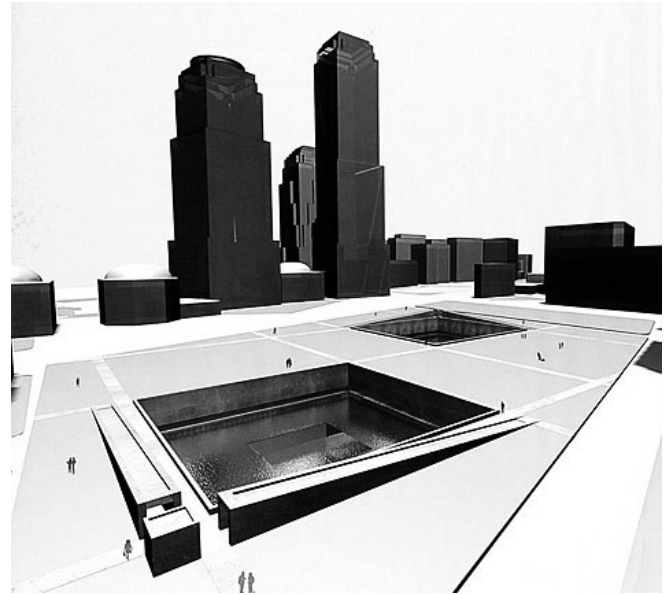
2006, Michael Arad, Peter Walker, Davis Brody Bond, Snøhetta

The memorial was erected to commemorate the September 11, 2001 attacks, which killed 2,977 people, consisting of a simulation of the two towers' foundation holes being rebuilt, as well as the names of the victims engraved on the surrounding walls.

Reflecting Absence, designed by architect Michael Arad and landscape architect Peter Walker, was named the winner of the LMDC's design competition in January 2004. The footprints of the Twin Towers are made up of 4,000 m² pools with the largest man-made waterfalls in the United States, symbolizing the loss of life and the physical emptiness created by the attacks. The waterfalls are meant to drown out the sounds of the city, creating a contemplative sanctuary. White oaks were planted in numerous areas of the memorial by landscape architect Peter Walker. ¹⁶

Designed by Davis Brody Bond, the museum is about 21 m below ground and accessible through a pavilion designed by Snøhetta. The National September 11 Memorial Museum encloses 10,000 m² of publicly accessible space. The pavilion has a deconstructivist design, resembling a partially collapsed building (mirroring the attacks), and houses two "tridents" from the Twin Towers. One of the museum's walls is an exposed portion of the slurry wall that kept the Hudson River safe during the September 11 terrorist attacks. In the museum, about half of what Daniel Libeskind wished to keep of the wall is visible. ¹⁷

The tower is built anew on a different site, so as not to erase the scene of destruction.



11 New York City | Original Michael Arad design board submitted in the World Trade Center Memorial Design competition.

Retrieved from: Matt, "Holiday Reading (Part 2): Michael Arad", Arkhitekton (December, 2007): <https://arkhitekton.net/2007/12/29/holiday-reading-michael-arad/>.

10 | MEMORIAL TO THE ABOLITION OF SLAVERY 2011, Krzysztof Wodiczko, Julian Bonder

In the eighteenth century, the river port of Nantes was a main departure point for French slave-trading expeditions. A good part of the city's wealth derived from this cruel activity and is displayed in the sumptuous palaces constructed by families engaged in the trade. The City Council earmarked seven and a half million euros for the transformation of the Quai de la Fosse into a space devoted to reflection on this history of slavery, the commemoration of its abolition and making known the ongoing struggles against present-day forms of slavery. The intervention also aimed to improve the city's relationship with the river.

"The transformation of a space which is currently 'empty' into a 'passageway' provides a link with the ground under the city of Nantes, on both sides, land and sea..."¹⁸

An open-air car park has been transformed into a riverside walk of some three hundred and fifty metres in length. The ground-level path offers access to a lower level where the pre-existing triangular-shaped spaces have been protected from rising river waters by means of a waterproof concrete basin. The resulting space is a gallery of trapezoidal section which evokes the hold of a slave ship, a cramped effect that is reinforced by the narrowness and partially submerged position of the gallery. This significant coincidence adds to the spirit of the Memorial gallery, which includes an information area as well as an exhibition space dedicated to the history of slave trading and various anti-slavery movements up to the current day. The museum facilities are complemented with the exhibition rooms of the recently refurbished Château des Ducs de Bretagne and organised tours through the city showing, among other features the luxurious residences of the old slave traders.¹⁹

Nantes has been given a public place imbued with ethical awareness as a result of this intervention, which brings light on one of the city's most deplorable moments.



12 Nantes city | Picture of the memorial chamber framed by massive glass panels on one side, and stone walls that allow the view of the Loire River on the opposite.

Retrieved from: Memorial to the Abolition of Slavery website: <https://memorial.nantes.fr/en/>.

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PROJECT PROPOSAL



RECOVERING IDENTITY

"A war that is destroying a city somewhere else is destroying a part of civilization, and therefore is an attack on cities everywhere." ¹

The built environment becomes both the means of violation and a source of evidence that can witness to the events that tore it apart. Too often, these structures or ruins are considered self-evident testimony of atrocity. The rage and consequent violation of built form can be considered therefore a strike against collective identities, meanings, and memories.

Feelings of fear, emotions, memories of the past conflict, displacements of people, the quest for identity, all impact the perception of space and time in a post-war city like Mosul. The conflict established deep roots, consuming values and symbolic expression of the Maslawi people. This leads to feelings of vulnerability, weakness or powerlessness. It may also threaten traditional ways of inhabiting spaces, for example when a symbolic building is destroyed or when a targeted group is not allowed to access or use a space or to build a place according to their values and understanding. ²

This understanding of spaces and architecture is linked directly to the concept of identity. After a similar crisis, in a fragmented society, this search is connected to the notion of 'place attachment' and 'place making', with the struggle to re-own spaces and buildings and re-consolidate the identity of the territory.

The anthropologist Marc Auge' and the historian Pierre Nora introduced the concept of "lieux de me' moire", which translates into 'realms of memory': places of symbolic value which form a constitutive element of the identification process. ³ The collective memory not only draws a link between individuality and community but also between past and present, dead and

alive, explicit and implicit, in and out. Space representations, and particularly of spatial boundaries, helps in defining the identity of a group and differentiate itself.

What else but destruction can arise from war?

The concept of 'urban vandalism' roots from Polish-Jewish lawyer Raphael Lemkin, who created the term 'genocide' during the Second World War. Lemkin described what he called "offences against the law of nations" using two interlinked concepts: 'barbarity' and 'vandalism'. Furthermore, barbarity became the core of the notion of genocide, while vandalism became primarily the act of "systematic and organized destruction of the art and cultural heritage in which the unique genius and achievement of a collectivity are revealed in fields of science, arts and literature". ⁴

Unfortunately, the notion of 'vandalism' was not introduced into the Genocide Convention, although international criminal law has since incorporated 'the destruction of cultural heritage' into the understanding of genocide. The UN Tribunal for ex-Yugoslavia noted that "where there is physical or biological destruction there are often simultaneous attacks on the cultural and religious property and symbols of the targeted group as well, attacks which may legitimately be considered as evidence of an intent to physically destroy the group". ⁵

The concept of eradication can be understood and identified in the act of full destruction of buildings, as well as in changing their function or appearance. In every case of symbolic violence, the dehumanisation of individuals is followed by an anthropomorphic attitude towards architecture, that sees buildings as something that can be 'wounded' or 'humiliated', as a way to achieving an offence and violation on people themselves: for example, a symbolic building transformed in a



01 Mosul Old City|The Al-Hadba' Minaret and the Great Mosque of al-Nuri after the explosion caused by IS militants. Photographer Fadel Senna, 2017.
Retrieved from: Getty Images.



02 Mosul Old City | Children returning to school despite the destruction, Moyasser Nasseer, 2018.
Retrieved from: Al-Ghad Radio collection.

stable or used as latrines or place of torture. Cultural cleansing gives permanence to ethnic cleansing, being "directed at collective memory, shared history, attachment to place and the built environment."⁶ This leads to the notions of ethnocide, *spaciocide* and *urbicide* developed by a number of authors including the architect and former mayor of Belgrade, Bogdan Bogdanovic, who defined *urbicide* as an "attack on the human and inert fabric of the city with the intent of destroying the civic values embodied within it".⁷ To these must be added the confiscation of land, destruction of outlook and views, closure and construction of enclaves, denial of privacy and destruction of landscape.

The attack of Mosul's urban fabric, the destruction of architectural symbols, residential houses, and public spaces, the slaughter of its citizens and subsequent displacement, all of it was an attack on the identity of the city and Iraq itself. With these considerations in mind, the quest for reconstruction and recovery of the city's urban integrity and people's dignity displays significant challenges. Reconstructing normality becomes a delicate issue, but is something that can and must be done using a proper conscious approach.

"Protecting the diversity and history of the Old City is the only way to maintain trust among its people. How can you convince a Christian to return to Mosul if their heritage is being obliterated?"⁸

The process of preserving and maintaining the urban environment and cultural heritage is intrinsically linked to solving the post-war crisis and ensure a future for the region and its economic growth and stability.

"As a result, planning is being required to preserve and promote cultural heritage, tangible and intangible, of the communities living in cities, since heritage has been recognized

to have a role in shaping the city's identity".⁹

This statement emphasizes the importance of cultural heritage regeneration as a means of restoring a city's unique and distinguished identity. Architecture could bring great positiveness and benefit to a devastated Maslawi society. Architecture can become symbolic and powerful, offering the opportunity to confront history instead of neglecting it. Architecture can contribute to creating spaces and places for everyone, and not only for the elite. The reconstruction in Mosul has to be done for Moslawi people, looking towards expressing Iraqi identity through architecture, architecture that can bring a sense of social justice and cohesion. Rebuilding a city for everyone.

PROJECT SITE

Substantial areas of the Old City have been damaged to such an extent that they will require extensive rubble clearance. Most importantly, these areas contain historic structures with a high heritage value that need to be protected from further destruction, while completely destroyed areas that have already been cleared should be protected from the uncoordinated reconstruction. Although the concept may appear redundant, it is presently posing a real threat towards the preservation of the most representative historical area of Mosul.

The Al-Maidan neighbourhood along the riverfront was the most severely affected by the conflict and thus subjected to the most radical reconstruction planning (Fig 03). The preservation of heritage elements and safeguarding of the cultural identity is of national importance ¹⁰ nonetheless, the residents claim that the area is at risk of losing its historical identity as a result of the new proposal by local authorities to transform the area into a "modern city." ¹¹ The plan aims at revamping the historic neighbourhood along the west bank of the Tigris River, which as previously mentioned consists mostly of ravaged souqs, medieval churches, centuries-old mosques, homes and schools, into a modern investment hub. Mosul Governor Mansour al-Mar'eed together with unidentified investors, devised the plan with the aim to create a new metropolis with gleaming high rises, and large supermarket and restaurant chains.

"The next generation won't even know what Mosul looked like." ¹²

The urban identity of Mosul is part of the cultural identity of the Moaslawi society, and a city identity is necessary and essential in preserving harmony and giving people a sense of belonging. Mosul's riverfront represents the most ancient part of the city, with a unique urban panorama and distinctive skyline. The near-water region of Mosul witnesses historical memories

and displays extensive heritage aspects, forming a composite integrated structure that is strongly linked with the typical running of the cities activities. The issues and opportunities of Mosul historic waterfront are unrivalled and pose unique planning and management challenges which nonetheless seeks for integrity and preservation of its characteristics and individuality.

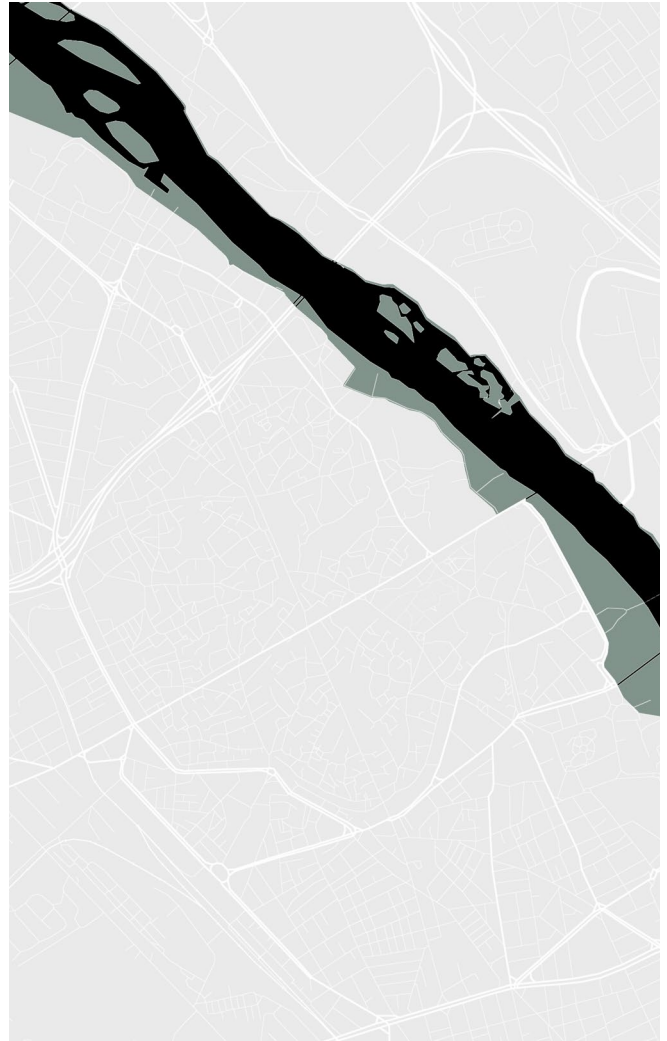
Therefore, the relationship between the structure of Mosul city and its riverfront is regarded as a major criterion in evaluating the most suitable location and approach for this thesis reconstruction project, aiming to formulate a proposal specifically for the urban regeneration of the riverside area of Mosul's Old City, in order to achieve urban sustainability after the devastation together with the conservation of the main features of the urban scene. Protecting the heritage is a priority, as much as its redevelopment and integration with new urban functions and utilities that can meet the needs for recreation, support collective memory, and offer an opportunity for future economic development.

Moreover, the Tigris River and its riparian ecosystem represent a fundamental component of the ecology of Mosul. The river has an ecological role in order to facilitate the movement and migration of species along a north-south axis within the territory where fragmentation, isolation and barriers take place. These considerations delineate the need for a regeneration project which implements ecological preservation of the city's green infrastructure alongside the historical one. Such a goal can be accomplished by designing recreational areas and tree-lined walking paths in order to create an aesthetically pleasing old town waterfront while also protecting the environment by acting as a natural filter against urban activity disturbances. Before the crisis, there were several tourists sites along the river, with cafes, parks and sports grounds lining the waterfront. Some of the

small islands and mudflats in the river were reachable by boats or pedestrian bridges, where residents of Mosul had access to recreational facilities as well. The river banks of Mosul Old City have a major social function for Maslawi people, representing an important active component of their public daily activities. Therefore, the regeneration of the urban fabric may start with a preliminary regeneration project of one of the city's most important actors: the Tigris river.

Furthermore, some areas are prone to flash flooding due to a lack of an adequate storm drainage system. Flooding is particularly severe in the low-lying areas surrounding the old city, which may restrict accessibility to the Old City. The design of green areas with a distribution of plant species that can absorb heavy rainfall can reduce downstream flood levels and help the soil to absorb more water. The creation of natural barriers, like a grove of reeds or tree-lined areas, can effectively reduce the severity of flooding. Moreover, trees can reduce geomorphological instability and slow down erosion phenomena. Most of the hydrophilic species that are typical of the riverbanks and levees, absorb a lot of water in case of flooding and their roots strengthen the shore. A key factor is the use of diverse and mixed vegetation. The design of a green corridor along the banks of the Tigris river will also contribute to the purification of the water that has been contaminated by excessive levels of pollution, as well as the regeneration of Mosul's damaged ecosystem.

This area has significant potential for development. The Mosul section of the Tigris River can become an important project that combines tourism, environmental management, and various investment possibilities for public facilities while maintaining local identity (Fig 03). In particular, promoting sustainable tourism will allow citizens to fully enjoy its public green space.



03 Mosul Old City | Project location map.
Retrieved from: Made by the Authors.



- 1 Shrine of Imam Yahya ibn Al-Qasim
- 2 Mosque of Imam Muhsin
- 3 Chaldean Archdiocese
- 4 Mosque
- 5 Shrine of Imam 'Abd-Rahman Madrasa Al-'Izziya
- 6 Cemetery Oman al-Zubaidi
- 7 Mosque and Tomb of Isa Dadah and adjacent Cemetery
- 8 Church Mar Korex
- 9 Chaldean Church Mar Isho'yab
- 10 Mosque Al-Adhiban
- 11 Mosque of Mahmud ibn 'Abd Al-Jalil

- 12 Mosque Al-Maadid
- 13 Chaldean Church Mar Isho'yab
- 14 Takiya and Tomb of Muhammad al-Afghani|Mosque of Shaykh Al-Shatt
- 15 Mosque Al-Makkawi
- 16 Mosque of al-Sab'awi
- 17 Mosque of Al-Kawazin
- 18 Mosque Ras Al-Kour
- 19 Mosque and Srine of Imam Ibrahim
- 20 Mosque Shatt Al-Jumi Tomb of Shaykh Ibrahim
- 21 Mosque Al-Mussafi

- 22 Mosque and Tomb of Nabi Jirjis (Prophet George)
- 23 Catholic Church Syrlac
- 24 Mosque of Abdal Rahman
- 25 Mosque of Al-Khalal
- 26 Mosque of Hamu Al-Qadu Tomb of 'Ala' Al-Din (Built in 1880|Destroyed during an airstrike on October 16, 2016)
- 27 Mosque of Al-Aghawat
- 28 Mosque Al-Khatoun
- 29 Mosque and Shrine of Awalad Al-Hasan (Bayt Shahidu)

- 30 Mosque and Shrine of Imam al'Abbas
- 31 Mosque of Mandrasa 'Abdal
- 32 Mosque Al-Basha
- 33 Mosque of Al-Khaidr (The Green Mosque)
- 34 Mosque Halabi
- 35 Castle Bashtabya
- 36 Castle Qara Serai (The black Palace)
- 37 Bab Al-Mashra
- 38 Christian Palace
- 39 Citadel Hammam
- 40 Monument Jug to Yunis Abn Yusuf



- 41 House of Ahmad Al-Yahya
- 42 House of Sharif al-Dabakh
- 43 House of Bashir Munir
- 44 House of Dawud Ishak
- 45 House of Hana Michel
- 46 House of Beit Hamushi
- 47 House of Qantarat Al-Jomard
- 48 School of Christian Priestry
- 49 Primary School of Al Manahil
- 50 Elementary School Al-Tahira
- 51 School Al-Sharqiya
(Built in 1920, one of the most prestigious schools in Mosul)

- 52 University Al-Hadba'a
- 53 Department of Arts
- 54 Museuh of Mosul
- 55 Police Station Al-Saray
- 56 Arboretum
- 57 Basin of Sulfur
- 58 Hospital for Children
- 59 Nineveh Health Centre
- 60 Auditorium City Hall
- 61 Mosul Amusement Park
- 62 Public Baths
- 63 Football Arena
- 64 Municipality Square

- 65 Market Al-Shaareen
- 66 Market Al-Saray
- 67 Market Al-Arbea's
- 68 Bus Station
- 69 Area of Total Destruction
during the fightings of 2017

	Good Conditions
	Ruined
	Razed
	Monuments

0 50 100 200 km

04 Mosul Old City | Map of the heritage along the riverside and respective level of damage.
Retrieved from: Made by the Authors.



05 Mosul Old City | Drone camera images capturing Al-Maidan neighbourhood's destruction, 2017.
Retrieved from: F. Dana, AP PHOTOS, Drone captures Mosul's destruction from above, AP News (July, 2017): <https://apnews.com/article/middle-east-collapse-of-the-caliphate-international-news-iraq-041bc87be41c43e5b0351f131169cdf0>



1301131

APPROACH

The work begins with the identification of physical, visual, socio-economic and spatial vocabularies from the architectural point of view of Mosul's urban fabric. As a result, a series of important axes emerged from the city structure, as Nineveh street which crosses the Old Bridge, and Azersjkan street which links the Al-Maidan neighbourhood with the Great Al Nuri mosque, reflecting the urban lifestyle of the Maslawi people. These streets were identified as focal points that will furthermore constitute an important element for the identification of the most suitable locations for public facilities (Fig 08).

Additionally, a broad examination of the city reveals that Mosul has very few public green areas. Mosul currently hosts 140 public green spaces, with a total of 141 ha, revealing a lack of urban infrastructure. There is a great need of restoring and enhancing public parks in the city, and the riverside offers high potentials for rehabilitation and the design of a green corridor that may serve as a symbol of recovery (Fig 09).

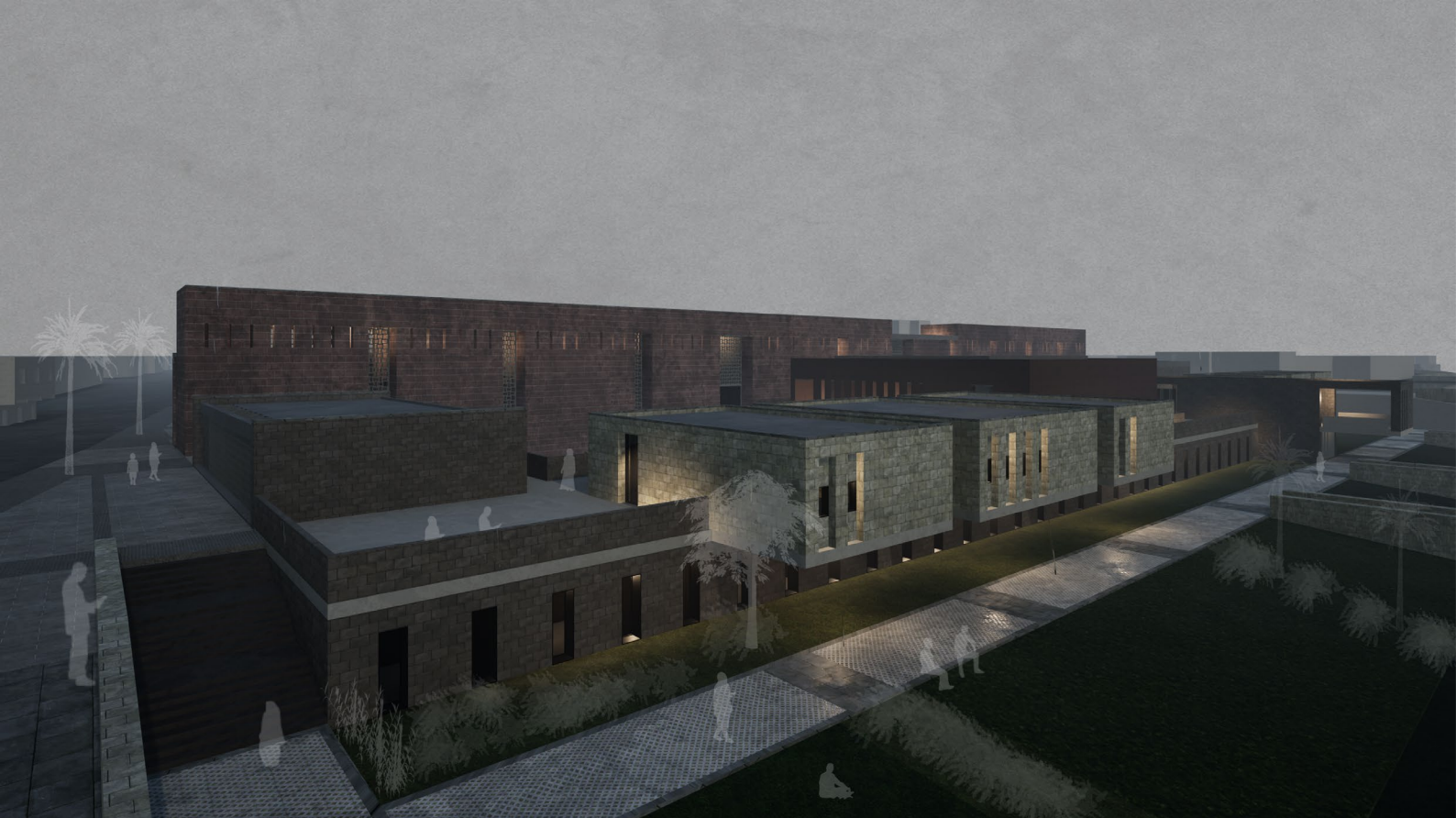
The riverfront is also characterized by vast empty spaces. With the accuracy and sensibility of preserving the heritage sites and historical valuable structures, a number of areas have been identified as suitable for the design of public facilities that can provide new activities for the city. The functions will be then linked together throughout the green infrastructure of vegetation and urban furniture, which intends to act as backbone structure on which the reconstruction of the city fabric may start. The term 'reconstruction' itself is considering nature as the main driving force, an organism in constant mutation that doesn't imply permanent obstructive structures, but rather evolves with the city itself inheriting its organic character (Fig 10).

Among the identified potential sites, one in particular has great strategic importance in terms of its position: the large car parking adjacent to the Old Bridge. Firstly, it has a significant value due to its location on Nineveh Street, identified as the

main commercial street in Mosul city Centre and one of the first and oldest streets, a landmark with physical, social-cultural and historical characteristics representing the character of Mosul City Centre.¹ Secondly, it is located in proximity to the Old Bridge which acts as a landmark itself, linking the two sides of Mosul. The plot is also close to the souq zone, an iconic marketplace that is rich with heritage values and may become a significant attraction in urban tourism. The desire to search for local food, traditional crafts and observing the locals way of life has always attracted people to visit local markets and bazaars. This point of intersection between such important symbolic elements of Mosul city seeks the need for an emblematic building, that can establish itself as a new monumental landmark.

The integrated proposed design harmonizes together infrastructure, landscape, and architecture to transform the waterfront of post-war Mosul into a new ecological corridor that anticipates the inevitable patterns of flooding of the Tigris River and establish a resilient, multi-layered public space for recreation and contemplation in the middle of the dense city centre (Fig 11).

The site is together waterfront and city, landscape and urban structure, division and integration. The city fabric is welcomed and gradually blended with the green ecosystem of the Tigris bank, creating an intertwined boundary between city and nature. The project is a sanctuary, with a diverse variety of trees, shrubs, plants and flowers from a range of local species that offers people space for tranquillity, space for contemplation, space for remembering the past and embrace the future.



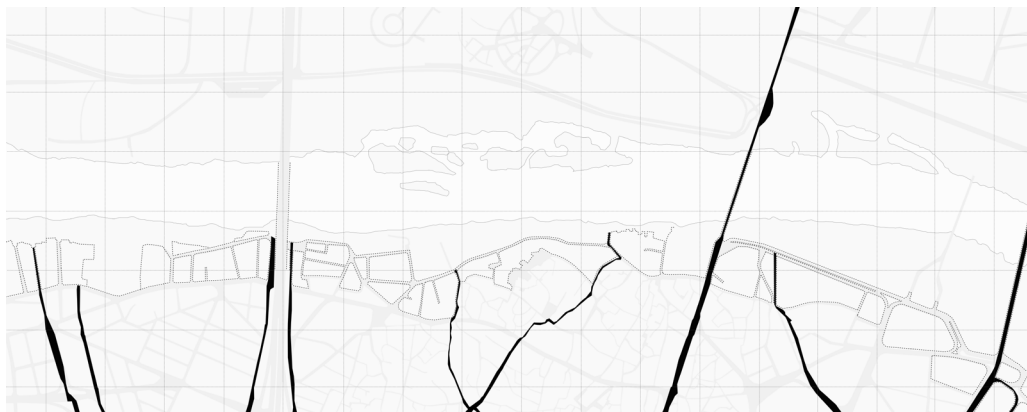
06 Urban Proposal | Riverfront promenade visualization.



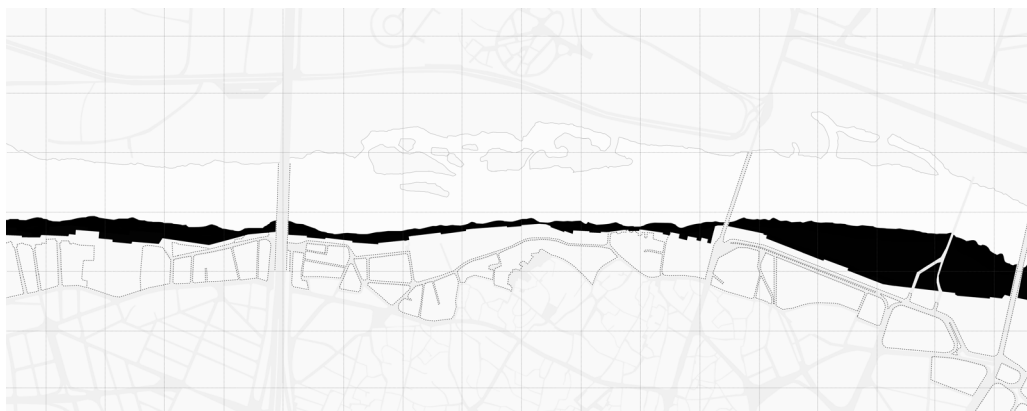
07 Mosul Old City | Collage of pictures showing the facade of the city on the riverfront.
Retrieved from: made by the Authors.

Old Bridge Area: suitable for the location of an emblematic building to represent and support the process of reconstruction.

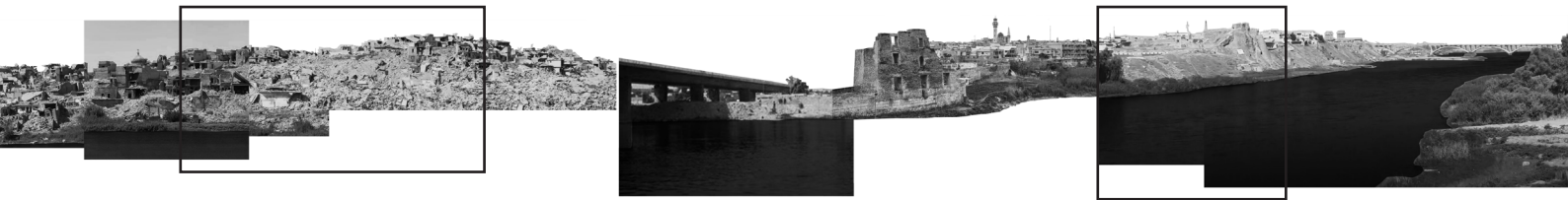
DESIGN CONCEPT DIAGRAMS



08 Important urban connectors.

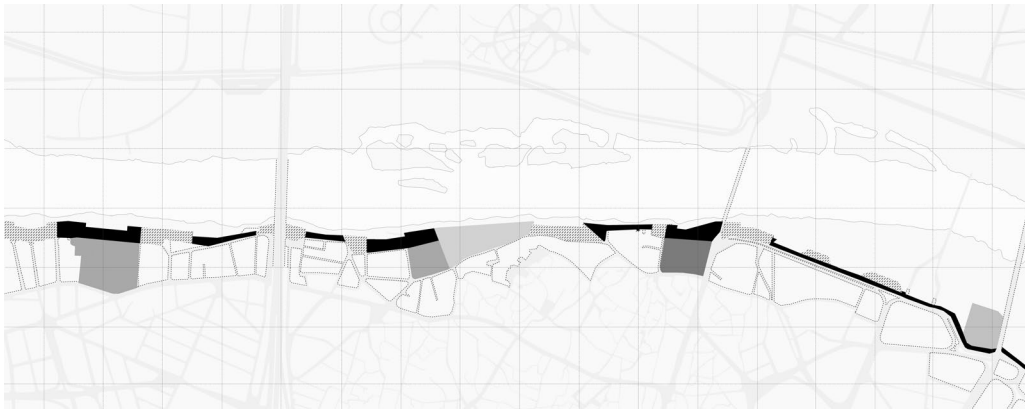


09 Tigris bank green corridor.

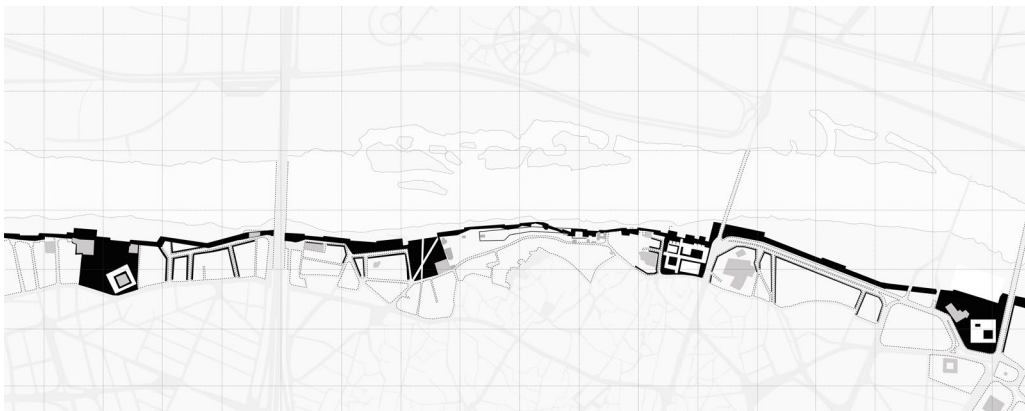


Area of Total Destruction: the memory of the tragic events that completely obliterated this portion of the city must be honoured. The residential dwellings are prone to be rebuilt anew, efforts should be therefore made to restore the Shaykh Al-Shatt Mosque following a subtle methodology that can ensure the preservation of the memory throughout a memorial.

Bash Tapia Castle: is in proximity to the medical district of Mosul and numerous schools, the location is calling for the establishment of a sustainable urban park that may provide space for recreation, children's facilities and the preservation of the ruins of the historic citadel.



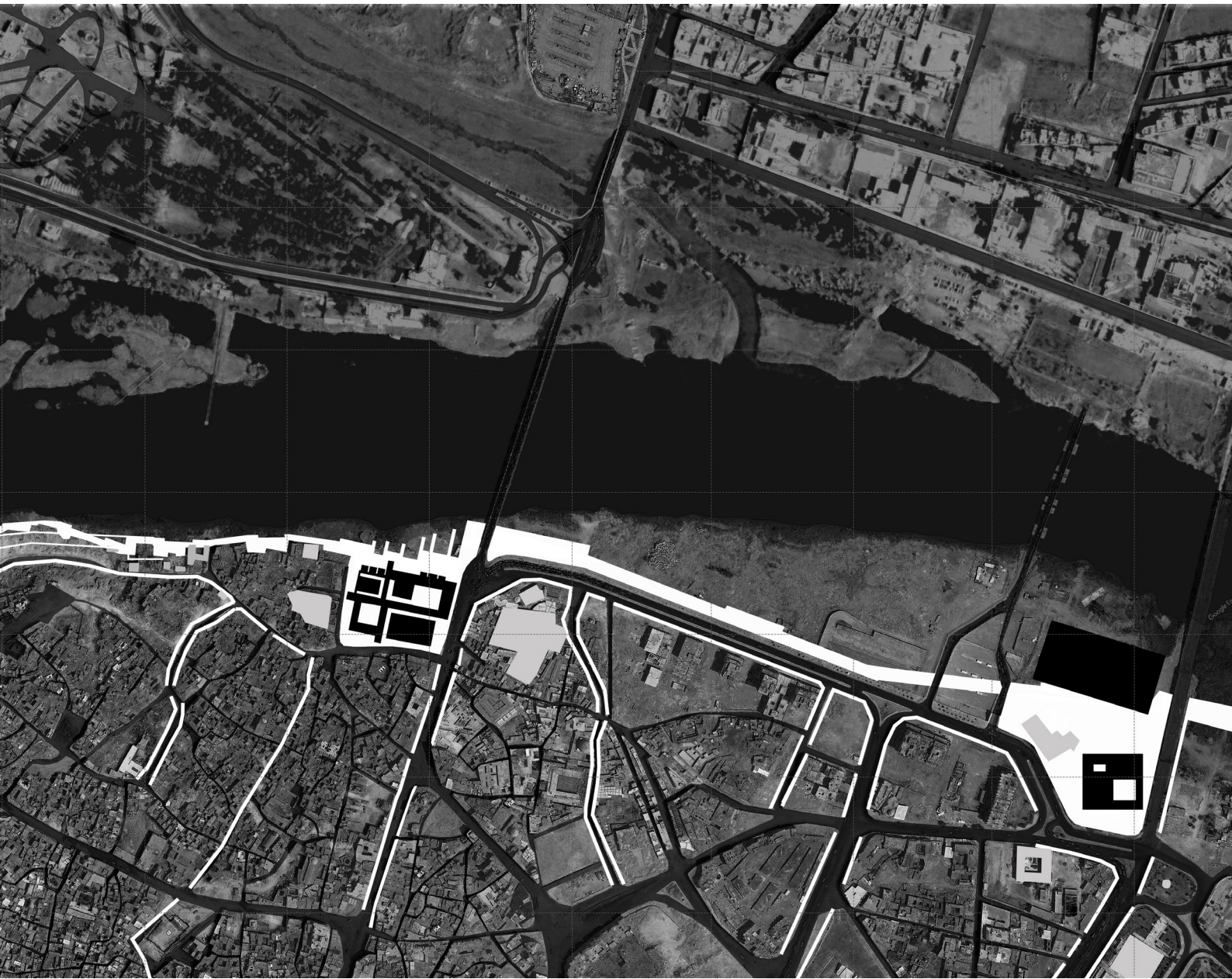
10 Proposed areas of intervention



11 Project development



12 Urban Proposal | Schematization of the area of intervention.



AIMS OF THE PROJECT

The vision for reconstruction was guided by the goal of achieving an exhaustive design, which translated into five principles:

- Principle 1: Create a memorable identity for Mosul's Riverfront. Offer people a monumental symbol that can return dignity to the mutilated Maslawi society and serve as a driving force for urban reconstruction.
- Principle 2: Preserve the identity of the city, by analysing and understanding its architectural and urban features and implementing the resulting physiognomy into the design process.
- Principle 3: Allow people to remember the tragedies of the war with intimacy. Offer a place for peace, for meditation and for the education of the past.
- Principle 4: Improve the quality of the riverfront by protecting and remediating the ecosystem of the Tigris River and promoting ecological diversity. Use landscape design to reduce the risk of erosion and flooding in flood-prone neighbourhoods and keep the river clean and pollution-free.
- Principle 5: Create a social active riverfront: parks, promenades and ghats to enjoy the water and revitalize the riverfront neighbourhoods. Public spaces are an entitlement of the community and a need for Mosul's neighbourhoods where outdoor facilities must compensate for the lack of social space in the private realm. Stimulate economic growth by means of public utilities and touristic attractions.



The ancient fortification wall



The riverside symbolic promenade



The architectural grid



The urban pedestrian promenade

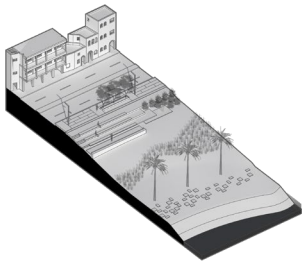


The secondary organic riverside paths

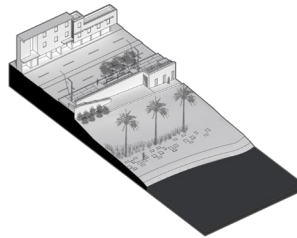


The green corridor

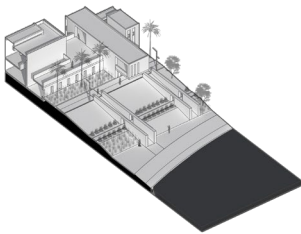
14 Urban Proposal | Axonometric representations of the landscape typologies along the Tigris bank.



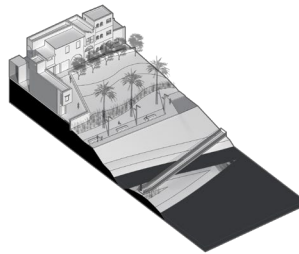
A | Riverside terraces



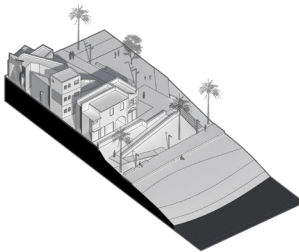
B | Memorial promenade



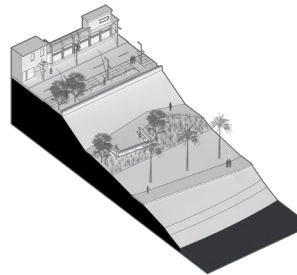
C | Museum riverside gardens



D | Retention basin



E | Urban park



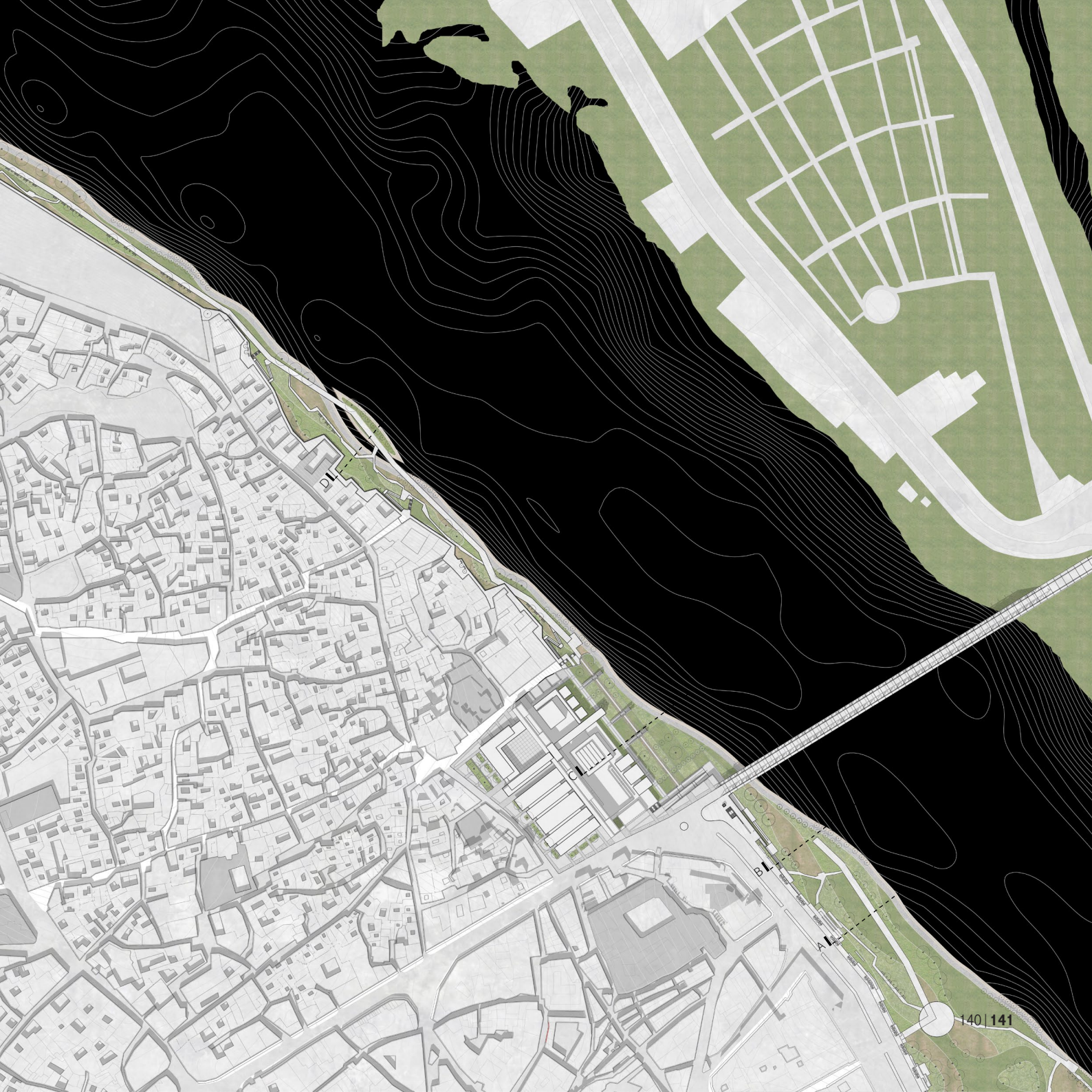
F | Multileveled pathways



15 Urban Proposal | Master project plan.

Project Proposal | Reconstructing the Limit: Urban Revival via Architecture and Landscape design in war-damaged Mosul, Iraq.





A LIVING MUSEUM

Obviously, working on architecture and space alone cannot erase or transform the past, but comprehending the spatial dimension of the conflict can be critical in developing a holistic response to the reconstruction issue. Reconstruction after a conflict is a key issue, and the choices made will shape not just the urban fabric, buildings and spaces, but also social interactions, collective identities, the sense of belonging. In such circumstances, architecture may serve as a tool for empowerment, not just in terms of preserving the built environment but also in terms of supporting and developing livelihoods.

This concept was essential in determining the architectural principles to be followed for the emblematic building at the core of the project proposal. Located at the intersection of the iconic Nineveh street with the Tigris River, crossed by the Old Bridge, and in proximity to the historic Souq, the building clearly requires for a subtle forethought design process in order to act as a revival symbol for the city. Moreover, the purpose of giving people hope for rebirth was enhanced throughout the function of the building itself.

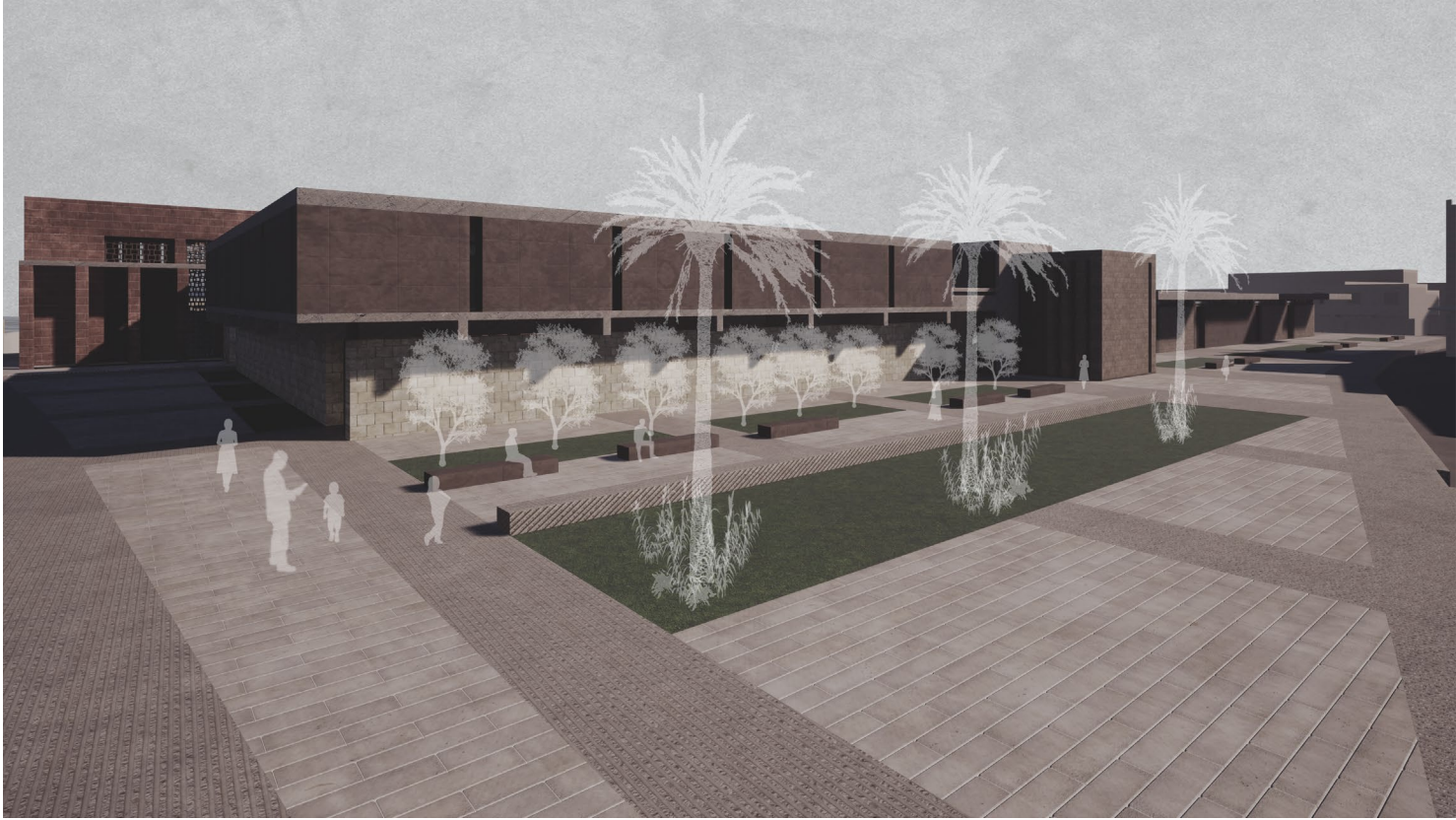
As a synthetic physical act, architecture has long been a prevalent means of giving a commemorative presence to memory, and Mosul is saturated with memory of the pulsing pre-war life of the city, as well as its destruction. As a result, in post-war Mosul the riverside area has become a gaping void, an immense absence at the head of the city. The context clearly seeks for an architectural entity that can offer a place for cultural and collective expression, since almost every architectural structure addresses, in a direct sense, the cultural identity and philosophy within an urban context.¹³ In absence of similar spaces, the people find forms of creative responses to their needs in terms of values or social behaviour, throughout solidarity networks, informal adaptation of places, symbolic reoccupation of spaces, graffiti and wall painting, street theatre

or installations. It is the proposal's objective therefore to keep the alternative narrative of the population alive, voiced and accessible, through a Living Museum.

"Throughout the various attempts to create through architecture and urbanism a consciousness of collective memory—or, perhaps, as seems more likely, to fill the emptiness that comes from having no memories—what was remarkable was the unquestioned assumption that the objects created would come to stand for memory. In every aspect, architecture most perfectly reproduced the old, Aristotelian-based assumption that to transfer memories to objects would preserve them from mental decay. Looking at the works with claims to reconstitute the memory of cities, they reveal no misgivings about the capacity of objects to take the place of memory—buildings and memory seem to have been treated as exchangeable currencies."¹⁴

During the war, the Maslawi people were stripped of their historical narrative, and the proposal seeks to provide to the Maslawi society this essential space where to express themselves, a new untraditional spatiality where to collect the memories of the people through life stories, visual records, art, testimonies, festivals, expositions, made by Maslawi people for Maslawi people. The Living Museum is a response that emphasizes the role of the civilians as social actors who initiate a full range of activities transforming the past conflict in cultural and creative expression. Additionally, rigorous data collection is essential not only to preserve the cultural patrimony but also for rebuilding the society itself. The people need a place to reborn, to remember about the conflict and try all together to forget.

"Artfully selective oblivion is necessary to all societies. Collective well-being requires sanitizing what time renders unspeakable."¹⁵

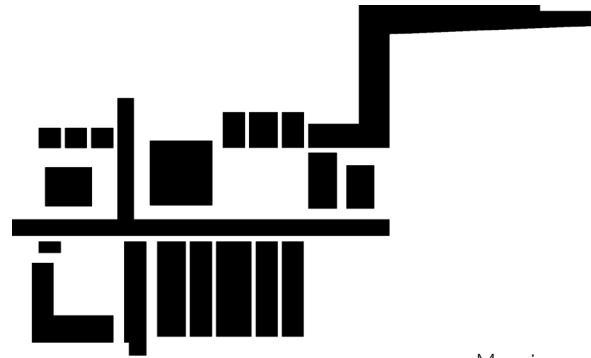


16 Architectural Proposal | Exterior visualization of the administrative building.

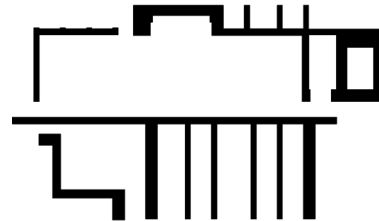
Understanding the potential of architecture as an instrument of reconciliation and healing is at the nucleus of the project proposal. Therefore, aspects of the Islamic structural organization of Mosul were implemented in the concept design. In the early Islamic ages, the city was provided with a main Friday Mosque which became the future cities' nucleus, around which all the other central activities developed. The position of the Al Nouri mosque is therefore centric related to the urban fabric, at the intersection of the two main axes of the city. To enhance this aspect of centrality, the project follows a centric organisation with two main perpendicular axes that give structure to the space and serve as connectors in the infrastructure of the city.

A main structural body is identified to work as the primary vertical circulation system of the project, to which the secondary spaces are connected creating a clear hierarchy to the overall design. It represents a volumetric entity developed to connect the northern urban fabric with the historic Souq working as a double corridor that emphasizes the relationship between limit and connection. The main body can be therefore crossed on the outside, underneath the portico, or through the inside, entering the Museum itself and eventually accessing also other activities. The element's volumetry retraces the idea of the ancient citadel which existed in the same location in historic times, reassembling the concept of a fortress. This structure gives access to the other sections of the building, the serviced spaces, which can also operate completely independently from each other, in the sense that they can be accessed separately. Their functions allows for the integration of a variety of activities that may be hosted inside the Living Museum.

The city's centrality represented by the Al Nouri mosque, is recalled, on the other hand, by the implementation of a main body that provides a specific function and stands out in the overall composition. Its purpose is to host particularly valuable expositions or activities, acting as a Ursi for the Museum: a main public representative room.



Massing



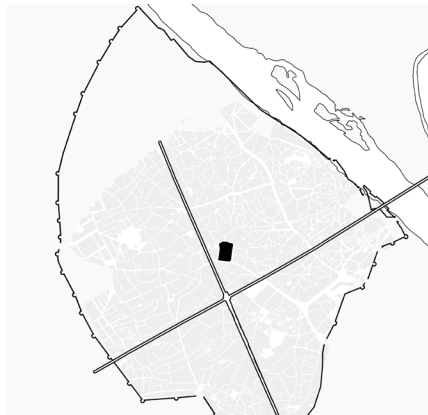
Passages



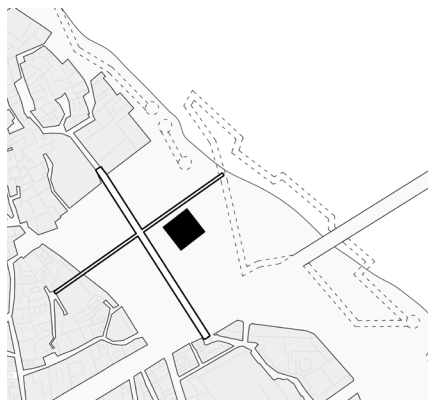
Courtyards and voids



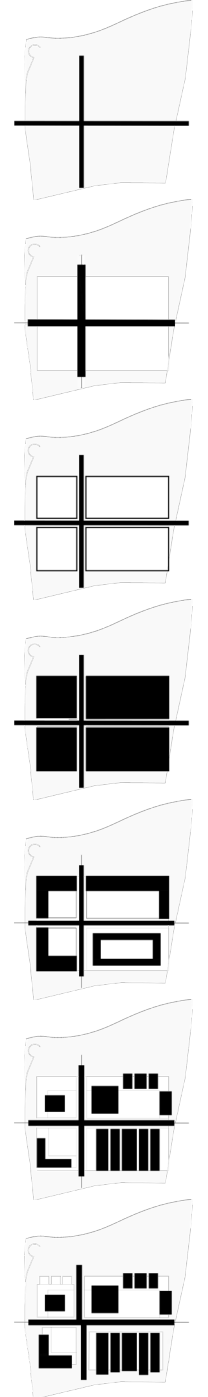
Typical layout of the Islamic city



Mosul city layout



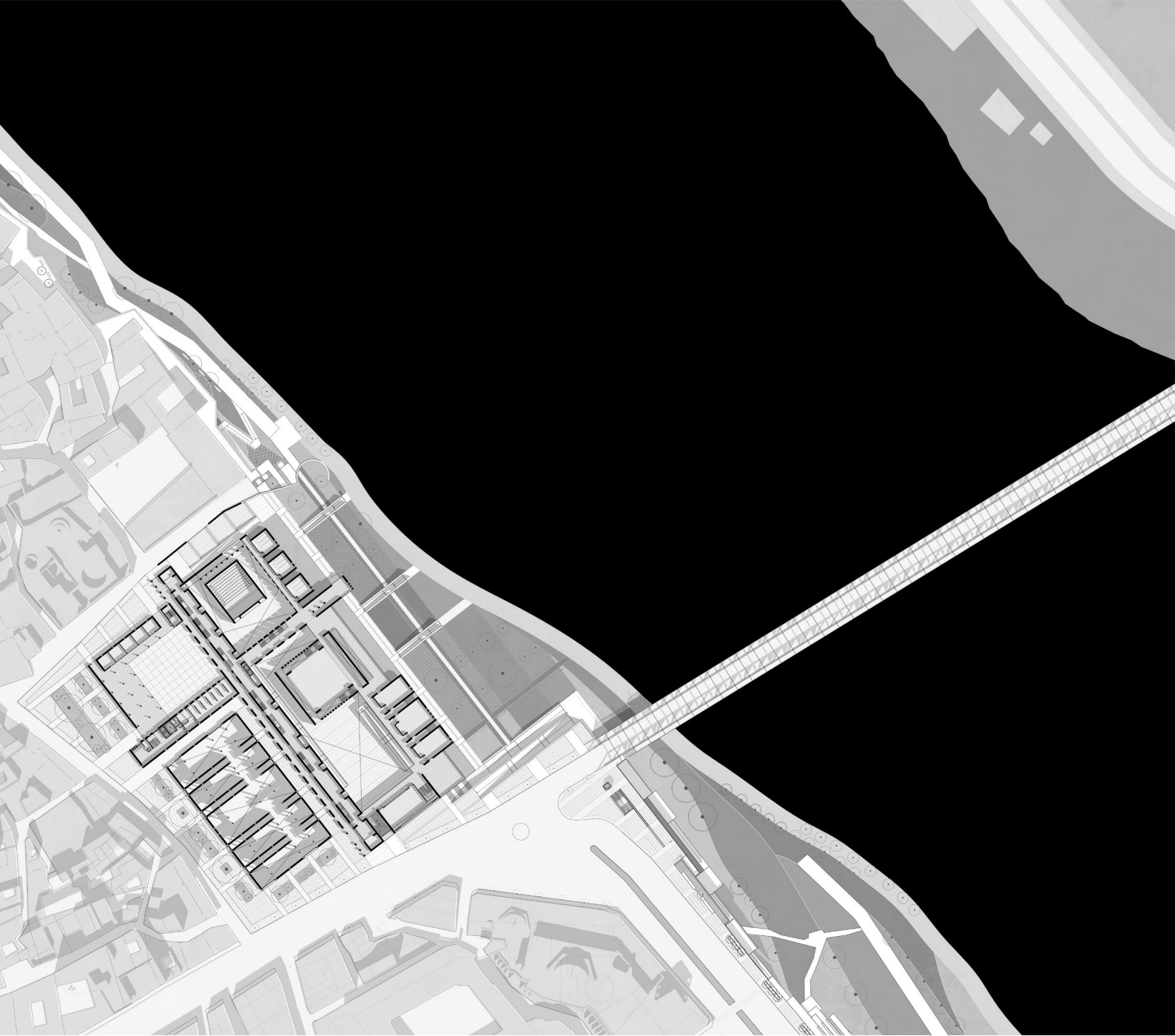
Architectural proposal layout





19 Architectural Proposal | Master project plan.

Project Proposal | Reconstructing the Limit: Urban Revival via Architecture and Landscape design in war-damaged Mosul, Iraq.





20 Architectural Proposal | Elevation along the Tigris river.

The following functions may be described by looking at the project with the two major axes acting as the x and y axes on a cartesian graphic: on the upper quadrant on the left, the administrative area of the Museum is located, with independent access and vertical circulation, which distributes: on the ground level to the archive; on the first level to administrative offices and private studios, for the experts taking care of the antiquities exposed; and, lastly, on the underground leads to one floor dedicated for laboratory purposes, and a last level of storage area with direct access to the exposition rooms.

The functions related to Mosul's citizens are located in the upper quadrant on the right: the horizontal axis provides access to a series of classrooms available for meetings and workshops useful for the education of the population towards the use of proper reconstruction approaches; while next to the classrooms, surrounded by an internal courtyard, the auditorium stands out offering a space for official and social gatherings.

The further functions related to the Museum are located on the lower side, near to the historical souq and accessible via Nineveh Street, the city's major axis. On the left, a set of interconnected exhibition rooms developed on two levels offer space for a permanent exposition area of valuable ruins and artefacts, in order to preserve and explain the city's narrative. While on the opposite side, on the right, the Museum provides a series of multifunctional exhibition spaces dedicated for the Maslawi society to express their creativity and art, facing the beauty of the riverfront.

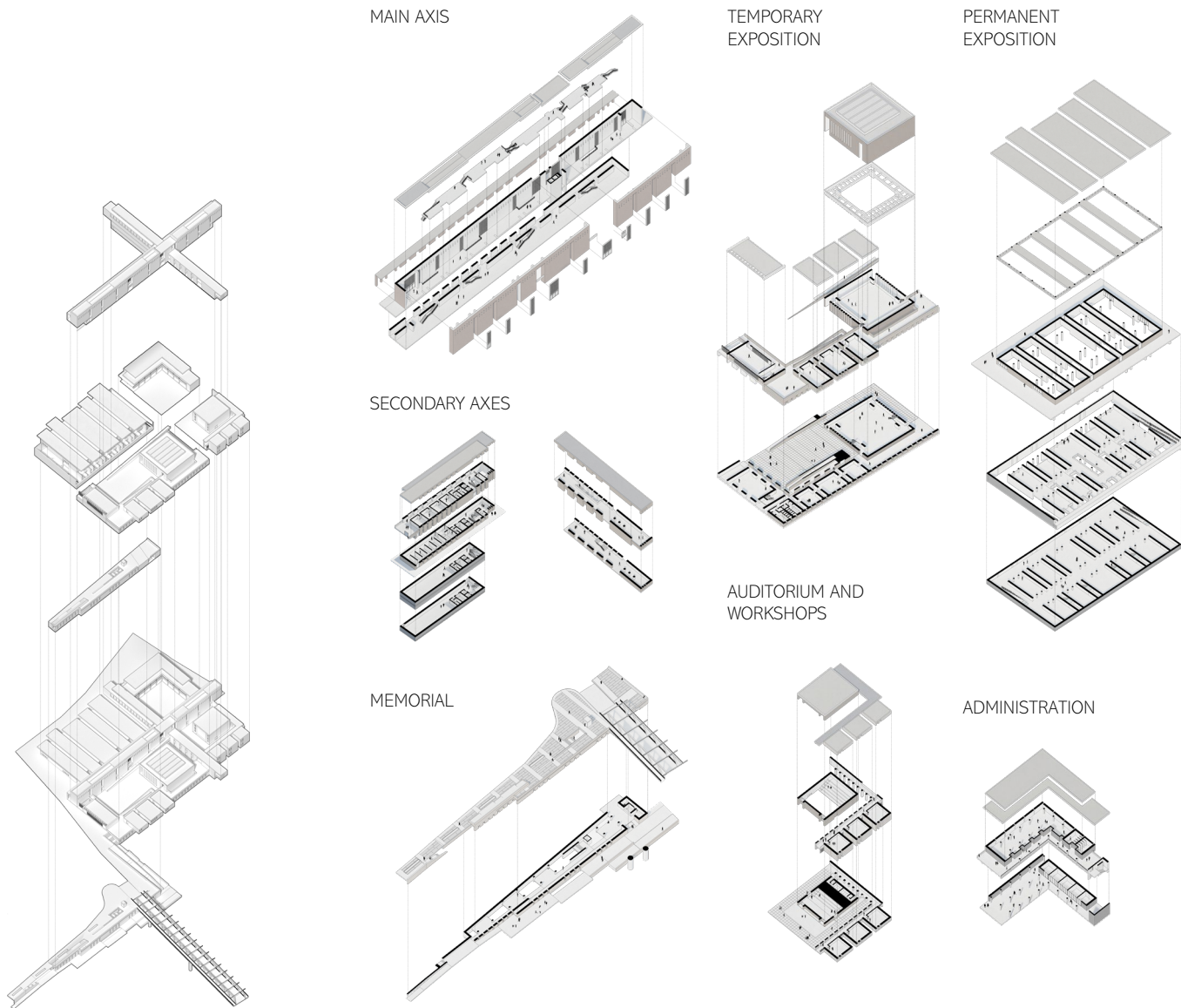
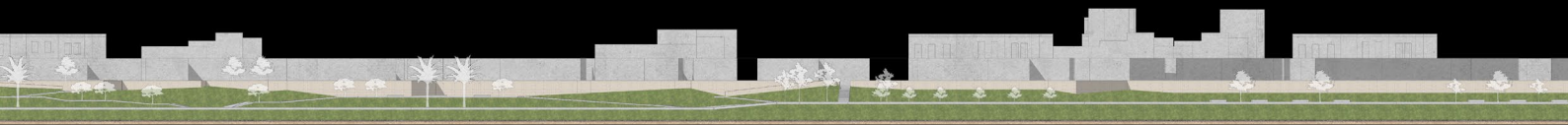
The study of the interaction between the project's spaces and functions, reveals an essential characteristic which is connected to an aspect of people's lifestyle: the symbiosis between public and private. An accurate design of the different

elements provide a continuous interchanging in between the two values: people can cross the museum on the outside and participate in its public spirit, take a look at the expositions from the street level throughout the glazed openings, gather in manifestations in the public courtyard, or rather take part of its private side by entering its rooms, experiencing its intimacy, and still maintain a link with the outside. In and out, full and void, private and public, are set always at a limit but never completely separated.

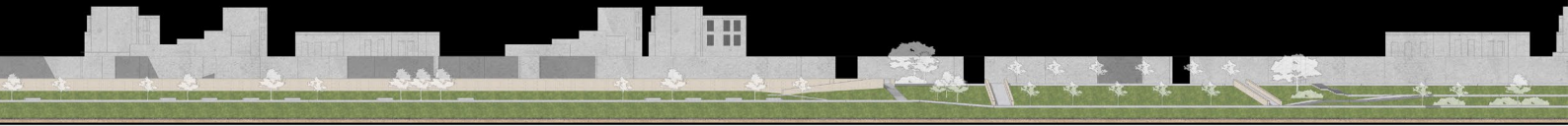
An important outcome of this study is the extension of the Museum on the riverside, under the Old Bridge, to create a public memorial site for the tragedy of the war. The structure can be reached from the main courtyard of the museum, throughout an underground passage, although it is also accessible from the riverfront promenade. The people enjoying the new riverside's natural environment can choose to walk on the outside next to the memorial, or cross it on the inside and stop for a moment to contemplate, remembering the past, before getting out and allowing themselves to forget once again in order to let peace re-enter their souls.



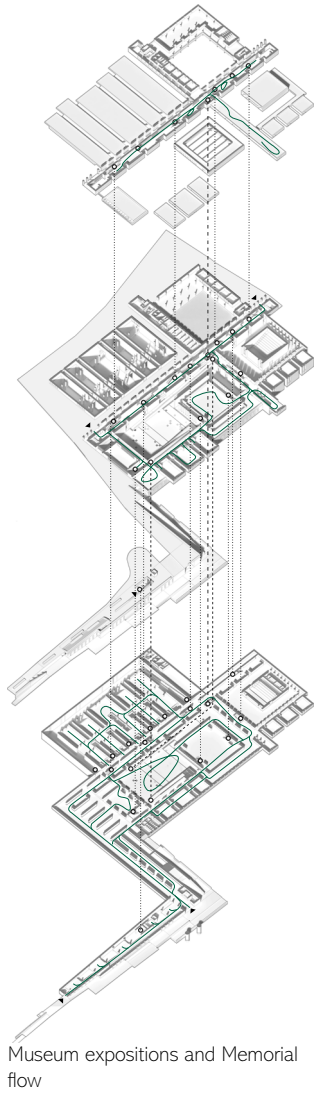
21 Architectural Proposal | Interior visualization of the permanent exhibition space.



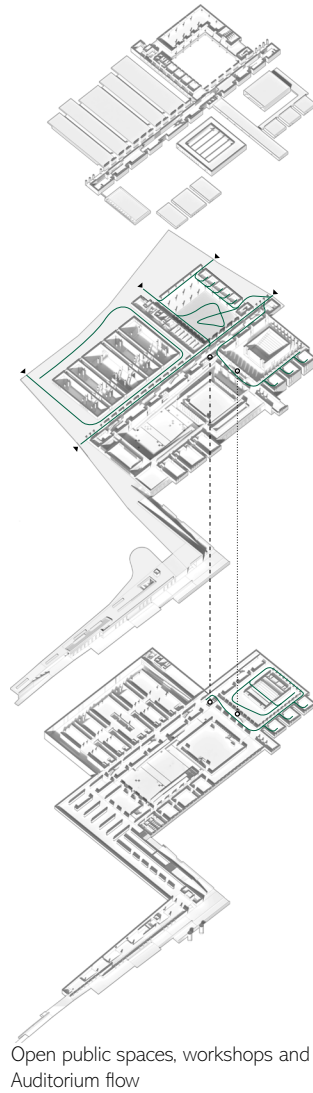
22 Architectural Proposal | Explode axonometric view of the various components of the project.



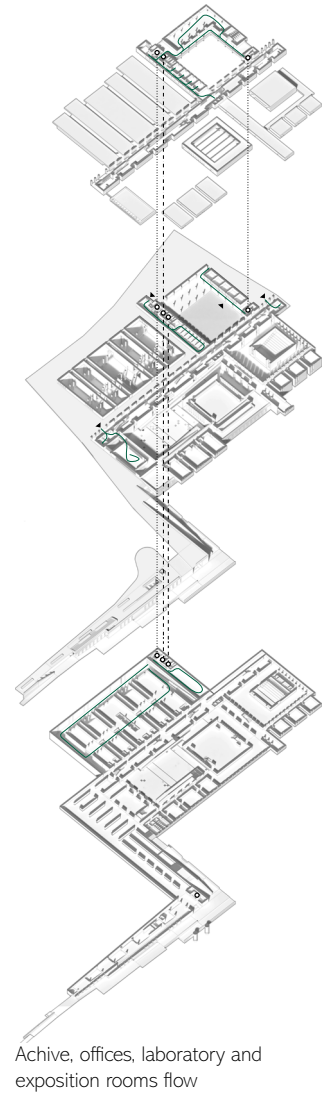
VISITORS



CITIZENS



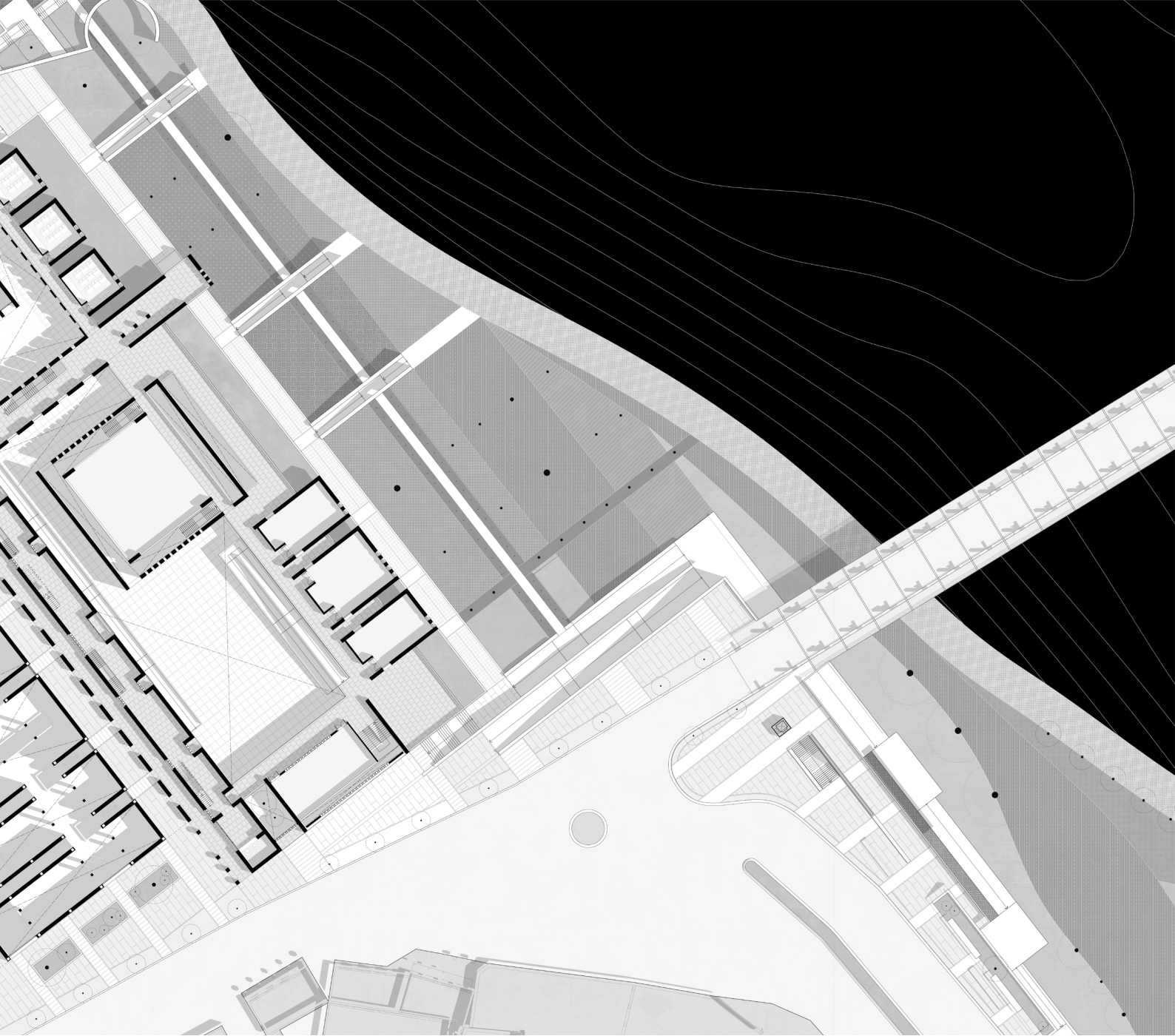
CURATORS



23 Architectural Proposal | Diagrams of the various circulation flows.

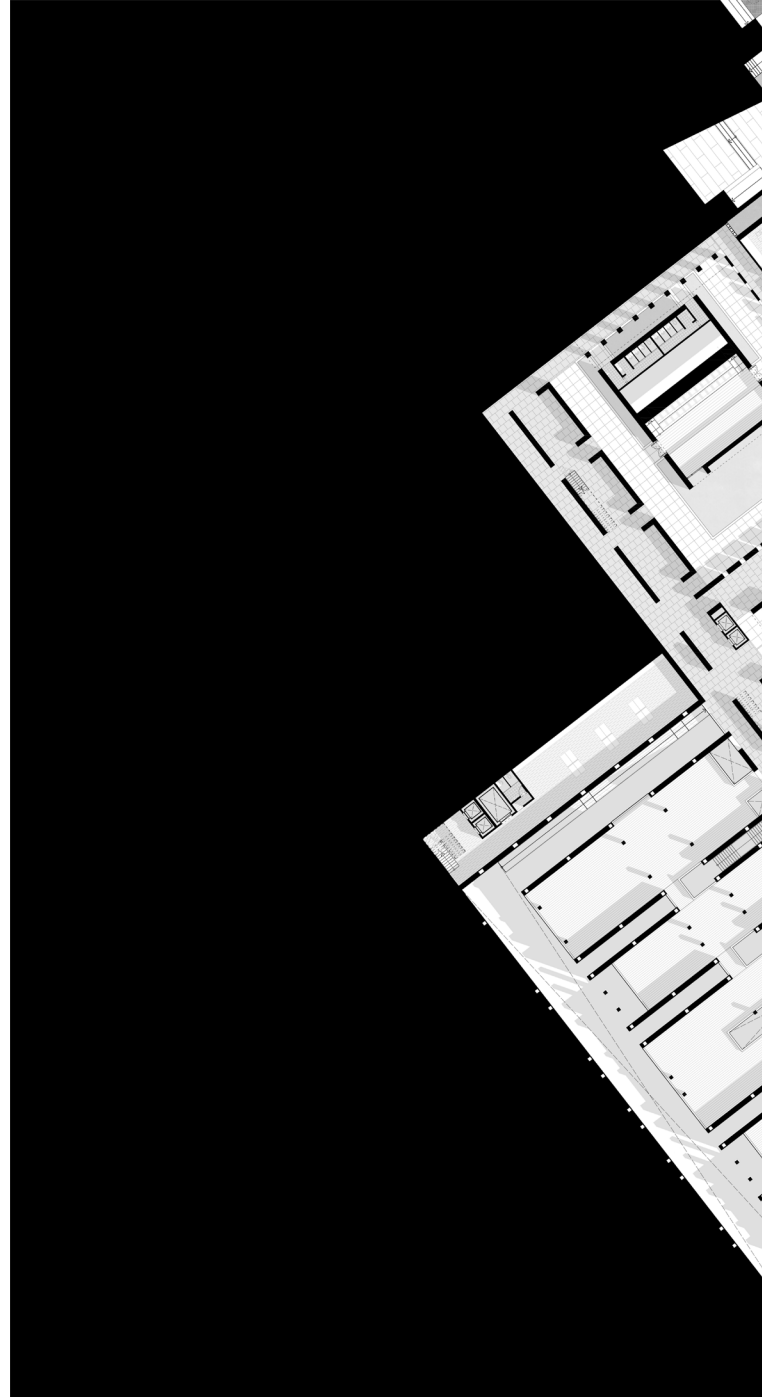


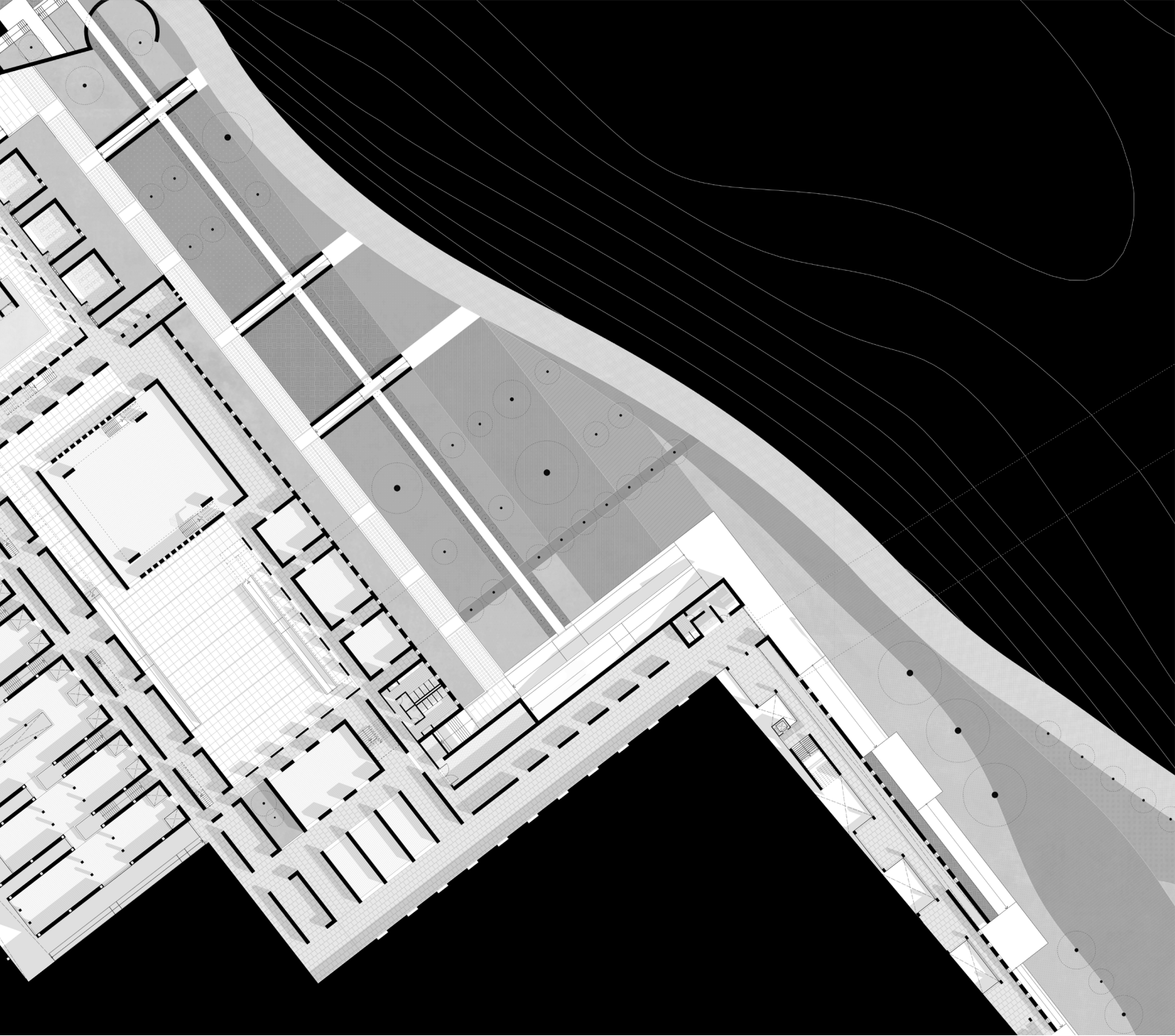
24 Architectural Proposal | Ground floor plan.

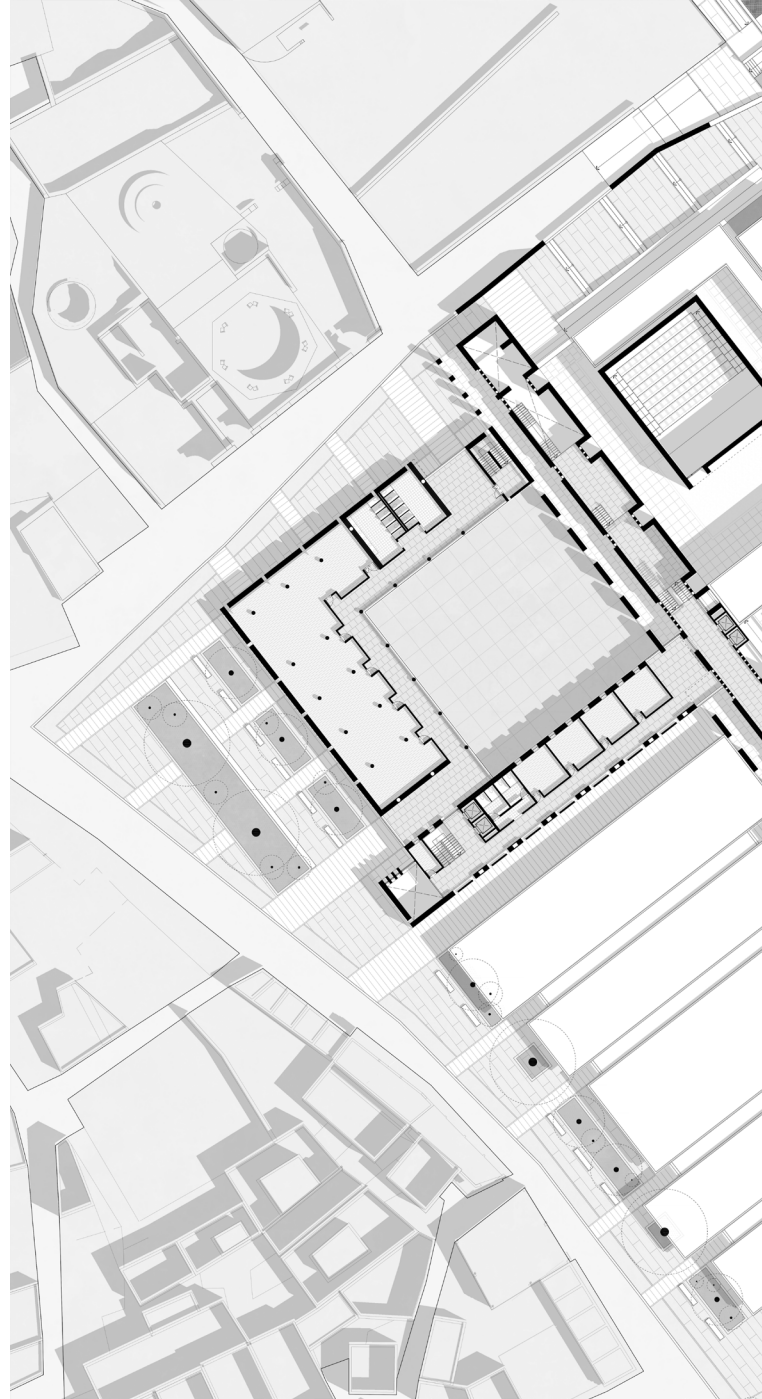




25 Architectural Proposal | Underground floor plan.



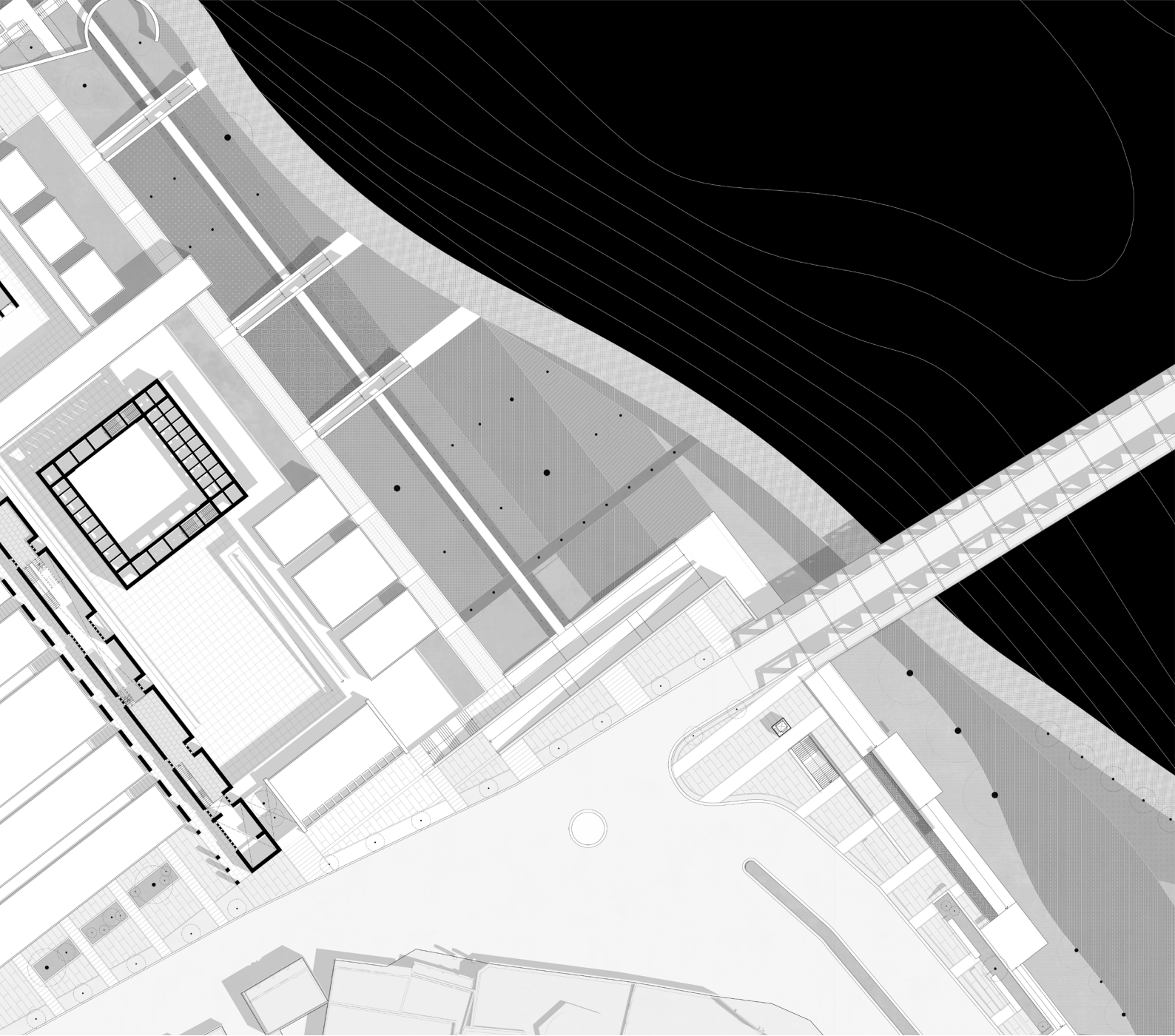


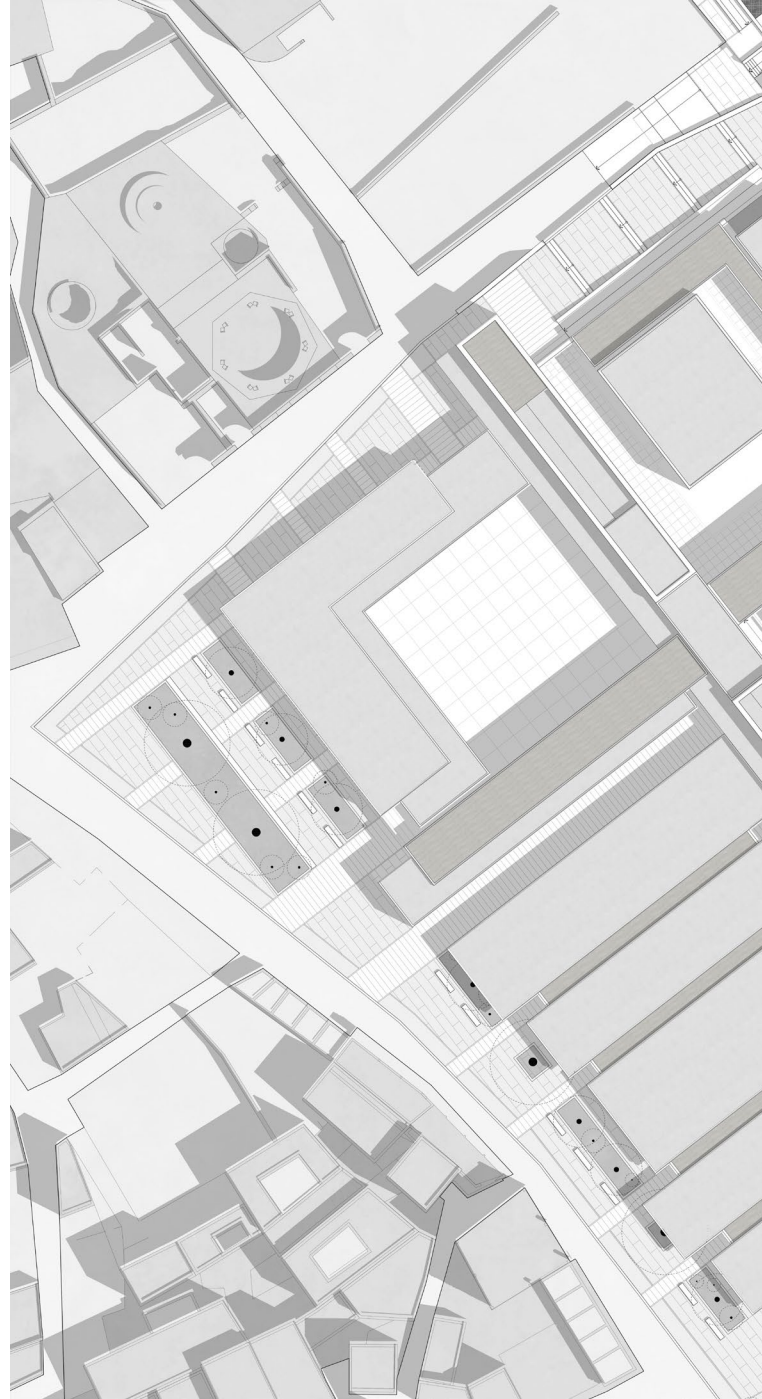


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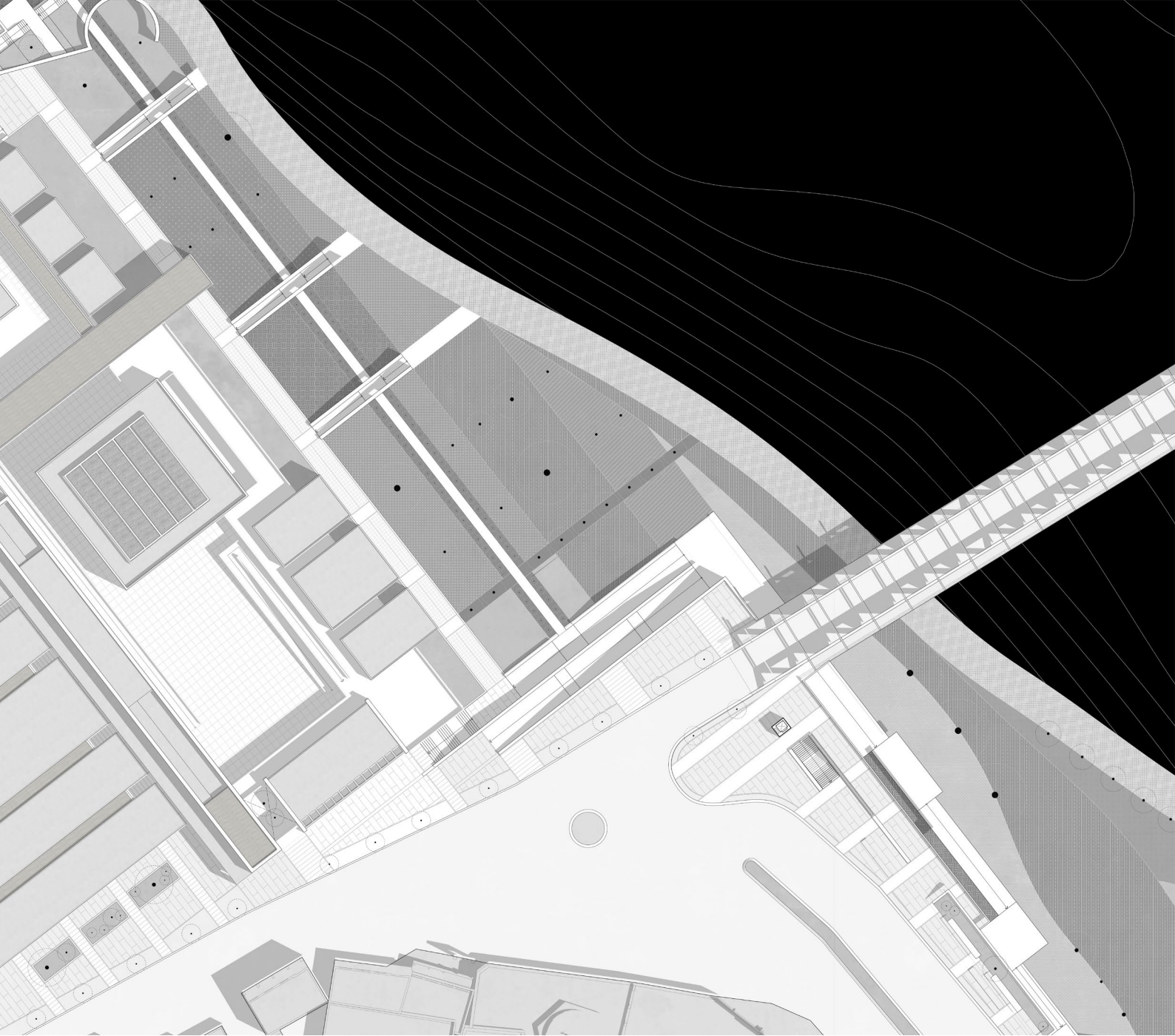


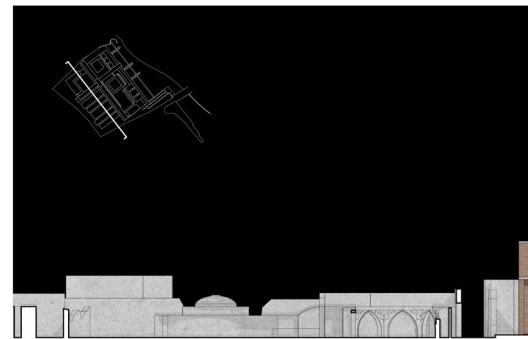
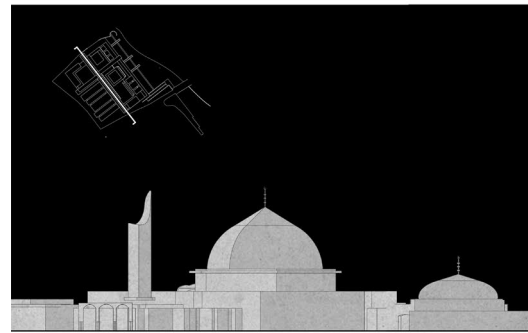
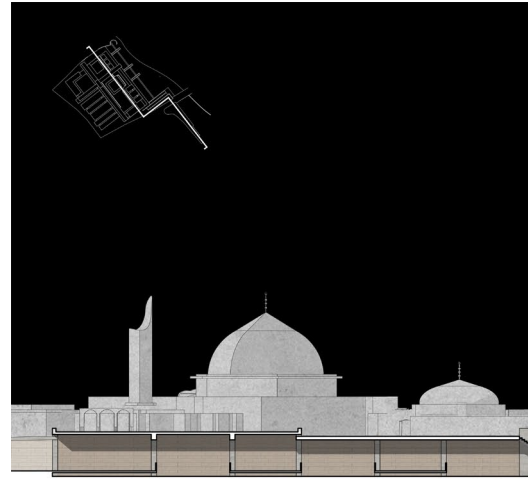
26 Architectural Proposal | First floor plan.





27 Architectural Proposal | Roof top plan.

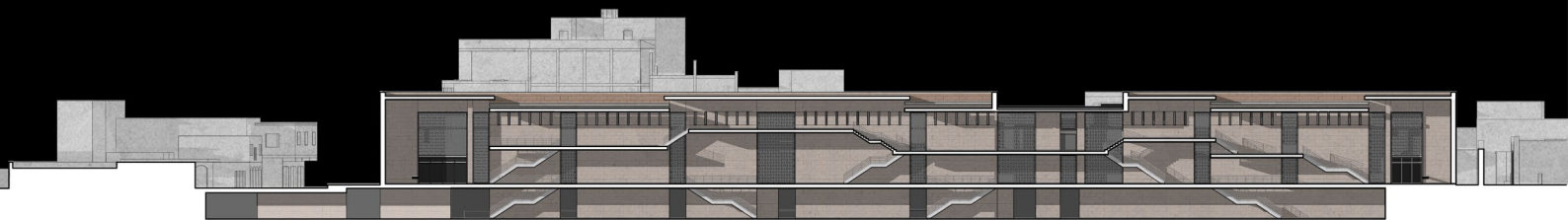


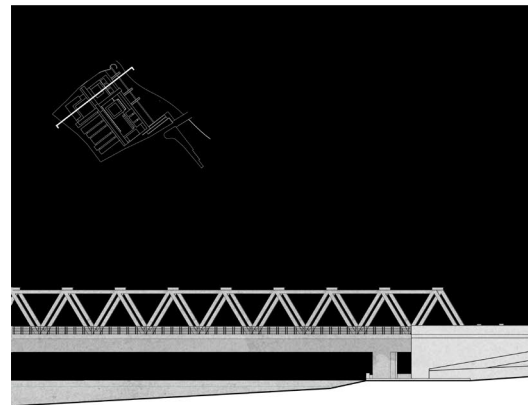
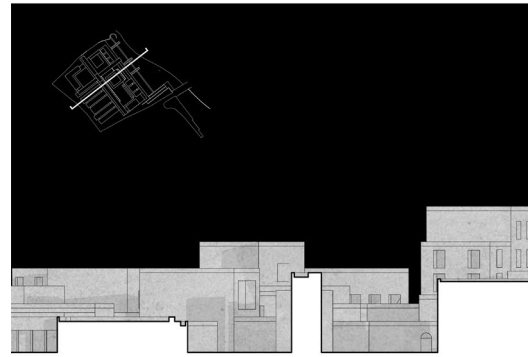
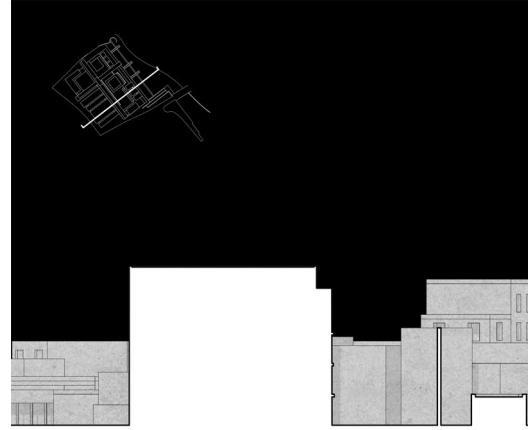


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28 Architectural Proposal | Longitudinal sections.

Project Proposal | Reconstructing the Limit: Urban Revival via Architecture and Landscape design in war-damaged Mosul, Iraq.

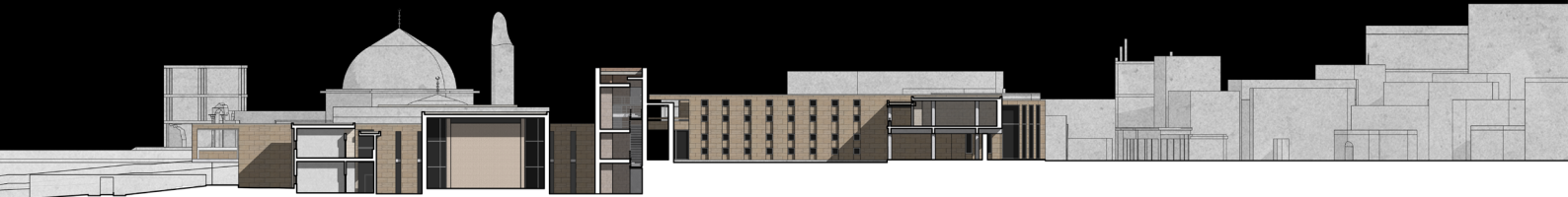


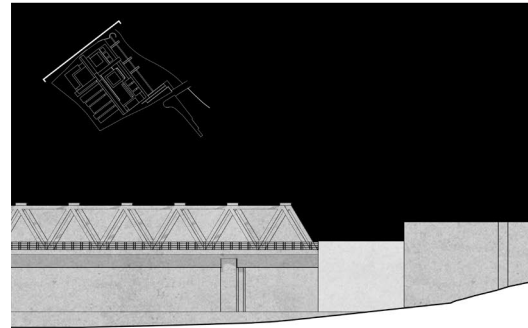
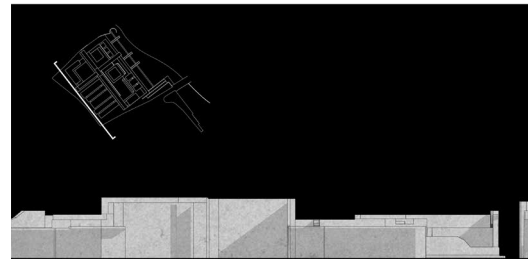
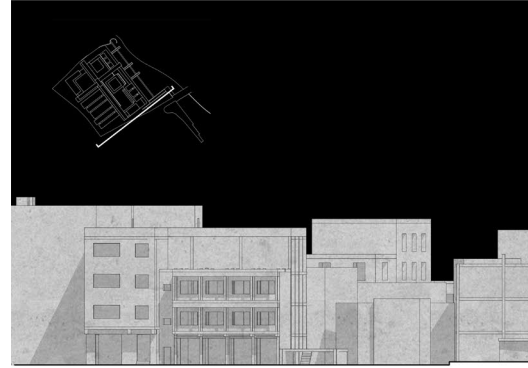
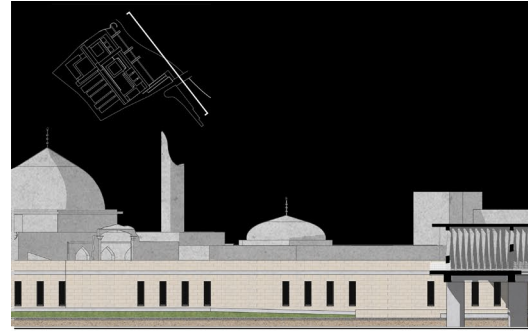


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29 Architectural Proposal | Transversal sections.

Project Proposal | Reconstructing the Limit: Urban Revival via Architecture and Landscape design in war-damaged Mosul, Iraq.

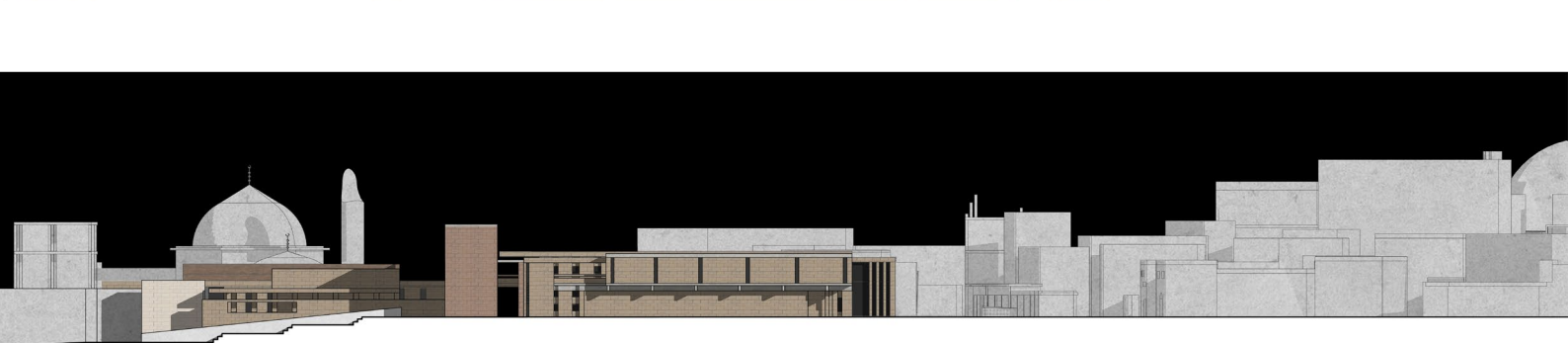




0 5 10 20 50 m

30 Architectural Proposal | Elevations.

Project Proposal | Reconstructing the Limit: Urban Revival via Architecture and Landscape design in war-damaged Mosul, Iraq.





31 Architectural Proposal | Interior visualization of the main axis portraying the building's vertical circulation system together with the various interior platforms providing space for additional activities and expositions to happen, while also connecting the East and West wings.



ARCHITECTURAL CHARACTER

FEATURES

The meandering backstreets, elegant courtyard houses, and high minarets of the Old City, all embodied the “Spirit of Mosul.” While most of the city’s distinct architectural legacy has been lost, the city’s historic and cultural spirit is still very much present. It is therefore crucial that the process of reconstruction, rehabilitation and restoration respects not only the actual surviving architectures of the historic urban fabric, but also the traditions and techniques used in their original construction. The regeneration of the historic city has to enhance and feed the local inhabitants’ feeling of belonging and identity within the history of the place.

At the core of the strategy stands the use of appropriate materials and designs, in order to successfully preserve the character of Mosul and revive the Old City. An understanding of the architectural elements and their relationship and meaning in relation with the people and in between themselves occurred in order to subtract an abstraction of the traditional style. As a result, the Museum was designed according to principles and concepts that may provide a glimpse of the former architectural and cultural splendour of the Old City.

The Project, however, doesn’t mean to establish itself as a new architectural style but rather seeks to integrate Mosul’s architectural tradition with the social behaviours and needs of its citizens, under a new subversive perspective. Integrating traditional elements of the urban structure and architectural composition of the city, the proposal aims to reinforce the character and identity of the city centre. Uniformity and contrast of the architectural features of the Museum will influence the distinctiveness of the riverfront’s elevation, establishing itself as a powerful landmark contributing to Mosul’s dignified regeneration and providing a sense of place, a sense of belonging.

The approach is therefore directed towards the necessity

of rooting traditional values to the contemporary environment of the city despite the awful harm it has suffered, in order to preserve the identity and characteristics of its urban and architectural structure: “[..] aim to preserve Mosul’s heritage rather than turn it into another Dubai.”¹⁶

Walls, roof, openings, structure, form and building colour were adopted and consistently applied into the overall design. The structural organization of the city with rigid elements very well repeated, colonate and vertical partitions, were adopted and studied in relation to the proposed function. The openings, in particular, represent an abstraction of the typical classic window from the residential architecture, and their repetition was carefully arranged to give a sense of continuity in the structure. The arrangement of the facades was also done in accordance with Mosul’s architectural traits, using repeated vertical partitions following a predefined repetition pattern.



32 Architectural Proposal | Riverside gardens.



33 Architectural Proposal | Monometric axonometry.

The collonate is implemented as an organizational element as well, dividing spaces without physical obstruction and allowing filtration. The feature reassembles a reinterpretation of the Tarma from the residential architecture to the public one. Similar to the traditional Islamic houses, the collonate individuates a system of served spaces on upper levels, while acting as a covered portico on the ground floor.

The most significant characteristic applied was however a reinterpretation of the concept of the Kabishkan, which is a peculiar element of the Islamic house: walking throughout the Museum it is possible to have a glimpse of a multitude of spaces from one single point of view. From the main axis and its platforms at different levels, for example, it is possible to have a look to the outside at the activities taking place in the different courtyards, as well as to the inside of the exposition spaces. The concept of women seeing without being seen is therefore reinterpreted in this feature. Furthermore, the notion applies as well to other areas of the Museum, allowing visual connection in between the elements, and from the street level with the large openings providing a glance inside the exposition rooms without physically entering the building.

A regard to the historical nature of the city of Mosul and ancient Nineveh was given throughout the treatment of the courtyards towards the riverside. Their excavation in the ground serves as a reminder of the archaeological nature of the place as if it would be an archaeological site itself. The courtyard concept was moreover studied in relation to the people's needs and lifestyles. On the street level, in proximity to the urban fabric, the Museum provides an open courtyard acting as a public space freely accessible to people for gatherings and public activities, as bazaars or social events, to take place. The other two courtyards towards the riverside serve as connection space in between different elements of the Museum, reassembling the typical function of the courtyards from Mosul's residential architecture.



34 Architectural Proposal | Exterior visualization of the main exposition room and the surrounding courtyard.



35 Architectural Proposal | Monometric axonometry, section cut.

MATERIALS

Mosul is the only large city east of the Euphrates River that is primarily constructed of stone and brick. Marble is used extensively, particularly in columns, door and window frames. During the reign of Nur al Din, specialized construction techniques, such as carving on marble with bitumen filling, were introduced to the city from Damascus. Its buildings and monuments were partially built with re-used elements from Roman temples and early Christian churches.¹⁷

The main materials of the Old City are stone, baked or raw bricks, wood, gypsum, which is very workable, used as frames to make the houses more rigid and in traditional mortar and plastering, and the Mosul marble, which is mostly used by the wealthier people who can afford to construct the entire façades of their houses using marble.

Therefore, the project's strategy attempts to promote local materials usage in building construction and preserve the architectural style and heritage of the city, by adopting the use of local materials available in the region. The main stone implemented is the Limestone rocks, which is also the most spread kind of stone in the region, found in the Middle Miocene Fatha geological formation which covers an area Mosul and Badoosh dams. In the same formation, other materials like marl and gypsum can be found. Calcitic and dolomitic limestone particularly is widely distributed in various regions of Iraq, having wide diverse uses in industry, agriculture, and construction. In the field of civil engineering, limestone is used for manufacturing materials such as portland cement and lime; it is also used as a building stone and as crushed aggregate for highway bases.

From the hydrogeological point of view, limestone has an optimum resistivity for dry and wet conditions, and possess a high resistance,¹⁸ making it the most suitable material for the construction purposes and location of the Museum. Two

typologies of Limestones were selected, based on the different shades of colours: the yellowish-grey tone corresponds to the Marly Limestone, while the Arenaceous Limestone has a whitish-grey colour.

The street level urban design of the pavement is planned to provide a continuous pathway along the riverfront on the urban level, using standards derived from the museum's alignments. Concrete tiles in two distinct colors of grey were used as the materials. Sandstone and limestone tiles were chosen for the museum's inner courtyards.



36 Urban Proposal | Riverside promenade visualization.



37 Architectural Proposal | Interior visualization of the main space on its second level.

LANDSCAPE

At the forefront of the strategy is the creation of a network of green spaces that includes public parks, pedestrian and semi-pedestrian greened streets and open green areas along the riverside. The scope is to create a filter made of dense vegetation and lines of riparian autochthonous trees upstream the area, allowing an efficient flooding protection system and create a highly valuable natural area very important both for the riverine ecosystem and for the whole city offering an open space for activities to happen.

In the context of Mosul, the new riverside serves many and multilayered performative functions in the city. The ecological corridor is capable of reducing pollution providing also an opportunity for urban land development. The project was therefore designed using low-maintained native vegetation, lush water-grasses, and wildflowers.

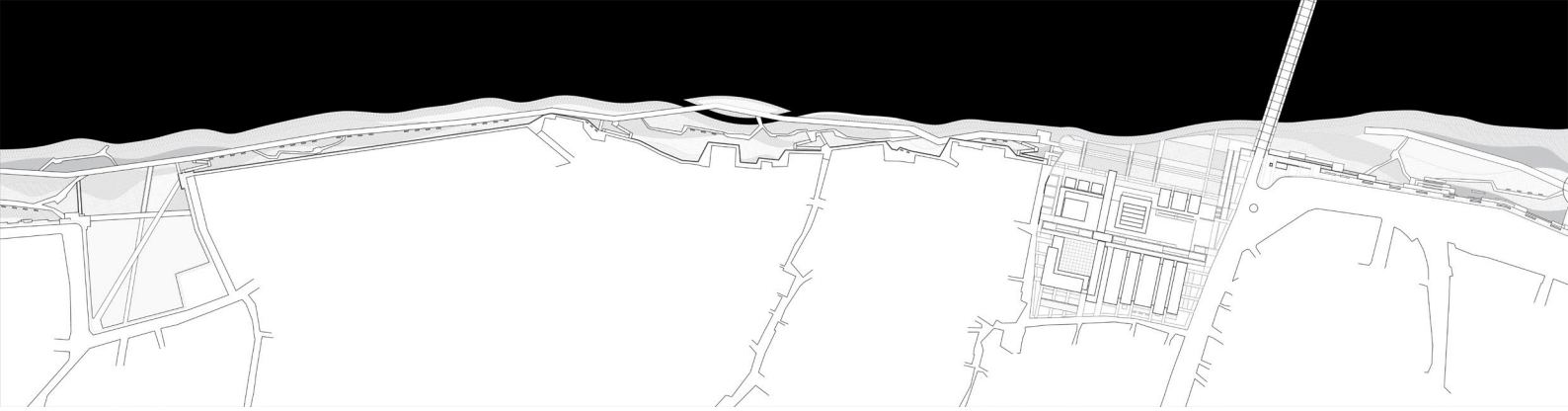
Date palms, Phoenix Dactilifera, are the region's representative tree species of the region and a key feature of the design, thanks to their dense high canopies that provide effective shading. Other types of trees include the Five-stamen Tamarisk, which grows in close proximity with the water, and Pistachio and Almond trees, which may grow to heights of 5 to 10 meters, respectively. The landscape design incorporates the Aegilops Speltoides grass, Poa Bulbosa grass, and Bordeum Bulbosum grass among lush water-grasses. The variety of plants ranges between Milkvetch, Hypericum herb, and Licorice plant. Lastly, the flower species Anemone Coronaria was chosen to crown particularly valuable zones along the pathways. The plant species distribution and variation will reduce downstream flood levels and flows along with helping the soil to absorb more water.

Furthermore, the green structure is meant to softly infiltrate the urban structure by means of crooning the main arteries and alleys directly connected to the riverbank with lines of trees,

that can provide shading and improve the urban environment. The riverside vegetation will grow and develop following an organic trend. The climate of the region allows also for different settings for each season. In the spring, people will be greeted by a thriving park in a lavish colour palette, while in the summer of the various shades of green.



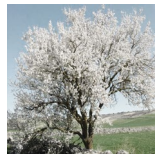
38 Urban Proposal | Riverside terraces visualization.



Phoenix
Dactylifera



Pistacia Vera



Prunus
Amygdalus



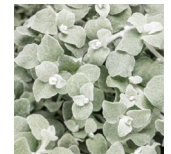
Tamarix
Chinensis



Astragalus



Hypericum



Helichrysum
Petiolare



Anemone
Coronaria



Poa Bulbosa



Hordeum
Bulbosum



Aegilops
Speltoides



Grassland



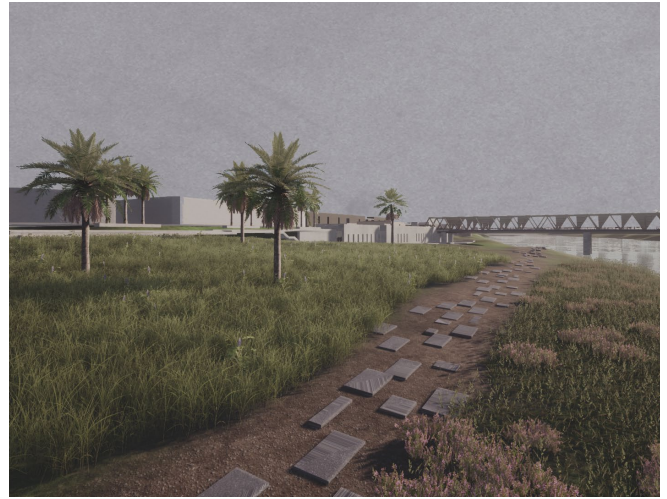
39 Urban Proposal | Landscape design with the identification of the various species of vegetation.

PATHS

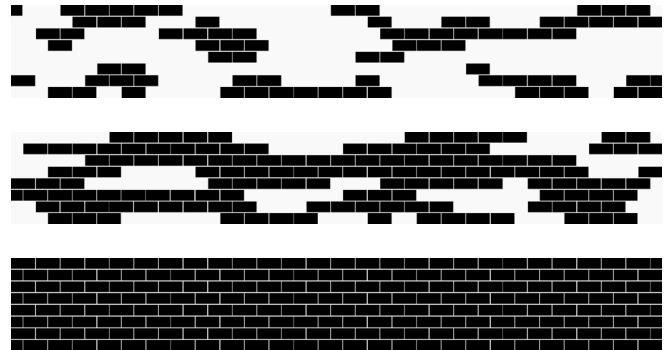
The amount of rubble from the devastation of Mosul is estimates at 11 million tonnes. This amount of debris is three times the size of the Great Pyramid of Giza or four times the size of the Eiffel Tower. UN-Habitat and technical partners are working to improve debris quantification, estimations, and operational management scenarios for recovering and recycling the massive amount of debris.¹⁹ The current situation and ongoing process have brought to light a key challenge for city stabilization, which is finding appropriate solutions to the massive amount of debris generated from the conflict.

Therefore, the need for reuse, together with the memory of the great devastation, generated the concept of the riverside symbolic path. In an attempt to reclaim Mosul's heritage and identity, its orientation and position resemble the traces of the city's historic defence wall. The strategy aims to create a contemplative walkway along the riverbank, using the bricks of nearby demolished buildings to reflect the devastation of the urban fabric facing the riverfront: a modification of the brick density on the path will mirror the amount of damage that occurred on the city's front facade.

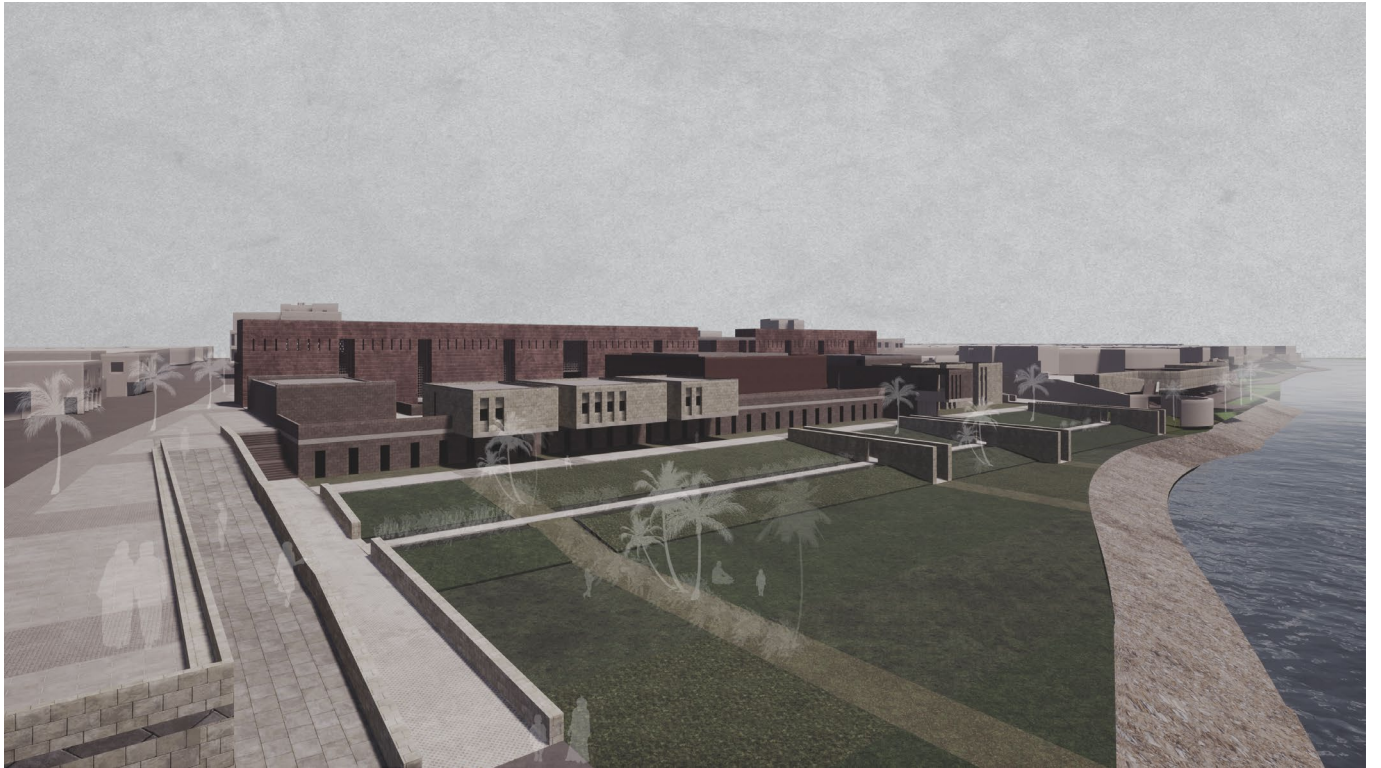
In terms of secondary pathways, their origin is inextricably linked to the spatial organization of the urban environment of Mosul. Its characteristics are a key factor of the streets form and hierarchy, reflecting the human behaviour within the environment. As a result, these routes enhance the design strategy in terms of their identity, spatial formulation, and the richness of visual composition, achieving harmony between urban structure and riverside, between man and nature. These secondary paths might also be formed out of materials of reuse, mainly crushed debris which provides high reuse opportunities.



40 Urban Proposal | Visualization of the symbolic promenade.



41 Urban Proposal | Scheme design for the symbolic Path: [a] Full Path; [b] Medium Fragmentation; [c] High Fragmentation.

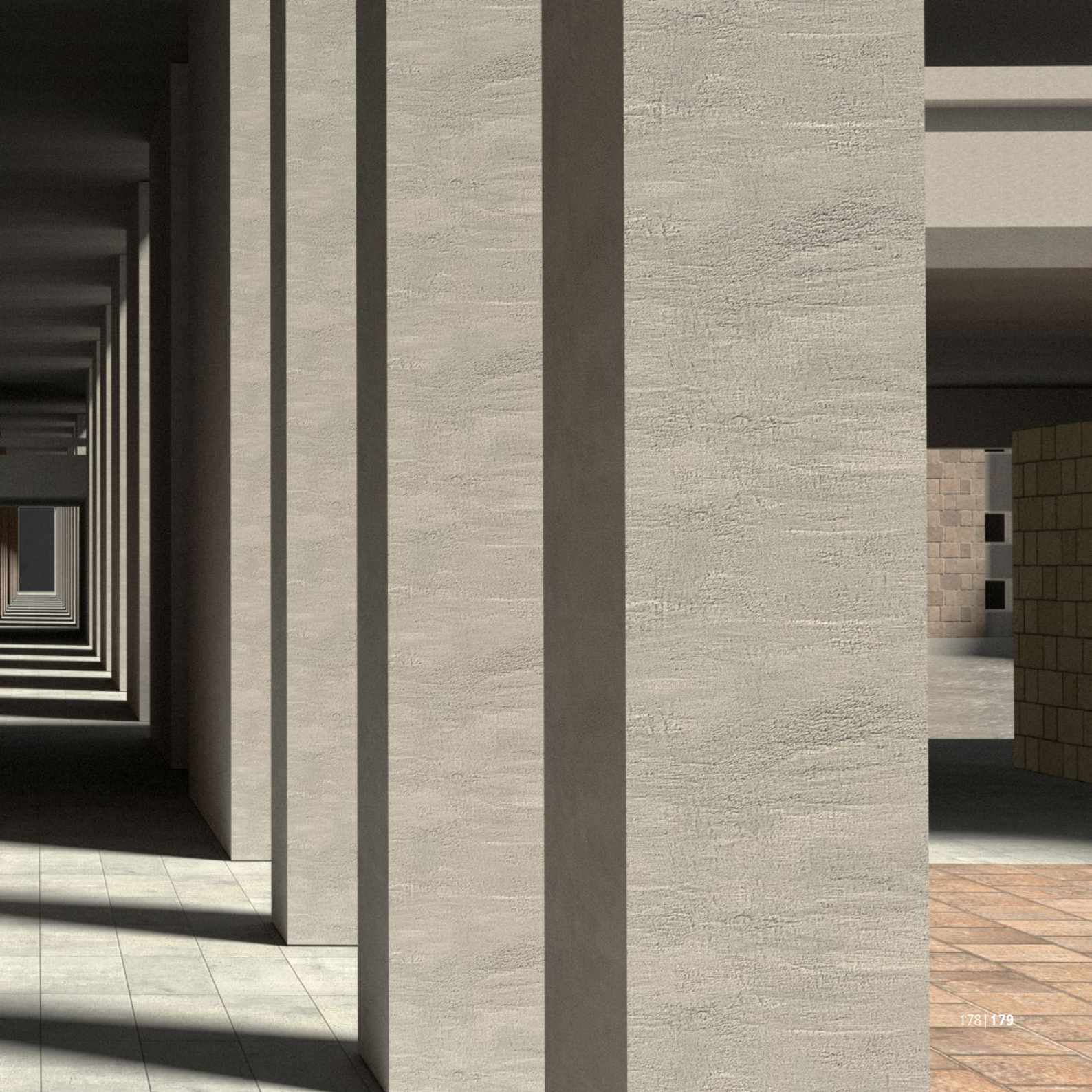


42 Urban Proposal | Comprehensive visualization of the museum design from the bank of the Tigris river.



43 Architectural Proposal | Exterior visualization of the covered passage along the main axis offering an interposition of internal and external, private and public pathway throughout the museum.

Project Proposal | Reconstructing the Limit: Urban Revival via Architecture and Landscape design in war-damaged Mosul, Iraq.



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CONCLUSIONS

Mosul's future hinges on a complete reintegration of its architectural heritage with the riverbank of the Tigris, in order to commemorate the splendour of its riverside historical panorama and reestablish the relationship of its citizens with the water.

In the light of Iraq's ongoing challenges, the critical areas of concern must be addressed for assisting Mosul in securing a sustainable future for its archaeological and historical heritage within a framework of cultural rights. The project proposal and strategical approach presented can be evaluated as important components of a recovery and development strategy for the rehabilitation and future reconstruction of Mosul, highlighting current challenges and suggesting ways forward.

Over time these interventions are likely to influence the patterns of architectural urban design, achieving a more adequate riverfront facade related to the context of Mosul. The riverside green corridor it's intended as a public structure to track the flux of people, while also bringing attention to the matter of the water and establishing a connection between city and river. A similar intervention can give guidelines for the riverfront reconstruction, focusing on the planning process to provide a framework and principles for the settlement of the new structures.

The challenges are immense to enable a culturally diverse and mutually respectful society and maximise the social, cultural and economic benefits. The precedence, however, is the desire to provide individuals with a feeling of place, reclaiming their proper home.

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