

WATERMARKS

New modes of inhabitation
in the water dominated landscape of Rome

Sergiu Vlad Sirbu

A thesis submitted in partial fulfillment
of the requirements for the degree of

Master of Architecture

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Committee:

Jim Nicholls
Jennifer Dee

Program Authorized to Offer Degree:

Department of Architecture
College of Built Environment

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Abstract

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Rome is a city of WATERMARKS and has always existed on FLUID FOUNDATIONS. The volcanic pyroclastic flows and the erosion and sedimentation of the Tiber River generated the topographical conditions for Rome's foundation, always re-founding itself through fluidity. The comfort that Romans had with fluidity is evident in Giovanni Piranesi's Vedute di Roma, which depict their engaging and fluid inhabitations of ancient ruins during Medieval Rome. Piranesi also depicts the activity and engagement between the city and the Tiber taking place along the river's edge, at ports such as the port of Rome in Testaccio, Porto di Ripetta and Ripa Grande. This fluidity is disengaged with Rome's ascension to the capital of United Italy in 1861 and the fossilization that followed through the embankment of the Tiber and obsession with classicism and its preservation. Due to climate change and more extreme weather events, the fluidity and interaction between the city and the river will be re-engaged as seasonal flooding will once again regenerate and re-found Rome. This thesis project will transform Campo Boario into a place of open engagement with the flood waters and the community, through architectural sedimentation and erosion that will allow it to respond to the water's current and flow in a resilient rather than resistant manner.

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The foundation of Rome began at the river's edge and on the hilltop. This dual foundation of the sacred ground above and fluid underpinning of the Tiber River below, allowed Rome to continuously transform and remain current by becoming a place of fluid multiplicity. The Tiber has always been the "lifeblood and timekeeper of Rome" through the rhythmic rise and fall of its seasonal flooding. A large part of the city is built in the flood plain of the Tiber, which through its seasonal flooding re-founds the city with its waters, depositing onto and scouring from the ever-changing datum of the ground plane. The city is then founded and re-founded onto fluid foundations that allow for change, movement and diversity of relationships and interactions with the Tiber.

The fluidity of the relationship between Rome and the Tiber, and the fluid character of Rome as a city, have been slowly disrupted and disjointed through a concern with permanence and archeological preservation, which began in 1861, as Rome became the Capital of United Italy. Fluidity and transformation did not project the intended strength and competence that Rome intended to express as a European Capital. Therefore, the city began to transform into a disjointed collection of historical artifacts; a tourist attraction that presents itself in distinct and separate episodes. Meaning arises from engagement, interaction and flow, and when these relationships are lost or destroyed, meaning is lost and importance becomes purely historical.

This disjunction of the city and the river is most strongly observed in the Tiber's transformation over the last two centuries. The Tiber was embanked in 1871 and transformed into an element of dislocation appearing as a scar cutting across the fabric of the city. Simultaneously, individual buildings and spaces in the urban fabric are being disengaged and isolated through the process of being preserved and

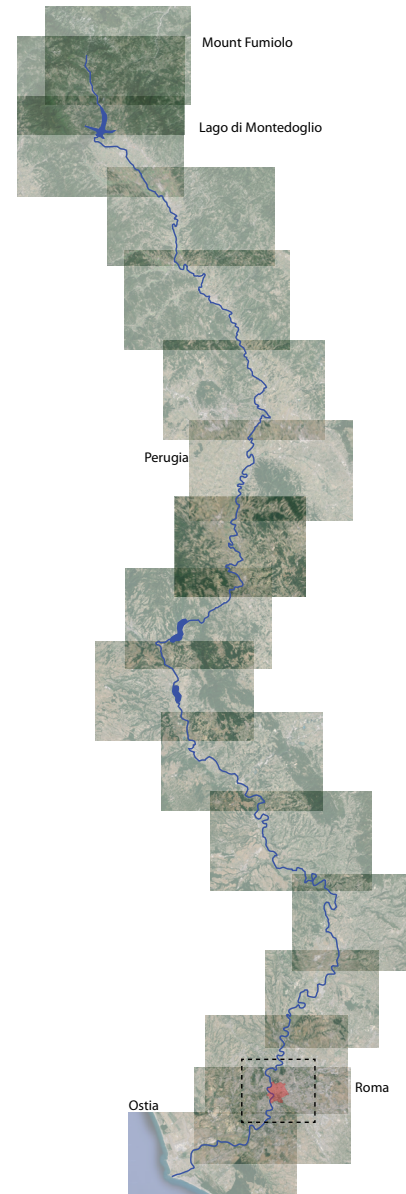


Figure1: Tiber River from headwaters to the sea.

"muzeified". What becomes important is their continued existence, no matter their loss of meaning and importance as part of the city as a whole.

Mattatoio di Testaccio is a foundational project for Roma Capitale, and part of the consolidation of city functions, as the Slaughterhouse of Rome. The Mattatoio was designed by Giaochino Ersoch in 1888 with a fluid and open overlay of ritual and sacrifice. It is now being lost to fossilization as the Tiber was in 1861. The Tiber embankments were designed to hold the river's waters back to a height of fifteen meters above sea level, an elevation that was just over a meter higher than the Tiber's waters during the latest floods of 2008 and 2012. Due to climate change and more extreme weather events, the Tiber's seasonal floods will soon breach the embankments and Rome will once again return to its fluid foundations.

This thesis project will explore the relationship between Rome, its people and the Tiber by transforming the Mattatoio di Testaccio and specifically Campo Boario into a place of open engagement with the Tiber's waters and the neighborhood. This open engagement will be developed through an approach of resilience rather than resistance to the Tiber's forces of erosion and sedimentation.



Figure2: Painting of the Pantheon during flooding.



Figure3: Panoramic view of Campo Boario

I. FLUID FOUNDATIONS | ROME & THE TIBER:

Rome has always existed on fluid foundations. The geological history of the city's landscape shows that it has been generated and transformed over time through fluid events like volcanic eruptions, pyroclastic flows, and the Tiber's actions of erosion and sedimentation. These events and processes generated the topography and conditions for the foundation of the city of Rome.

The city of Rome is located between two large volcano systems generated by the subduction zone between the Eurasian and African tectonic plates approximately 300,000 to 600,000 years ago. To the north of Rome, the Sabatine Volcanic system has left behind the crater lakes of Bracciano, Trevignano and Anguillara. To the south is the Volcanic System of Latium that generated the Alban Hills through its pyroclastic flows. Both of these clusters of volcanoes were of the explosive type; their eruptions 'exploded' the mountains, showering the surrounding area with its debris. The materials that travelled furthest were the fragments and dust from the top of the volcanoes, which settled and created the tufa rock of Rome.

The volcanic pyroclastic flows blocked the original Tiber Valley and caused the river to change course and interact with the flood of rock and volcanic debris. The Tiber is the generator of form; its sedimentation and erosion carved away at these deposits and created the topographical conditions

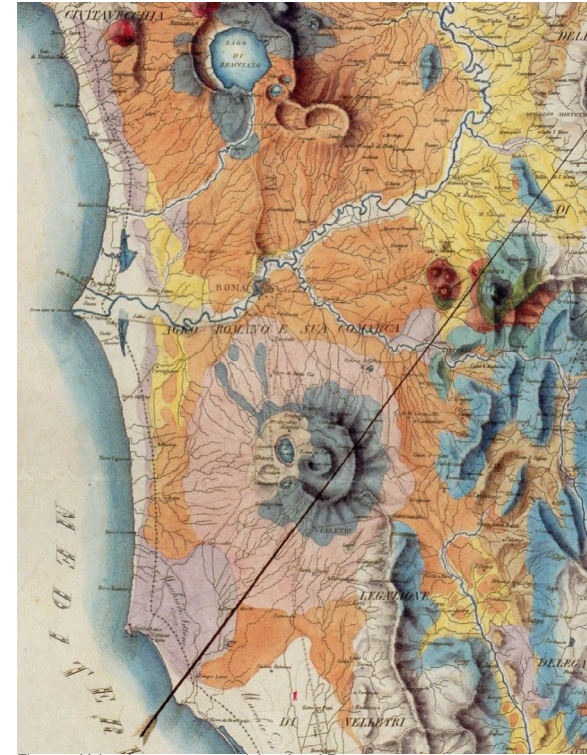


Figure4: Volcanic system around the city of Rome.



Figure5: Section of the geological system around the city of Rome.

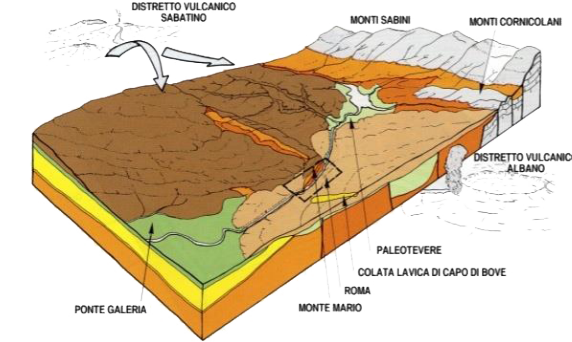


Figure6: Volcanic pyroclastic flows.

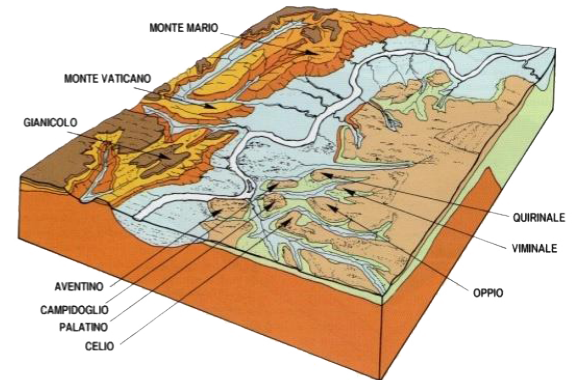


Figure7: Tiber erosion and sedimentation of the volcanic deposits.

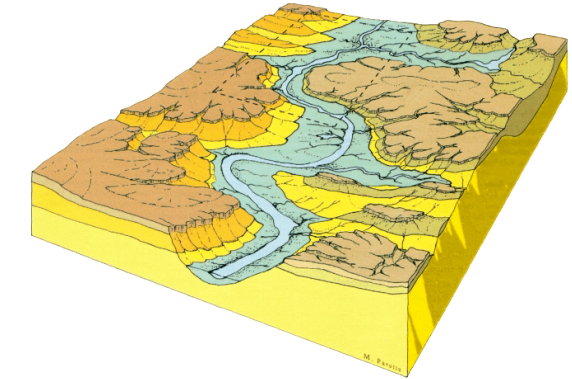


Figure8: Tiber river generating the landscape of Rome.

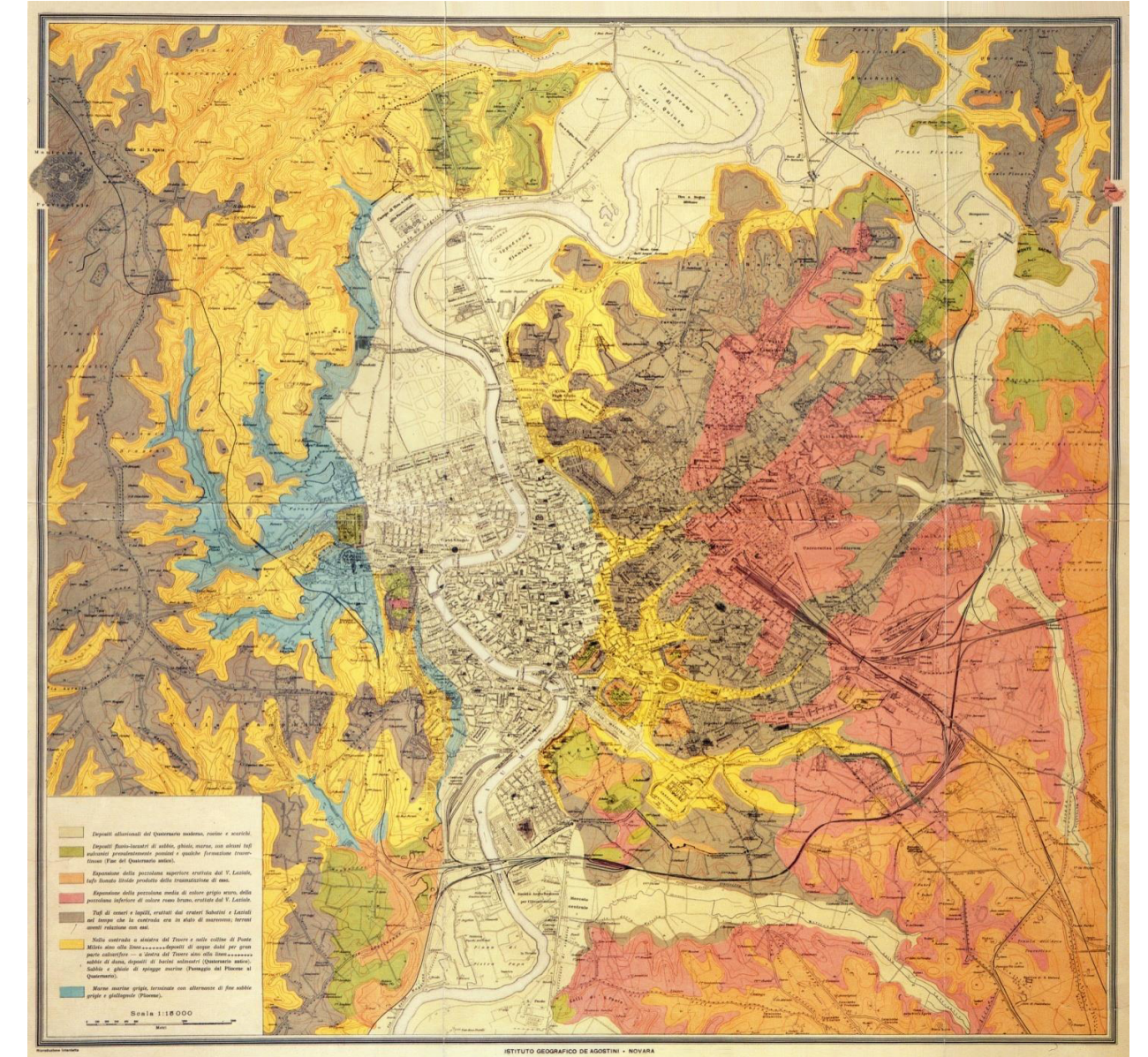


Figure9: Tiber river generating the landscape of Rome.

for the founding of Rome. The location of the early roman settlements is completely dependent on the topographical conditions generated by the interaction between the volcanoes and the Tiber. For the early settlements, the river provided a transportation route for trade and a natural defensible barrier to protect against Etruscan and other aggressors. The city was founded at the water's edge, where the access and transition between land and water was the most fluid, in the low lands that would become the Forum Boarium.

Rome is a city of watermarks documenting the intertwined relationship between Rome and the Tiber. The interaction between the city and the river takes place at the water's edge. It is along the Tiber's edges that the water's actions of sedimentation and erosion work and transform the land by carving it away and depositing silt on its muddy shores through its repeated rise and fall.

This fluid edge also generates an added layer of human activity and engagement between the land and water. These activities are distributed along the river's shores and result in human erosion and sedimentation along the water's edge.

This human activity and flow between the water and land spikes into intense points of exchange and engagement at specific locations along the river. These locations at which the maritime and land based activities connect and transition between each other are the Tiber's ports. Porto di Ripetta and Porto de Ripa Grande are two examples of Roman river ports that not only engage the Tiber and the city, but they transform the river into a conduit connecting Rome with the world and at one point its empire.



Figure10: Tiber river and Porto di Ripetta in the distance c. 1871.



Figure11: Tiber river and Porto di Ripetta in the distance.



Figure12: Porto di Ripetta.



Figure13: Giovanni Piranesi etching of Porto di Ripetta.



Figure14: Giovanni Piranesi etching of Porto di Ripa Grande.



Figure15: Giovanni Piranesi etching of Ponte Sant'Angelo.



Figure16: Photograph of Porto di Ripetta before Tiber embankments.



Figure17: Photograph of Porto di Ripa Grande before Tiber embankments.



Figure18: Photograph of Ponte Sant'Angelo before Tiber embankments.



Figure19: Porto di Ripetta was destroyed during the construction of the walls.



Figure20: Photograph of Porto di Ripa Grande after Tiber embankments.



Figure21: Photograph of Ponte Sant'Angelo after Tiber embankments.

A large part of the city of Rome is located in the Tiber's flood plane causing the activity and engagement that takes place at the river's edge to become submerged below the Tiber's waters during its winter flooding. As the river's water rises and falls, its edges move in and out of its banks and into and out of the city. The movement of the river's fluid edges forces Romans to engage with them and its waters not just along the Tiber's shores but also in their streets, piazzas and homes. This interaction with the floodwaters is by necessity rather than by choice, yet Romans have adapted and developed ways to deal with this fluidity, since Rome has always been a city of fluidity, flow and movement.

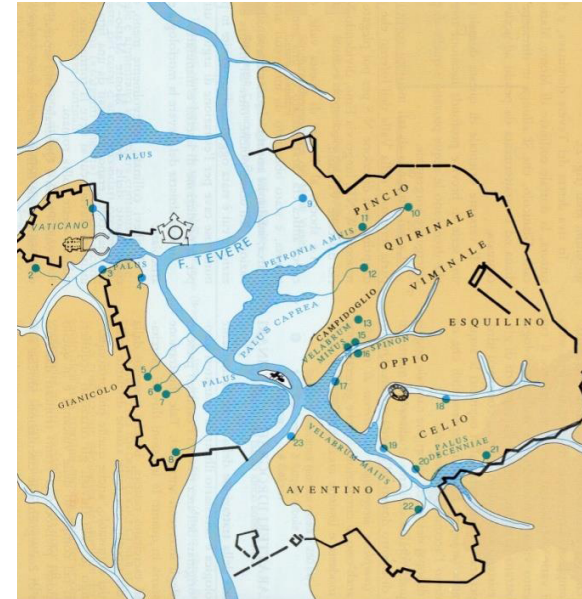


Figure22: Map of the Tiber's flood plane in Rome.



Figure23: Normal Level - under 7 masl
masl - Meters above sea level



Figure24: Flood Level 1 - 10-13 masl

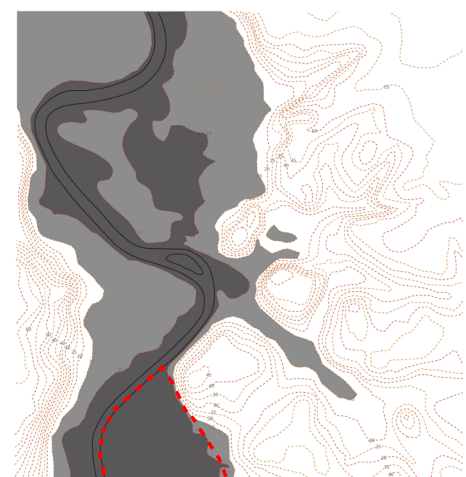


Figure25: Flood Level 2 - 13-16 masl

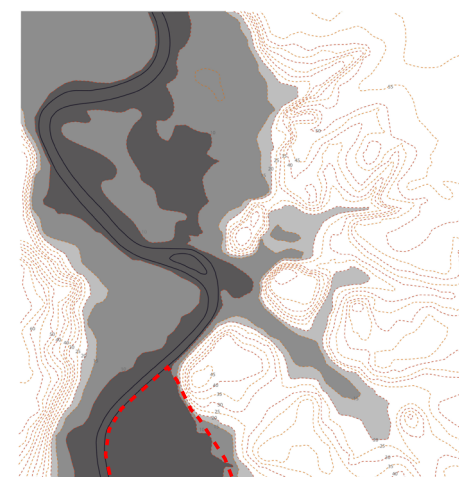


Figure26: Flood Level 3 - 16+ masl



Figure27: Pantheon flooded.



Figure29: Via Ostiense flooded.



Figure31: Basilica di San Paolo flooded.



Figure28: Pantheon flooded during the Middle Ages.



Figure30: Piazza Navona flooded.

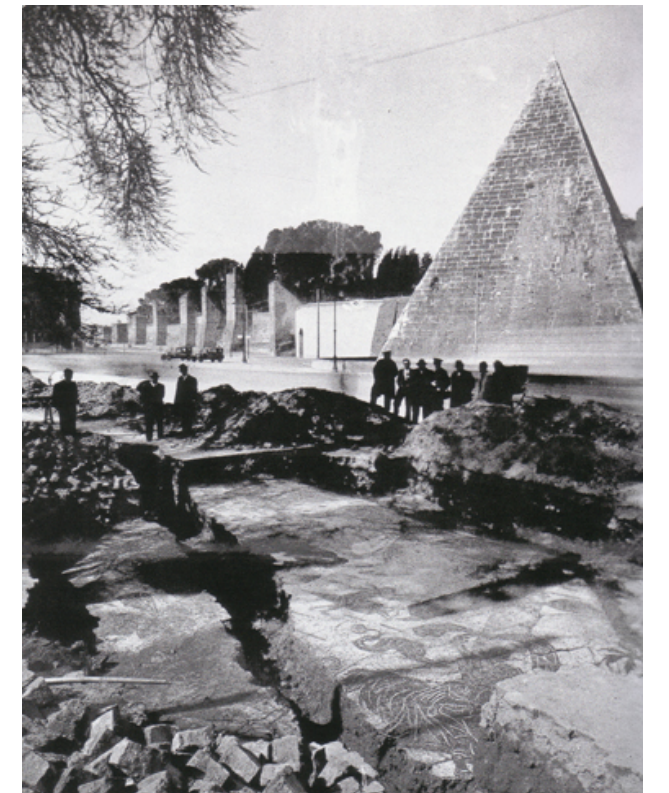


Figure32: Piazzale Ostiense and Via Ostiense flooded.

The reality of seasonal flooding and the moving target of this fluid datum are evident in the watermarks documented by the numerous flood markers of Rome. The Idrometro is the master flood-measuring marker for Rome, erected in 1821 on the façade of the church of San Rocco and is a consolidated reminder of the intimate relationship between the Tiber and Rome.

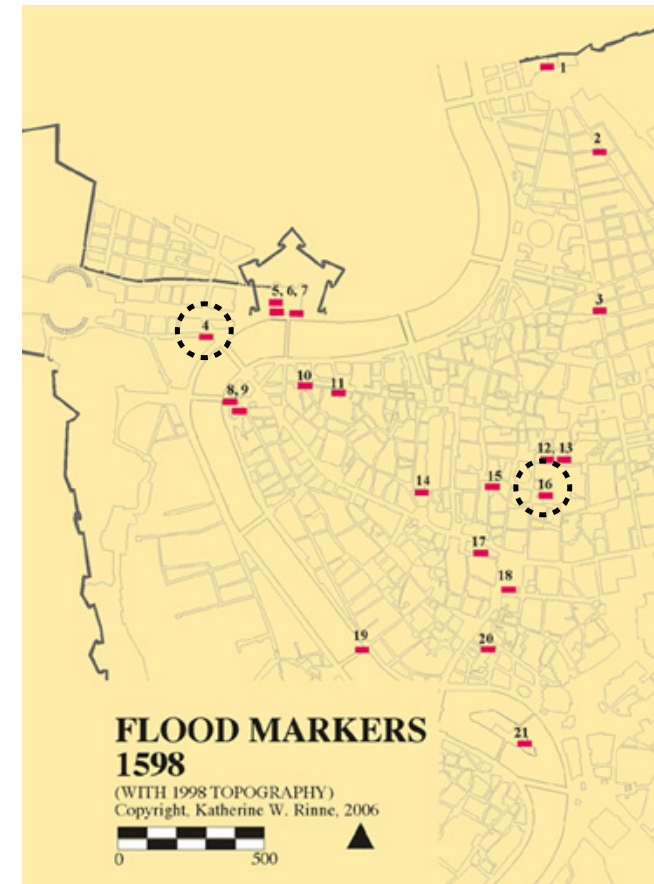


Figure33: Map indicating the locations where flood markers.

Tiber Flood Classification in Rome:

Normal Level:

- Water Level: 5-7 masl
- Discharge: 200 cu. meters/s

Elevated Level:

- Water Level: 7-10 masl
- Discharge: 800 cu. meters/s

Level 1 Flood:

- Water Level: 10-13 masl
- Discharge: 1500 cu. meters/s

Level 2 Flood:

- Water Level: 13-16 masl
- Discharge: 2000 cu. meters/s

Level 3 Flood:

- masl greater than 16.

Embankments have an elevation of 15 meters above sea level.

Elevation in Campo Boario is 14 masl



Figure34: Idrometro: On the facade of the Church of San Rocco Church [full view].



Figure35: Number 4: Hospital of Santo Spirito, flood of 1598 at 19.56m



Figure37: Number 16: Church of S Maria Sopra Minerva flood of 1422 at 17.22m



Figure36: Idrometro: On the facade of the Church of San Rocco Church [detail].



Figure38: Number 16: Church of S Maria Sopra Minerva flood markers.

II. FLUID INHABITATION | MEDIEVAL ROME:

The comfort that Romans have developed to Rome's fluidity and constant transformation can also be seen in the fluid nature in which they inhabited the city during the Middle Ages. Some of the most imaginative and interesting ways of connecting to place by interacting with the fluid datum of the ground plane are depicted by Giovanni Battista Piranesi in his Vedute di Roma, etchings of Medieval Rome created between 1748 and 1774. During the Middle Ages, Rome's strength and influence over the world withered away due to the partitioning of the Roman Empire in 293 and eventual collapse of the Western Roman Empire in 476 CE. This marked a one thousand year period sometimes referred to as the Dark Ages, during which the Roman Empire saw the disintegration of its political, economical, military and social institutions. During this time, Rome's size and population shrank dramatically and its people forgot most of the key skills and elements that made it great. The art of road building, aqueduct building and maintaining running water and plumbing were all lost to time, transforming Rome into a place resembling

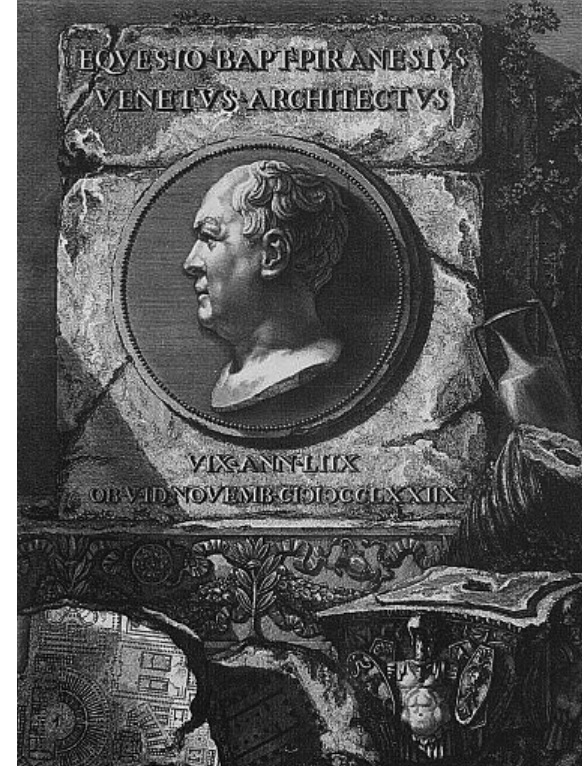


Figure39: Portrait of Giovanni Piranesi.



Figure40: Giovanni Piranesi etching of Portico di Ottavia during Medieval Rome.

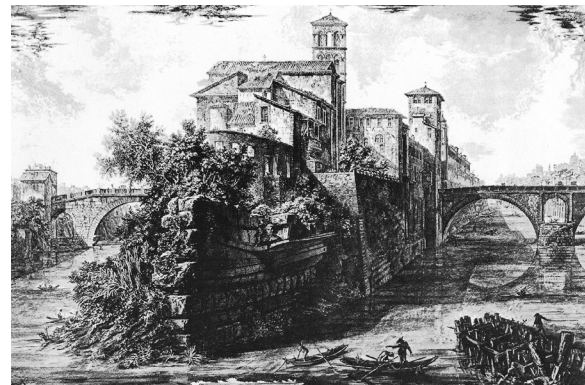


Figure41: Giovanni Piranesi etching of the Tiber Island.



Figure42: Giovanni Piranesi etching of Forum Romanum.



Figure43: Giovanni Piranesi etching of Forum Romanum showing high sediment levels during Medieval times.

a village more than a metropolis. It is during these turbulent times that ingenuity and new modes of inhabitation in the shadow of the former imperial capital developed from need and necessity. Piranesi depicts Romans responding, adapting, and adjusting to the flooding and re-appropriating the ruins of ancient Rome in fluid and engaging ways. It is through Piranesi's etchings that we see the Temple of Cibile transformed into a house, the Arch of Titus converted into a gated community, the Pyramid of Cestius becoming a fortress and the Forum Romanum existing as a livestock pasture (also known as "Campo Vaccino" or field of cows or cow pasture).



Figure44: Giovanni Piranesi etching of the Arch of Titus.



Figure47: Arch of Titus today.



Figure49: Giovanni Piranesi etching of the Arch of Titus during Middle Ages.



Figure45: Temple of Cibile today.



Figure46: Giovanni Piranesi etching of the Temple of Cibile during Middle Ages.

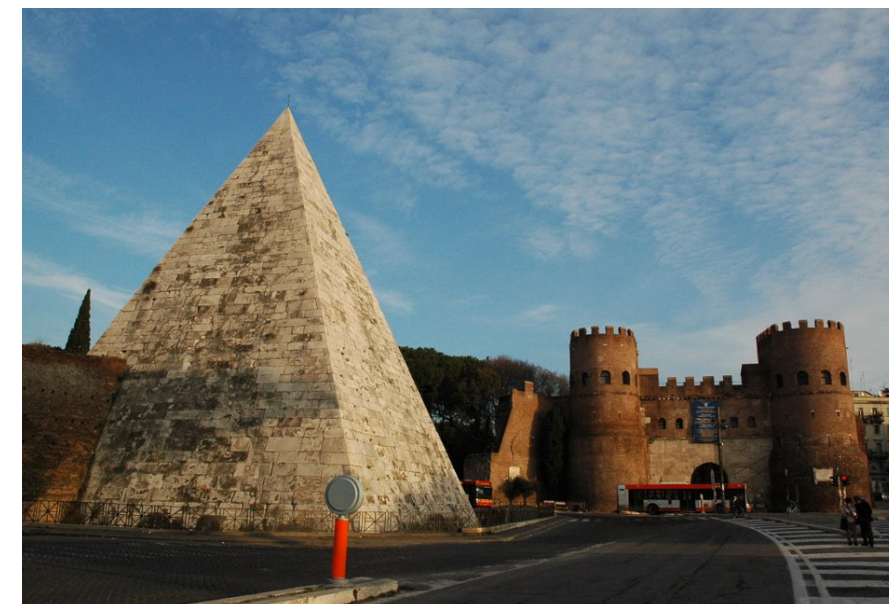


Figure48: Pyramid of Casius today.

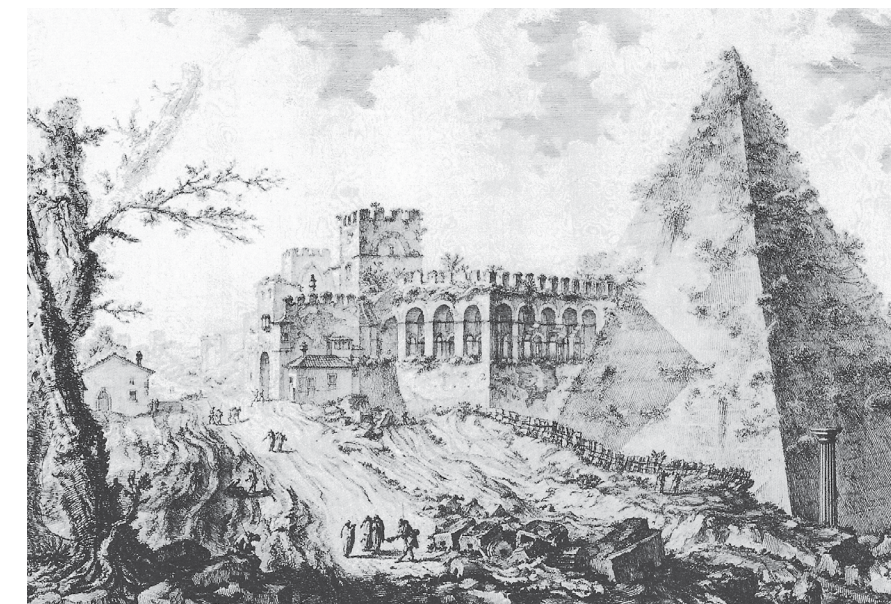


Figure50: Giovanni Piranesi etching of the Pyramid of Casius during Middle Ages.

The etchings of the Forum Romanum and specifically of the Arch of Diocletian show the dramatic rise in the sediment levels during this period. The Forum Romanum, as the low lying area of the city, experienced the most intense sediment deposition as it flooded through the one engineering feat that originally drained its marshes into the Tiber, the Cloaca Maxima. During flooding events, the Tiber's waters rose and the Cloaca back-flowed into the Forum, settling sediment and burying ancient monuments that were not being maintained during this period.

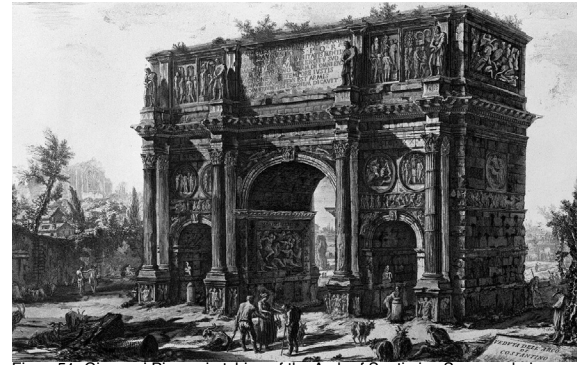


Figure51: Giovanni Piranesi etching of the Arch of Septimius Severus during Middle Ages.



Figure53: Painting of the Arch of Septimius Severus during Middle Ages.



Figure52: Giovanni Piranesi etching of the Cloaca Maxima during Middle Ages.

III. LOSS OF FLUIDITY | FOSSILIZATION: DISENGAGEMENT | Tiber Embankments:

The fluidity and engagement between Rome, the Tiber and its people began to be eroded in 1861 when Rome became the capital of United Italy. In order to rise to the level of a European capital, Rome had to project strength and competence. Yearly flooding of most of the city was going to have the opposite effect so a process of cleaning up and reducing fluidity was underway. As a result, the fluid interaction between the city and the river was disengaged in 1876 by the construction of the river embankments, meant to control the Tiber's fluctuating waters. The construction of the embankments had a devastating effect in the tightly connected and cohesive urban fabric of central Rome. The Tiber walls were completely out of scale with the rest of the city and its fabric, when comparing Rome's winding and narrow streets and alleys to the heavy-handed straight lines and heights of the embankment walls.



Figure54: Map of United Kingdom of Italy circa 1867



Figure55: Tiber Embankments circa 1870.

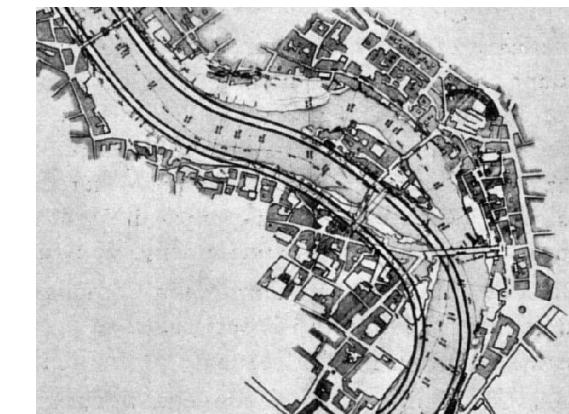


Figure56: Tiber Embankments proposed plan.

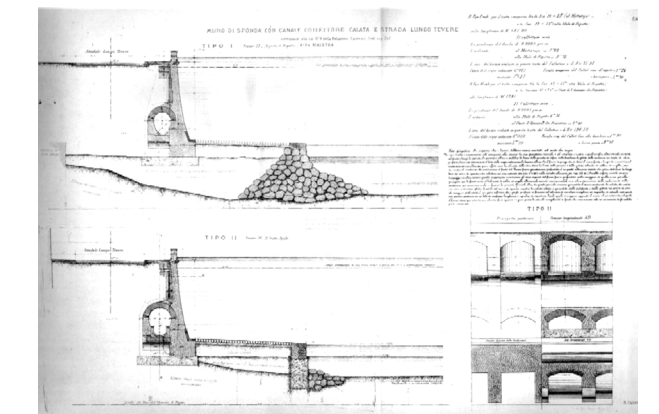


Figure57: Tiber Embankments section details.

The relationship of the built form to human scale, which is one of the best attributes of Roman streets, was completely lost in the river walls. The embankments appear like an urban canyon and a huge cut scar on the city and its fabric. The Tiber was a place of multiplicity and interaction between ground and water, terrestrial and maritime activities, and has now been turned into a dead and fossilized space, lacking scale, activity and life.



Figure61: Ponte Fabricio before embankments.

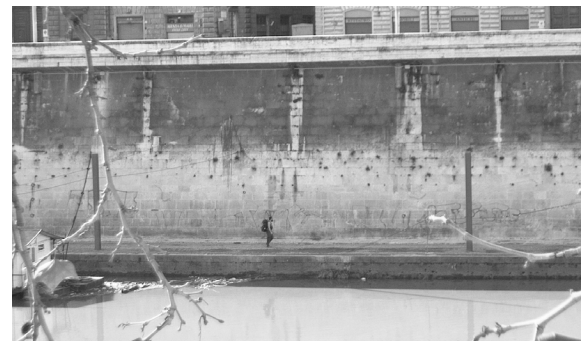


Figure59: Embankment walls and human scale.



Figure62: Ponte Fabricio after embankments.



Figure60: Embankment access stairs and scale.



Figure63: Ponte Fabricio today.

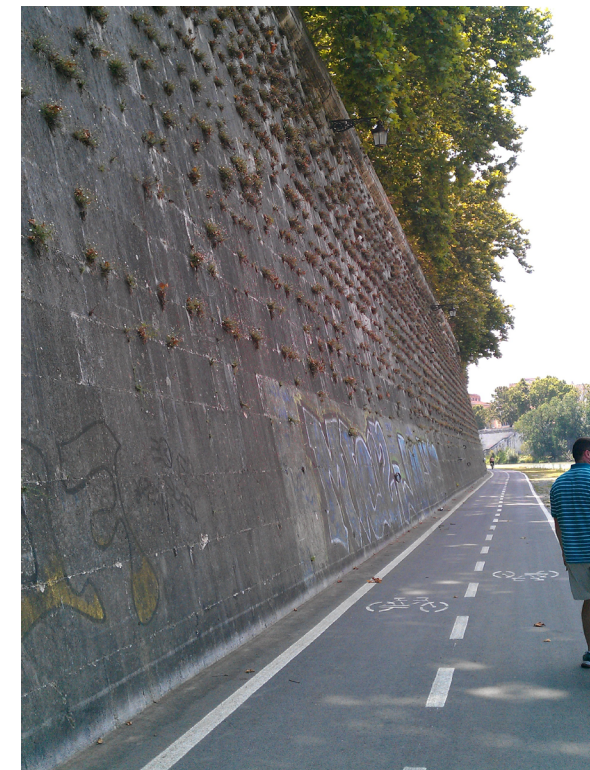


Figure58: Embankment walls and human scale.

FOSSILIZATION | Historicism and Archeological Preservation:

In the search for a renewed legitimacy as the Capital of Italy, Romans began to look at its history and former symbols of strength and power, dating back to the ancient world and the Roman Empire. This search for legitimacy and meaning led to a renewed interest in classical Rome and archeological efforts to recover the power of that world. Extensive archeological activities revealed many of the buried ancient ruins that were covered up by the Tiber's deposited sediments. This rise in interest for the power of ancient artifacts resulted in an attitude of historicism, in which artifacts became meaningful simply due to their appearance and age. The construction of kitschy monuments, such as the Vittorio Emmanuelle II, is a result of this obsession with the classical period of Rome. Importance was placed purely on appearance without any consideration to site connections and engagement with the city.



Figure64: View of Forum Romanum.



Figure65: Vittorio Emmanuelle II Monument

Along with the historicized obsession with appearance and age, came another obsession with preservation and refusal to accept change. Preservationists became interested in protecting and preserving existing urban fabric at any costs, without any other considerations. A degree of appreciating and preserving the urban fabric is healthy and needed, but the reality is this excessive preservation of the city is slowly removing more and more of its structures from the natural lifecycle, separating them and placing them in their own little world by cutting most or all interactions with their surrounding in order to fully preserve them and prevent them from changing at all.



Figure66: Aerial view of the Vittorio Emmanuelle II Monument showing how out of scale it is with its surroundings.

This loss of engagement and interaction is destroying the existing and potential relationships. It is the fluidity of engagement that brings people and neighborhoods together. This individual entrapment

of preserved buildings are like small Tiber walls ripping the neighbors, neighborhoods and the city apart, transforming it into a collection of fossilized dead artifacts that sit alone as distinct islands with no interconnections or relationships. The city is becoming a series of distinct experiences, as these stand-alone artifacts become disengaged from the story of Rome and therefore cannot be related back into a flow and storyline that gives them meaning.

DISENGAGEMENT | Monte Testaccio & Testaccio Neighborhood:

This "active" deactivation of neighborhood synergies can be seen in the neighborhood of Testaccio, in the quarantining of Monte Testaccio and in the former slaughterhouse, Ex-Mattatoio. The neighborhood of Testaccio is in the southeastern quarter of Rome, an area that was outside of the Servian walls of the 4th Century BCE, but inside the Aurelian walls of the 3rd Century CE, which wrapped around the southern edge of the neighborhood and along the eastern shore of the Tiber to the west. Testaccio is the twentieth Rione of Rome, part of the twenty-two administrative divisions of today's Rome, and the descendant of the Augustan Rione XIII, Aventinus. The neighborhood is now named after the amphorae mound that stands at its center, Monte Testaccio, which is composed of broken clay pots discarded there during the olive oil trade of the High Roman Empire, a product of the commercial flow and intense activity of the port of Rome. The 150-foot high pile of broken clay pots was not deposited in Testaccio by the Tiber's siltation but by a different kind of sedimentation. It is the product and marker of the activity and engagement between the neighborhood and the Tiber as this place, which is site of the ancient port of Rome and the warehouse district.

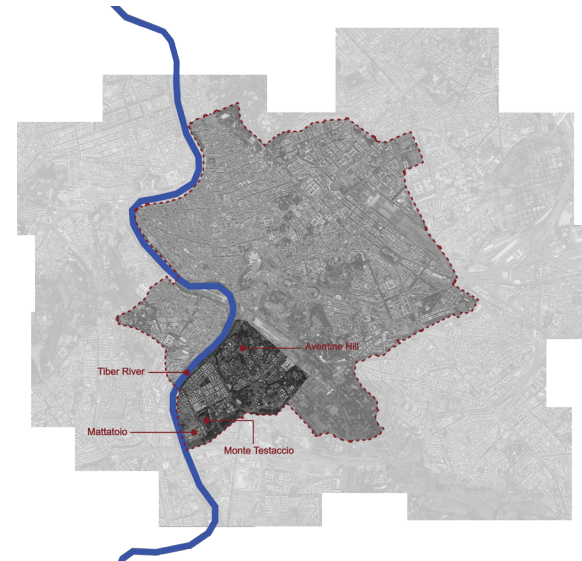


Figure67: Map of Rome and Testaccio neighborhood.

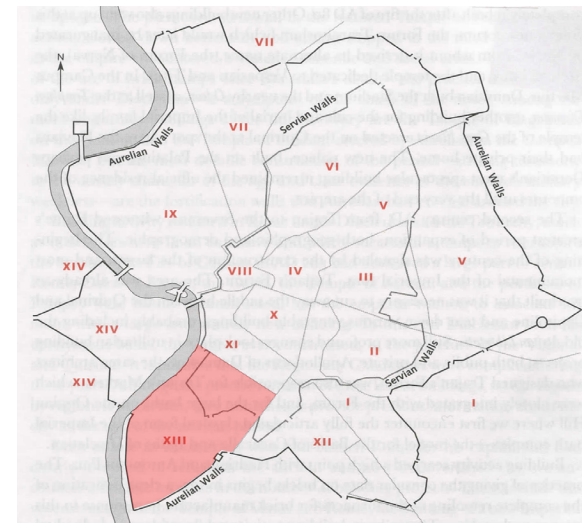


Figure68: Map of Rome Riones and Testaccio neighborhood.



Figure69: Path to Monte Testaccio.



Figure70: Monte Testaccio panoramic view.



Figure71: Top of Monte Testaccio.

Monte Testaccio has become a landmark of Rome and an identifier for the neighborhood of Testaccio. One would expect that the symbol and landmark of a community to be celebrated, engaged and a focal point of the neighborhood, but instead, Monte Testaccio is a fenced of ruin with a very limited gated access that is accessible by reservation predominantly to tourists instead of neighbors. The hill has been transformed into an artifact, a museum piece that is not meant to be handled, touched or interacted with, but fully controlled for the purpose of preservation. This becomes like a blank spot of dead space in the neighborhood, lacking activity and engagement to the community.

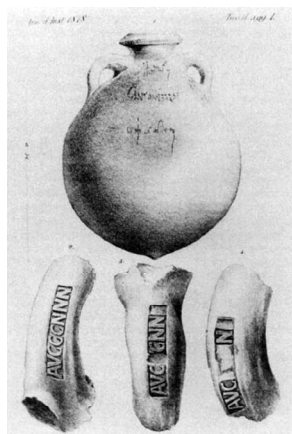


Figure72: Side view of Monte Testaccio revealing its amphorae composition and fence.



Figure73: Gated access to Monte Testaccio.



Figure74: Excevation of Monte Testaccio revealing its amphorae composition.



Figure75: Aerial view of Monte Testaccio and Mattatoio.

MATTATOIO DI TESTACCIO | Foundational Project:

This fossilization is not only occurring to topographical landmarks like Monte Testaccio but it is also affecting buildings of the neighborhood like the Roma Capitale institutional complex of the Mattatoio di Testaccio. During the late 1800s, Rome had to project a sense of strength and power, due to an Italy that was not in unanimous agreement about its ascension as the capital of United Italy. This lack of legitimacy resulted in the consolidation of city functions into institutions of Roma Capitale. Mattatoio di Testaccio was designed by architect Gioacchino Ersoch in 1888 and built from 1888 to 1890, and was the institution that consolidated the slaughter and distribution of meat to the city according to the highest hygiene standards as the “slaughterhouse of Rome”. The Mattatoio thus becomes a foundational project for Rome, as the Capital and the Kingdom of Italy, continuing the tradition of re-founding that Rome has had throughout its existence. “Rome does not cease to be founded [... its], foundation is recurrent” (Serres), and it is brought to life through a variety of events and traumas, which create relationships and community.

Located on the eastern shore of the Tiber, in the flat plain between the river and Monte Testaccio, the Mattatoio is built in the Tiber’s flood plain, on flat alluvial sedimented ground. The slaughterhouse complex occupies the ancient site of the port of Rome, one of the most active areas of the river’s edge during the Empire, activity documented by the amphorae mound of Monte Testaccio. The Mattatoio aligns to the gridded layout of the neighborhood to the north and east by nestling against the courtyard style worker housing and the farmer’s market to the northeast. The relationship to the north is closed, with no connection to Via Aldo Manuzio through any gates or openings, just the side facade of a long shed roofed building. To the south, the Roma-Fiumicino railway artery that connects stations Roma Ostiense to the east



Figure76: Statue of Mithras sacrificing the bull on top of the main gate of Mattatoio di Testaccio.



Figure77: Drawing of Mattatoio di Testaccio location in Testaccio.



Figure78: Aerial view of Monte Testaccio and Mattatoio looking north.

and Roma Trastevere to the West borders the Mattatoio. The compound has an introverted character that is inward looking, with walls and edge buildings have high arched windows that deny any glimpse to the interior site and activities.

The location of the Mattatoio along the banks of the Tiber River is not accidental. This area of Testaccio used to be populated by the emporiums, porticos and docks of the port of Rome. This low-lying area along the river was the center of imperial commerce and trade, importing products such as olive oil and livestock from the far reaches of the empire. The navigability of the Tiber up to this point allowed smaller boats to transport livestock between Rome and Ostia, the maritime port of Rome, on the shores of the Mediterranean Sea. Seafaring ships would transfer their freight to river faring boats that navigated the Tiber up to Rome or onto land moving vehicles that were transported to Rome on Via Ostiense. The location of the Mattatoio adjacent to both the Tiber and Via Ostiense connected it to the livestock supply chain.

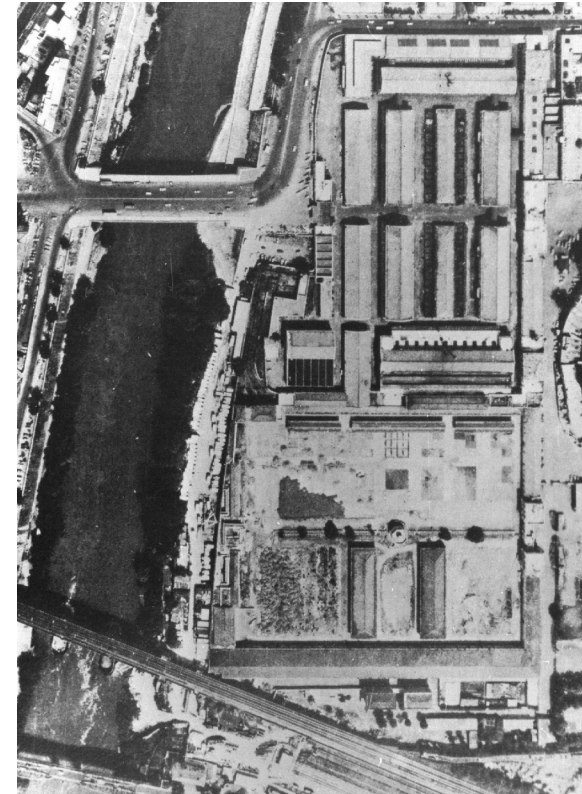


Figure79: Aerial view of Mattatoio and Campo Boario.



Figure81: View of Testaccio neighborhood model depicting the Port of Rome.

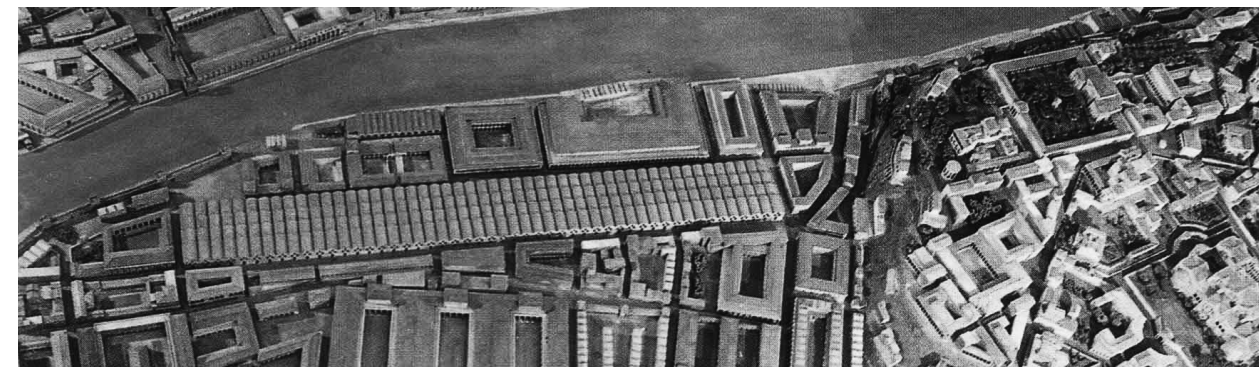


Figure80: View of Testaccio neighborhood model depicting the Port of Rome.



Figure82: Aerial view of Via Ostiense looking towards Porta San Paolo and Pyramid.



Figure83: Via Ostiense as it begins in Ostia.

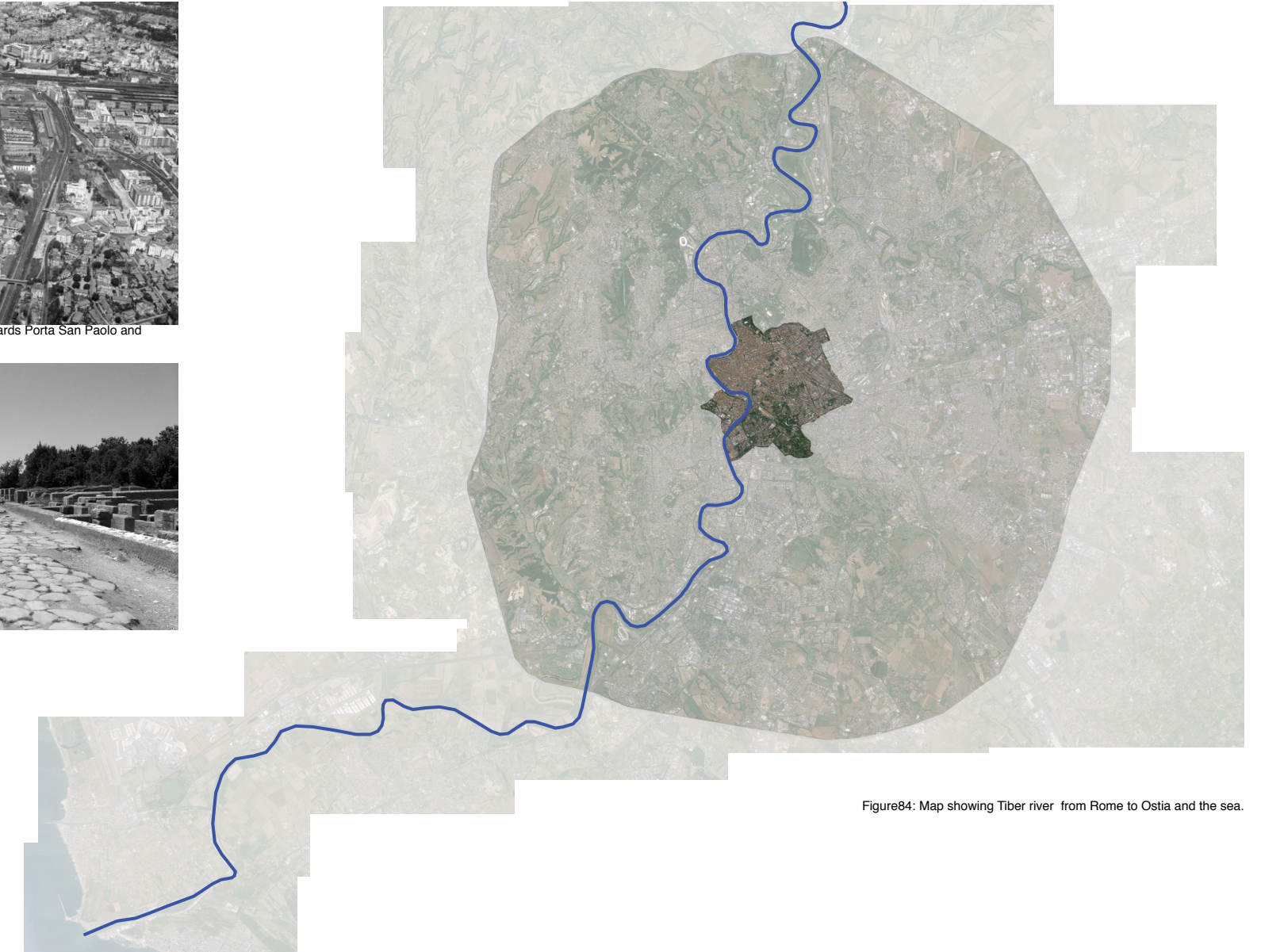


Figure84: Map showing Tiber river from Rome to Ostia and the sea.

CAMPO BOARIO | An organization of flow and sacrifice:

The exchange and interaction between the slaughterhouse and neighborhood community took place primarily in Campo Boario, the livestock market and holding area for the animals waiting to be slaughtered. The Campo was an intensely active space organized by a center axis between the entry gate at its eastern end, on the side of Monte Testaccio, and the Borsa building at its western end, on the Tiber's shores. This axis divided the Campo into two zones. The northern half was occupied by the stalle and padiglione, the holding pens for the animals waiting the impending and inevitable slaying. The southern side of the Campo was the Mercato del Bestiame (livestock market), a series of large covered spaces for commerce and exchange where livestock was bought and sold. The axis also generates a flow starting from the entry gate by Monte Testaccio and moving west on the elevated walkway to the Padiglione Centrale, the central watchtower that oversaw the entire Campo. From the central pavilion, one would move towards the Borsa (bag/purse) building where customers were paid. The high activity level of the Campo Boario is evident by the presence of a "trattoria" (restaurant) and the "Corpo di Guarda"



Figure85: Gate Building of Campo Boario with Central Pavilion in the background.



Figure86: Central Pavilion in Campo Boario looking down the central axis.



Figure89: Borsa Building in Campo Boario looking down the central axis.



Figure87: Mattatoio di Testaccio stalle (livestock stalls).



Figure88: Mattatoio di Testaccio stalle (livestock stalls).



Figure90: Campo Boario under construction.

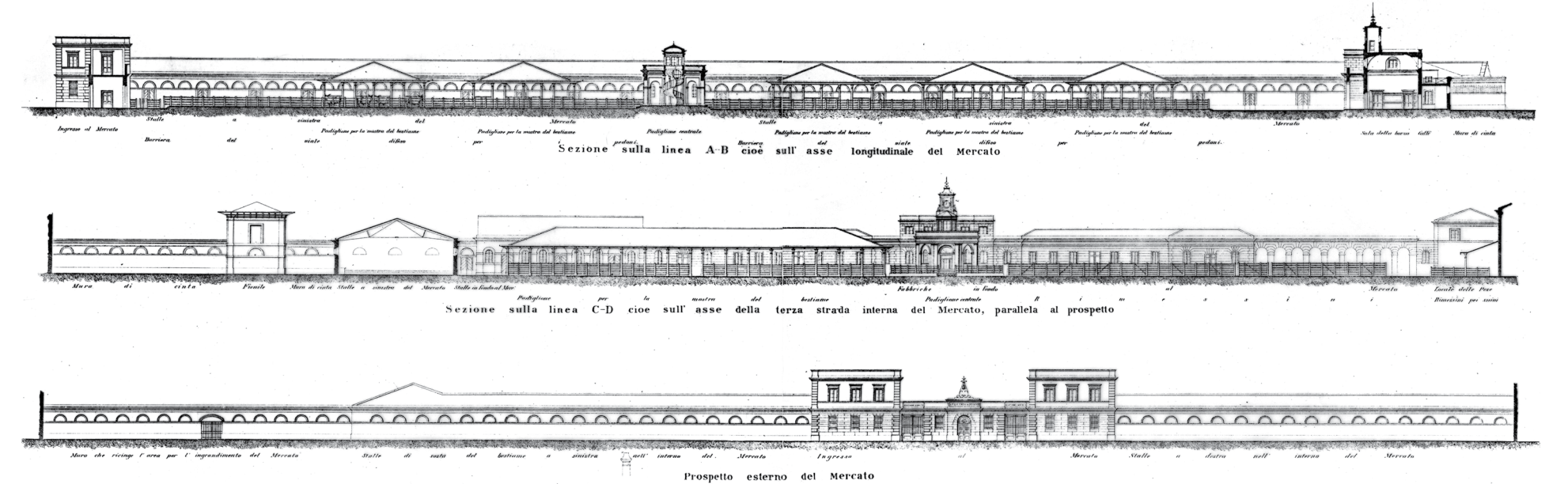


Figure91: Campo Boario site sections (original drawings).

a police post charged with maintaining order in the hectic livestock auction market. These movements and flows of people, animals and blood connect the slaughterhouse to the community and generate the activity and meaning of the Campo Boario in the neighborhood.

The slaughterhouse is located to the north of Campo Boario and is organized with a central cluster of eight buildings that are surrounded by auxiliary edge buildings. Each of these structures serves a specific function in the overall process of slaughtering, processing and distributing meat to the city. These primary meat-processing buildings are: the Macello Ovino (Sheep slaughter), Tripperia (Tripe), Vitellara (Cattle), Stalle Pel Bestiame Domito (Livestock stalls), and Pelanda Dei Suini (Pig Skinning). They are interconnected by overhead rail systems that guide wheeled meat hooks, allowing the transportation of carcasses from building to building. Along the southern edge of the Campo is a long shed roof building that contains interior storage rooms and stalls, with a black wall to the outside and the railroad track further to the south. A larger building completes the northern edge of the Campo Boario, the water building and Pelanda dei Suini building.



Figure92: Macello Ovino door and overhead rail system in Mattatoio (sheep slaughter).



Figure93: Tripperia entrance door and overhead rail system in the Mattatoio (tripe).



Figure96: Vitellara entrance door in the Mattatoio (cattle slaughter).

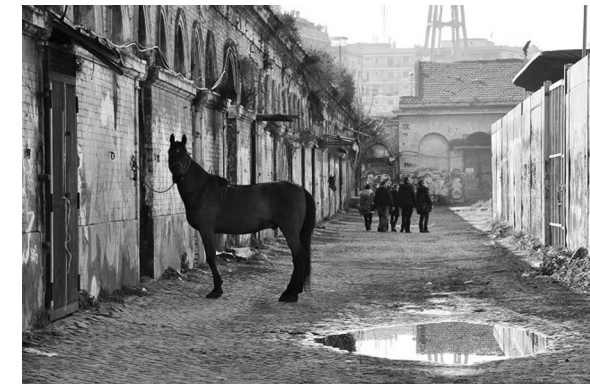


Figure94: Stalle building along the southern edge of the Campo Boario looking west.



Figure95: Pelanda dei Suini of the Mattatoio (pork slaughter).

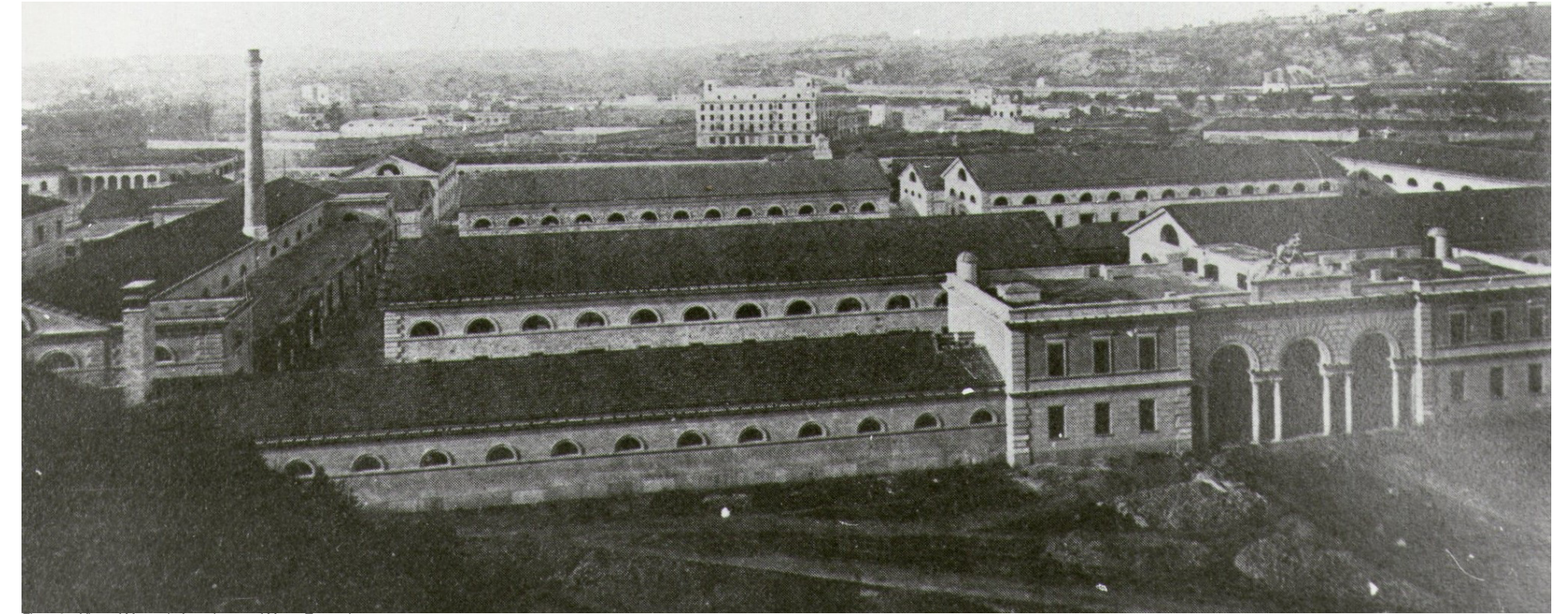


Figure97: View of Mattatoio from the top of Monte Testaccio.



Figure98: Overhead rail system used to transport slaughtered livestock carcasses from one building to another in the Mattatoio.



Figure99: Detail of the overhead rail system in the Mattatoio.



Figure100: Overhead rail system used to transport slaughtered livestock carcasses from one building to another in the Mattatoio.

CAMPO BOARIO | Re-founding through sacrifice:

The ancient Greek sacrificial altar and its decorations of sacrifice such as the bulls head, garlands and bones developed into the Greek temple and the Doric language. Ersoch used this language in the design and reinterpretation of the Mattatoio through a lens of sacrifice. He did not just build a warehouse, but instead achieved meaning by using the Doric order and sacrificial decorations to transform the slaughtered animals into sacrificial victims and the Mattatoio into a sacrificial altar.

Most buildings have plain Doric entablatures and are treated in a subdued manner that would be appropriate for an industrial facility. The processing buildings have plain brick walls, arched windows with plain frames that are high on the walls. The only decoration or expression on these functionally oriented processing buildings is in the corners, which are articulated with flat large stones. These buildings are interconnected by a complex system of suspended iron rails that weave in and out from interior to exterior and allow the overhead transportation of slaughtered carcasses from one building to another. The iron truss and rail system is not analogous to the rest of the architectural language of the Mattatoio, yet it is apart of the technological advancements and progress that is part of the legitimation of Roma Capitale as the leader of united Italy. The juxtaposition between the Doric expression and the industrial metalwork speaks to the relationship between the sacred and sacrificial aspects of slaughter and the pure requirements of clean, safe and efficient production of meat for the capital.



Figure101: Ancient Greek sacrificial altar.



Figure102: Ancient Greek temple (Temple of Hephaestus).



Figure103: View of architecture school Universita di Roma Tre, after redevelopment.



Figure104: Mattatoio di Testaccio detail of corner articulation of processing buildings.



Figure105: Mattatoio di Testaccio door detailing of the processing buildings.



Figure106: Overhead rail system used to transport slaughtered livestock carcasses from one building to another in the Mattatoio.

The gate buildings on the other hand are a lot more expressive in their articulation and decorative elements. The main entry gate, at the northeastern side of the Mattatoio is the largest gate to the complex. The gate building has two stories, imposing its presence by rising above the adjacent perimeter buildings. It is a double height, triple arched entry supported by double Doric columns. The overall entablature is still relatively plain, but the section above the three arches is decorated with the traditional sacrificial elements of bull skulls, garlands and flowers. The same decorative elements can be seen on the Ara Pacis, the sacrificial altar of Augustus. On the top of the gate building is a sculpture of Mithras slaying the bull, again emphasizing the function of the complex as a slaughterhouse as well as the connection to tradition, myth and sacrifice.

The Borsa is the western edge building of Campo Boario. It is the place where payment was made in exchange for the livestock brought and sold to the slaughterhouse. This was the most active and communal place of the entire complex, and the area of highest exchange. The Borsa building stands out from the other single story buildings that define the western edge of the Campo Boario by having a raised second half story with clerestory windows and a central clock tower. Similar to the entry gate on Via Luigi Galvani, the Borsa has a tripartite entrance with three doors below an entablature supported by two Doric columns. The decorations on the entablature are the same sacrificial decorations of bull skulls, garlands and flowers, transforming Campo Boario into a sacred place of sacrifice.



Figure107: Mattatoio di Testaccio main gate statue of Mithras sacrificing the bull.



Figure108: Mattatoio di Testaccio main gate entablature decorations of sacrifice. Bull skulls, dentils, garlands and flowers.



Figure109: Decorations of sacrifice (bull skulls, garlands and flowers) on the Ara Pacis, the sacrificial altar of Augustus.

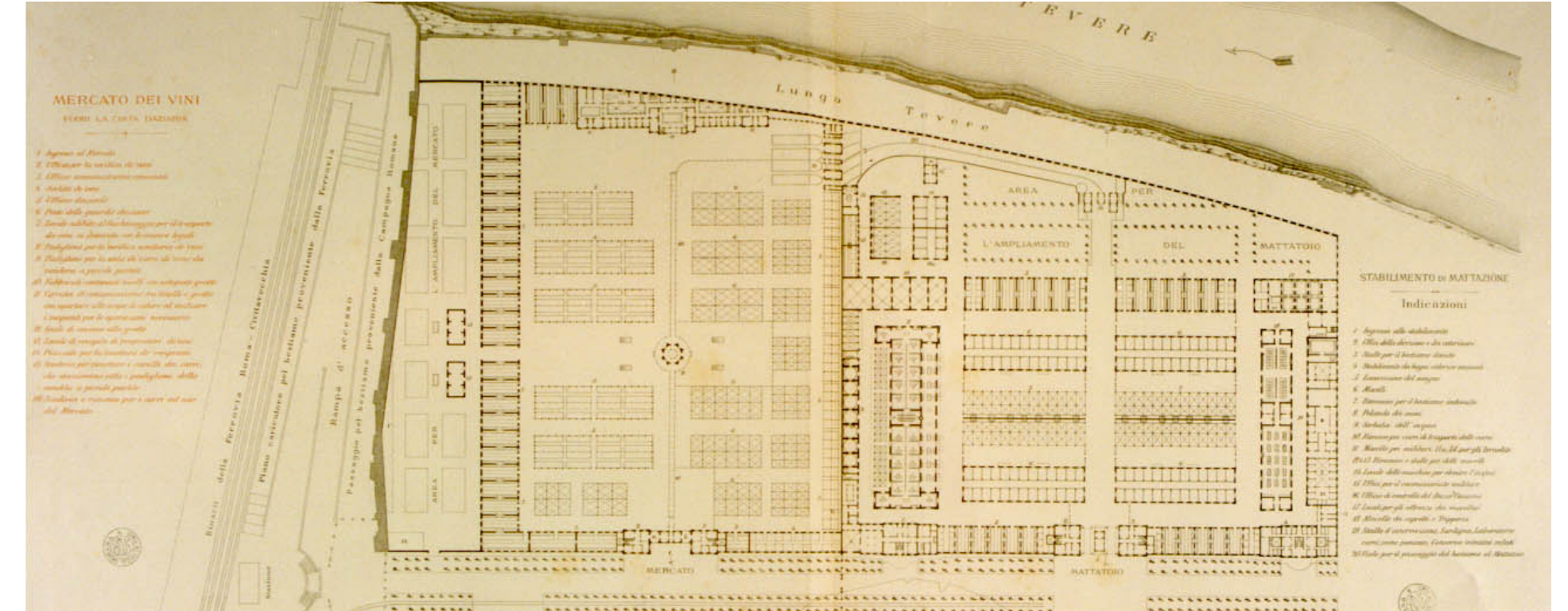


Figure110: Original plan of Mattatoio di Testaccio.

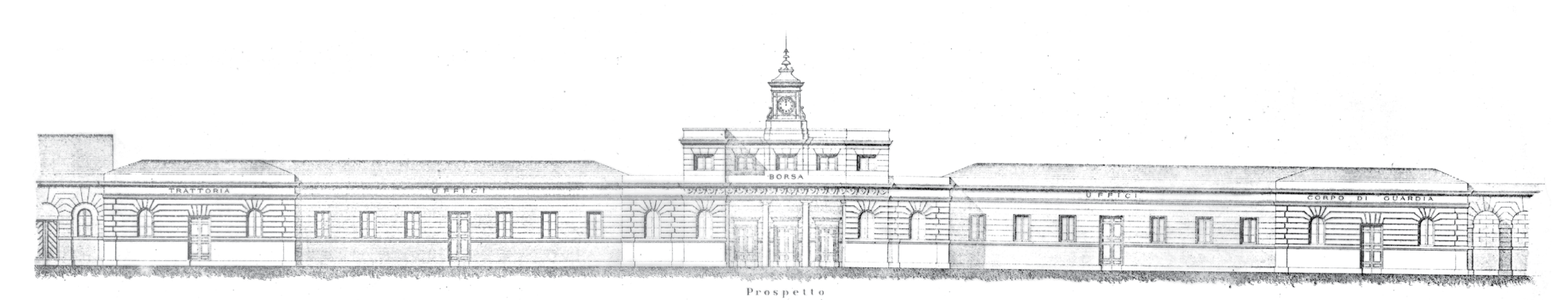


Figure111: Original elevation drawing of the Borsa building and flank buildings, showing the uffici (offices), trattoria (restaurant/eatery) to the left, and uffici (offices) and Corpo di Guardi (police post) to the right.

ABANDONMENT | Decommissioning the Mattatoio:

The population of Rome increased from 430,000 in 1890, to 3,000,000 in 1975, resulting in an increase of demand for processed meat. The Mattatoio's production could not satisfy the increase in demand and in 1975 it was decommissioned and replaced by a larger and modernized facility near Via Togliatti. As the activity and engagement of the Mattatoio ceased, the slaughterhouse compound fell into disrepair and abandonment.

The entire area exudes a strong feeling of what used to be, an emotion of absence and loss, that makes one pause and mourn in a solemn moment of intense connection to something outside of history. The abandoned spaces of Campo Boario and the fossilized emptiness that weighs on its spaces is similar to the surreal atmosphere of Giorgio de Chirico's metaphysical paintings. The empty and repetitive arched facades, the long shadows and "images of forlornness and emptiness", all inspire an emotional response and an overwhelming sense of loss. It is this presence of absence and disengaged relationship, yet still captivating attraction is what makes the Campo such a powerful experience.

The former fluidity and engagement that the Campo generated during Roma Capitale was sporadically carried on by temporary uses and fluid inhabitations. The buildings of the Campo Boario were temporarily reused by the police station for offices and storage, the stalls in the southern building were used as shelter for the horses that draw tourist carriages through Rome, and the Borsa and open center of the Campo were used by the Roma and Villagio Globale people.



Figure112: Scene of abandonment in Campo Boario c. 2000.



Figure113: Abandoned Pelanda dei Suini c.2000.



Figure114: Stalle building along the southern edge of Campo Boario being used as horse stables used to pull tourist carriages c. 2000.



Figure115: Abandoned view of Campo Boario and Gasometro in the background. Figure116: Giorgio de Chirico painting entitled "The Enigma of a Day II" (1914).



Figure117: View of Gasometro across the railroad tracks, looking south from the Stalle building. Figure118: Giorgio de Chirico painting entitled "Piazza d'Italia" (1913).

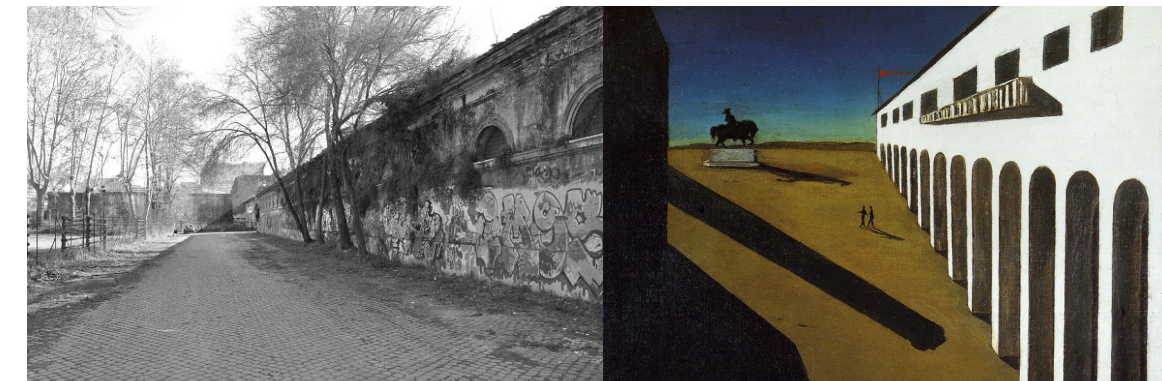


Figure119: Abandoned exterior elevation of the eastern edge building of Campo Boario. Figure120: Giorgio de Chirico painting entitled "Departure of a Poet" (1913).

The Roma gypsies squatted and used parts of the Campo Boario as their home, in their transient movement across Europe. Their members are always changing and the Campo functioned as a kind of temporary asylum in their never-ending trek around the world. The difference between the Roma gypsy settlement and other social centers that practice squatting is that unlike the squats such as the Villagio Globale which thrives on diversity and international activism, the Roma are a homogeneously distinct ethnic group.

Villagio Globale established itself in the Campo Boario and in the Borsa building in 1990, fluctuating in size and activity levels over the years, but always maintaining a presence. The organization has worldwide chapters and is a social center for travelers and social outcasts. These so called global villages, host events like concerts, art exhibits and raves, all with undercurrents that are against "the system" and traditional norms. The global village in the Ex-Mattatoio is similar to squatting communities that exist in all major European cities today.



Figure121: Borsa building as it is being occupied by the Villagio Globale c. 2000.



Figure122: Campo Boario abandoned and occupied by squatters and their trailers, with horses grazing on grass that has overgrown on top of cobblestones.



Figure123: Squatters and their trailers along the Stalle building of the Campo Boario.



Figure124: Members of Villagio Globale performing in Campo Boario.



Figure125: Rave inside the Borsa building, organized by Villagio Globale.



Figure126: West elevation of the Borsa building covered in graffiti, and a Villagio Globale member riding alone.



Figure127: Aerial view of Monte Testaccio and caravans squatting in Campo Boario.

EX-MATTATOIO | Attempt at re-engagement:

A more comprehensive redevelopment began in 1992, with the renovation and rehabilitation of the wings along Via Aldo Manuzio on the north edge and Via Benjamino Franklin on the northeast edge, by the architecture school of Università di Roma Tre. The project reused one external wing of the complex to house three lecture rooms and one auditorium. The architecture school's professors and students did environmental analysis and sustainability work for the project, which reused 16511 square meters at an estimated cost of 40 million euros.

In 2007, Citta dell'altra Economia, an eco-friendly market, renovated the Weights Buildings (Pese) and the edge pavilions that open up onto Campo Boario. According to their project website, "the USD 7 million project to create a "Città dell'Altra Economia" (Alternative Economy City) was undertaken between September 2005 and September 2007 with the intervention connecting the structurally restored and rehabilitated spaces of the city's former Testaccio Slaughterhouse. It is the first place in Europe dedicated to fair trade, ethical finance, renewable energy sources, open communication, responsible tourism and resources recycling and reuse." The spaces are organized within four modules. The first module is an administration and exhibition space for responsible tourism and ethical finance. The second and third modules house an organic farmer's market, café and restaurant, research library and conference space for up to 80 people. The fourth module houses workshops and micro-factories dedicated to fair trade, recycling, reuse and renewable energy.

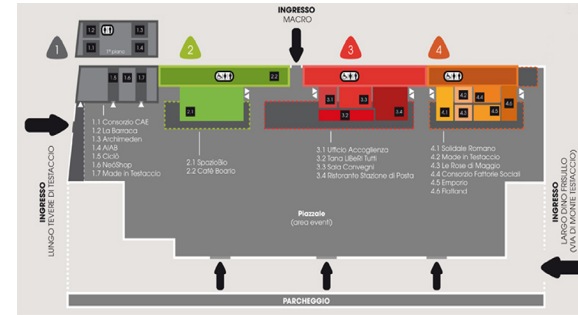


Figure128: Plan of Citta dell'altra Economia, redevelopment of north side of Campo Boario.



Figure129: Citta dell'altra Economia, northwestern corner of Campo Boario.



Figure130: Citta dell'altra Economia, reusing the covered stalls of Campo Boario.

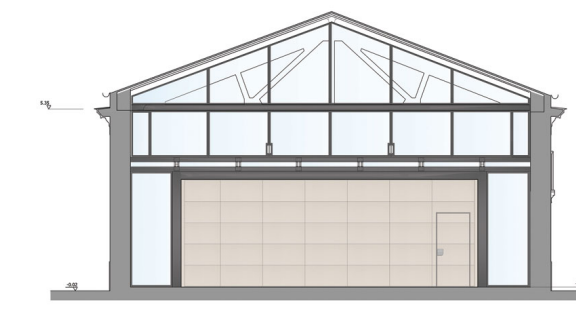


Figure131: University di Roma Tre section drawing of auditorium.



Figure132: University di Roma Tre classroom and auditorium.



Figure133: University di Roma Tre from top of the auditorium.

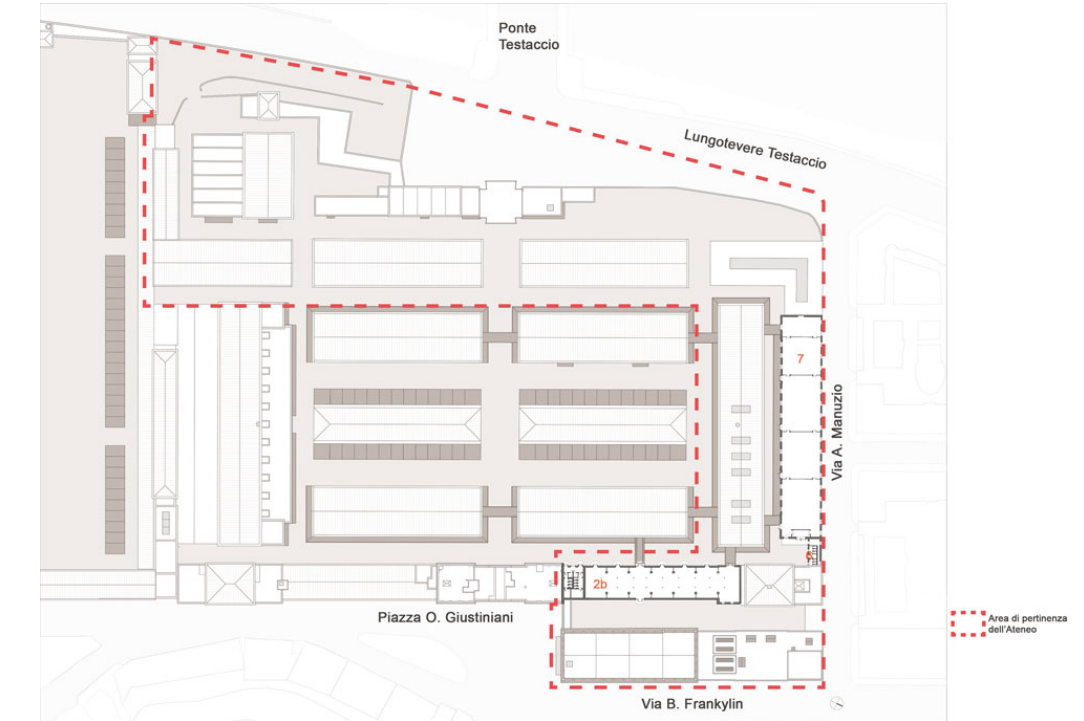


Figure134: University di Roma Tre redevelopment site plan on the north and west sides of the Mattatoio di Testaccio (in the slaughterhouse complex).

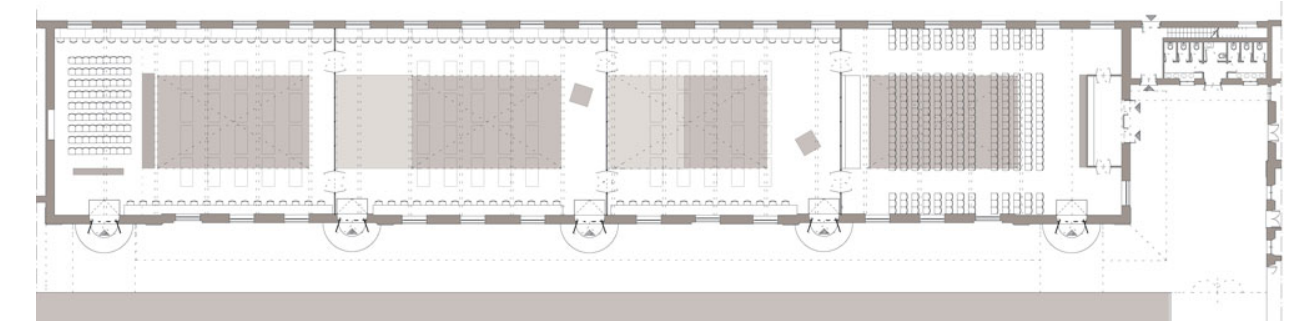


Figure135: University di Roma Tre plan of classrooms and auditorium.

The project has an intensely sustainable approach with cutting edge systems intended to maximize energy use while also using eco-friendly materials. According to their website, the complex is equipped with seven thermo-mechanical independent power houses that use CFC-free coolants, heat pumps with COP >3, and UTA with dynamic recovery >70%. The complex has a solar photovoltaic system of 166 silicon panels with an output of 180 Wp peak power and 40,000 kW annual production – reducing CO2 emissions by some 25,000 kg annually. Thermal comfort and natural lighting is accomplished with insulated glass and low-energy, low-emission lighting. All of these innovative sustainable strategies have been recognized through numerous awards including the Holcim Awards Acknowledgement prize for Europe in 2005.

In 2002, Museo di Arte Contemporanea di Roma (MACRO) reused a total area of 105,000 square meters, as MACRO Future, to house art exhibitions and encourage an interest in contemporary art. MACRO Testaccio opens from 4.00 pm to midnight every day, except Monday in response to, according to their website, engage “the dynamic character of the neighborhood and the massive presence of youngsters during the evenings”. The scope and layout of the space make it particularly conducive to grand multimedia explorations. In this context, local, national, and international artists from the visual and other arts interact and generate a reconfiguration of the Arts through the fusion of different modes of creative expression. The MARCO uses the original entrance of the Mattatoio, the northeastern gate, opening onto the small piazza between the market, Monte Testaccio and the Mattatoio. Shoppers frequent this area during the day and youngsters during the evening and throughout the night, as they frequent the dance clubs that are dug into the base of Monte Testaccio.

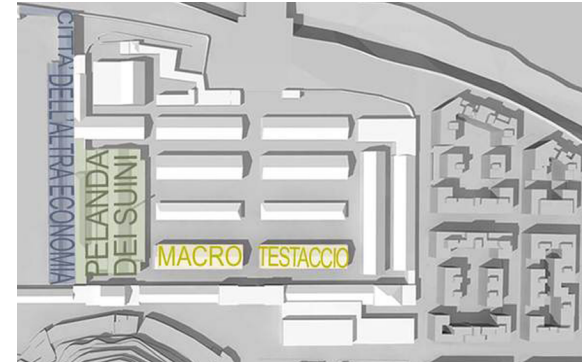


Figure136: Site plan of the redevelopment of the Mattatoio into the MARCO, Pelanda dei Suini Gallery and Citta dell'altra Economia eco-market.



Figure137: Main gate of the Mattatoio, which is transformed into the main entrance of the MARCO museum.



Figure138: Interior view of the Pelanda dei Suini art gallery.

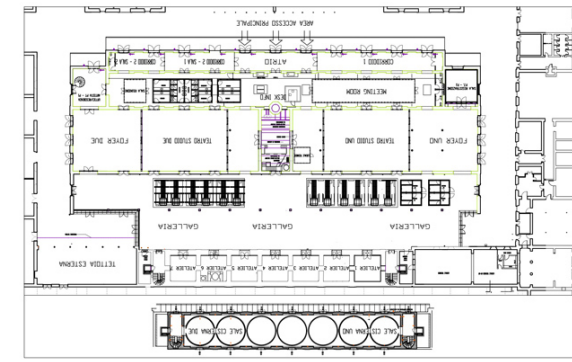


Figure139: Plan of Pelanda dei Suini as it is being redeveloped into an art gallery.



Figure140: MARCO museum courtyard.



Figure141: Interior view of the Pelanda dei Suini art gallery.

La Pelanda, an exhibit space, reused the central building between the Mattatoio and Campo Boario starting in 2007. It was envisioned as a cultural production center that was born as a project ten years ago following the ideas of Zoneattive (active zones). It is an area of 5000 square meters and is intended for exhibitions, training and workshops. The management of La Pelanda is handled by the Macro Museum, and it will become part of the New Macro complex consisting of the existing Museum of Contemporary Art in Via Reggio Emilia and the two pavilions of the Macro Testaccio. The complex is dedicated to contemporary art, which is intended to interact with the Academy of Fine Arts and the faculty



Figure142: view of the interior side of the main gate of the Mattatoio, which is transformed into the main entrance of the MARCO museum.

of the architecture school. The La Pelanda project represents the most significant restoration of the Mattatoio as an industrial architecture space, for a total cost of over thirteen million euros.

Just like with Monte Testaccio, the re-development of the Mattatoio by these organizations is done through the lens of industrial archeologists and preservationists with an approach that attempts to reach for meaning and draw legitimacy from the site's historic importance. They are in a continual quest to "clean up" and beautify the neighborhood, wiping away layers and traces formerly sedimented and overlaid onto the slaughterhouse, leaving nothing but a clean slate of pristine, historicized and dead site of the Mattatoio. As the structure of the slaughterhouse becomes an enclosure for museum and art pieces, the Mattatoio is put on display as a museum piece itself. This approach to reuse results in a homogenous and historicized understanding of the Mattatoio's meaning and importance in which everything is treated the same, covering up idiosyncrasies and pulling out only specific events. There is no difference; there is no sacred and profane; no acknowledgement of the spilled blood or its flow and engagement generating properties. The Mattatoio and Campo become a collection of historical artifacts, disengaged and distinct pieces that lose their meaning as they become harder and harder to understand in the context of Rome because of the lack of context and connection to their surroundings and the story of Rome. The museum therefore, embodies the character of loss and disengagement that the site, neighborhood and city are facing, by presenting distinct sets of artifacts in complete isolation, just as the way the city and site are beginning to be experienced.



Figure143: Static atmosphere of the petrified Mattatoio, inside the MARCO museum.

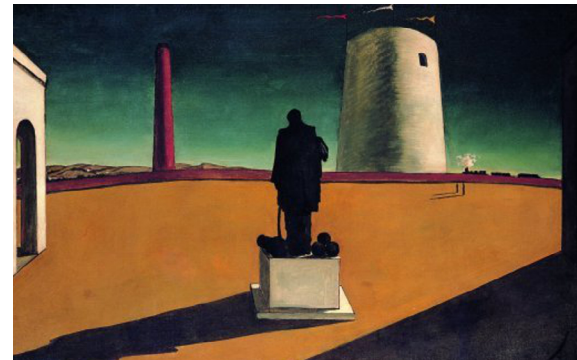


Figure144: Giorgio de Chirico painting entitled "The Enigma of a Day II" (1914).

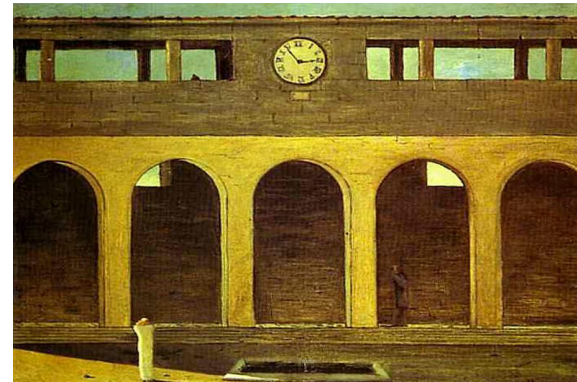


Figure145: Giorgio de Chirico painting entitled "The Enigma of the hour" (1911).



Figure146: View of architecture school Universita di Roma Tre, after redevelopment and the static and disengaged character of the resulting transformation.

HOMOGENEITY | Loss of Engagement:

There has been a trend in recent years of cleaning up industrial sites and replacing them with parks and museums, especially slaughterhouses being reused as museums, as in the case of Park de la Villette in Paris and the case of the Mattatoio in Rome. Bataille says that “we have become a nation of cheese eaters” where we spend Sundays going to the park and the museum, wondering around and admiring our society’s accomplishments, in a complete state of numbness and inaction. We attempt to make ourselves believe that we are above violence, that we are completely rational and logical beings, and that no blood is ever spilled. We only see the museum’s whitewashed walls and green grass fields of the parks, we don’t want to see the blood flowing, the profane and vulgar aspects of our society. Hollier argues that “nowadays the slaughterhouse is cursed and quarantined, [but] the victims of this curse are neither the butchers nor the animals, but those fine folk who have reached the point of not being able to stand their own unseemliness, an unseemliness corresponding in fact to a pathological need for cleanliness” (Hollier, xiii). This obsession with cleanliness is reducing all differences to similarities, all heterogeneous environments like the original Mattatoio into a homogeneous place of museums and art galleries. Ultimately, this heterogeneous nature of the programs and functions of the Ex-Mattatoio fuel the disjuncting of the city and neighborhoods, creating more distinctions and less shared and engaged relationships to site, architecture and community. In terms of the relationship between the slaughterhouse and the museum, Hollier argues that “one does not exist without the other, [it is not] the conjunction of these poles but the space between them” (Hollier p.xiii) where meaning and community exist. Bataille says that “at the heart

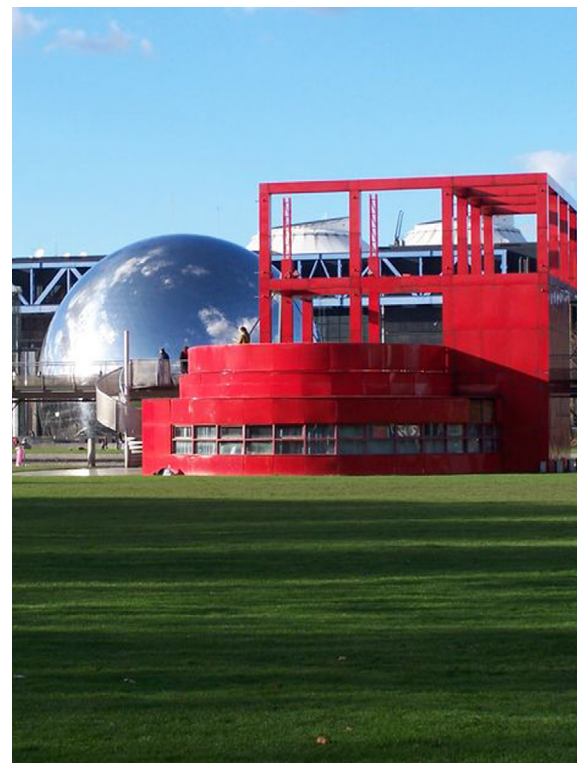


Figure147: Park de la Villette, Paris. A park and museum on the former site of the slaughterhouse district.



Figure148: Abandoned and empty pork processing building, Pelanda dei Suini c.2000.



Figure149: Photograph inside the Vitellara (cattle slaughter building) while still in production.

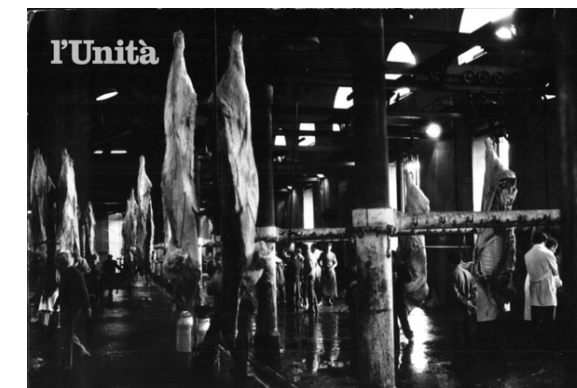


Figure150: Photograph inside the Vitellara (cattle slaughter building) while still in production.

of beauty lies a murder, a sacrifice, a killing. [There is] no beauty without blood”. This is to say that we need the museum and the slaughterhouse, the beautiful and the vulgar, in order to have interaction and exchange, to create meaning and community from difference. Both the slaughterhouse and the museum are connected to the sabbatical rhythm, according to Hollier, through “the sacrificial nature of the first and the fact that it is on Sundays that one visits museums” (Hollier, xiv) reflecting on how one spends the seventh day. The difference between the museum and the slaughterhouse (art and religion) is in the difference between the ways one chooses to spend its time when work is forbidden. “One of the ways of spending it is clean and the other dirty: one attracts and the other repels [...] and it is precisely this difference that gets lost with the conversion of slaughterhouse into museum, [...] as if it were possible to spend and be spent without getting dirty, spending energy without polluting, shamelessly, nothing repugnant about it, right at home in public space, with everybody looking” (Hollier xiv). The point is that difference is inherent in everything one does, in order for one to win, another has to lose, through every action there is an exchange, a transfer, a relationship of gain and loss, of expenditure; There is “no beauty without blood [...] at the heart of beauty lies a murder, a sacrifice, a killing”. We cannot keep something new forever and make use of it too, therefore, as Nietzsche requires, we need to make sure that whatever it is, “it serves life”. This means that we shall not preserve and protect Monte Testaccio or the Mattatoio, but instead push for connectivity and interaction in a place of open engagement and continuous inhabitation, where a renewed atmosphere of flow and activity can make the presently considered ruins “serve life”.

IV. RETURN TO FLUIDITY | RISING WATERS:

The rising waters of the Tiber will return Rome to fluidity and require these fossilized features to engage and interact with the forces of the river, like Medieval Romans, by necessity rather than by choice. Climate change in the last century has been transforming the weather patterns of the entire planet and more extreme weather has shifted the old “normal” towards the extreme. Weather events such as tornadoes have started occurring in places that historically never experienced them; hurricanes have grown stronger and larger; cold, hot, dry and wet spells have increased in frequency and intensity across the globe.

These changes in weather patterns and their intensification have made a difference in Rome as well. Most of these shifts in weather patterns do not have a dramatic impact on most areas, but due to specific circumstances in Rome, these small changes can come together at one time with catastrophic results. Small changes in precipitation, taking place over a large area of northern Italy, can cause very large floods in Rome.

The Tiber River begins in the northern part of the Apennine Mountains in Italy and travels about 400 km before passing through Rome and draining into the Tyrrhenian Sea. The Tiber’s river basin covers an area of 6750 square miles (17,500 square kilometers) with approximately 90% of the basin lies in the regions of Umbria and Lazio. The Tiber River basin has approximately 4.7 million inhabitants (2009), some 60% of whom live in Rome. The topography of the basin varies from lowlands to highlands and is mainly characterized by a temperate climate with hot, dry summers and cool, wet winters. The highest



Figure151: View of Forum Romanum and extreme weather in Rome, where snow is not a normal occurrence at any time of the year.



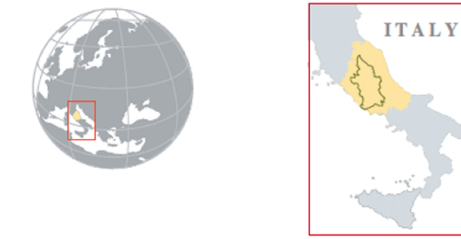
Figure152: Piazza di San Pietro and extreme weather in Rome, where snow is not a normal occurrence at any time of the year.



Figure153: Romans using the Circum Maximus as a snowboarding half-pipe during a rare snowy day in Rome.



Figure154: Map of the Tiber River and its tributaries.



- Basin
- Central Appennines District
- ◆ Ramsar site
- Hydroelectric power plant
- National park
- City

precipitation in both the Tiber River basin and the Central Apennines District is usually recorded in the autumn and spring, with a peak in early winter and a dry season during the summer. The annual average discharge of the Tiber River into the Tyrrhenian Sea is 225 cu. m/s or approximately 7 billion cubic meters. Depending on the hydrologic conditions, the maximum discharge can exceed 1500 cu. m/s or can be as low as 60 cu. m/s.

This entire area drains via the Tiber into the Tyrrhenian Sea and passes through Rome only a few miles before reaching the sea. This means that the Tiber is at its absolute highest capacity at the point at which it passes through Rome. This means that even a small increase in rainfall or snowmelt in northern Italy, can result in disastrous floods in Rome.

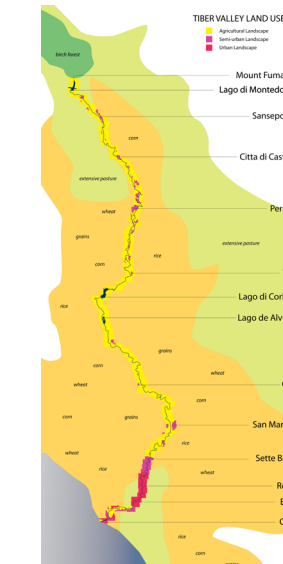


Figure155: Tiber valley land use map.

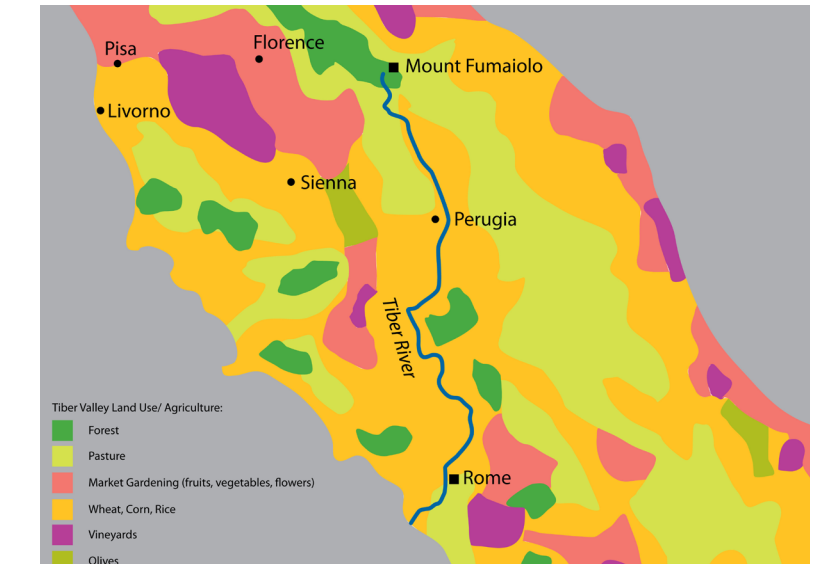
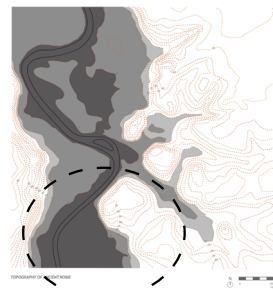


Figure156: Tiber valley land use map.

The markers that document the high water lines of historic floods can be found on church walls and monuments throughout Rome, going back to the flood of 1422 and having waterlines above the 15 masl (meters above sea level) that the current Tiber embankments can contain. These extreme floods have occurred on an average of one per hundred years, yet the Tiber embankments were almost breached twice in the last decade. In 2008 and 2012, the Tiber's water rose to approximately 14 meters above sea level, prompting officials to evacuate the population around the Tiber during the 2008 flood, when the walls peaked above the waters by a mere one and a half meters.

If recent history is any indication, these hundred year floods will become 25 year floods and then 10 year floods, leading one to consider a scenario in which the Tiber embankments will be overwhelmed by its waters more often. The highest recorded flood in the last 700 years was the 1598 flood, which reached 19.56 meters above sea level, way above the current capacity of the Tiber walls. These recent floods are signs of what is to come, and are prompting one to consider the possibilities of this re-engagement between the city and the river and a refounding of Rome on this renewed relationship with the Tiber.



16+ masl - flood level 3

Tiber Flood Classification in Rome:

Normal Level:

- Water Level: 5-7 masl & Discharge: 200 cu. meters/s

Elevated Level:

- Water Level: 7-10 masl & Discharge: 800 cu. meters/s

Level 1 Flood:

- Water Level: 10-13 masl & Discharge: 1500 cu. meters/s

Level 2 Flood:

- Water Level: 13-16 masl & Discharge: 2000 cu. meters/s

Level 3 Flood:

- masl greater than 16.



Figure157: Ponte Sisto with normal winter water level.



Figure158: Ponte Sisto during Tiber flooding of 2008.

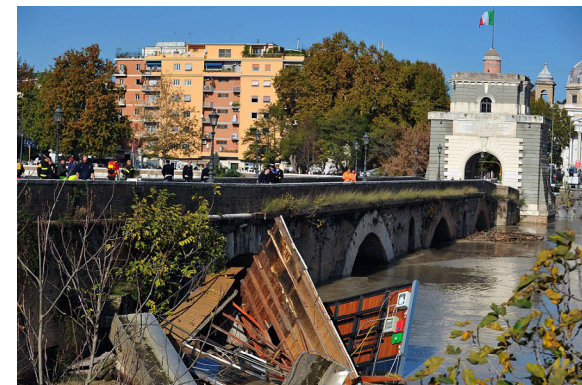


Figure159: Ponte Milvio gathering debris as water is close to reaching the top of its arches during the November 2012 flood.



Figure160: Pons Fabricius with low summer water level.



Figure161: Pons Fabricius with Tiber River flooding.



Figure162: Ponte Vittorio Emanuele II during Tiber flooding of February 2014.



Figure163: Ponte Vittorio Emanuele II during Tiber flooding of February 2014.

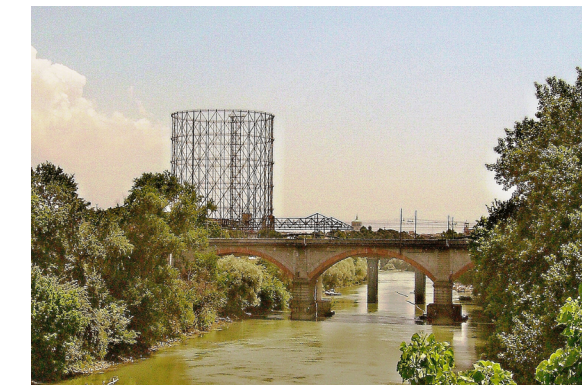


Figure164: Ponte Ferroviario di San Paolo just south of the Mattatoio, with the Gasometro in the background, with normal Tiber river water level.



Figure165: Ponte Ferroviario di San Paolo just south of the Mattatoio, with the Gasometro in the background, with Tiber river flooding.

Based on the signs of rising waters of the last decade, these are visions of what the neighborhood of Testaccio, Monte Testaccio and Campo Boario might have to respond to in the near future. The flat topography of the flood plane that is Testaccio, would inundate uniformly across its entire lower flatlands, with only the Aventine and Aventino hills rising above the flood waters along with the top of Monte Testaccio. This will be a return to a similar fluidity that Piranesi depicts in his Vedute di Roma of the comfort and imagination that Medieval Romans showed. It will be a return to what Rome has always been, a city of FLUID FOUNDATIONS.



Figure166: Giovanni Piranesi etching of the Portico di Ottavia during medieval Rome.



Figure167: Scenario envisioning a flooding event in Testaccio, with Monte Testaccio completely surrounded.



Figure168: Scenario envisioning a flooding event in the Mattatoio.



Figure169: Scenario envisioning a flooding event in the courtyard worker-housing located north of the Mattatoio.



Figure170: Scenario envisioning a flooding event in Piazzale Ostiense.



Figure171: Testaccio Vicinity map showing the water level during a flooding event at a water level of 19 meters above sea level

V. OPEN ENGAGEMENT | Operations of Fluidity:

The goal of this project is to reconnect with fluidity and reignite a lost relationship between Rome and the Tiber through an attitude of resilience and movement rather than one of stiff resistance. This resilience will be achieved by responding and adjusting to the forces of the water's flow, its erosion and sedimentation, its rise and fall.

The open engagement between the site and water will be expressed through four relationships that become a clear set of operations from the river to the hill: CAST, OPEN, FLOAT and BRIDGE. The CAST builds up around the Borsa building and is an expression of the sedimentation action of the Tiber. The OPEN relationship will take place along the buildings oriented perpendicular to the river's flow and respond to its erosive actions. The building of the Campo's gate responds to the rising and falling of the waterline through a relationship of FLOAT and the connection between the Campo Boario and Monte Testaccio is achieved by rising above the waters and moving across a BRIDGE.

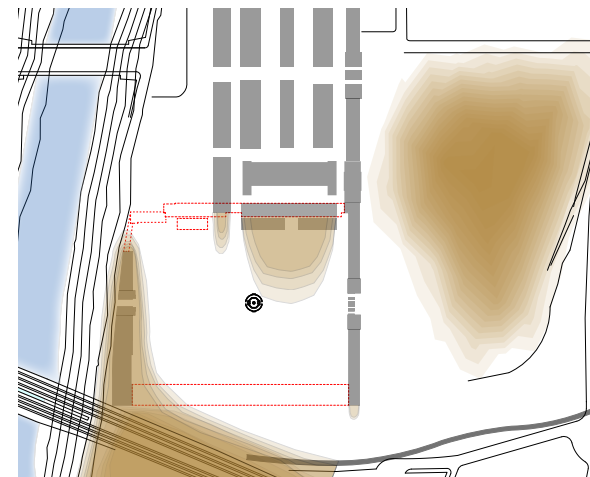


Figure172: Sedimentation patterns in Campo Boario.



Figure173: Building prone to erosion in Campo Boario.

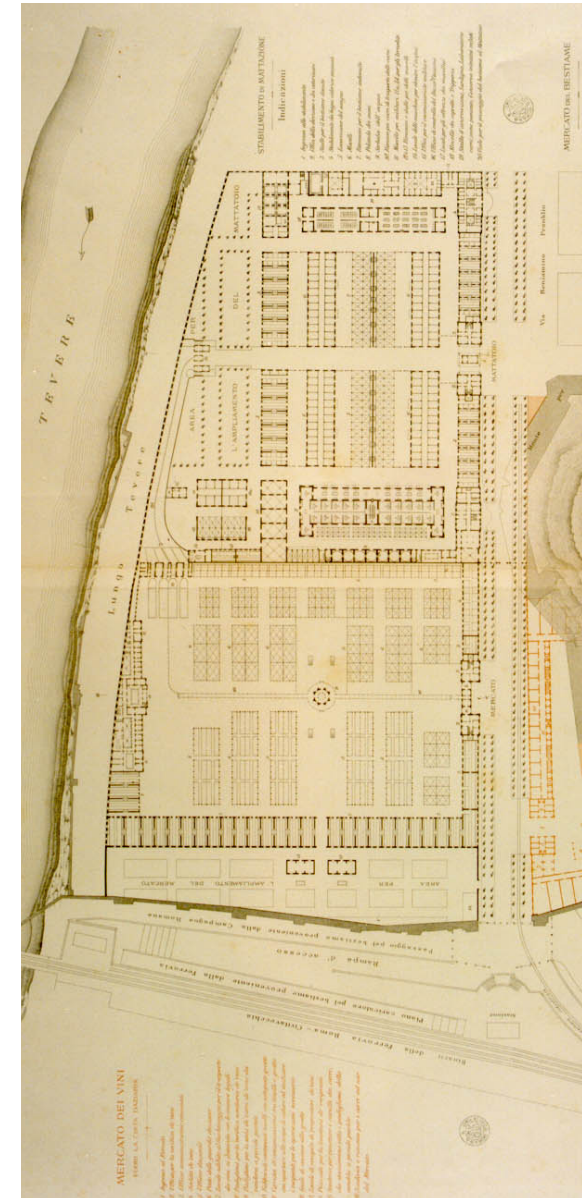


Figure174: Original Plan of the Mattatoio di Testaccio.

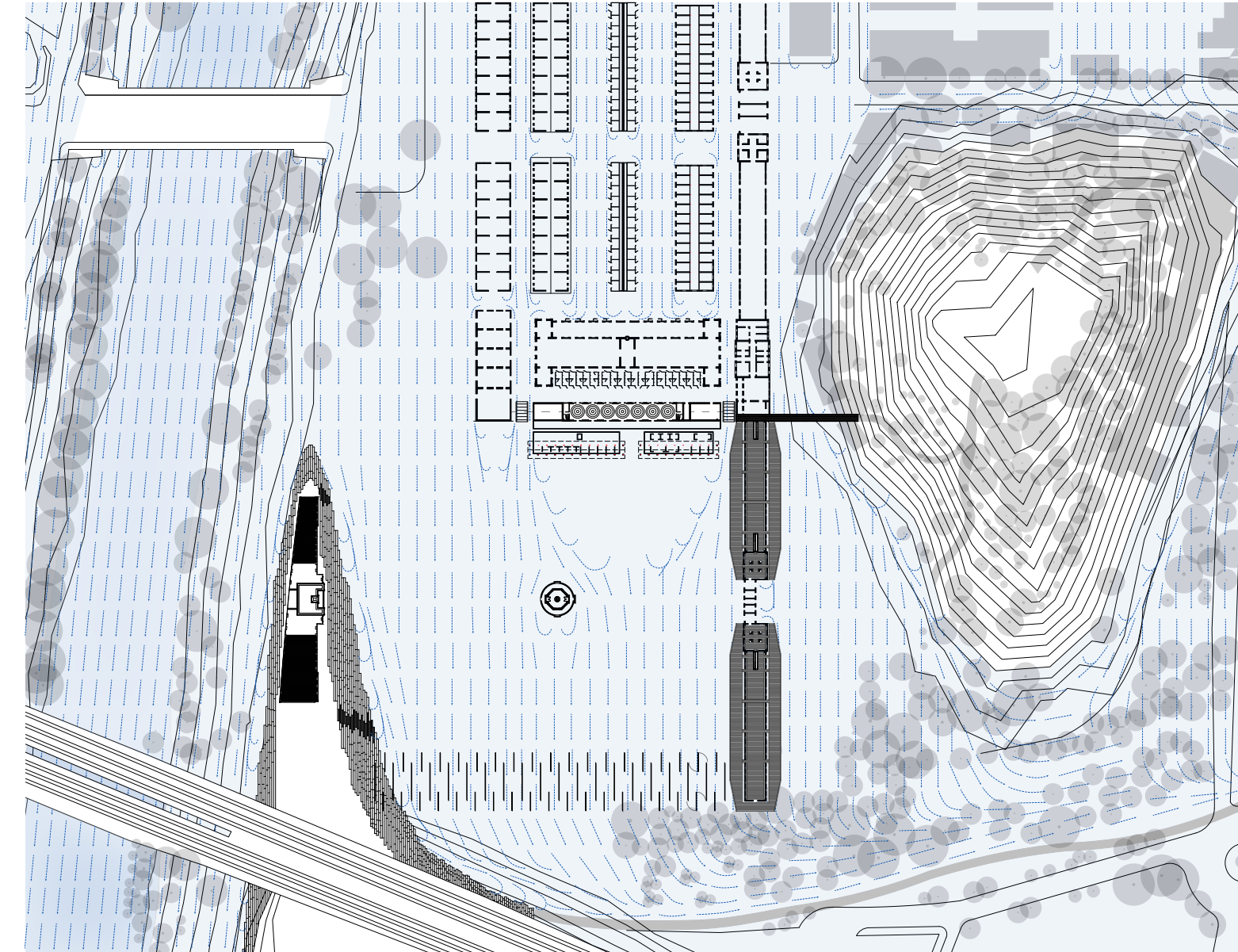


Figure175: Campo Boario Site Plan

CAST | Borsa Building:

The Borsa building is an expression of the water's sedimentation over years of action upon the site. The layers upon layers of the sediment deposited by yearly floodwaters are captured by duplicating the sedimentation through human construction and then revealing it as an impression left onto the original Borsa walls. As the building is peeled away, it reveals the density and weight of the sediment that now holds an impression and memory of a former existence. The fluidity can be understood here by the way in which the sedimentary material of the concrete flowed into every crevice of the Borsa's articulated façade, capturing its sacrificial expression within the sedimented layer. The impression of the overlay of sacrifice that Ersoch laid onto the Mattatoio blends with the understanding of the continuous sedimenting actions that take place at the site from before the slaughterhouse and long after it is gone. It is a blending of sacrifice and sedimentation in a place that becomes a community space, which embraces fluidity and multiplicity.

The Borsa sedimentation walls are like an up swelling of the ground, rising out of the water to meet and protect the site against erosion. The shape of the encasement creates a curved hard edge that redirects water towards the east and protects the railroad embankments from being washed away.

The top surface of the "concrete hill" is stepped and articulated in a way that provides a gathering space and seating both on the Campo side as well as facing the Tiber. Inside, the cavity created within the

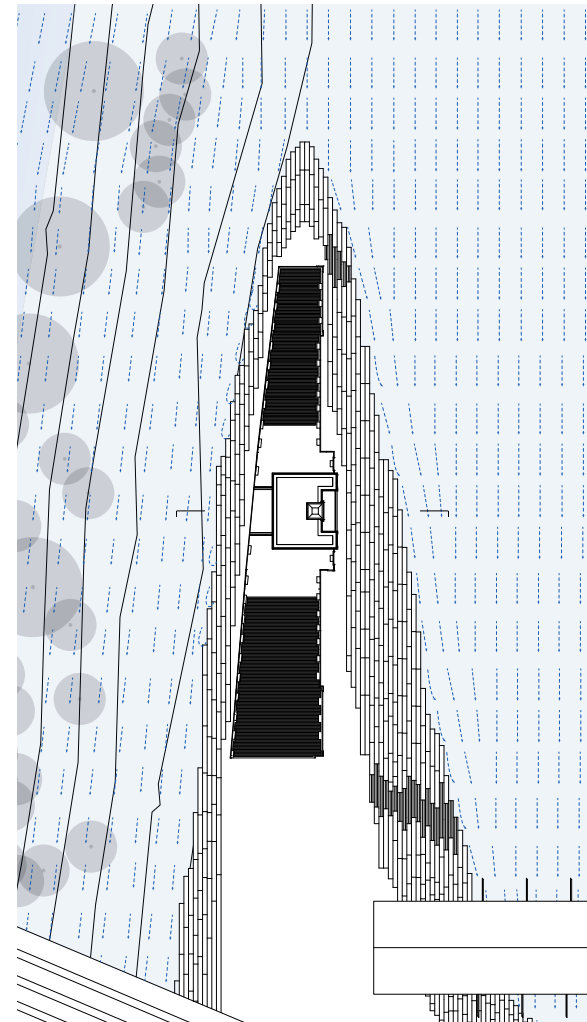


Figure176: Borsa building Plan

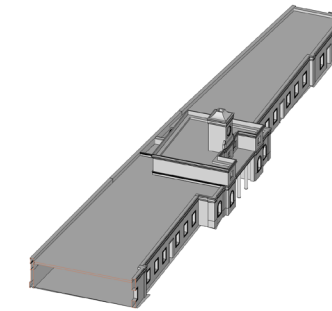


Figure177: Original Borsa Building

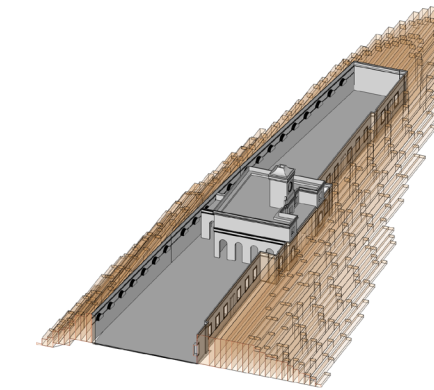


Figure178: Borsa Building encased in sedimental layer.

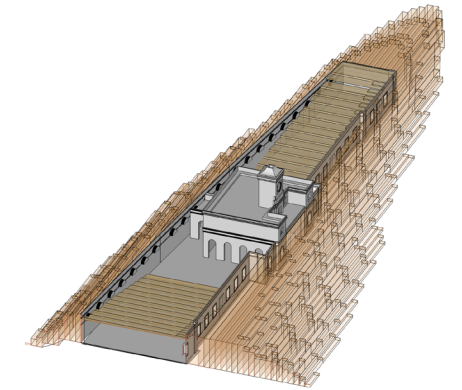


Figure179: Borsa Building is removed and replaced with auditorium seating.

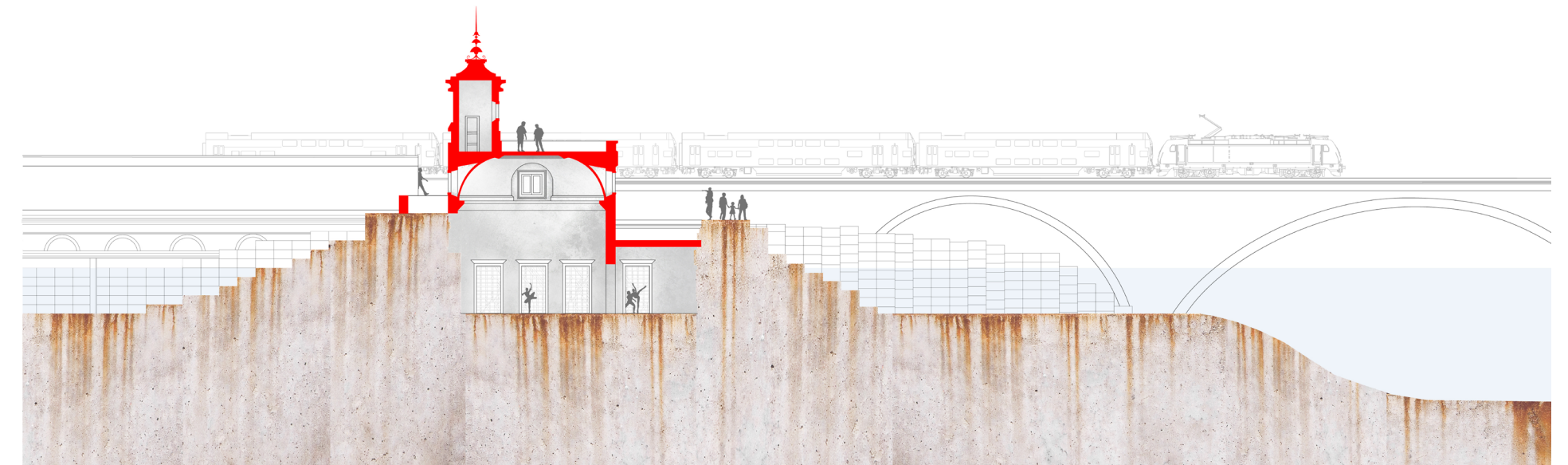


Figure180: Borsa building Section

encasement becomes a community incubator and gathering space that exists within the "sediment" and below the height of the waterline during flooding events. The seating is expressed through light wood construction that fits within the monolithic sedimental enclosure in order to articulate it as one space. The wood structure is held back from the heavy concrete walls, allowing a space that intensifies the contrast and relationship between the two materials.

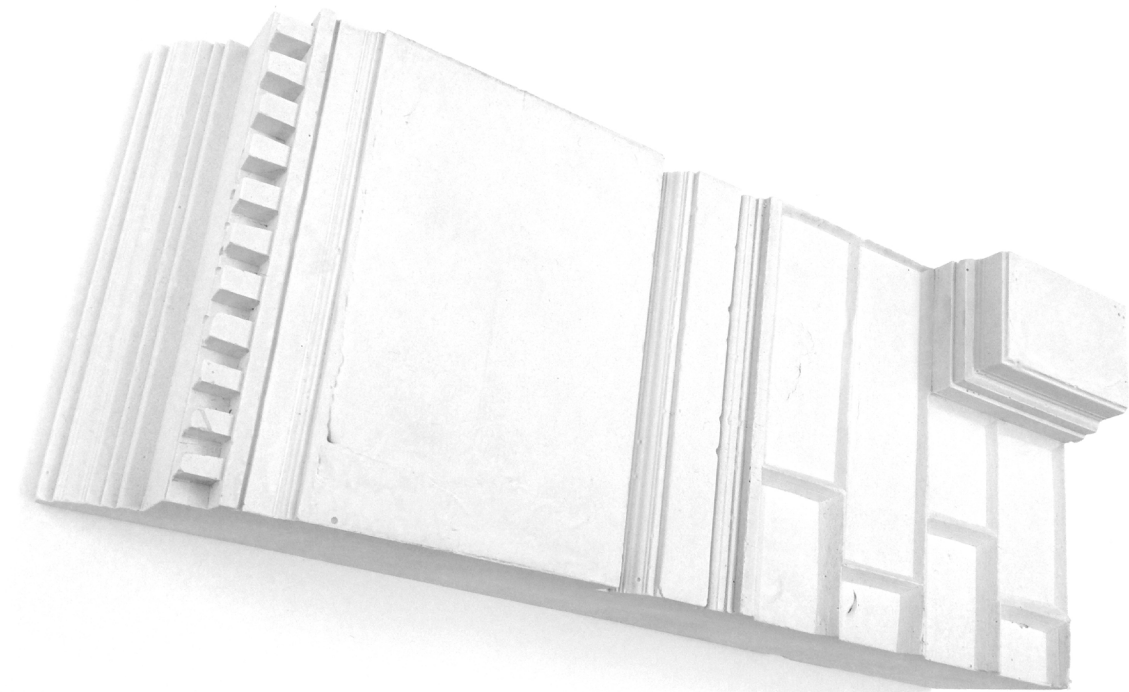


Figure182: Wall Section detail model (plaster).



Figure181: Aerial view of Borsa building during flooding event.

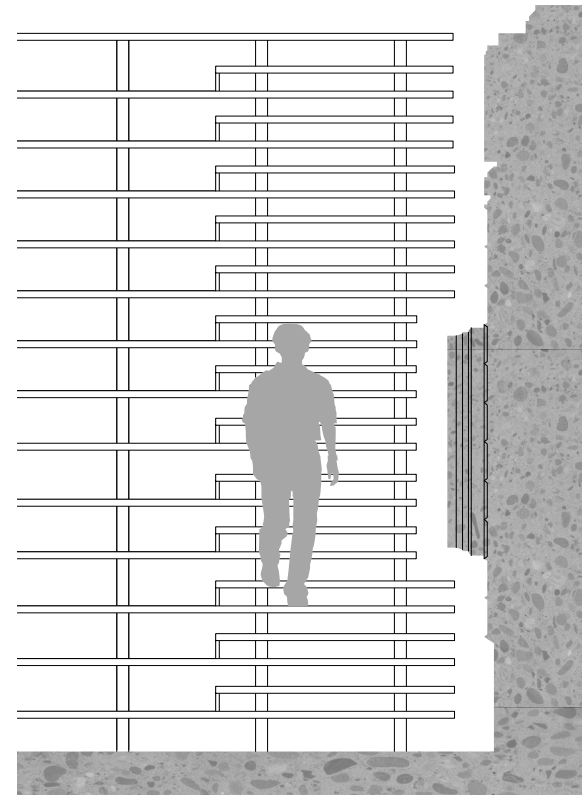


Figure183: Borsa Wall Section



Figure184: Borsa Building sedimental expression of auditorium.

OPEN | Stalle Building:

The Stalle building comprises the southern edge of Campo Boario and it responds to the erosive powers of the river's currents and flow. This building is in danger of being washed away due to its east-west orientation being frontal to the water's currents, which is flowing north to south.

The Stalle building's structure lends itself to being transformed and opened up to the water through a few interventions of architectural erosion and sedimentation. In order to prevent its destruction, the north and south facades are removed below the layer of windows, exposing the interior walls that separate it into a series of units. The window entablature will now span 28'6" from wall to wall with the additional support of two steel trusses that fit their web structure between the windows in order to maintain the openness and expression of the windows.

The party walls are aligned parallel to the flow of the water and are not in danger of getting pushed over by the current, but they are of masonry construction and susceptible to erosion. In order to protect against erosion, the walls will be clad in corten metal panels and angled at each end in order to deflect the water and debris as they move through the building.

As the building is opened up to the water, the facades are replaced by large pivoting doors that serve each individual unit. These doors are also clad in corten steel and can be operated individually, yet when the Tiber's water rises, a water wheel located below the level of the Campo west of the Borsa is activated and overrides individual operation by opening all of the pivoting doors in anticipation of the flood.

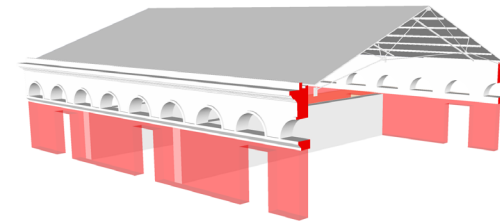


Figure185: Remove facade perpendicular to water flow direction

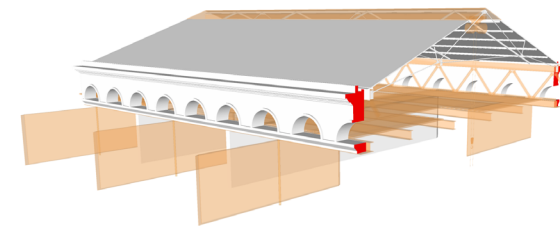


Figure186: Insert pivoting doors, floor at top of interior walls, skylight

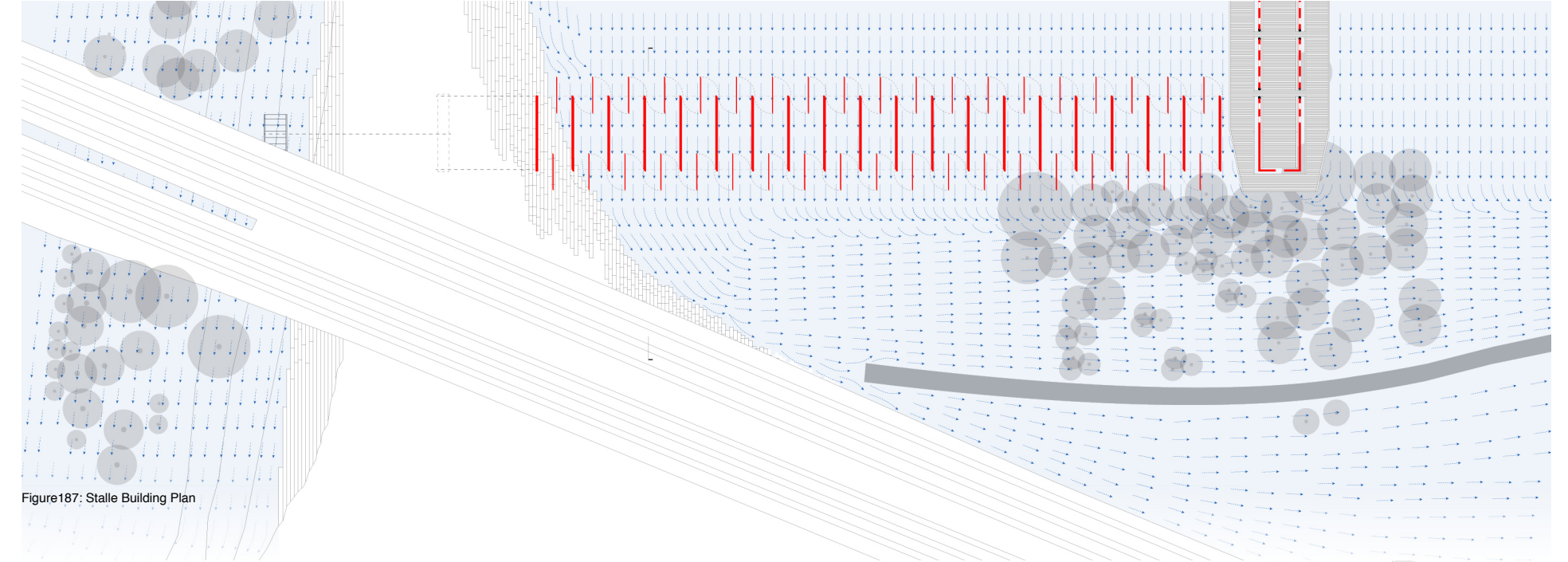


Figure187: Stalle Building Plan

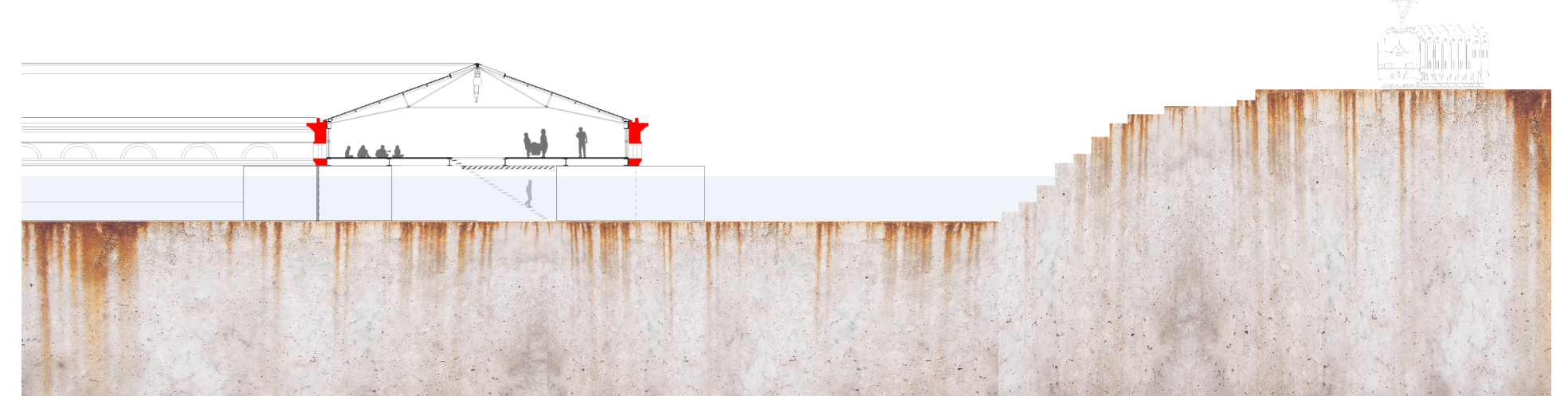


Figure188: Stalle Building Section

As the building is transformed and opened up to the waters in response to their erosive forces, it also provides the ability for continuous inhabitation by allowing the activity to move from below to above. A floor is installed on top of the walls that creates a second story inside the space of the existing building. This space is served by individual stairways in each unit that rise up during flooding events. The objects and belongings of each unit are moved to the upper floor before and during floods by a gantry crane that travels the entire length of the building along the ridge of the roof and accesses the lower floor through openings in the center of the top floor. A skylight is also added along the ridge of the roof, to allow light into the more compressed space of the upper floor after the transformation.

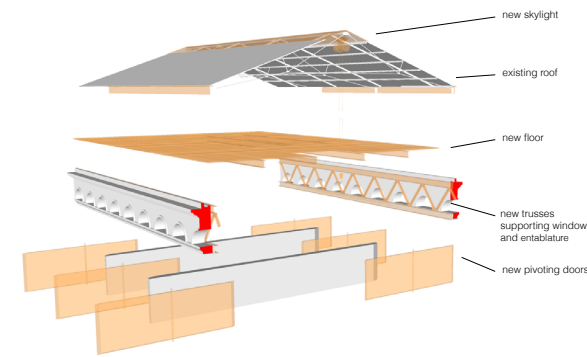


Figure189: Exploded diagram of structural and tectonic elements



Figure190: Stalle Building showing activity of workshops.

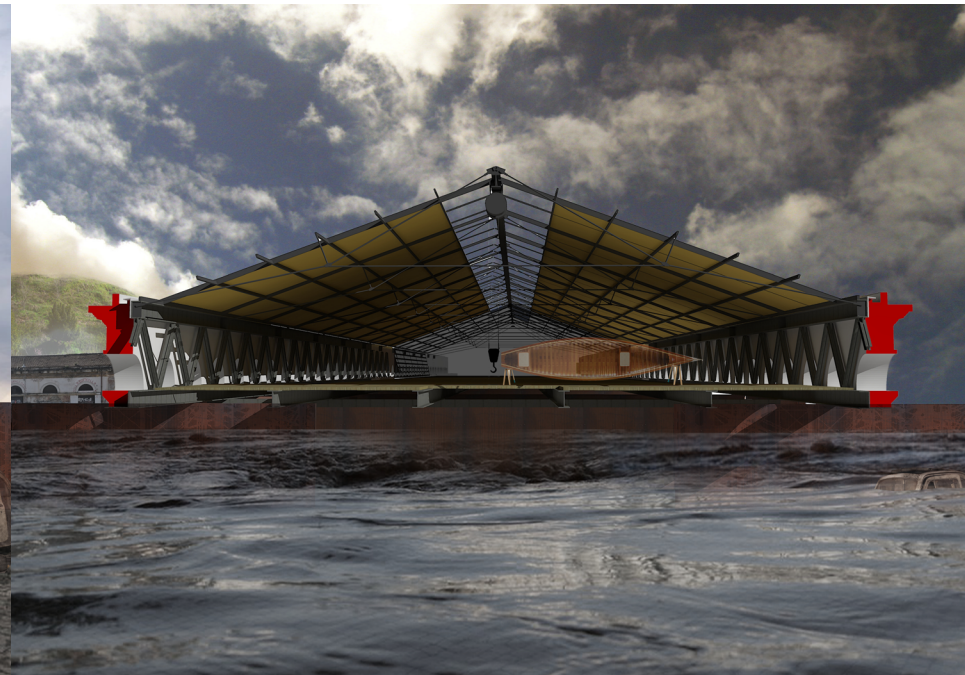


Figure191: Stalle Building showing activity of workshops moving above as floodwaters flow through the ground floor.



Figure192: Stalle Building showing activity of workshops and permeability and openness from front to back.

FLOAT | Campo Gate Building:

While the Stalle building responds to the lateral movement of the water and its currents, the FLOAT response of the Entrance Gate Building responds to the vertical rise and fall of the floodwaters. This building is oriented parallel with the water's currents and therefore is minimally affected by their erosive action. The rise in water level would flood the interior of the building and its contents. While the Stalle building moves activity above during the flood, this building rises with the waterline and FLOATS on top of it.

The entire floor is built up as a floating wooden dock that spans the whole width and length of the building and extends outside of it on the east and west edges. The exterior portions of the dock allow engagement and interaction between the building and the emergency flood boats that arrive at the site by way of water. The boats dock at the platform like cars parking in a lot.

The floating dock allows the open market on this side of the Campo Boario to remain active during dry times and floods alike. This relationship with the water allows the FLOAT to maintain continuous operation through these moments of fluidity and interaction between the Campo and the Tiber.

The building is adjusted to the floating dock by the removal of the wall portions above each door, which allows the dock to float higher against the building. Each door is then replaced by vertically sliding doors that coil up at the top; a typical way Roman shops are protected in the alleyways along piazza markets. Along each vertical side of the doors are sliding rail and wheel connections that anchor the dock to the building and allow it to slide up and down while staying in place.

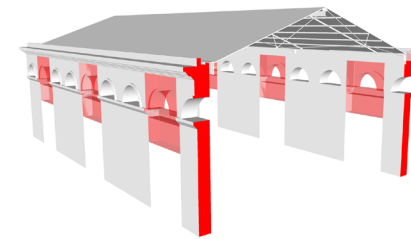


Figure193: Remove windows and entablature above doors

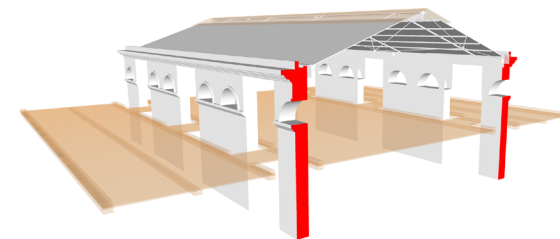


Figure194: Insert floating deck, skylight and gangways to bridge

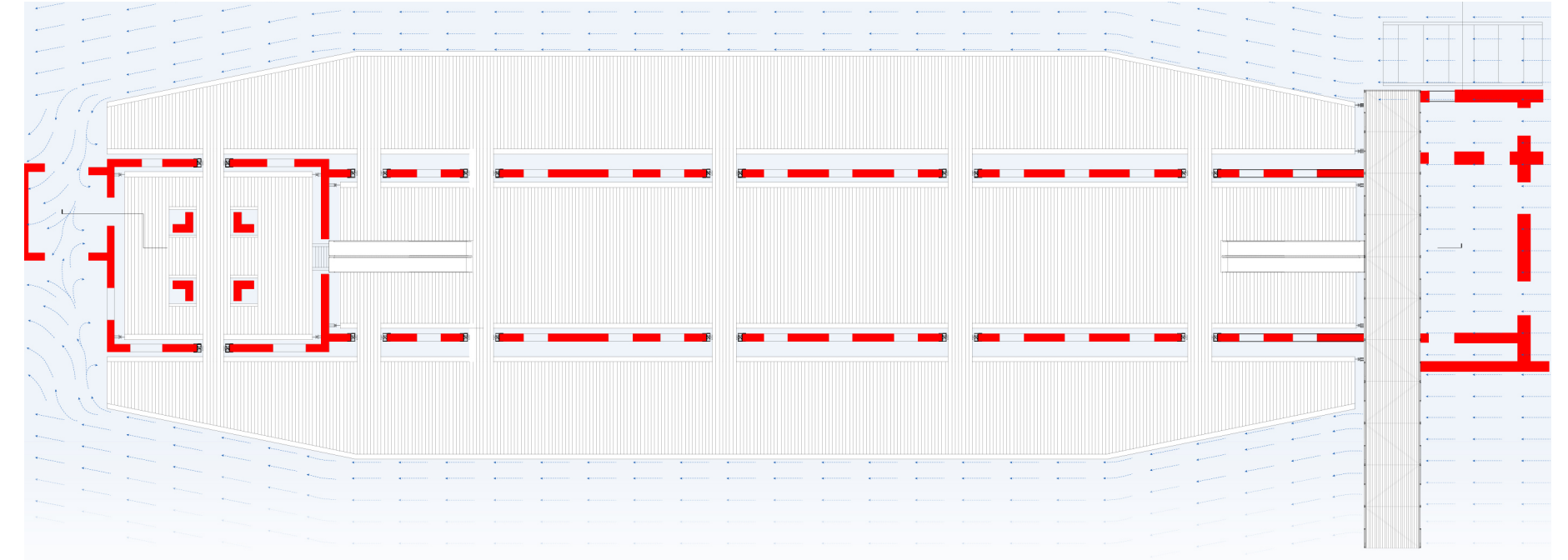


Figure195: Dock Building Plan [FLOAT]

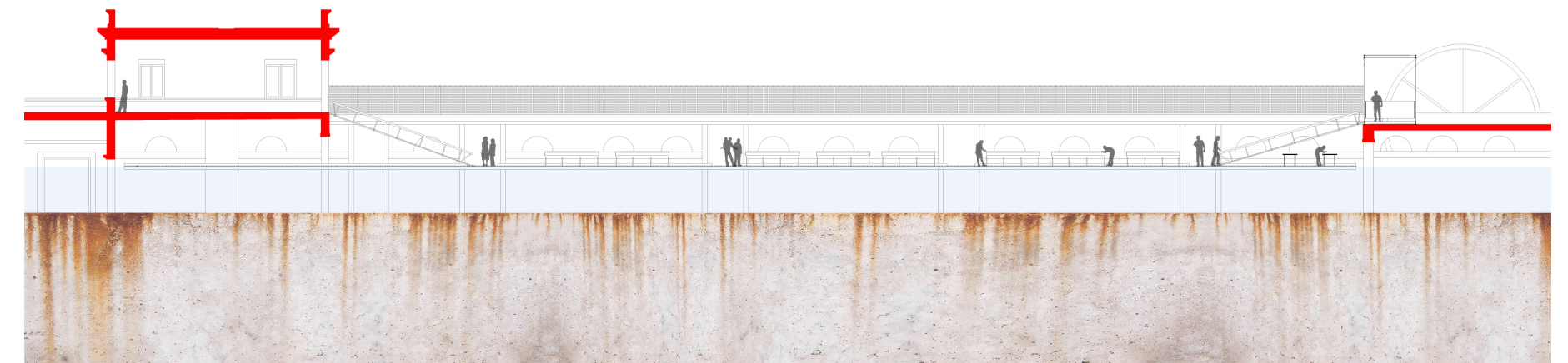


Figure196: Dock Building Section [FLOAT]

The docks are built within the two single story buildings on either side of the entry gate to the Campo, which is a two-story structure. The two separate floating docks are connected across the gate building by gangway ramps that engage the second story of the gate building to the dock level of the lower buildings. The gangways are anchored at the top with a pivoting connection, which allows them to change their slope by sliding back and forth on the dock at their base, as it rises and falls. The same gangway ramp assembly is also used to connect the northern dock to the bridge that connects the Campo Boario to Monte Testaccio.

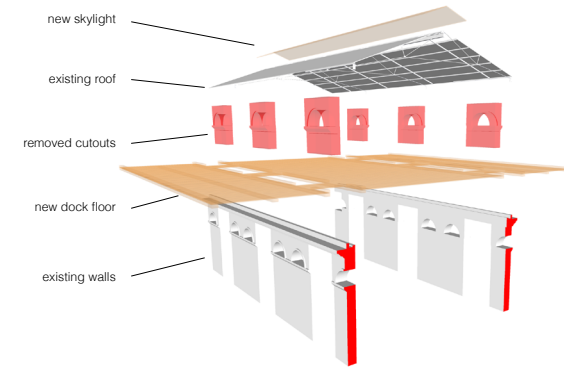


Figure197: Exploded diagram of structural and tectonic elements.



Figure198: Dock Building showing activity of open market.



Figure199: Dock Building showing activity of open market moving with the floodwaters.

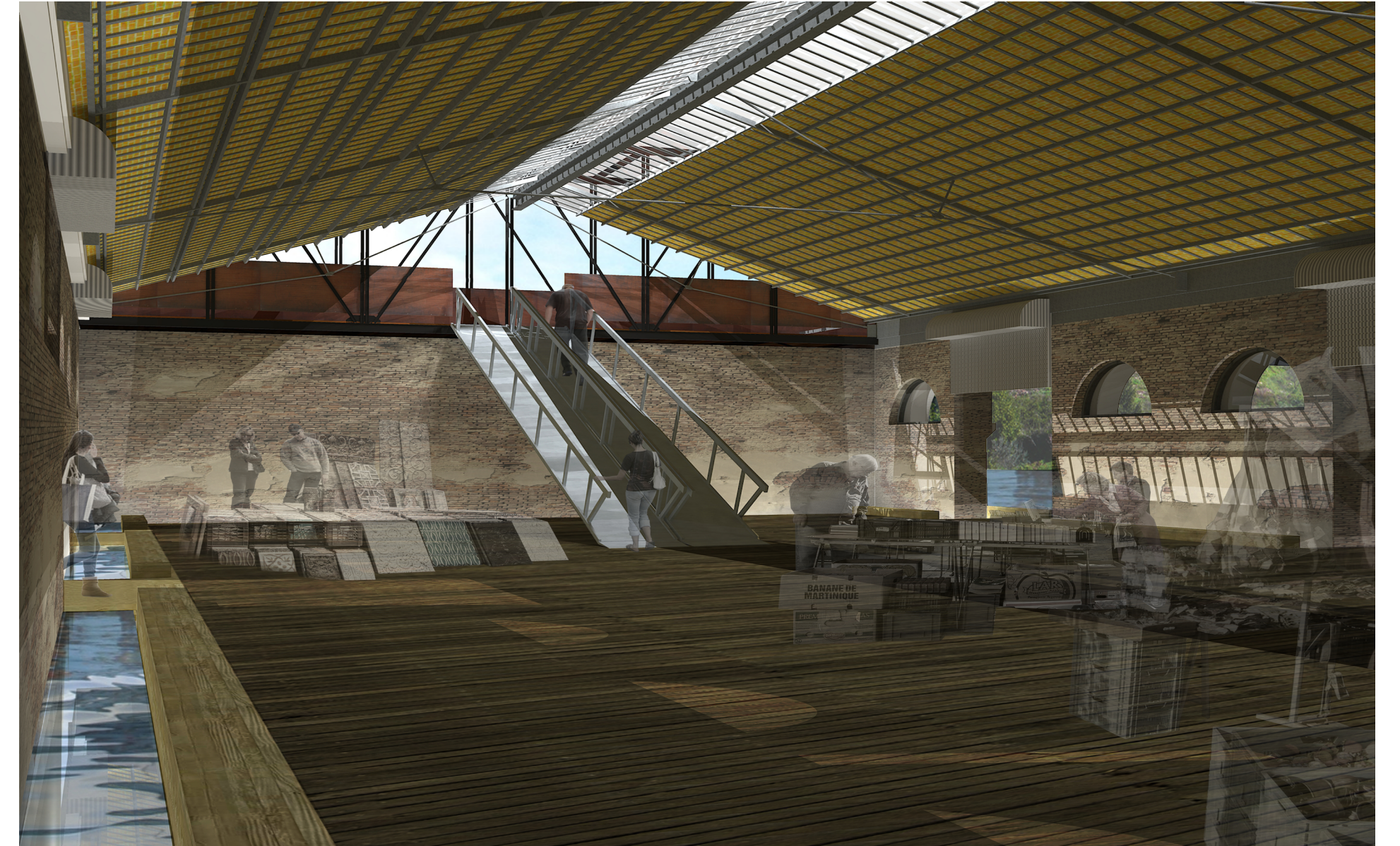


Figure200: Dock Building showing continuation of the active open market during flooding event.

BRIDGE | Connection to Monte Testaccio:

The BRIDGE is the vehicle of connection to Monte Testaccio and the final operation in this transition from the depths of the river to the top of the hill. This set of operations begins down below, within the Borsa building, where the occupants are beneath the waterline during flooding events. From the Borsa, the Stalle building opens up to the water and lets it move through unimpeded. The dock building moves with the water as it floats on top of it, and connects to the BRIDGE that finally rises above the fluidity and moves above the water to higher ground.

The BRIDGE connects Campo Boario to the high ground of Monte Testaccio by spanning the floodwaters, creating visual and tectonic connections to the Gasometro tower and its site of abandonment across the railroad tracks from the Campo. The structural language of the bridge is derived from that of the Gasometro and its horizontal arms that extend out to the river. The bridge relates to the horizontal movement and engagement of the Gasometro to the Tiber, however the BRIDGE moves in the opposite direction and connects to Monte Testaccio. This transference of lateral movement that exists between the Gasometro and the Tiber, and between Campo Boario and Monte Testaccio completes a different circuit of connectivity in the neighborhood; a circuit of movement, flow and engineering expression through the ghosts of former industrial centers.



Figure201: Gasometro complex and its structural expression and relationships.



Figure202: Bridge to Monte Testaccio and its structural and visual connection to the Gasometro in the distance.

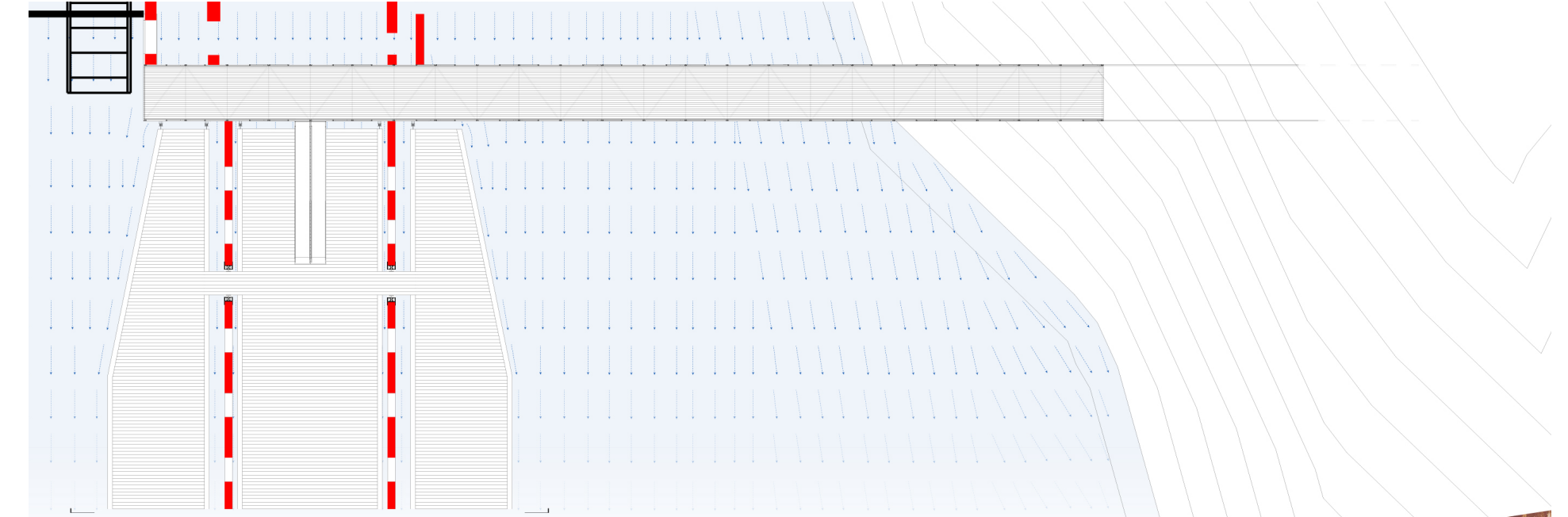


Figure203: Plan of Dock Building and bridge connection.



Figure204: Section of Dock Building and bridge connection.

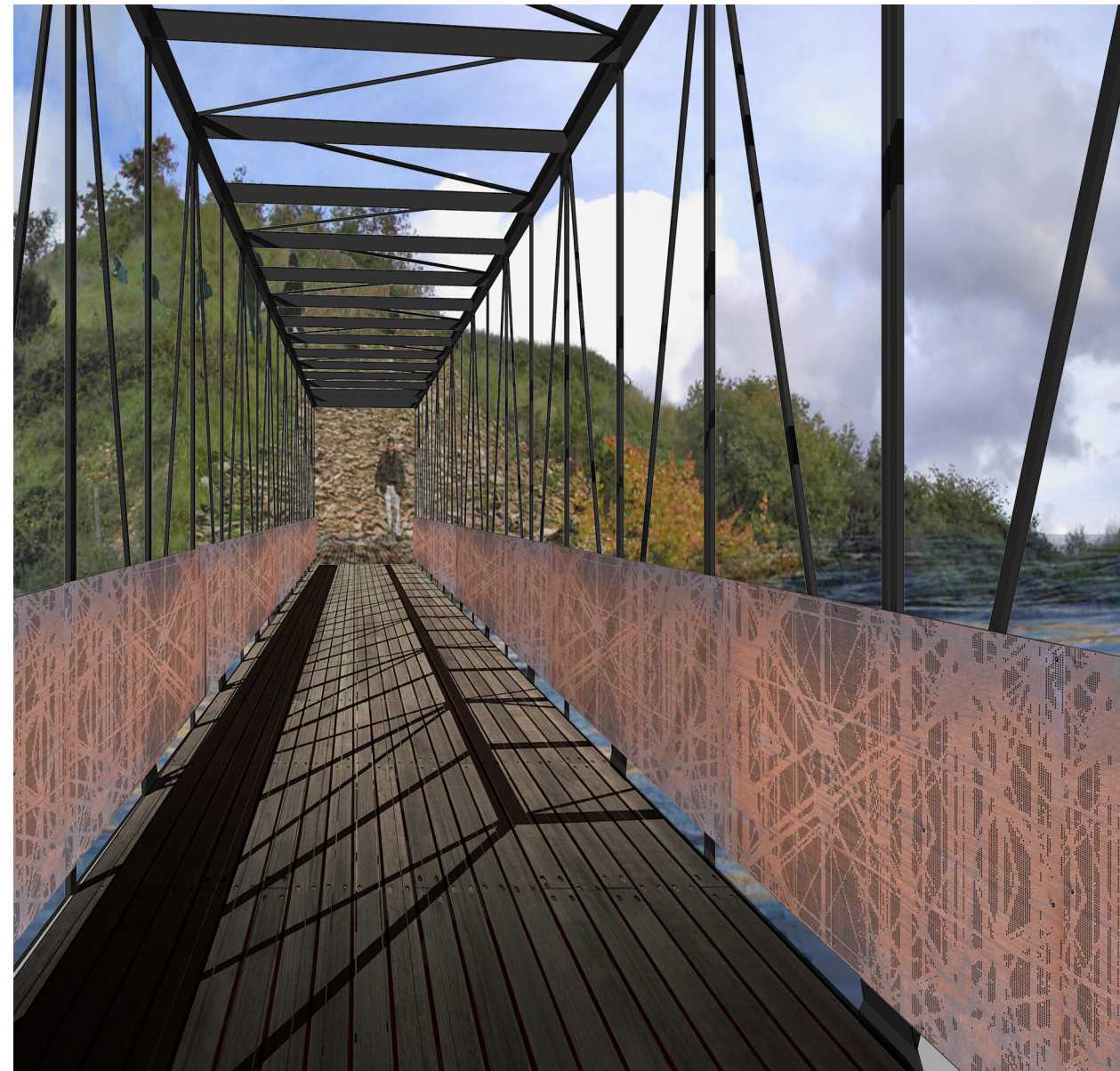


Figure205: Bridge connection to Monte Testaccio.



Figure206: Gasometro di Testaccio.



Figure207: Gasometro di Testaccio.



Figure208: Gasometro di Testaccio reaching out to the Tiber.



Figure209: Gasometro di Testaccio.

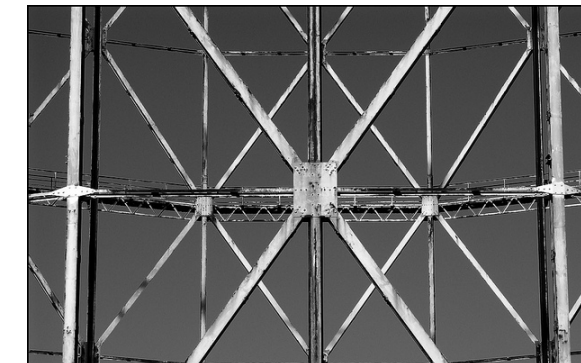


Figure210: Gasometro di Testaccio structure and expression.



Figure211: Gasometro di Testaccio across abandoned fields of dirt.

The structure of the bridge shares the industrial character of simplicity and functionality that can be seen in the structure of the Gasometro. It is a set of two trusses supporting a floor deck of wood and guardrails of corten steel panels. The trusses are anchored to the dock building and slips into the rubble of Monte Testaccio. This connection is loose and allows for movement within the pottery mound while gaining stability by extending deep within its rubble. The bridge becomes a physical connection between two neighborhood fossils, allowing people to access both and move between them, generating a new flow and movement that can begin to regenerate activity and life.

CONCLUSION:

Rome has always been a city of WATERMARKS and FLUID FOUNDATIONS, due to its intertwined relationship with the Tiber. The comfort Romans have for the city's fluidity is seen in Giovanni Piranesi's etchings of Medieval Rome and in the importance and celebration placed on the watermarks left behind by the Tiber's actions of the city through the flood markers displayed on numerous church walls.

The Mattatoio di Testaccio is located at this point of engagement and fluidity between the city and the river, at its edges and in its flood plane. This thesis project responds to the Tiber's forces of erosion and sedimentation, and to the fossilization and disengagement that has been eroding Rome's fluidity since it became the capital of Italy in 1861. The Tiber embankments and search for meaning that Romans experienced during the late 19th and 20th centuries led to a fossilization of the urban fabric and petrification of the city's fluidity.

The transformation of Campo Boario from a still and fossilized space of disengagement into a site of open engagement with the Tiber's fluidity and the city's activity is achieved through the set of operations that respond to the river and the city. The four elements of the design work individually and in congress to reconnect the river's edge to the hilltop and the neighborhood as a whole. The BORSA on the river's fluid edge expresses the aftermath of the repeated cycles of flooding and sedimentation connecting the site to the river, the ground and fluidity. The response to the water's erosion takes place in the OPEN attitude of the Stalle building, where the movement is not just horizontal but also vertical in terms of continuous inhabitation. The continuous inhabitation and perpetual activity generated through the responses to the water is also articulated by the dock FLOAT building, which moves up and down with the waterline of the flood water and remains an open market throughout flooding events. The BRIDGE connection to Monte Testaccio re-engages the Campo with the hill and opens it up to the people of Testaccio while also connecting in expression and structural language across the railroad tracks to the Gasometro and its industrial site.

These interventions of architectural erosion and sedimentation within Campo Boario promote an attitude of resilience, through openness, engagement and interaction, rather than one of resistance that can be seen in the Tiber's embankments. It is movement, flow and engagement that create relationships that give meaning to a place and a community. It is these values and strategies of open engagement and continuous inhabitation that transform Campo Boario from a place of stillness and loss into a center of activity and meaningful neighborhood space that brings the community together and "works for life".



Figure212: Street wall along Via Capo di Ferro, showing the fluidity of the city fabric and the way a column can become a window frame.



Figure213: Giovanni Piranesi etching of Foro di Nerva, showing the fluidity of this building which is simultaneously a temple front, church, city wall and house.

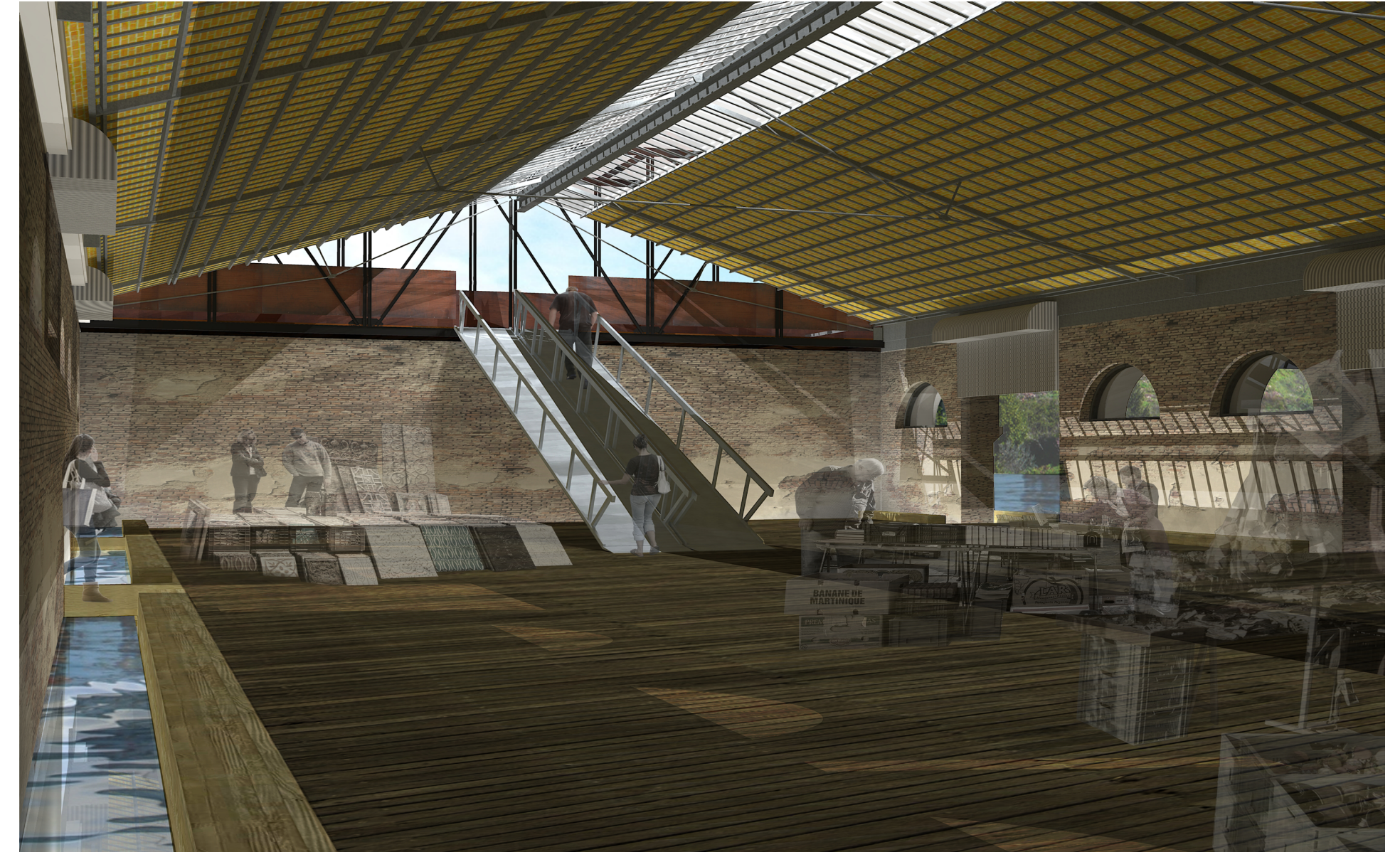


Figure214: View of the FLOAT building, showing not just a watery fluidity, but also a fluidity of use, activity and engagement, which is comparable to the fluidity seen in Piranesi's depictions of Medieval Rome.

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