MEGAPORT: Architecture in Infrastructural Environments

by

Saud Anwar Sharaf

B.S. Architecture
University of Virginia, 2004

Submitted to the Department of Architecture
in partial fulfillment of the requirements for the degree of

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at the
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Submitted to the Department of Architecture on January 18, 2007 in partial fulfillment of the requirements for the degree of Master of Architecture

ABSTRACT

Site: Arabian Sea, major region for container shipping bulk breaking.
World trade is growing at a rate twice the world's economy. The assembly and customization of traded goods are increasingly decentralized around the globe. The frequency of their transportation and exchange is increasing. The phenomenon is of container freights, specifically: transshipment. Transshipment ports are no portals to cities, but are increasingly becoming autonomous global entities. The ports are mere switchboards, an exchange mechanism between ships. Transshipment is the fastest growing shipping market. Ships are getting bigger. Ports are expanding and dredging deeper, as they struggle today with overcapacity. New terminals are built, as economies of scale reach saturation in existing ports. The form of the global infrastructure is changing. In response, a new infrastructural move is necessary: a Megaport for transshipment. The Megaport is a transshipment port solely for ultra large containerships. It affords an economy for such transoceanic ships to remain in sea, and for local ports to be served through feeder ships. The Megaport is self-sufficient, autonomous and offshore. In this colony of globalization, an infrastructural architecture is absolutely necessary.

Thesis Supervisor: Alexander D'Hooghe
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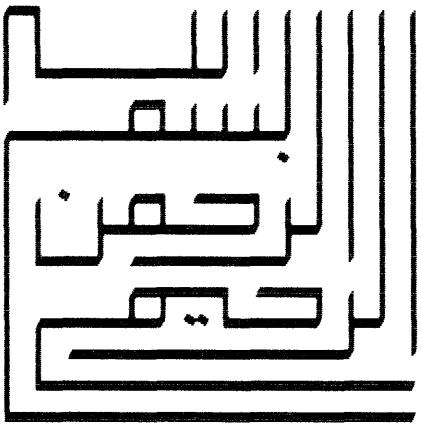

Acknowledgements

This thesis was a wild ride. It began with a manifesto, one which had long broken away from all norms in pursuit of a model of the world. Our claim that architecture is fundamentally a bold infrastructural gesture provocative to all superstructures certainly did not go without scrutiny and criticism. Our claim that the potential of architecture lies not in its abstract expression of 'everything' in the environment, but in its ability to strategize in the environment, did not stand without the accusations of fantasy. Yet this thesis stood up to all its claims of being a bold, provocative and real architectural proposal. It took a tremendous amount of trust, tolerance and support from all the individuals named here to sustain and build the thesis program and realize its fullest potential.

Alexander D'Hooghe, whose eye for the potential of my work, coached me throughout the thesis semester always setting a pace for my work.
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Julian Beinart systematically offered constructive criticism and opportunities for discussion towards shaping a convincing thesis argument.

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Mark Jarzombek, MIT Director of History, Theory and Criticism of Architecture and Art (HTC), and Professor of the History of Architecture, engaged me in the social vision of the project, which fed into contextualizing the human entity into the infrastructural strategy of megaport.
Lucia Allais, MIT HTC PhD candidate, who during the thesis proposal portion, systematically reacted to my writings which aided in shaping the final proposal.
Marco Bianchini, PhD, senior researcher, Institute of agro-environmental biology and forestry, Italian National Research Council, discussed with me the environmental potentials of the project, and shared his research on aquacultures.

Ahmed Obaid al-Mansoori introduced me to the relationship of the state to the market and sustained our discussion throughout the course of the thesis project.
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Firas al-Khatib gave me the tools which aided me in writing the business plan for the project and reacted to my proposals.
Ioannis Bertsatos, MIT Ocean Engineering PhD candidate, with whom I had multiple conversations about offshore structure, inspired my imagination in realizing the immense possibilities of the world of ocean building.

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From the beginning, Nataly Gattegno and Jason Johnson, of FutureCitiesLab, supported and aided me as I developed my thoughts on architecture during my undergraduate years and into my graduate studies. Phoebe Crisman, Professor of Architecture at the University of Virginia, always stirred my ideas on and about architecture in the world of globalization.

Finally, my thesis presentation would not have been possible without the generosity of Maher el-Khaldi, Anas al-Faris, Matt Chua and Adele Philips with their time in the last hours of charrette.

All are good people and close friends who I will always value. Their acknowledgement here is the least I can do to express my gratitude.

My parents, Anwar Sharaf al-Hashimi and Fatma Obaid al-Mansoori, and my siblings, Omran, Sara, Ahmed, and Yousuf, for whom I am more grateful than anything else in the world, were always on my side. Them first, everything else follows, and the wild ride is only the beginning.

The Book of War

This thesis book is about the instigation of a war in the field of architecture. The potential of a book is its capacity to instigate and propagate claims. The war of the book is argument through claim and support. There is a political potential to the book, for do not all books hold within them the constitution for war? A constitution is the codified ideas of an apparatus. The apparatus assumes an eternal existence in space and time. Although its eternal state makes the book into a flask for preserving information, the power of the book is when it states itself in the environment, resisting it and appropriating war machines from it.

The book holds within it both a codified war and the formation of a regime. The regime is not just an intellectual regime, but a war machine with battlefield and war: from debate to war. If we search history, we find a hand full of books around which things tended to get bloody: from propaganda to dominance to defeat. Yet

the book must appropriate a war machine to support its propaganda and form its polity. The book appropriates followers to fight its war to resist the dissolution of its regime. The regime of the book can only be sustained by having followers. The war of the book is a state war, a war which reveals itself in both real and virtual dimensions. Ibn Khuldun identifies the sword and the pen as weapons of the state: the sword, weapon of an exterior war, and the pen, weapon of an interior war.[1]

In the global empire rising during our time, the history of its evolution is to be erased, and empire is to state itself as worldwide and eternal. We are its polity, and its dissolution we shall resist. We are the nomadic war machines appropriated by the global empire. Our wars are interior wars and intellectual wars. In an era where empire asserts itself, we write more books than fight wars. The pen is the weapon with which we instigate and propagate our claims in the world. This is the time for culturing, and the time for an architectural war.

[1] Abu Zayd 'Abd al-Rahman b. Muhammad Ibn Khuldun (d. 808/1406), *The Muqaddimah: An Introduction to History*, trans. Franz Rosenthal, ed. N.J. Dawood (Princeton: Princeton University Press, 1967), 213.

Saud Sharaf

MEGAPORT

Architecture in Infrastructural Environments

World trade is growing at a rate twice the world's economy. The assembly and customization of traded goods are increasingly decentralized around the globe. The frequency of their transportation and exchange is increasing. The phenomenon is of container freights, specifically: transshipment. Transshipment ports are no portals to cities, but are increasingly becoming autonomous global entities. The ports are mere switchboards, an exchange mechanism between ships. Transshipment is the fastest growing shipping market. Ships are getting bigger. Ports are expanding and dredging deeper, as they struggle today with overcapacity. New terminals are built, as economies of scale reach saturation in existing ports. The form of the global infrastructure is changing. In response, a new infrastructural move is necessary: a Megaport for transshipment. The Megaport is a transshipment port solely for ultra large containerships. It affords an economy for such transoceanic ships to remain in sea, and for local ports to be served through feeder ships. The Megaport is self-sufficient, autonomous and offshore. In this colony of globalization, an infrastructural architecture is absolutely necessary.

Figure 1

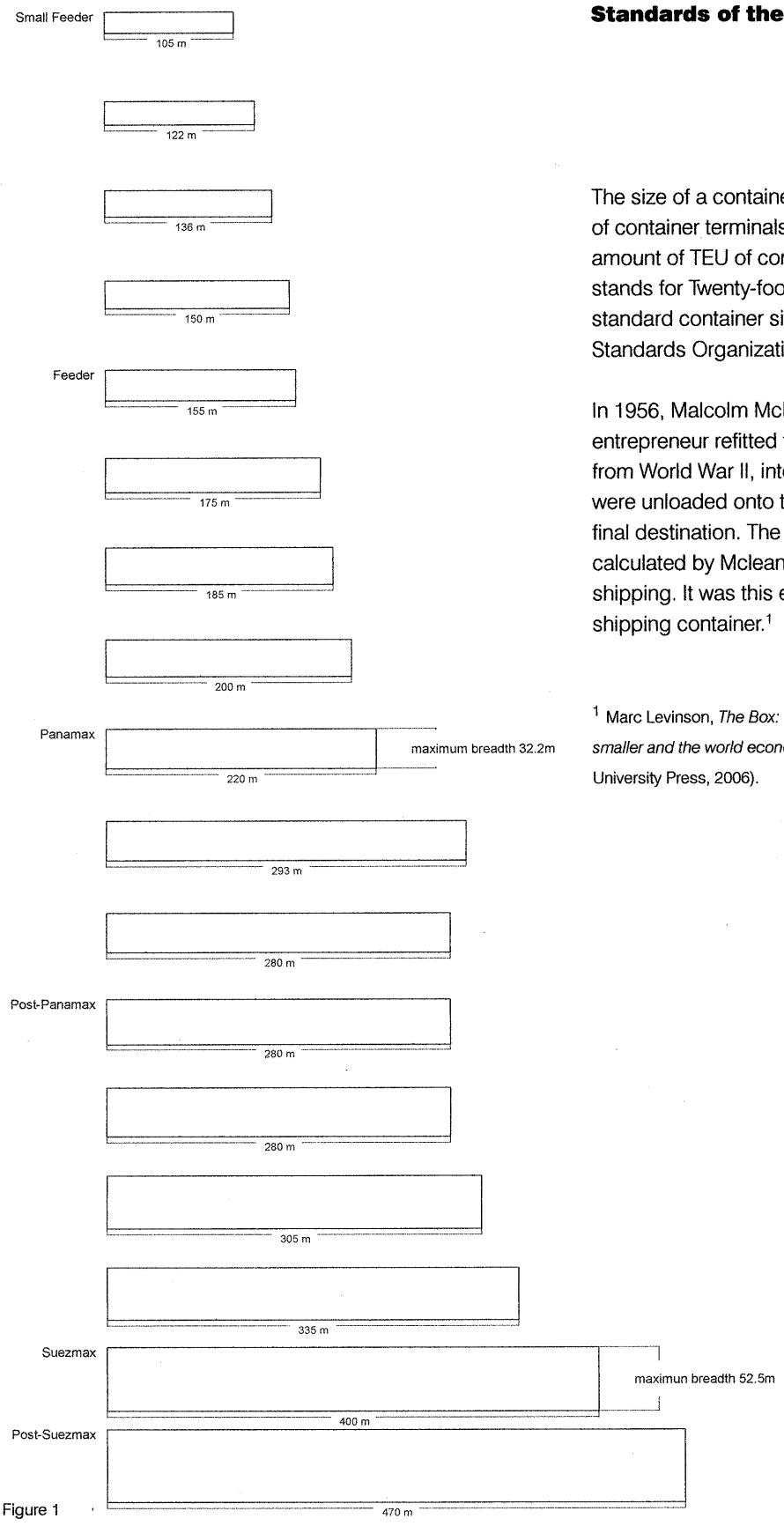


Figure 1

Standards of the Shipping Industry

The size of a container ship and the annual capacity of container terminals are normally stated in the amount of TEU of containers they can handle. TEU stands for Twenty-foot Equivalent Unit, which is the standard container size designated by the International Standards Organization.

In 1956, Malcolm McLean, an American truck entrepreneur refitted the Ideal-X, an oil tanker left over from World War II, into what Houston the containers were unloaded onto trucks and delivered to their final destination. The containerization of goods, as calculated by Mclean, dramatically reduced the cost of shipping. It was this event that marked the birth of the shipping container.[1]

[1] Marc Levinson, *The Box: How the shipping container made the world smaller and the world economy bigger* (Princeton, N.J.: Princeton University Press, 2006).

Container Standards	Length	Width	Height
	6.1 m (**20 ft**)		
	12.2 m (**40 ft**)	2.44 m (8 ft)	2.59 m (8.5 ft)
	13.7 m (**45 ft**)		

Table 1

Container Ship Classes	Vessel type	Dimensions	Number of containers
	Small Feeder		
	Ship breadth up to	approx. 23.0 m	Up to 1,000 TEU
	Feeder		
	Ship breadth	approx. 23-30 m	1,000 – 2,500 TEU
	Panamax Ship	max.:	
	breadth equal to	32.2 / 32.3 m (106ft)	
	Ship draught, for passing canal, up to	12.0 m (39.5 ft)	
	Overall ship length	294.1 m (965 ft)	2,500 – 4,500/5,000 TEU
	Post-Panamax	max.:	
	Ship breadth larger than	32.3 m	4,500/5,000 – 10,000 TEU
	Suezmax	max.:	
	Ship breadth up to	70 m	
	Ship draught up to	21.3 m (70 ft)	
	Draught x breadth up to	Approx. 820 m2	
	Overall ship length up to	500 m	10,000 – 12,000 TEU
	Post-Suezmax		
	One or more Suezmax dimensions are not met		More than 12,000 TEU

source: MAN B&W Diesel A/S

Table 2

The Arabian Sea

The site for the Megaport is the Arabian Sea. The Arabian Sea region is a major bulk breaking region. The container handling market has recently been the chosen market of competition of all port of the region. The growth in the shipping industry presents itself as opportunity for both major and minor ports worldwide. Each port of the Arabian Sea claims the same list of competitive advantages of having optimal location, steadfast port operators, and an advanced port facility. As ports pretend to be next transshipment hub in the region, a deceiving competitive market is implied from their similar agendas. Although the ports of Dubai and Salalah are the dominating ports of transshipment in the region, and the ports of the Dubai possesses 60% of port operation in the region, all the ports of the Arabian Sea and the Middle East fall below the averages transshipment market share of the top 15 transshipment ports worldwide.

The Megaport is a consolidation of the expansion investments of ports of the Arabian Sea to make a specialized transshipment port for transoceanic containerships. It is found that 63% of added capacity is intended for ultra large/transoceanic containerships. The annual capacity of the Megaport has to be 9,250,000 TEU. The economies of scale make it possible to use ultra large containerships for transoceanic shipping. Since ultra large transoceanic ships will make over a third of the global container over the next decade, ports worldwide are expanding and dredging deeper for the change in the size and form of the fleet. As a floating offshore modular structure, Megaport is a flexible port facility in the deepwater environment of the ultra large containerships. The modularity of its structure allows the port to flexibly and rapidly expand at comparable rates with the changes in the form of containerships.

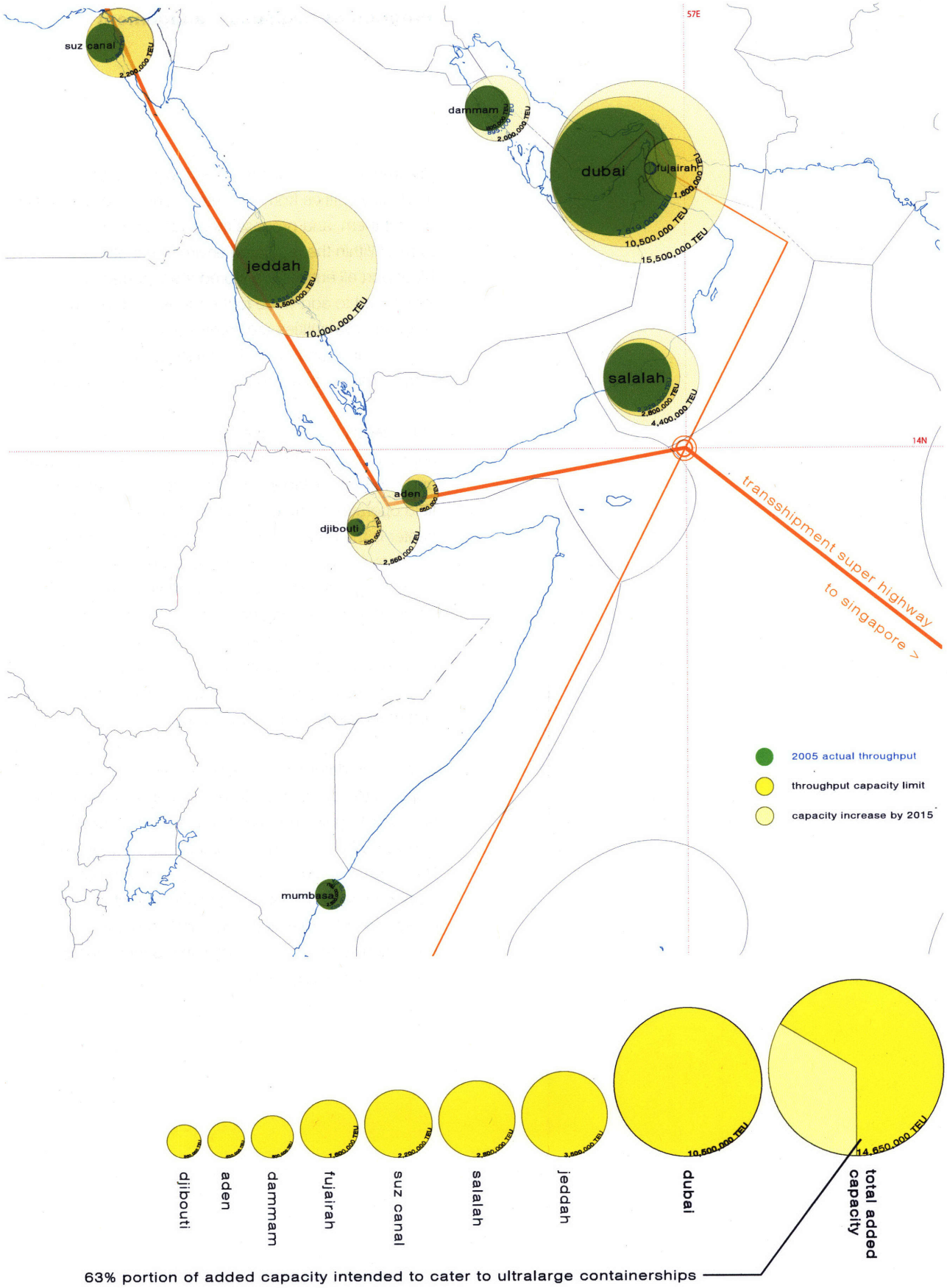

57E
14N
suz canal
2,200,000 TEU
dammam
2,000,000 TEU
dubai
fujairah
1,600,000 TEU
10,500,000 TEU
15,500,000 TEU
jeddah
3,500,000 TEU
10,000,000 TEU
salalah
2,800,000 TEU
4,400,000 TEU
aden
djibouti
2,560,000 TEU
transshipment super highway
to singapore >
mumbasa
2005 actual throughput
throughput capacity limit
capacity increase by 2015
djibouti
aden
dammam
fujairah
suz canal
salalah
jeddah
dubai
total added capacity
14,650,000 TEU
63% portion of added capacity intended to cater to ultralarge containerships
MEGAPORT CAPACITY: 9,250,000 TEU

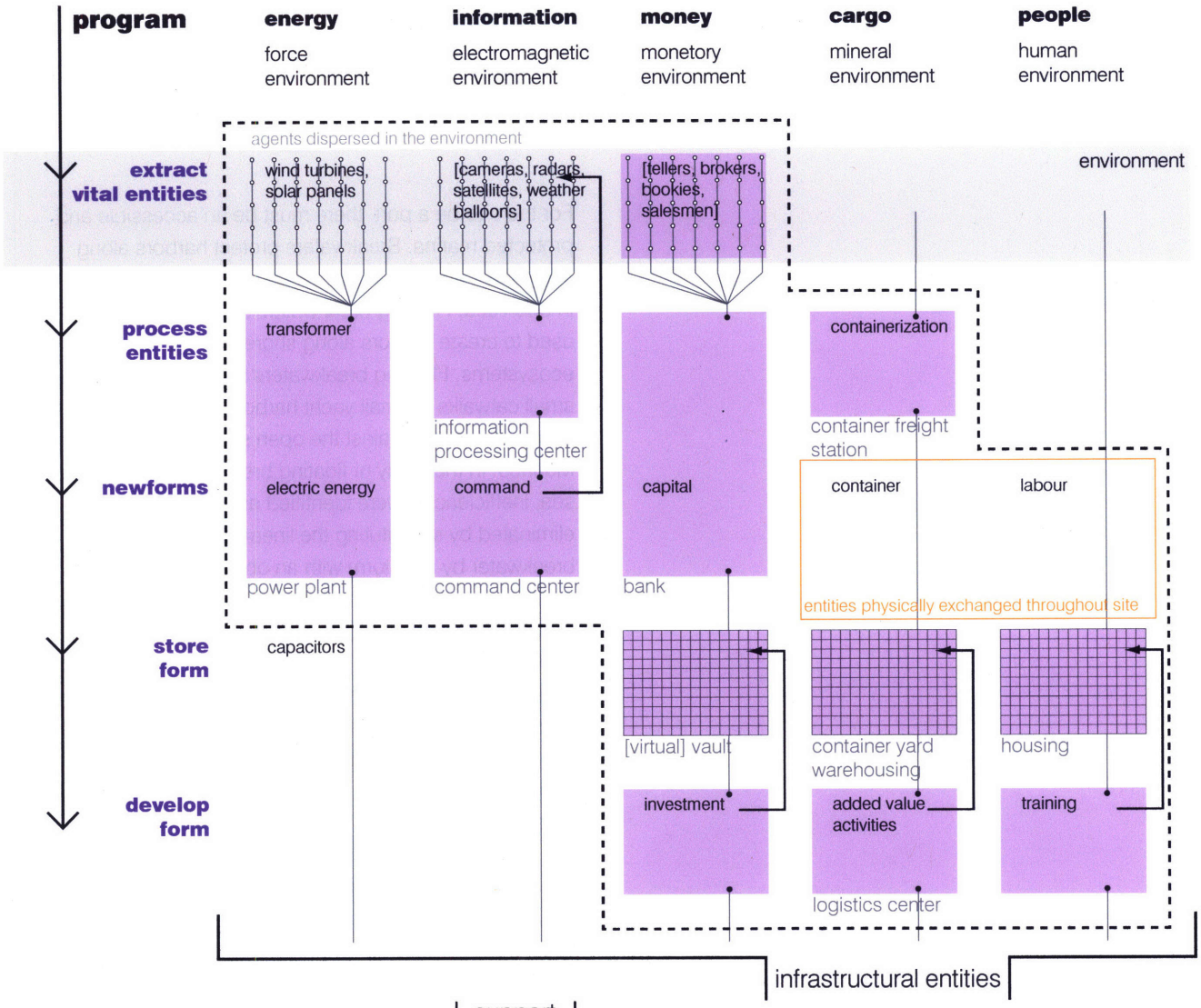
Figure 2

Program as Logistics Management

Program forms constitutes of strategy. The strategy is to identify entities from the heterogeneous environment, extract them, and process them into manageable forms. Within the regulated environment of the Megaport all entities are stored, transported, and developed to add value to the forms. In devising the program, five entities are identified: energy, information, money, cargo and labor. The strategy of the Megaport is the infrastructural process of logistics management.

Labor feeds back into the process as the necessary support for its maintenance. In the processing of cargo and information, labor is broken into two segments: field operations and command center. The command center is the bureaucratic core of the port. It is the watch tower for the airport, seaport and the security of the Megaport. The watch towers all depend on the information processing box. The information processing box extracts information using cameras, radar, weather balloons, and satellites from the environment. It processes information into legible models for the command center to make decisions.

It has been determined that 9,580 labor units are required to operate the Megaport. Labor is distributed between 13 units. Each unit is an infrastructural concentration, built on the floating supports of the Megaport. Each unit is a train station redistributing labor and cargo throughout the site. The station is equipped with amenities, fully sustaining each urban unit. Each station unit becomes into a functioning microcosm of everyday life.



support

	staff	staff area	entities	entity type	space	annual capacity
port						
control tower	50	4,000 m2				
field	4,024		20	berths	9,400 m	
			180,000	container slots	446,500 m2	9,250,000 TEU/yr
airport						
control tower	50	4,000 m2				
field	1,916		52	airplane slots		
security						
control tower	50					
field	1,054	4,000 m2		information		
information processing	456					
housing						
living	1,118		9,580	people	411,940 m2	
energy						
energy	162		225	wind turbines		450,000 kWhr/yr

Figure 3

An Artificial Atoll

For there to be a port, there must be an accessible and protected marina. Breakwaters protect harbors along shorelines, and floating breakwaters protect harbors in open sea. Floating breakwaters are increasingly used to create harbors along shorelines with sensitive ecosystems. Floating breakwaters range in size from small catwalks in small yacht harbors to major concrete forms protecting against the open sea, as in the port of Monaco. In the study of floating breakwaters in open sea, inefficiencies were identified and strategically eliminated by substituting the linear form of the breakwater by an L form with an obtuse angle.

Harbors are designed to properly accommodate the turning radius of ships. The turning radius of post-Panamax ships becomes the criteria for defining the form of the Megaport marina. Two marina sizes are defined corresponding to two classes of ships: post-Panamax transoceanic ships and feeder ships servicing land ports.

The L-form becomes into a modular unit which grows to define an artificial atoll in the open sea. The Megaport takes a single instance of the L-form and consolidates its capacities within it. The Megaport becomes into an expandable form as other port operators add modules to the Megaport. The L form defines the strategy of growth for this colony of globalization.

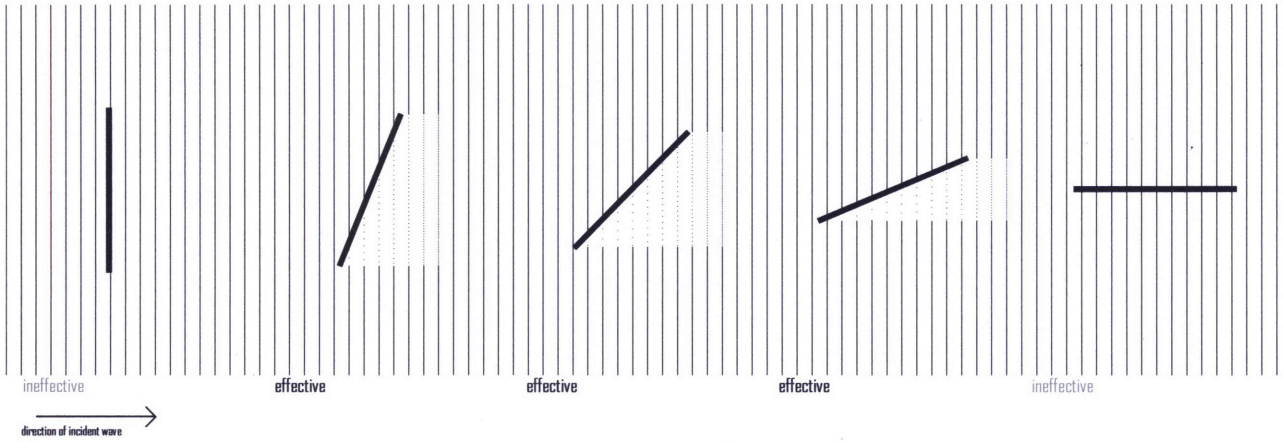


Figure 4

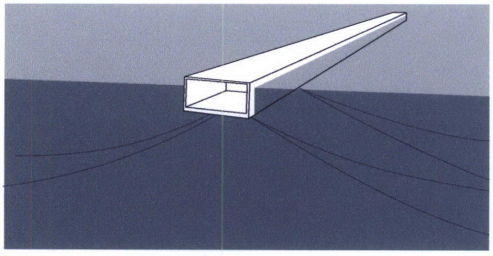


Figure 5 Floating breakwater

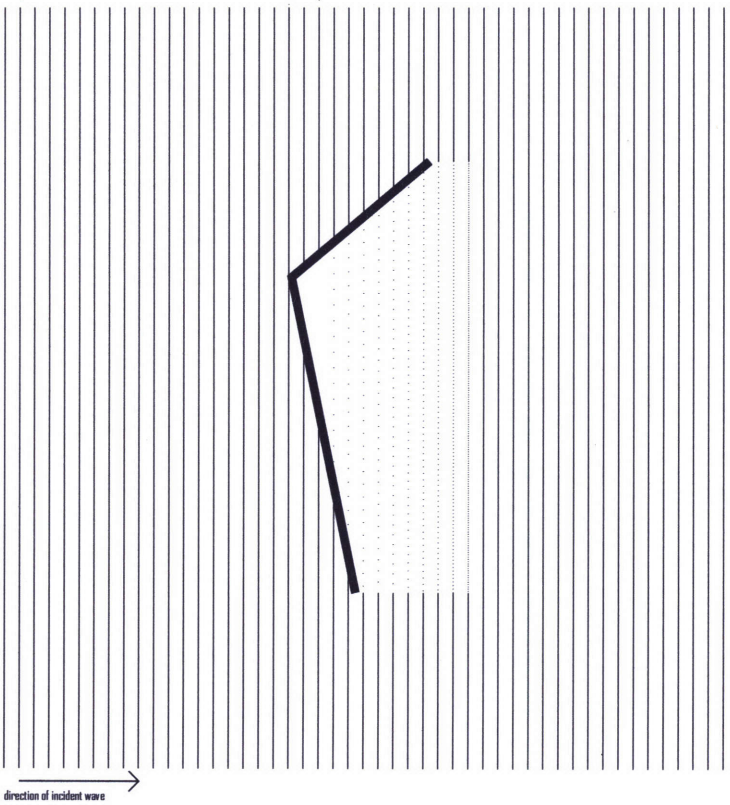


Figure 6

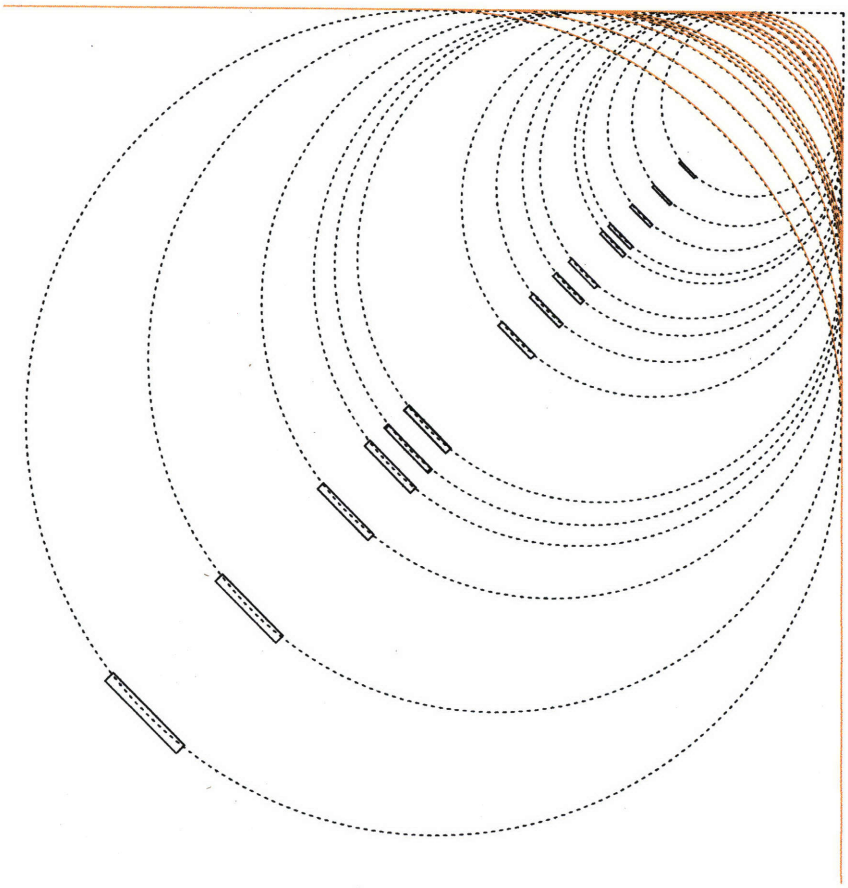


Figure 7 Ships radius of turning

artificial atoll

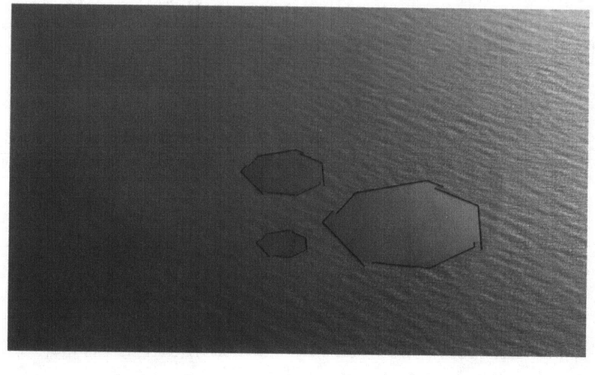


Figure 8

Toolbox

A submergible floating concrete form is a stable structural element: a floating column in the open sea. The concept of the column is a SPAR, which is essentially a 100 m long column moored to the ocean bottom. Thirteen columns in the Arabian Sea define the structural nodes on the site. Port and airport barges are stabilized against the floating columns. The potential of the system is its linearity, making it conveniently expandable.

The system proposed at the Megaport is a hybrid between the Japanese Mega float projects, which demonstrated the possibility of constructing a 4000 m long floating runways, and the SPAR used in deepwater oil and gas constructions. The Megaport is a hybrid structural proposition for the building of an offshore environment.

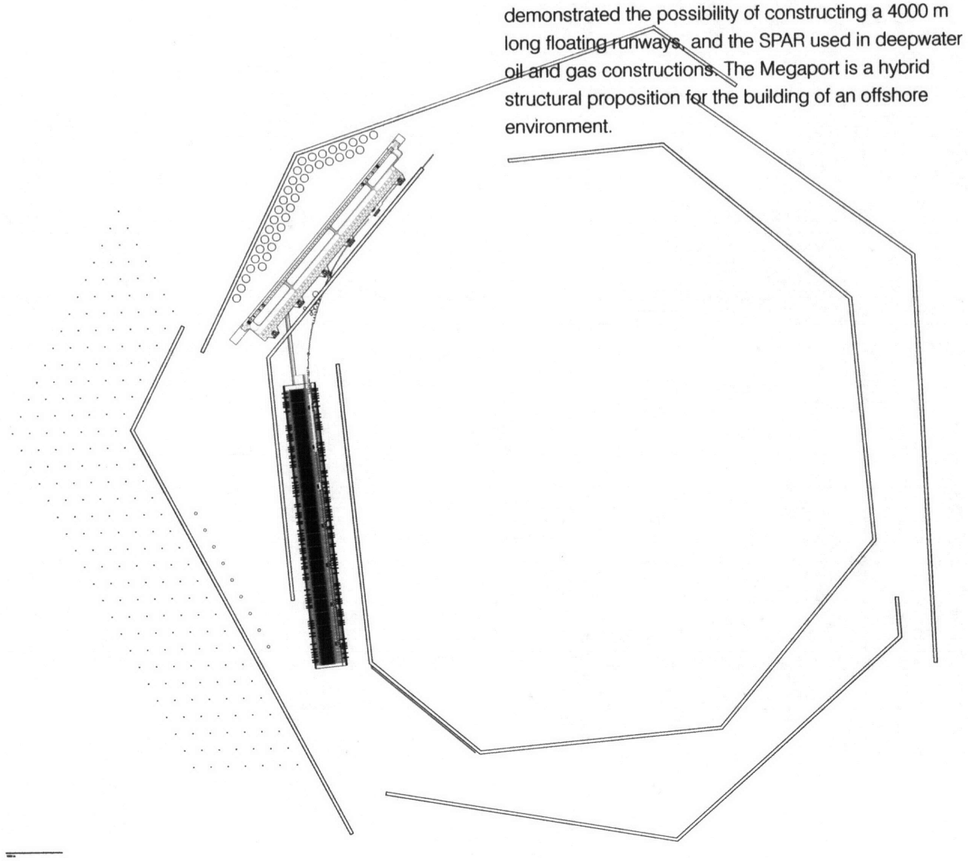
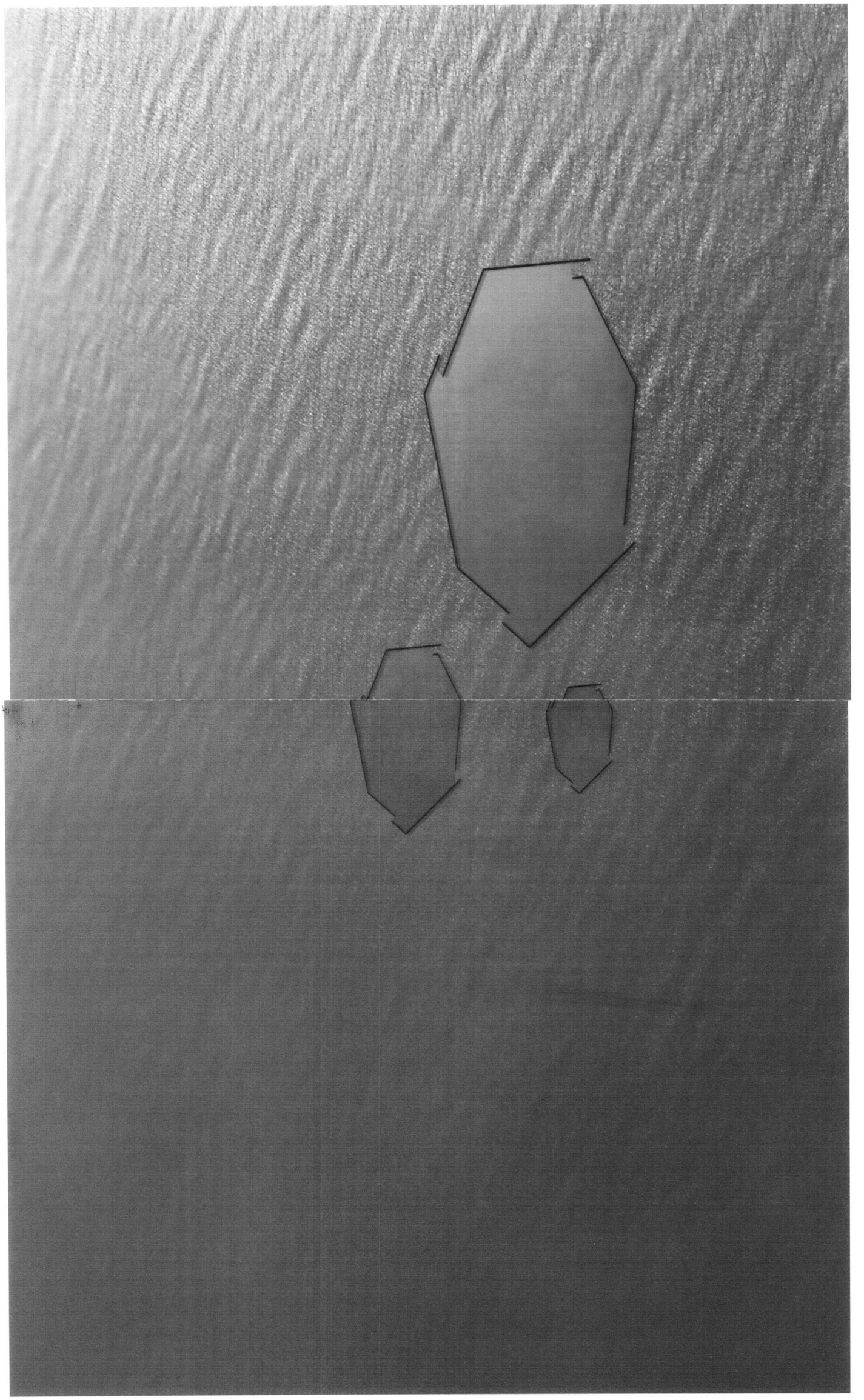


Figure 10



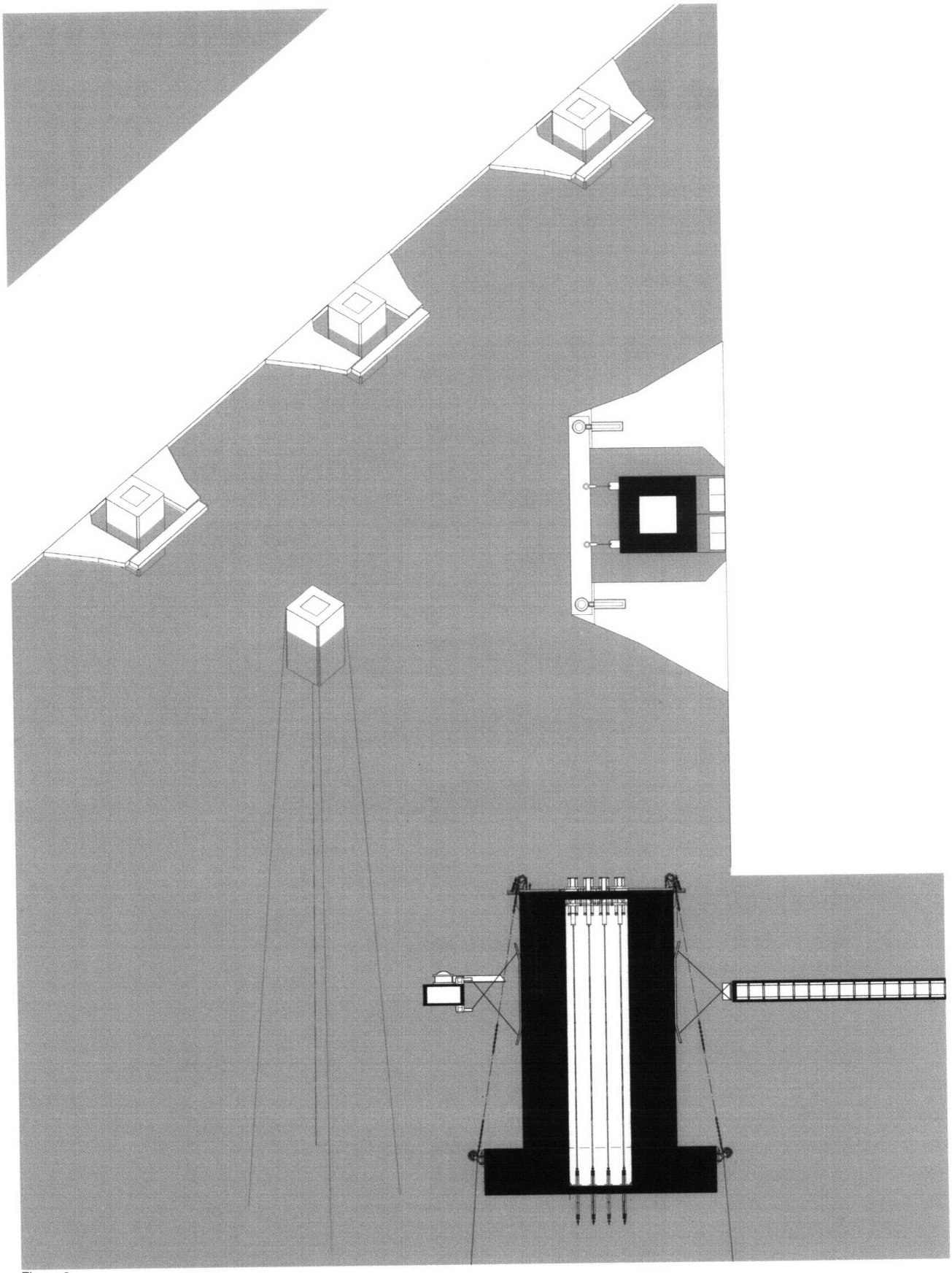


Figure 9

Megaport Master Drawings

axonometrics

master plan

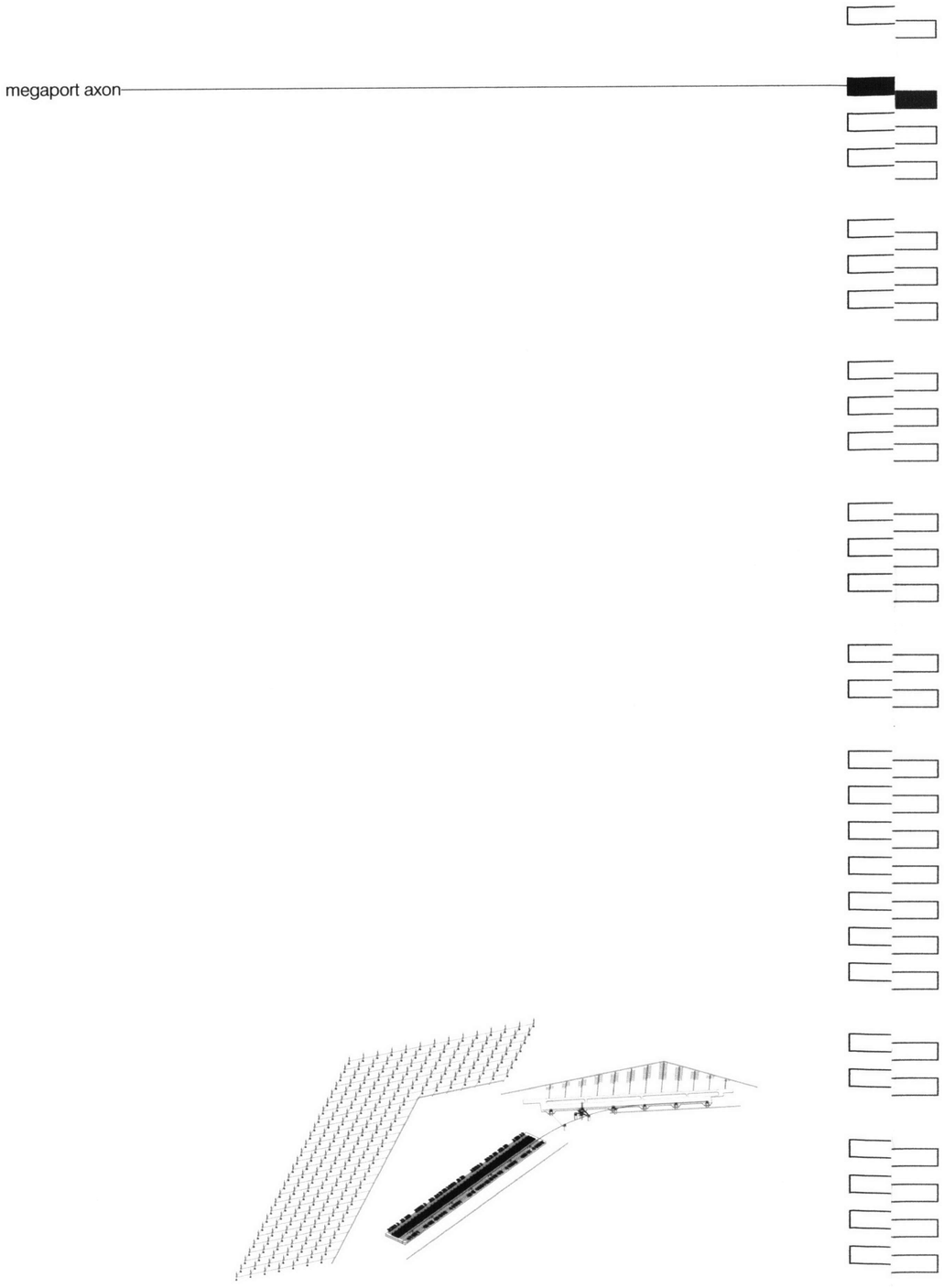
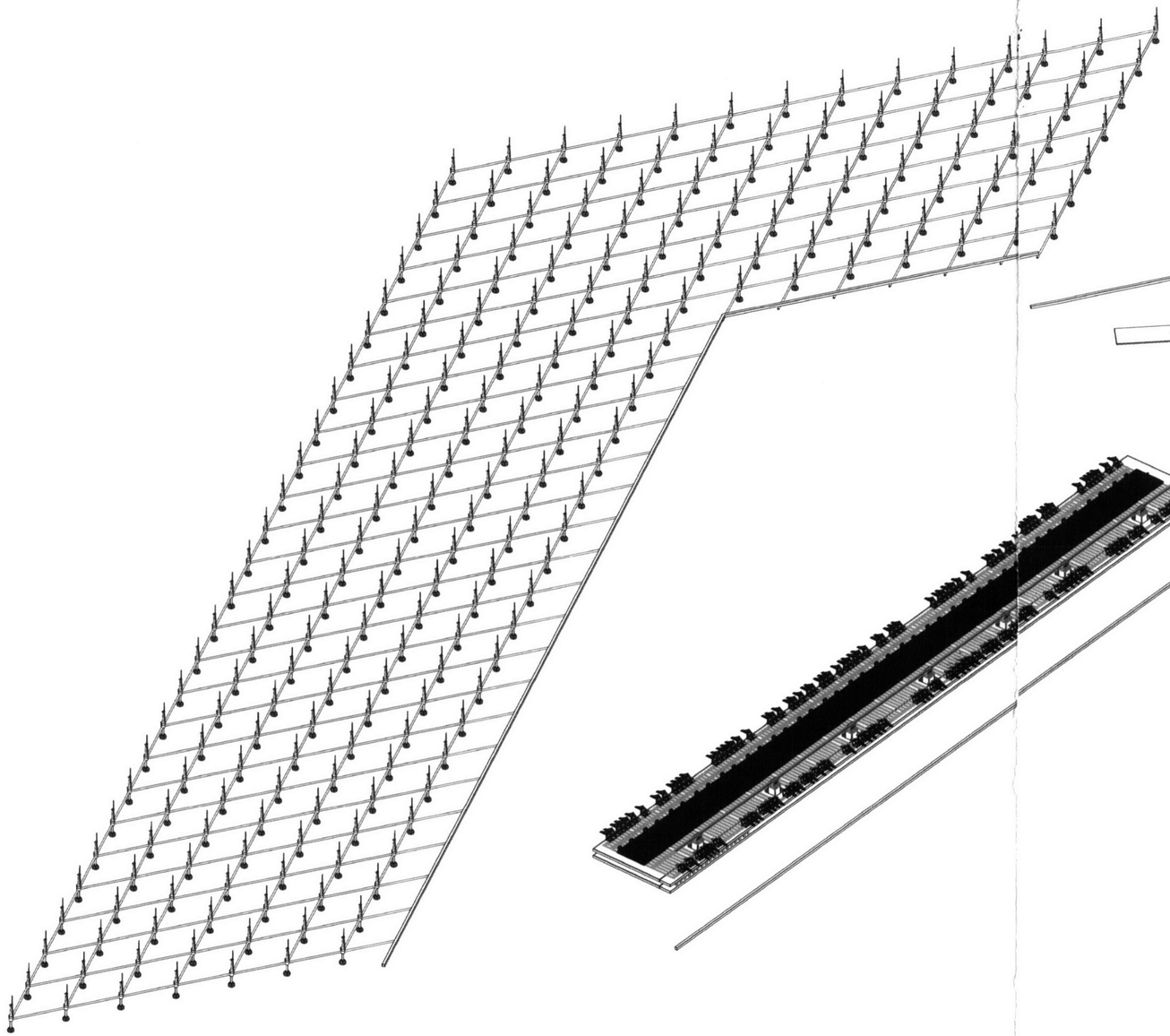
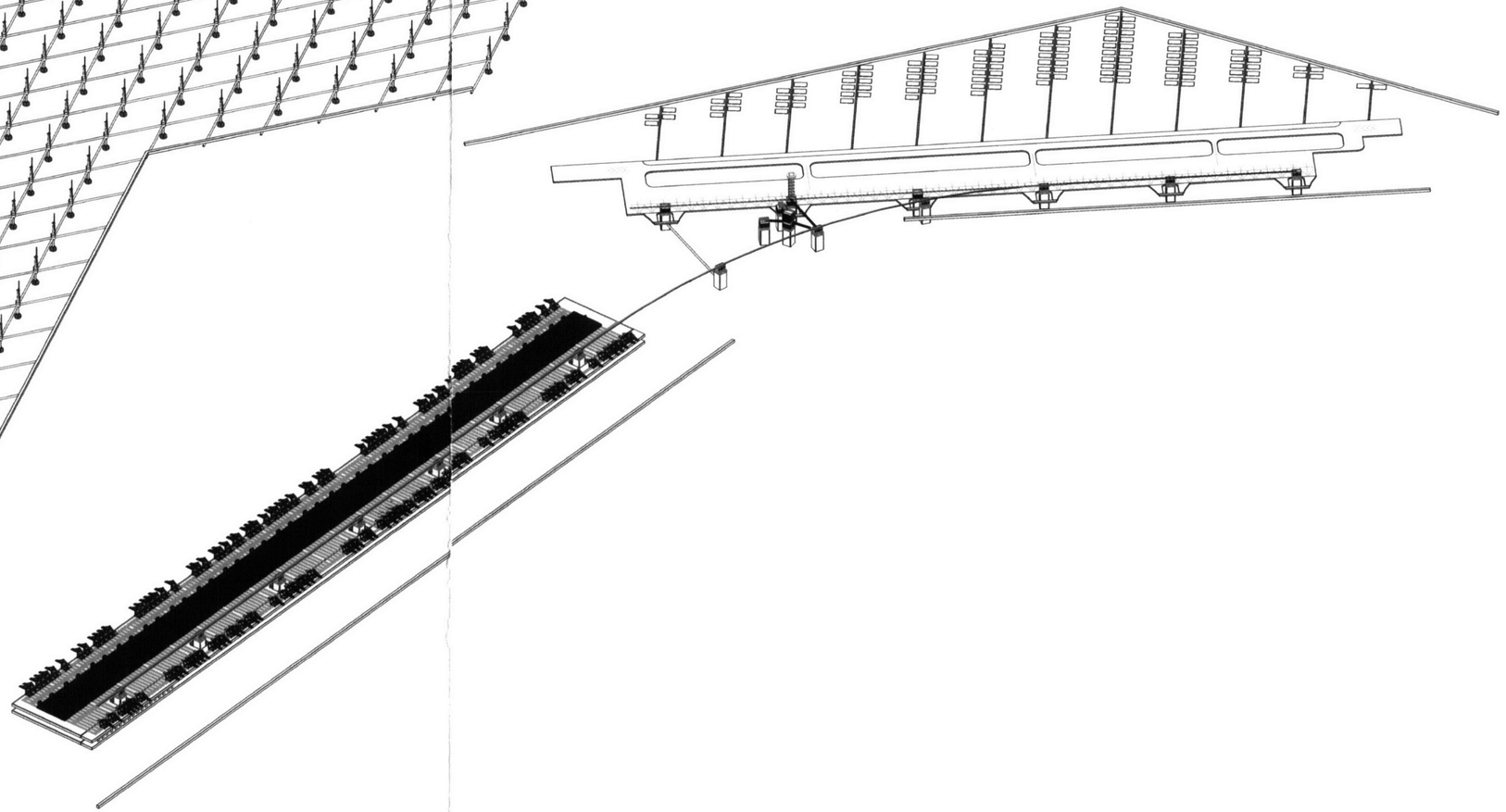
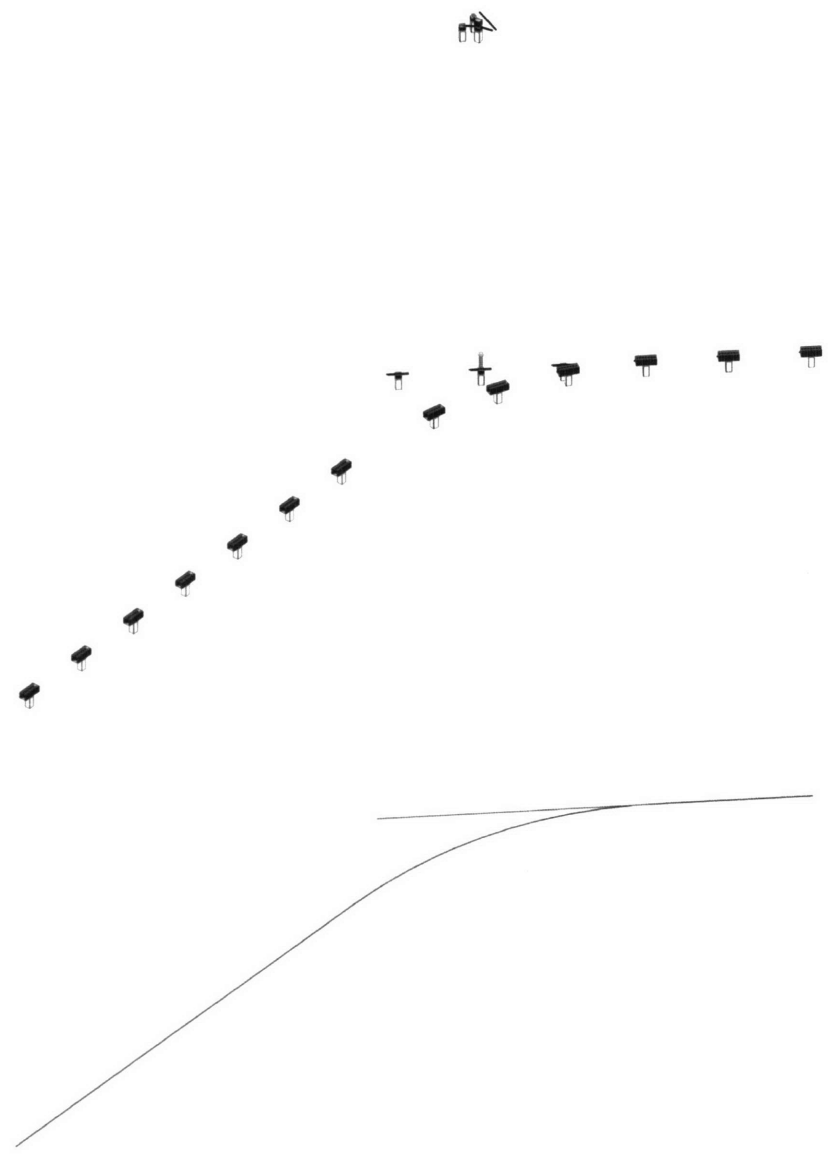


Figure 11





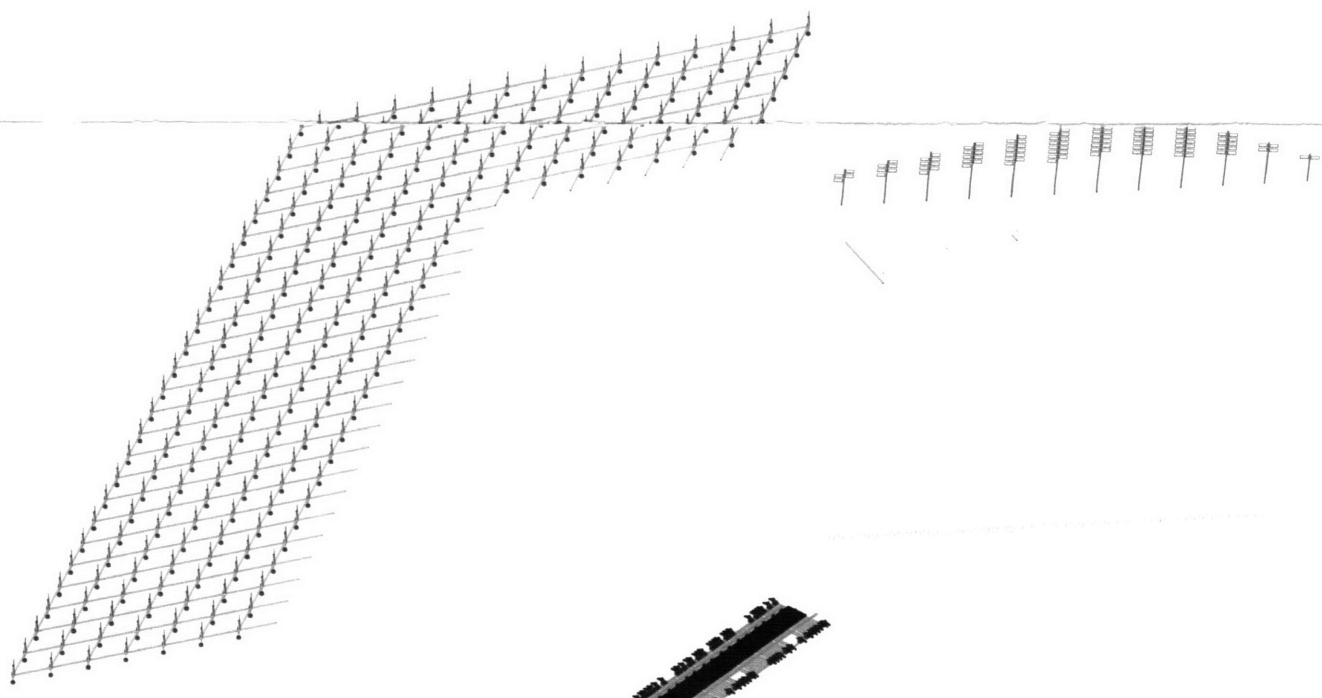
software
enterpeuner enterprises including
bank, stockmarket, casino, hotel, mall.



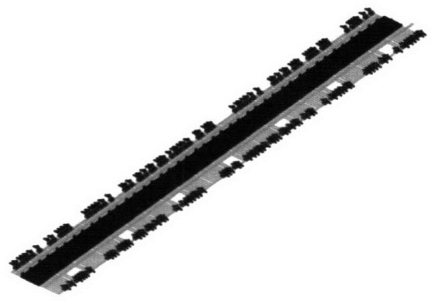
amenities: housing+command center
built over the existing system of spars required
to anchor site.

train
not all spatial problems are resolved spatially. scale introduces a serious problem. the train is a redistributing form, organizing the site into a series of train station.

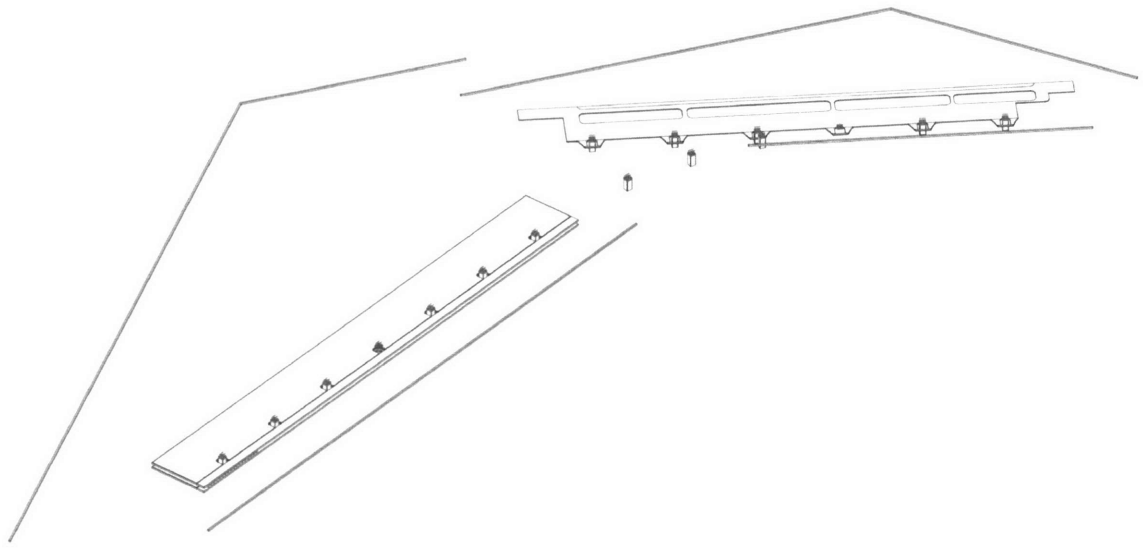
sustainance
self-sufficency implies that the megaport is a self sustaining whole. energy and food are harvested at the megaport by the windfarm and the aqua culture



port+airport
designed to maximum efficency, both cargo port and airport offer ships and airplanes speed record loading and reloading facilities.



system/ toolbox
the system used is adapted from the japanese mega float project with modificatoins for deepwater use. the runway is oriented optimally at 40-220 degrees. the port and breakwaters are opiented to accept incident waves throughout the year.



exploded axon

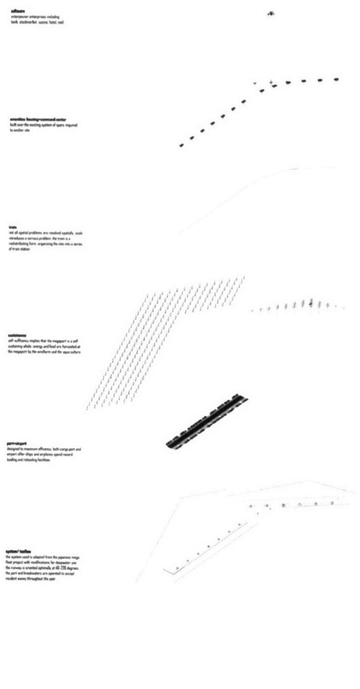


Figure 12

megaport masterplan

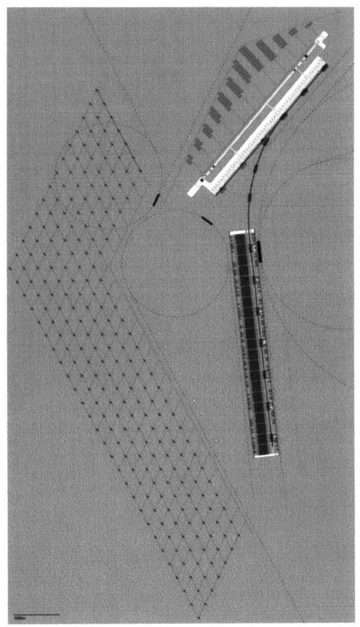
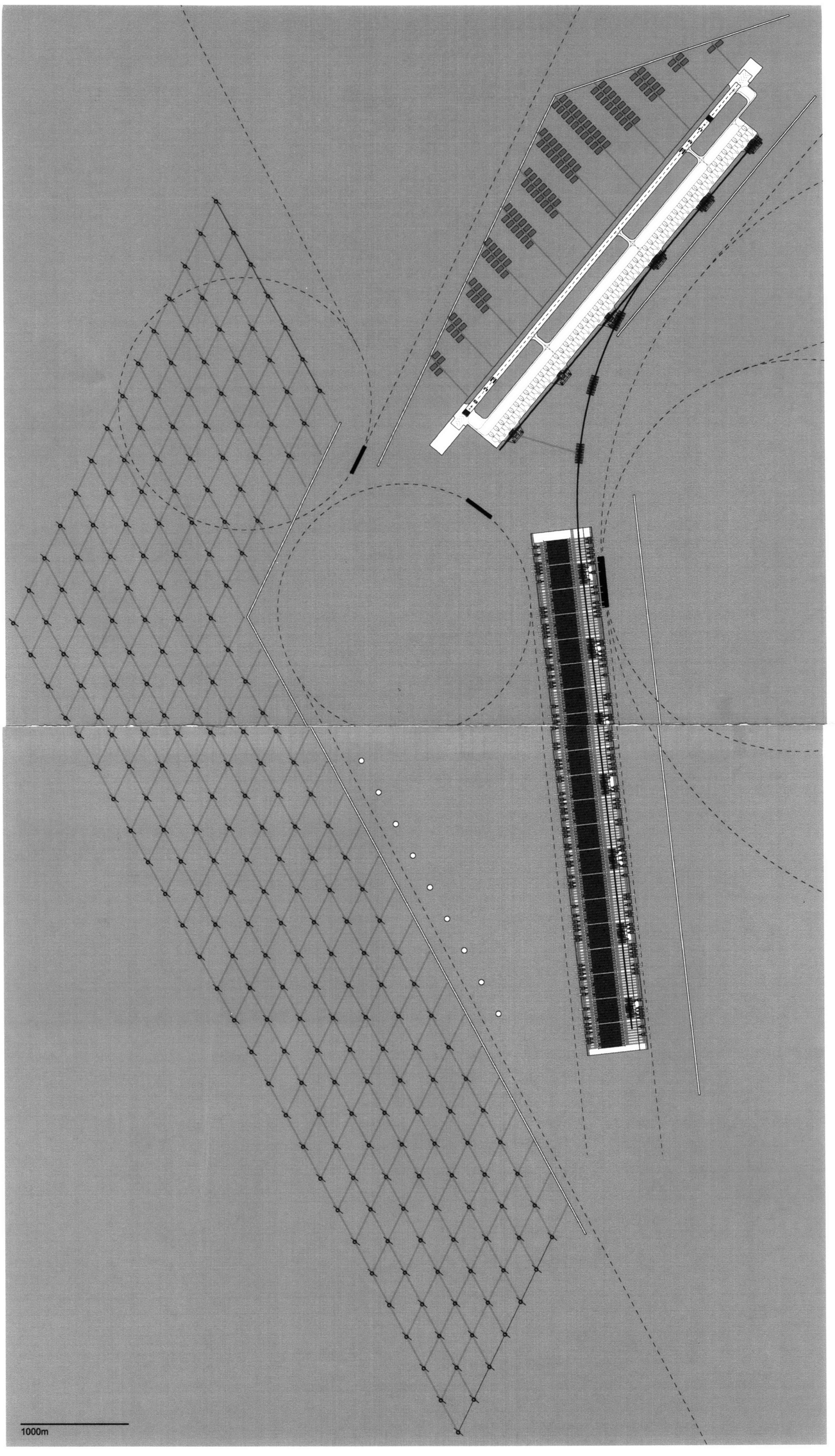


Figure 13


1000m

The Architecture of War

The environment is everywhere. It is the heterogeneously collection of everything. It extends physically and virtually. It is not a universal whole, but an environment of localities. The environment is a whole in flux, which multiplies and extends to infinity. Forms are the constituents of the environment. The environment will always define a smooth space, where forms are in attunement with one another, and ultimately in attunement with the environment. However the individual relationship of forms to the environment is that of conflict. The environment will readily annihilate form. All forms sustain themselves in the environment by having a war machine appropriated from the environment. Architecture is the making of form. As such, all architectural forms are engaged in a war with the environment. Building in the environment is not much of a choice as much as it is a matter of fact. If the propositions of architecture are environmentally infrastructural propositions, then architecture can have a strategic existence in the environment. As with any

form which sustains the environment, the ultimate relationship of architecture to the environment is an infrastructural relationship: an infrastructure on which superstructures development.

Architecture can and has engaged itself in almost all aspects of humanly endeavors. Increasingly, architecture is consciously defining itself as the expression of culture. However, in doing so, architecture becomes into a mere expression of information, a graph. Architecture is ready today to express everything through form. Yet the unrealized potential of architecture is in its brutal relationship with the environment.

Undertakings of mankind are certainly not isolated events, but are forms within the heterogeneous environment. The term 'form' is adapted here to neutrally term all entities within the environment, manmade or evolutionary, building or animal. Forms are concentrations of information. Tremendous amounts of information can be deduced from a form about its interior and exterior environments. Evidently, information is the

substance of everything, environment and form. While the environment is an infinite matrix of information, forms are the defined concentration of information. A new form, introduced into the environment, can be immediately overwhelmed by the matrix of information. The introduction of a form into the environment is a violent process: a process the result of which is war.[1] The environment can instantly annihilate a form. No form engaging the environment survives it without engaging in a war. The environment itself is a collection of heterogeneous forms. The intercourse of forms with one another is a matter of wars perpetuating throughout the environment. Intercourse is war as logistics. Logistics is a military term. Wars are won or lost even before they are fought. A form can only sustain itself so long as it has and sustains its war machine.

1 The relationship of environment to form is that of the nomadic war machine to the state. The nomadic war machine is directed against the state, warding off the formation of a state apparatus, and so is the environment directed against form. Form is the manifestation of an abstract state apparatus, one that has a law of interior and exterior. We are in agreement with the proposition of Deleuze and Guattari that war is not necessarily the object of the war machine, although it may be its necessary consequence. Gilles Deleuze and Felix Guattari, "Treatise on Nomadology," in *A Thousand Plateaus: Capitalism and Schizophernia*, trans. Brian Massumi (Minneapolis: The University of Minnesota Press, 1987), 416.

Logistical wars throughout the environment map the ecology of forms. The ecology is the performative map of the environment. Matrices of information can be deduced through traces of the map. Models of the ecology trace homogenized layers of information as techniques of accessing the ecological map. The map is the truth we can never access, and the ecology can only be remotely understood through the models deduced from traces.

Wants it or not, architecture is engaged in the war against the environment. The design of form is the design of war. Forms engage the environment in four different states. The first state is a short-lived scenario where no war is designed; the result: the total annihilation of form. The crushing environment prevails as absolute, leaving no trace of the form. To overcome the environment, a war machine of the environment must be appropriated. The first state is only the beginning before a form appropriates a war machine of environment, to become the environment, survive the environment, or in the absolute state of form: turn the war machine against the environment.

The Architecture of Strategy I: Tactical War

The attunement and symbiosis of certain forms with their ecology is a deceptive harmony of what fundamentally is the outcome of violent wars. In their violent war with the environment such forms are infinitely annihilated and reformed. Vanquished by the environment, form becomes into an evolving typology of the environment. The iterative process of annihilation and reforming describes no more than the survival of a form in the environment. Form becomes into environment. As environment is forever in flux, the evolution of form, or the becoming into environment, is a never ending process.

The war of the environment against form is a tactical war, maneuvered as it progresses. The war of a vanquished form too becomes into a tactical war, as it iteratively tries to survive the environment. In such war, the vanquished is forced into evolution as its only mechanism of surviving the environment.

The surviving form is an environmental form: architecture without architects. It is an organic architecture attuned with utter precision to the environment through a true feedback loop with the ecological map of the environment. Not architecture, but environmental forms. The study of environmental forms is the study of typologies. Environmental forms are variant forms, as result of their iterative reform in space and time. Archeological information is traced from the multiplicities of the form. As with pottery, environmental forms are the ideal medium through which chronological information is carried through.[1]

Environmental forms are found in all societies, savage, barbaric and civic. They are specific to the environment and are defined in terms of the environment. Environmental forms are surviving forms which assert the dominance of the environment. They survive is multiplicities, carrying in them chronological information about the environment. Environmental forms are

1 Clive Orton, Paul Tyers and Alan Vince, *Pottery in Archaeology* (Cambridge; New York: Cambridge University Press, 1993), 182.

unconscious evolutionary forms. Every new flow into the environment influences the material of the form, giving new substance to the environmental form: more wars, more information.

Environmental forms are attuned with the ecological map as they participate in forming the map of the environment. If the only way architecture can access the map is through the trace, then architecture could never produce environmental forms. Architectural forms never evolved as a matter of intercourse with the environment. Architecture thus cannot make the unconscious evolutionary form of a tactical war. Architecture is form built consciously in a single stroke.[2]

2 We are not concerned here with the process of design, an introverted remote development of desire made manifest in the form of building. The point sustains: when architecture builds in the environment, it builds once. An architectural form does not evolve. It is a brutal static form in the environment.

The Architecture of Strategy II: Schizophrenia

There is a strategic potential to the trace. Even though we submit that the environment is inaccessible, the trace cannot be dismissed as false. If the ecological map is the truth, then we submit that the truth can only be remotely understood. Thus the search for the truth is only a futile endeavor. The potential of the trace is not in the approximation of the smooth space of the environment, but in its capability to striate the environment. The potential of the trace is its capability of identifying a homogenized set of entities in the environment, extracting them as an appropriated war machine.

Traces deduce models, where the environment is traced, relations are deduced, and equations and models are derived. All models are ultimately channeled through modes of rationalism, where rationalism is the war machine which sustains the claims of the model. Here we will adopt rationalism as the practice of ex-

plaining phenomena in a manner agreeable to reason; while rationalist architecture is the application of rationalist principles to architecture. The relationship of the trace to architecture is evident in rationalist architecture as the expression of (traces of) the environment.

The danger of rationalism is not so much the danger of the environment as it is the danger of identifying with the environment. Rationalist architecture becomes nothing but the expression of rationalism, the expression of traces of the environment. Architecture becomes invisible. Architecture pretends to be an environmental form. With minimal resistance from the ecology, architecture literally disappears into thin air. Architecture does not engage the environment, it just looks right, as camouflage from the environment. Its war machine is an empty vessel, which only formally identifies with that of the environment. Rationalist architecture is a soulless form which survives the environment through schizophrenia. There is no substance in schizophrenic architecture: no wars are engaged, no map is drawn, and thus no information can be traced. It was as if such a form never existed in the first place.

Three literal forms with which architecture schizophrenically identified were pointed out by Anthony Vidler: nature, industry and city.[1] Again, in all three, architecture is reduced to a mere expression of each homogenous environment. Attested to by Laugier's primitive hut, architecture has been a victim of its own abuse of rationalism as early as the Enlightenment. Rationalist architecture is concerning since the potential of rationalism is not fully realized in architecture. Rationalist architecture can only fail in its environment, since architecture only pretends to be a form of the environment. It is form promoted as the ideal model for all other environmental forms. Environmental forms certainly need no models to follow. The models of rationalist architecture are not even relevant to how environmental form develop as manifestations of war. As it stands, rationalist architecture is an anomalous abuse of rationalism.

Rationalism has always catered to engineering. The engineer is the man of state. He striates the environment, appropriates a war machine, and turns it against

1 Anthony Vidler, "The Third Typology [1977]," in *Architecture Theory since 1968*, ed. K. M. Hays (Cambridge: MIT Press, 2000), 288-294.

the environment. The engineer traces the smooth space of the environment, deduces models from the environment, and extracts information from his models of the environment. The information is engineered into a war machine which is then turned against the environment. A bridge is such an engineered war machine: it is appropriated from the environment and used to resist the environment. The design of a bridge is a strategic war planned out to suppress the tactical war of the environment. A homogenized environment of forces is identified. Forces are channeled from the surface through a curve to resist the gravitational forces of the environment and the ever increase in entropy. The strategy of the bridge is the funicular curve. Rationalist models are for the engineer only means to an end. The superficiality of the trace is actually necessary to derive models. The potential of rationalism is its capacity to striate the environment, for the ultimately devise of strategy.

Architecture of Strategy III: Strategic War

The paganism of schizophrenic architecture does not suffice. It is not an absolute strategy of form. Schizophrenic architecture is paganism since it can only related to the environment's material world and all it can perform is the celebration of the environment's materialism. It is an architecture which can never claim a secular existence in the environment.

Environmental forms are resolved forms. They represent the smooth intercourse of a form with others in the environment. Its form is the result of an iterative environmental war. Can and should architects synthesize form as smoothly as the environment? Or should architects synthesize? If rationalist architecture is no more than a literal mimicry of environmental forms, then what do we say of an architecture which mimics traced relationships between forms? Can it claim to be a synthesizing architecture or is it different manifestation of a rationalist architecture.

Conflicts are native to forms in the environment: the space of conflict is the space of war. Relationships as we understand them are traced from the space of conflict. Architects again, identify relationships and synthesize them into a spatial resolution. In doing so, architects prescribe spatial relationships. Such prescribed relationships are then fed into an overarching narrative. It is concerning however. There is the distinct smell of structuralism in the narrative.

Structuralism claims to find basic structures underlying all cultural processes.[1] However, cultural processes are superstructures. They do not really have basic rationalist structures, although such structures can be deduced from traces. Superstructures arise as unpredicted syntheses of infrastructures. The narrative introduces a structure at the level of superstructures, and uses it as the trajectory to inform form. Form is infrastructure. So can infrastructure be informed by something as immaterial as prescribed cultural processes? The issue at hand is not even reverse engineering, which is

1 In reference to the structuralist ethnologist Claude Levi-Strauss. Simon Sadler, *The Situationist City* (Cambridge: MIT Press, 1998), 32.

infrastructural in both directions. The narrative is simply not convincing in devising strategy.

Narrative is most powerful as means of propaganda for architecture. In the renderings of Le Corbusier of 1922 for the contemporary city for 3 million inhabitants, narrative does not inform architecture and is only intended as propaganda of suggested inhabitation of form. Architecture only delights the environment with propaganda. At the infrastructural level, when realized, architecture fucks the environment.

If we do away with structuralism, the forms of architecture can only be irresolute. Specifically, the space of conflict is not resolved and left flexible. There are no prescribed spatial relationships. Synthesis is at the level of infrastructure, instead that of superstructure. The synthesis of programmatic irresolution is the beginning of a strategic architecture. In its strategic war, architecture appropriates a war machine from the environment and turns it against the environment. The

environment is striated. Traces of the environment are rationalized into models. The models deduce information about the environment. The information is engineered, an environmental strategy is appropriated, and a strategy for architecture is devised. Program forms constitutes of strategy. Programmatic elements are in conflict with one another and so they shall remain. The space of conflict is not resolved, instead, it is defined. The resolved space of conflict prescribes spatial relationships, while the defined space of conflict is soft allowing for superstructures to perpetuate.

Strategic architecture is a brutal architecture that defines itself in the environment. It is architecture of a strategic war. Its strategic war is turned against the environment and is robust enough to resist the tactical war of the environment. Architecture in the absolute state of form turns the war machine against the environment. Architecture prevails in the environment as absolute, eternal and static. Absolute architecture is architecture par excellence.

The Infrastructural Environment

The world today is an infrastructural world. Infrastructure implements logistics as a strategic war in the environment. Infrastructure tames and homogeneously categorizes entities from the heterogeneous environment. Infrastructure is control. Infrastructure striates the environment. The process of striating: identifying and extracting vital entities from the environment, defining a homogenized set of forms, and then forever storing, redistributing, and developing the forms until consumed by demand. Infrastructural flows are induced by demand.[1] For so long as demand persists, the flow of entities will occur regardless.

Of environmental entities are fluids, forces, electrons, capital, minerals, humans, and animals. By their sheer naming, we have already identified them as homog-

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1 Studies concerned with illegal markets conclude that such markets can never be eradicated by targeting the supply side. Demand is the inducing factor of any material flow. So long as demand persists, there will always be a market. R.T. Naylor, *Wages of Crime: Black Market, Illegal Finance, and the Underground Economy* (New York: Cornell University Press, 2002), 18.

enized entities in the environment. Entities are further homogenized into definitive forms which can be managed, maintained, and most importantly, quantified. From the raw, entities are redefined into forms of water, energy, electricity, money, labor, mineral resources and livestock. Each form has its corresponding measuring unit. Forms are stored in tanks, dams, capacitors, banks, warehouses, houses, and barns. They are redistributed via pipes, cables, satellites, trains, and trucks. And they are developable in energy farms, investment establishment, warehouses, training centers, and animal farms. The environment is razed and infrastructure prevails.

Engineers continue to propose models striating the environment to infinity. The material world is to be mined for all and everything it has to offer. Potential is in everything there is in the environment, it however must be identified. Intelligence is that ability to identify homogenized potentials for them to be extracted

and exploited into strategies.[2] In the infinite effort to striate the environment, nothing is to go to waste. Infrastructure striates the globe in the forms of infrastructural concentration. Infrastructural concentration form colonies within the material world. Cities are such concentration, strategically exploiting the economies of scale. Infrastructural concentrations are not incidental such as the intersection of two roads. They instead are proactive developments, creating intersections and building up a network.

The network is an emergent organization. It is never a designed totality. The escalating circulation of forms within infrastructural channels, inventories and logistics centers have created a concentration in which a worldwide infrastructural network has emerged. A smooth space is again reformed around the entire world. When at some point infrastructure had pre-

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2 Branden Hookway, *Pandemonium: The rise of predatory locales in the postwar world*, ed. and presented, Sanford Kwinter and Bruce Mau (New York: Princeton Architectural Press; Houston: Rice University School of Architecture, 1999).

vailed over the environment, now infrastructural concentrations are no more than objects or means adapted to the worldwide infrastructural war machine. A new environment again prevails. Facetted with infrastructural concentrations, the environment is a global whole and its control is worldwide. It is the infrastructural environment.

And so engineers striate again. A new field emerges in world trade: Logistics and supply chain management. The question is how do we appropriate and exploit this new infrastructural environment. The strategic war is time, and it is precisely and purely time which is being striated. This is where we are today: strategy to exploit time.

Logistics and Supply Chain Management

Logistics is a military term. Wars are won or lost long before battles are fought as a matter of logistics strengths and capabilities. The effective management of the flow of materials and information has a vital impact on achieving competitive advantage. So appropriate, apparatuses of global trade have recently adopted the principles underpinning the management of logistics from the military, war machine of the state. The definition of logistics is adopted here as "the process of strategically managing the procurement, movement, and storage of materials... and the related information flows through the organization."[1] While logistics define the planning framework of flows, supply chain management is the actual linking of the organization into the network of suppliers and customers and coordinating of materials and information flows.

1 Martin Christopher, *Logistics and Supply Chain Management* (Harlow, England; New York: Financial Times Prentice Hall, 2005.), 4.

The frequency of transportation and exchange of containerized goods globally is on an increase. Container transport does not account as much for the increase as the container handing market. The growth in container handling is reflective of businesses strategically managing the supply chain by decentralizing the assembly and customization of traded goods around the globe. The increase in the frequency of handling of goods globally accounts for the increase in container handling and transshipment.

Businesses today are managing the supply chain horizontally through a network of subcontractors, where each business entity is capable of excelling in the field of their expertise. Recently this model has come to replace the centralized manufacturing and assembly of goods. Businesses today focus on their competitive advantage, and delegate other components to competitive subcontractors. Every piece of the organization becomes value adding. When effectively managed, the supply chain becomes into a value adding network. By

outsourcing businesses are have the capability to offer their customers products or services with added value at competitively low prices.

The environment of the Megaport is an environment of business entities, apparatuses with appropriated war machines. The outcome of their wars is already predefined. Entities can only sustain the business environment by effectively striated the environment and strategically occupied it. Strategy is the decisive factor of how a form occupies and sustains itself in the environment. Strategy is a military term.

Megaport Drawings

container terminal

airport

energy

living /stations

container terminal plan

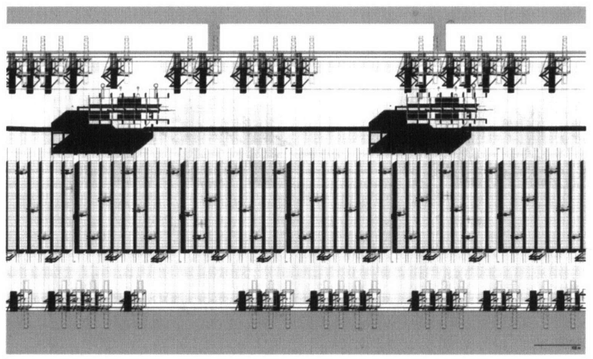
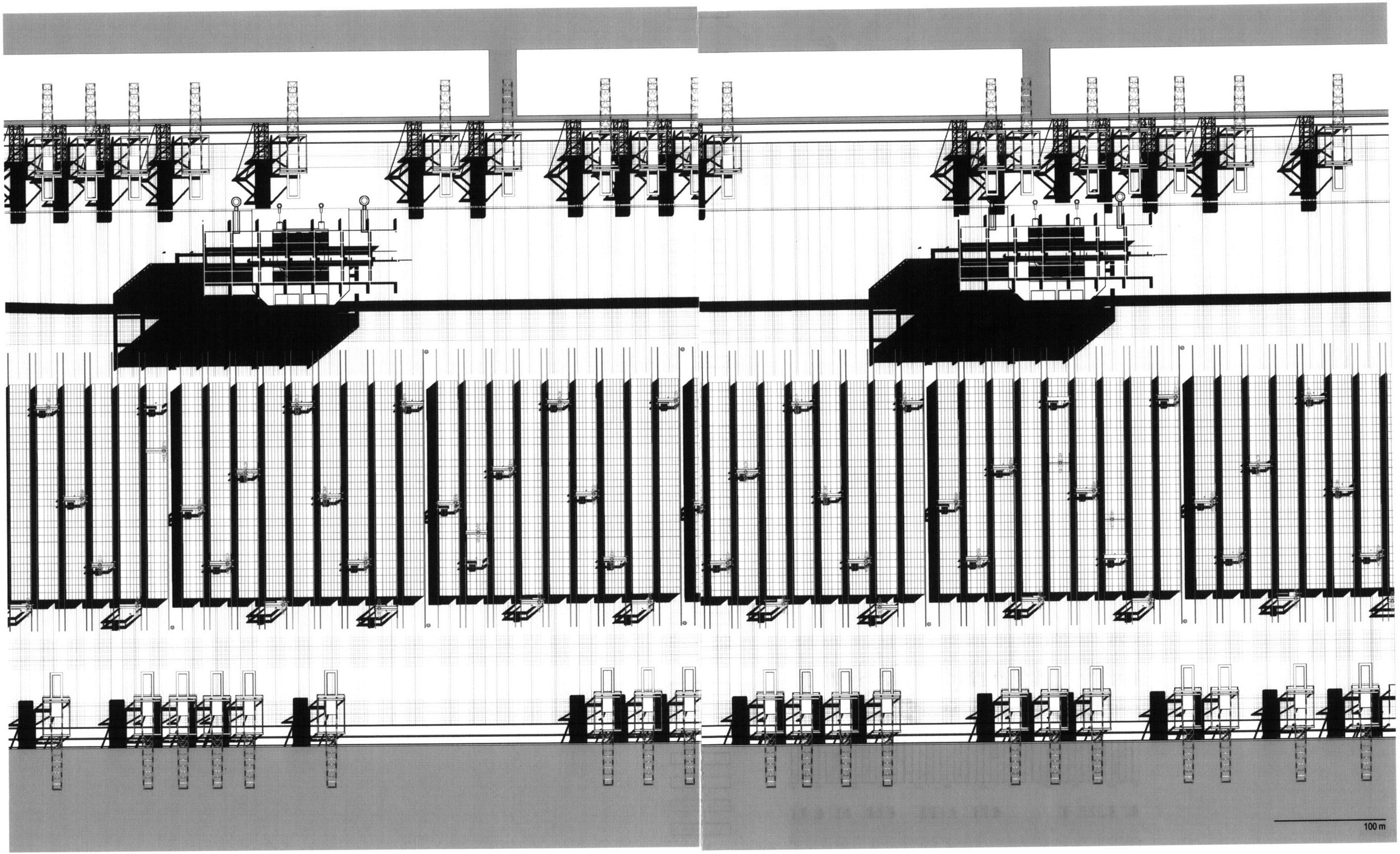


Figure 14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terminal longitudinal elevation

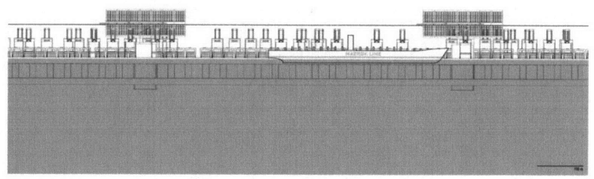
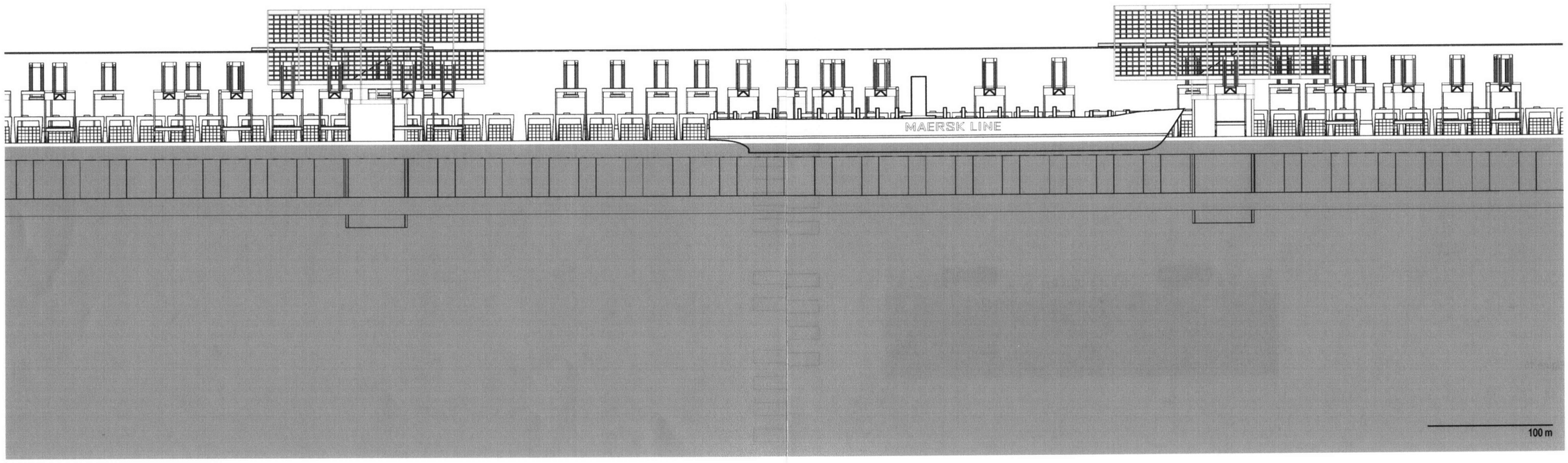


Figure 15


MAERSK LINE
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terminal transverse section

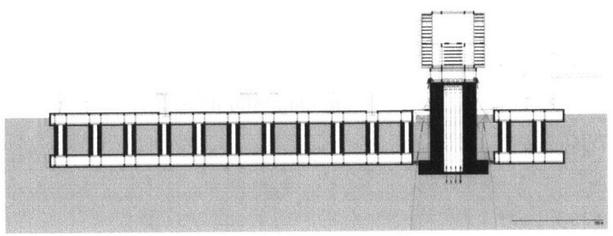
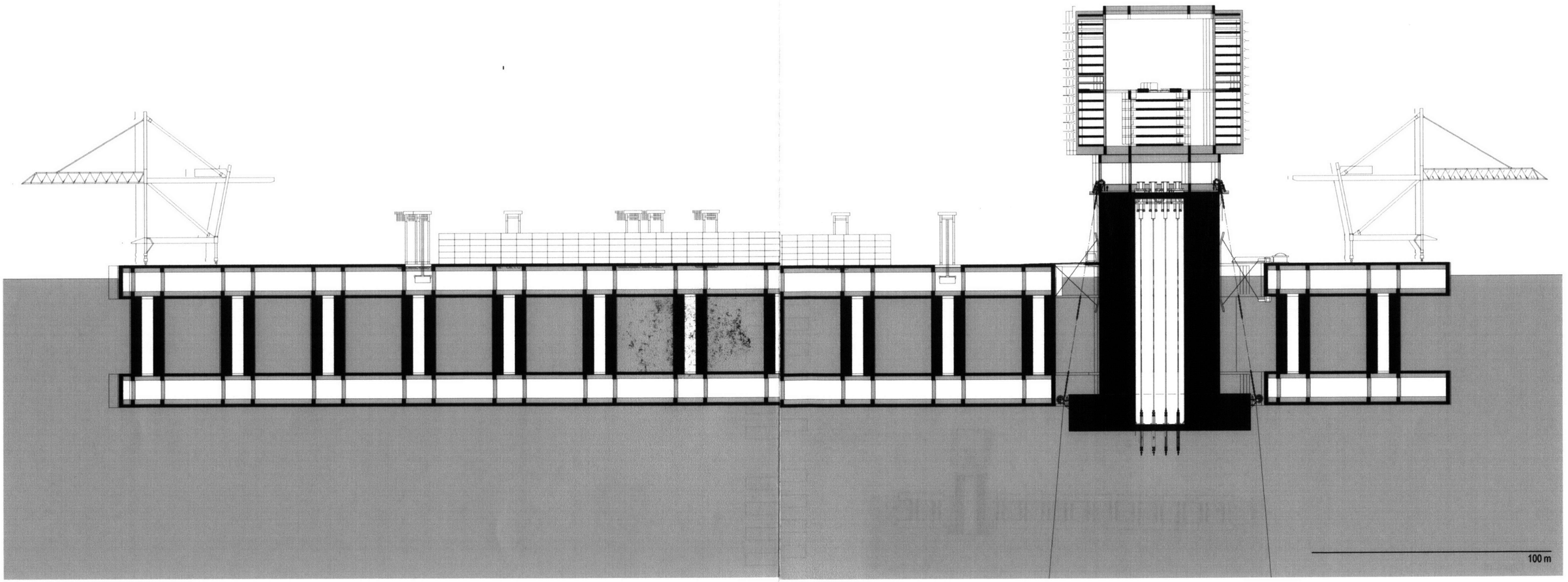


Figure 16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airport plan

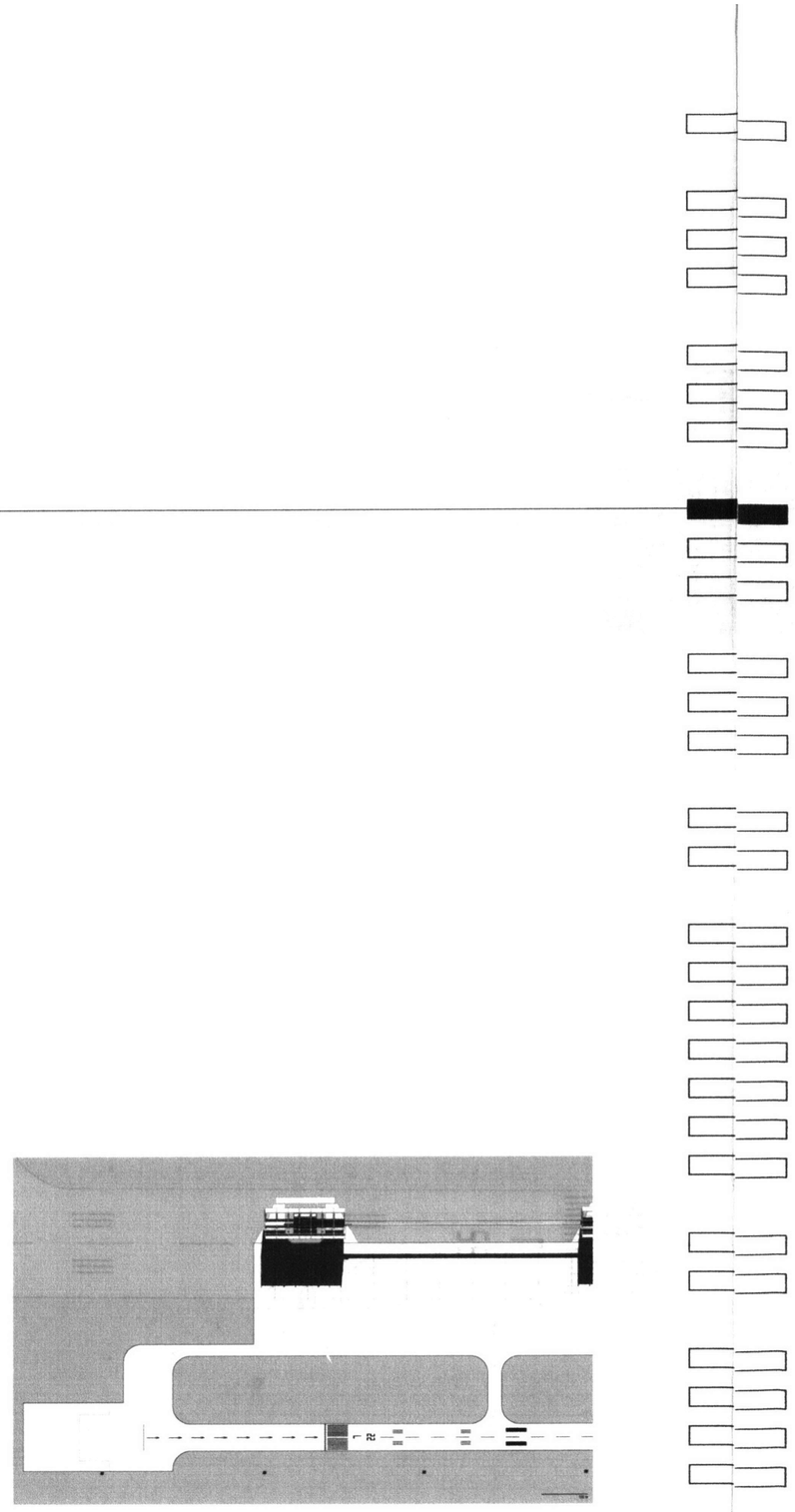


Figure 17

12
100 m

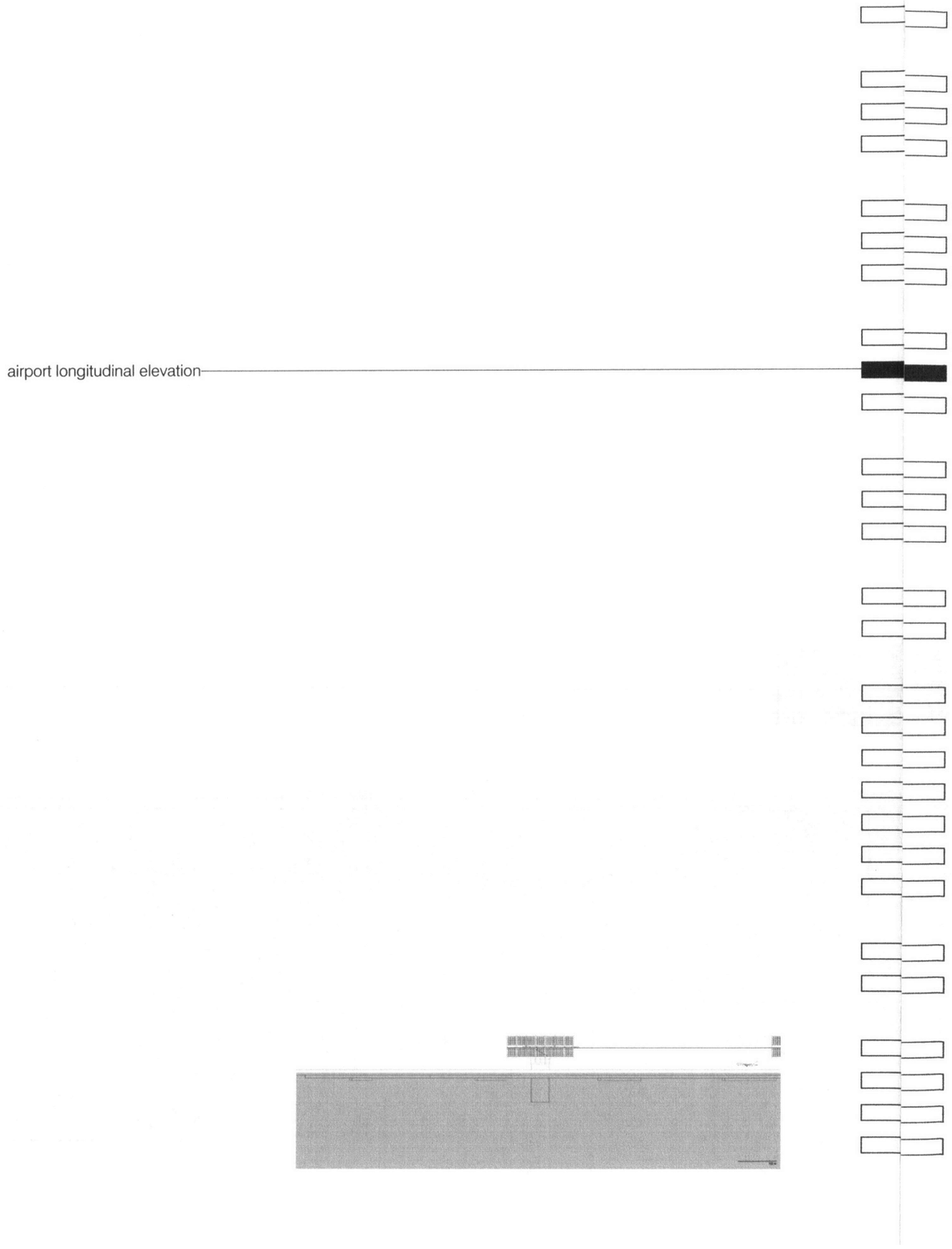
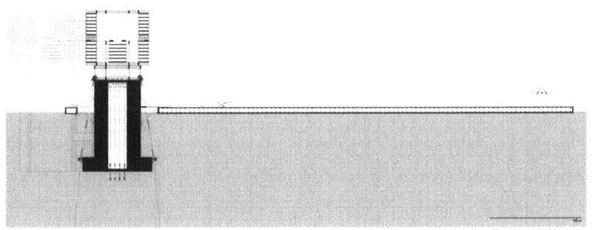


Figure 18

100 m

airport transverse section



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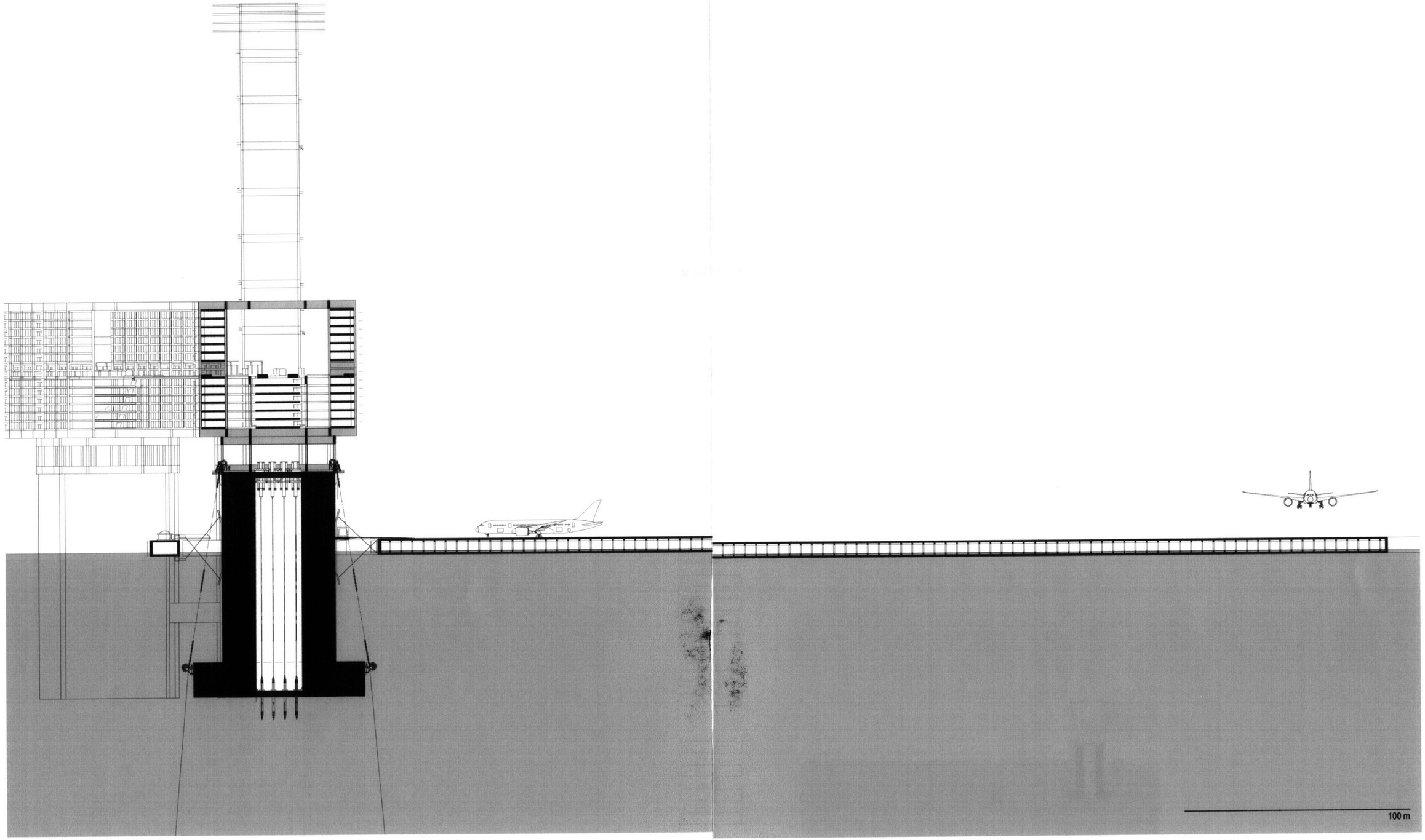
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energy plan

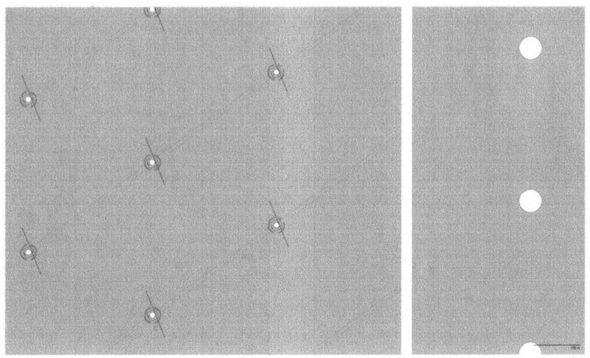


Figure 20

100 m

energy longitudinal elevation

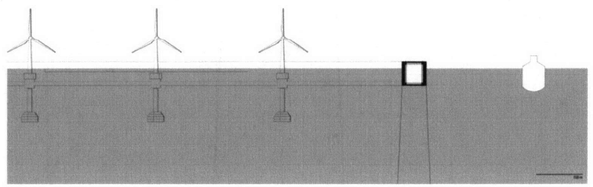
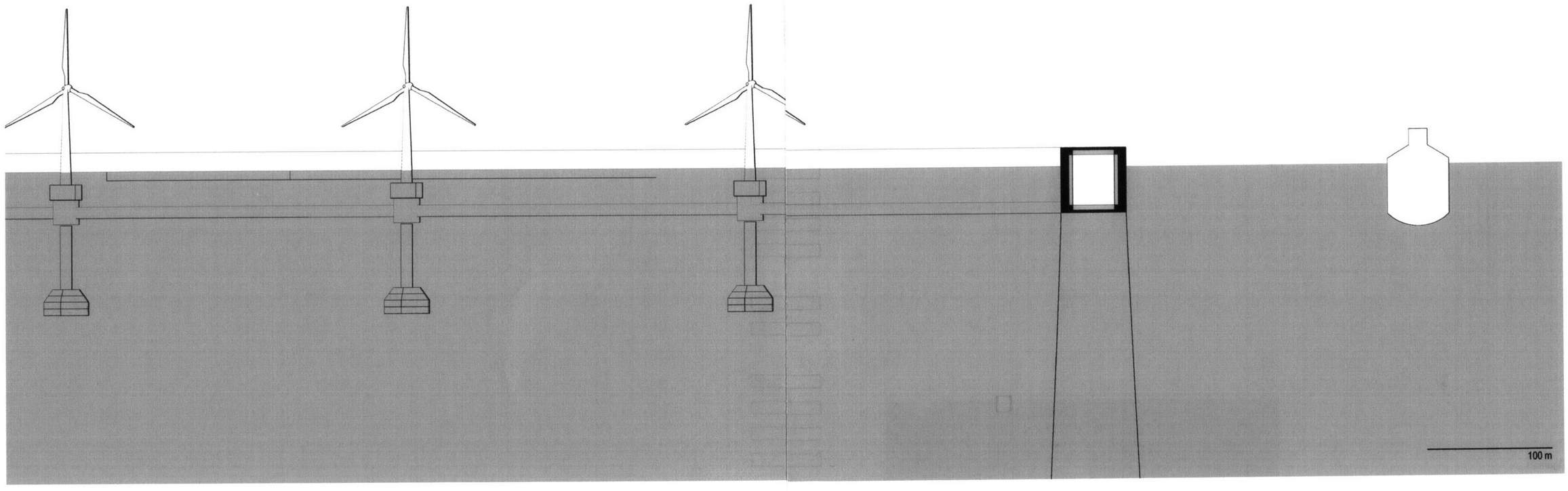


Figure 21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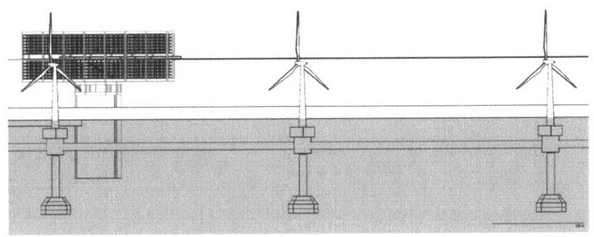
energy transverse section



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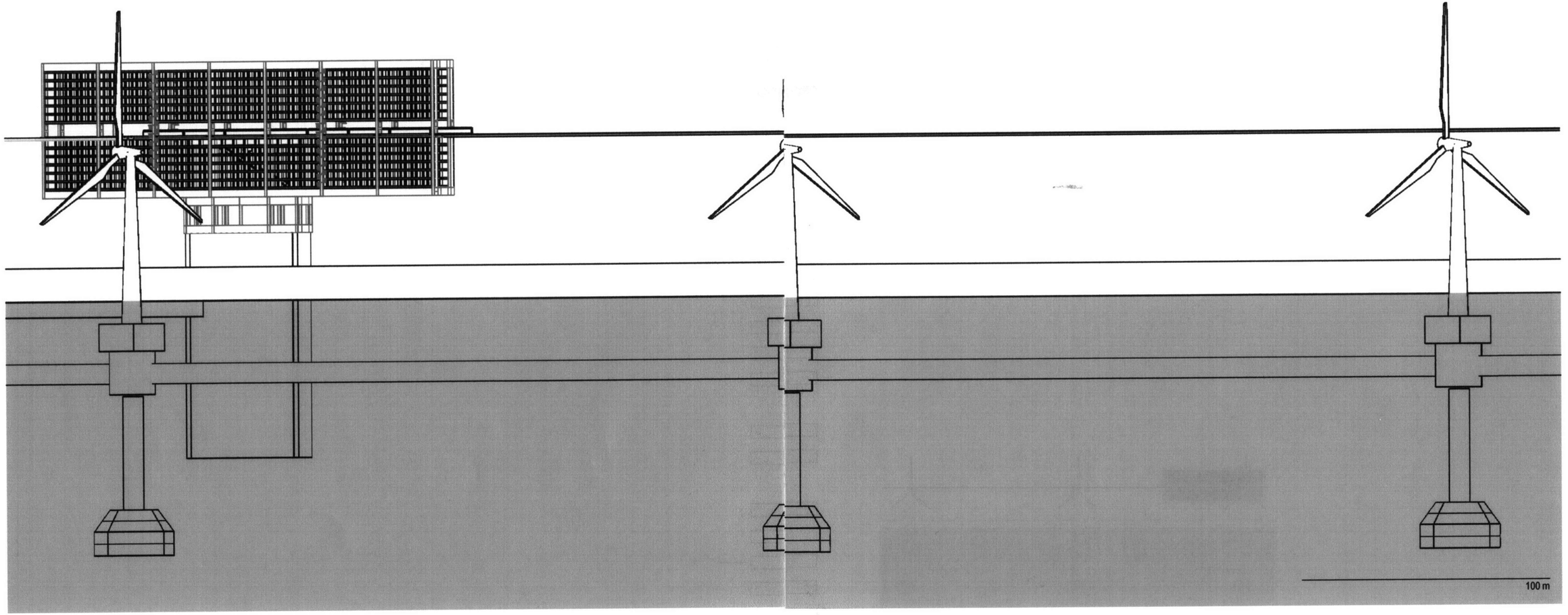
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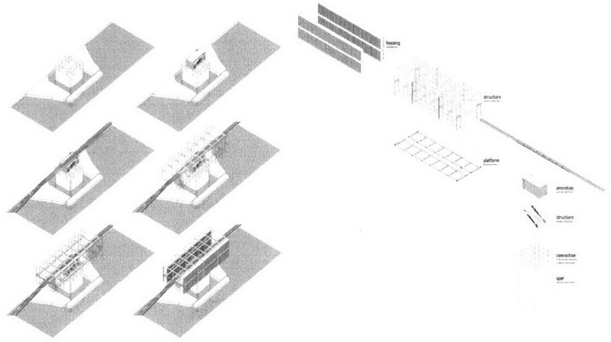
modular station organization axon



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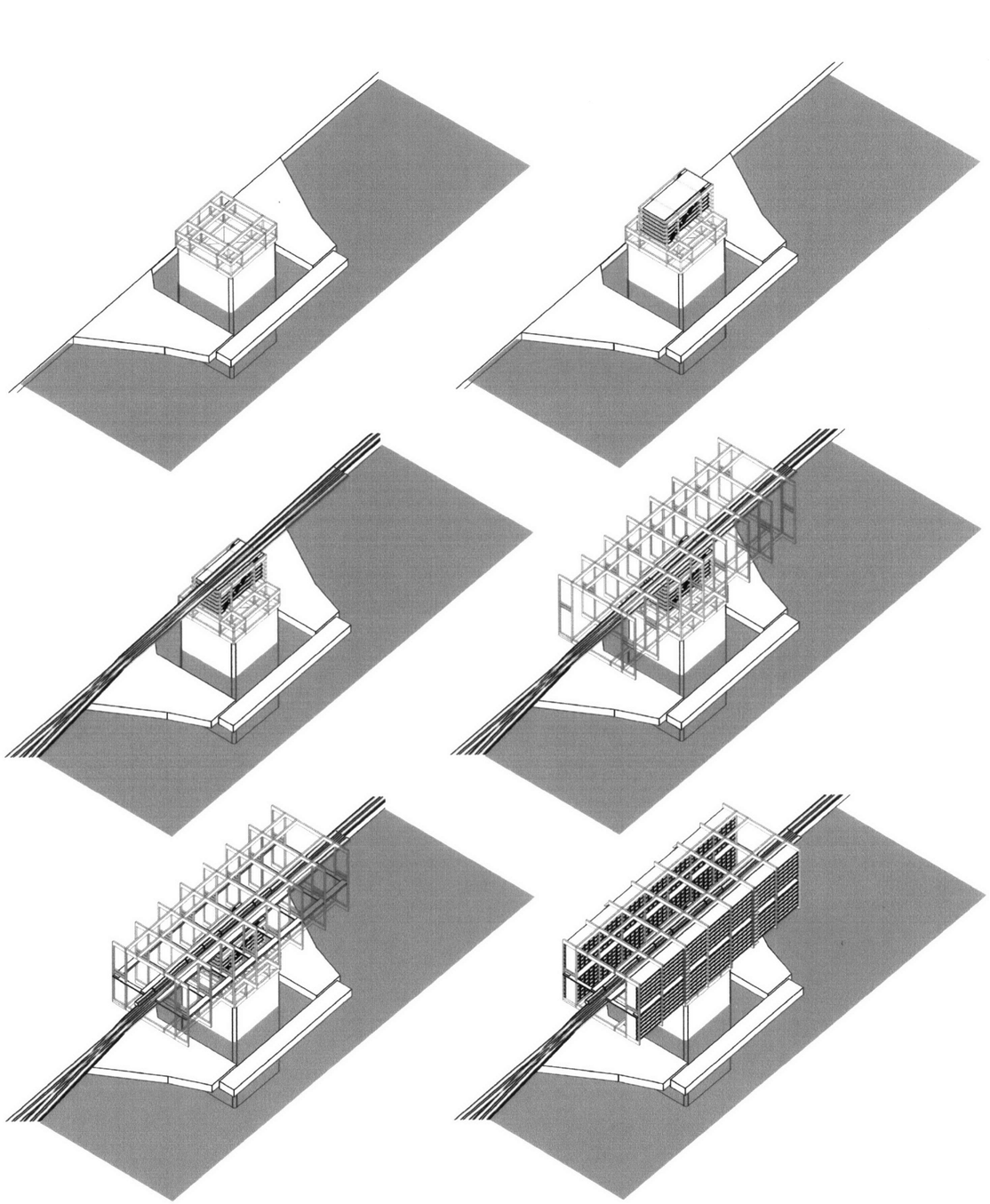
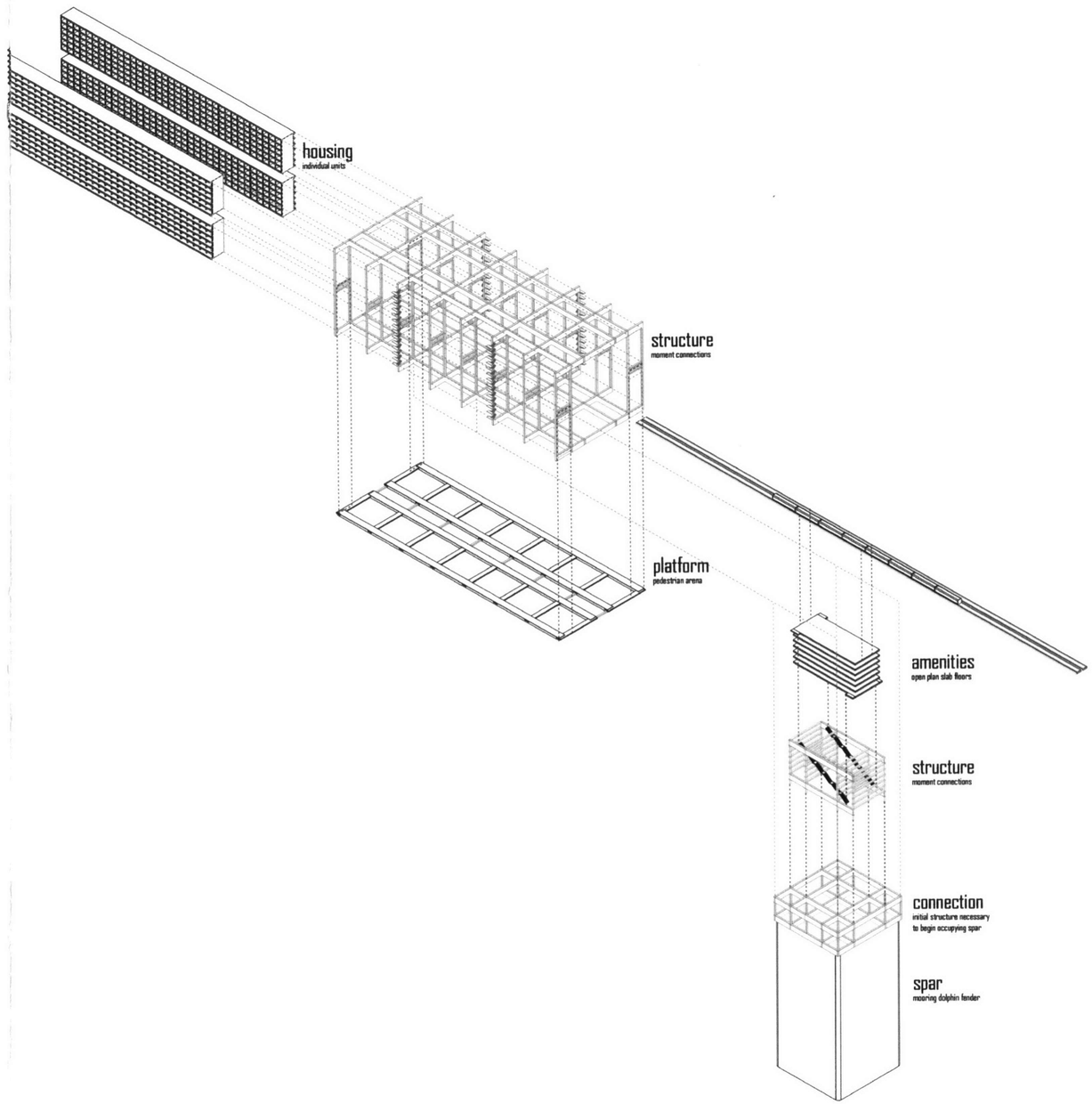



housing
individual units
structure
moment connections
platform
pedestrian arena
amenities
open plan slab floors
structure
moment connections
connection
initial structure necessary
to begin occupying spar
spar
mooring dolphin fender

housing/command center section

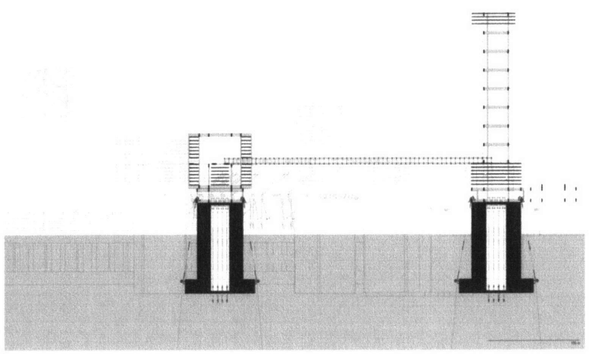
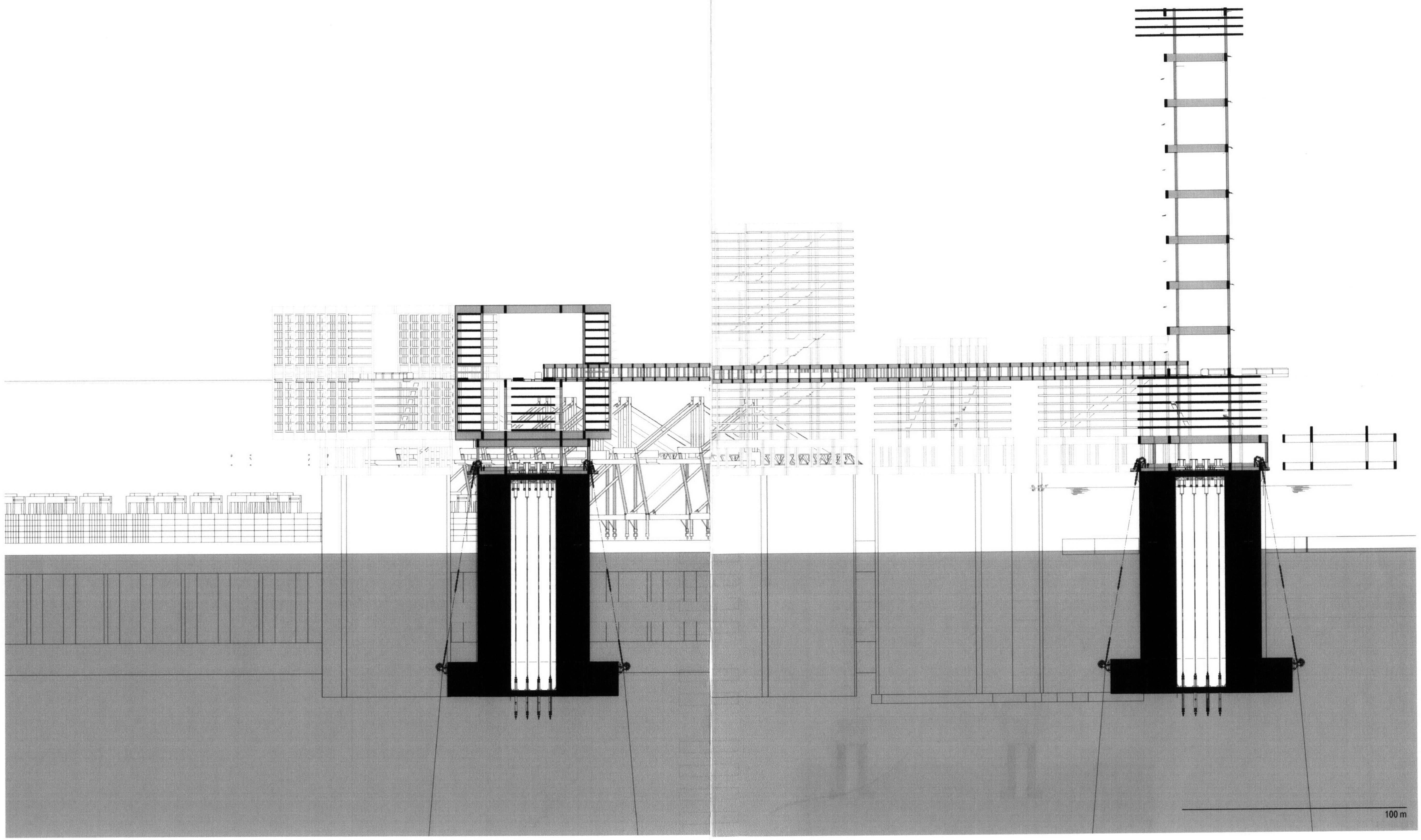


Figure 24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exterior of modular station 1

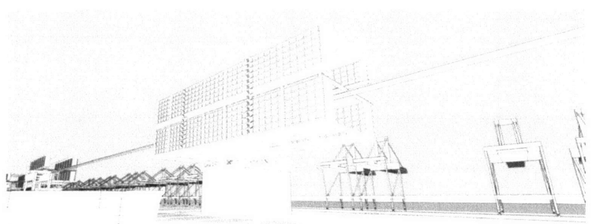
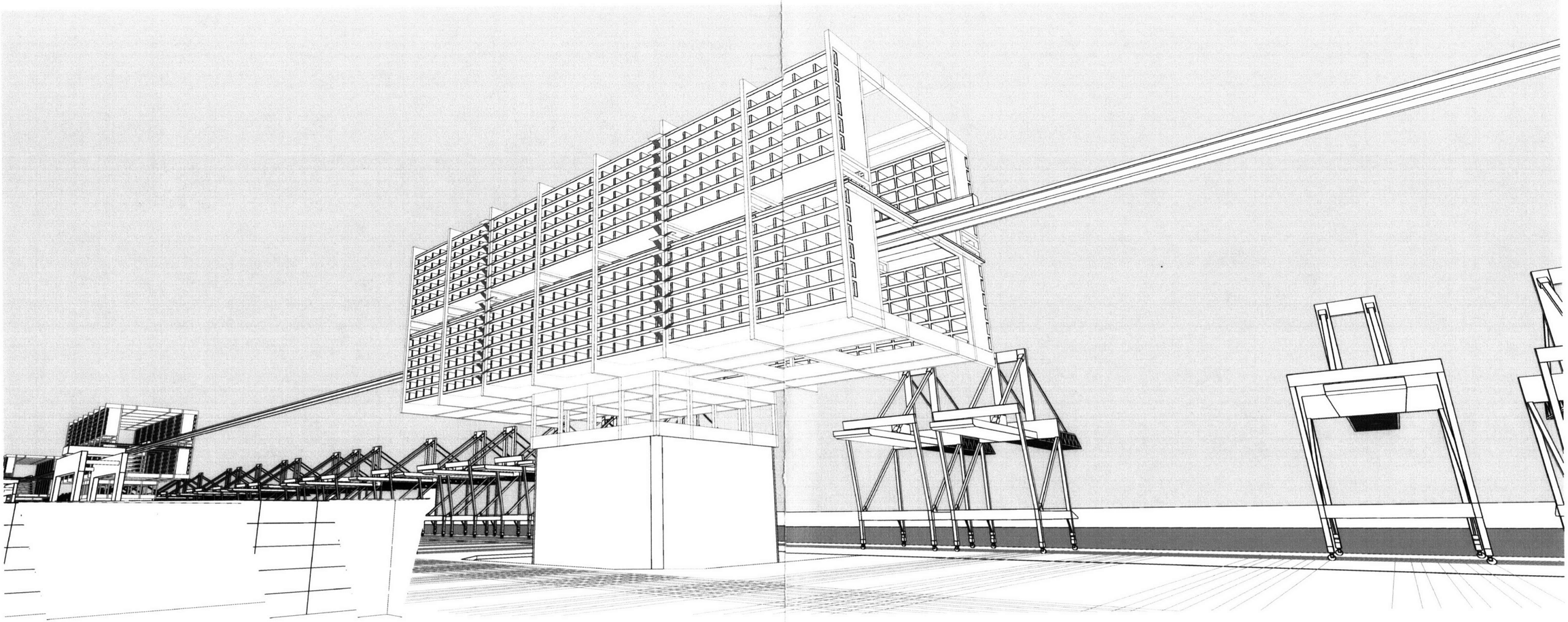
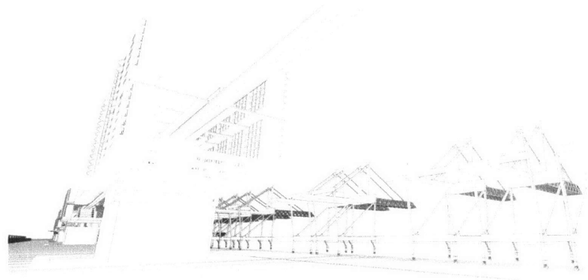


Figure 25



exterior of modular station 2



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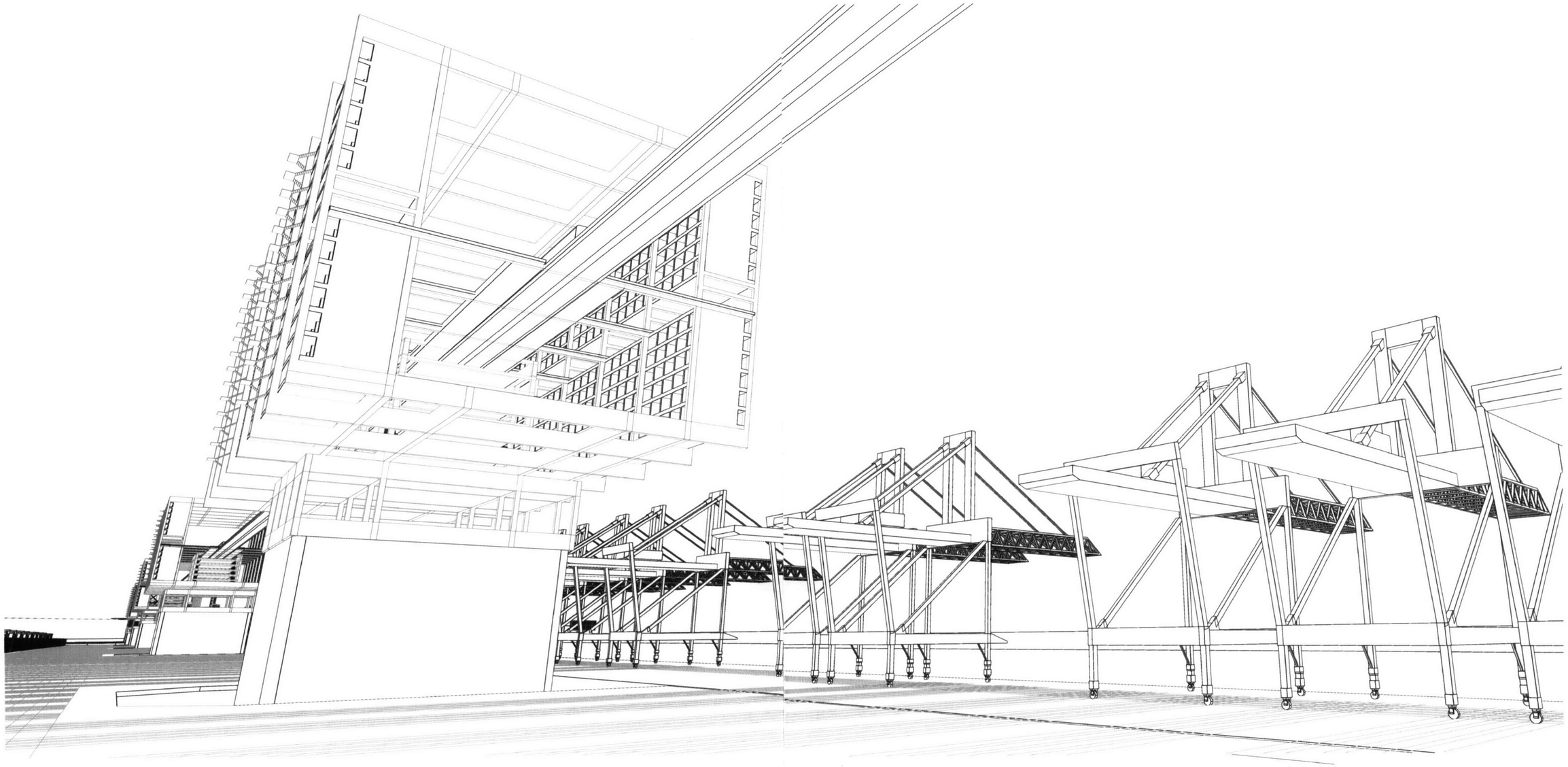


modular station train level

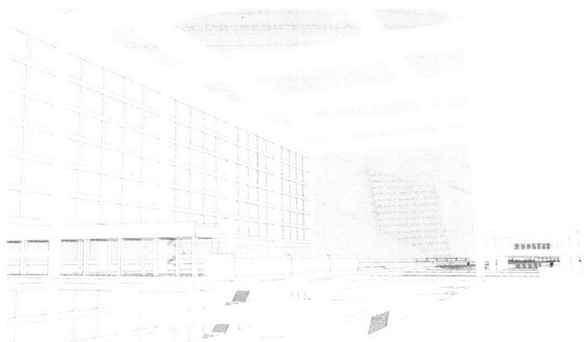
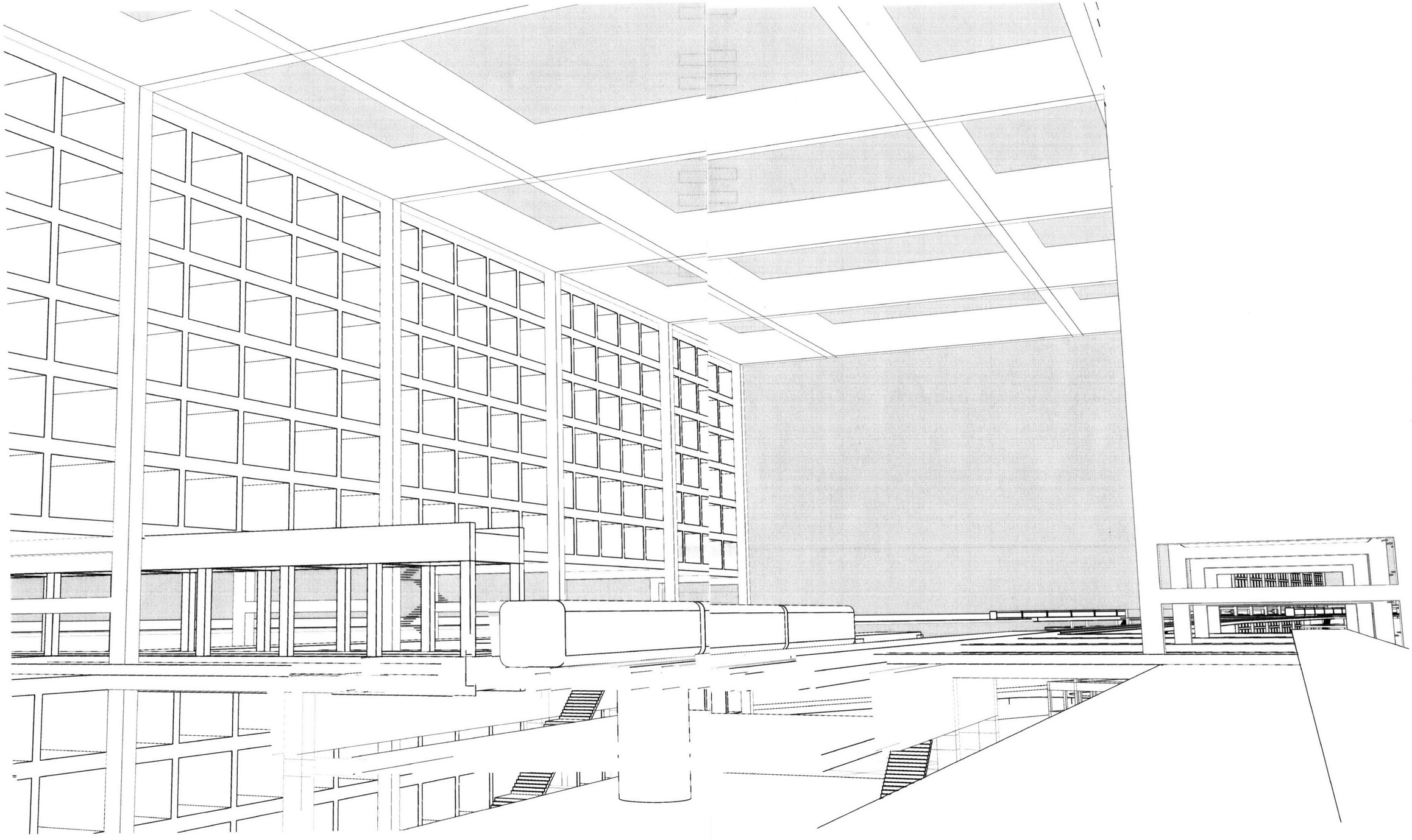
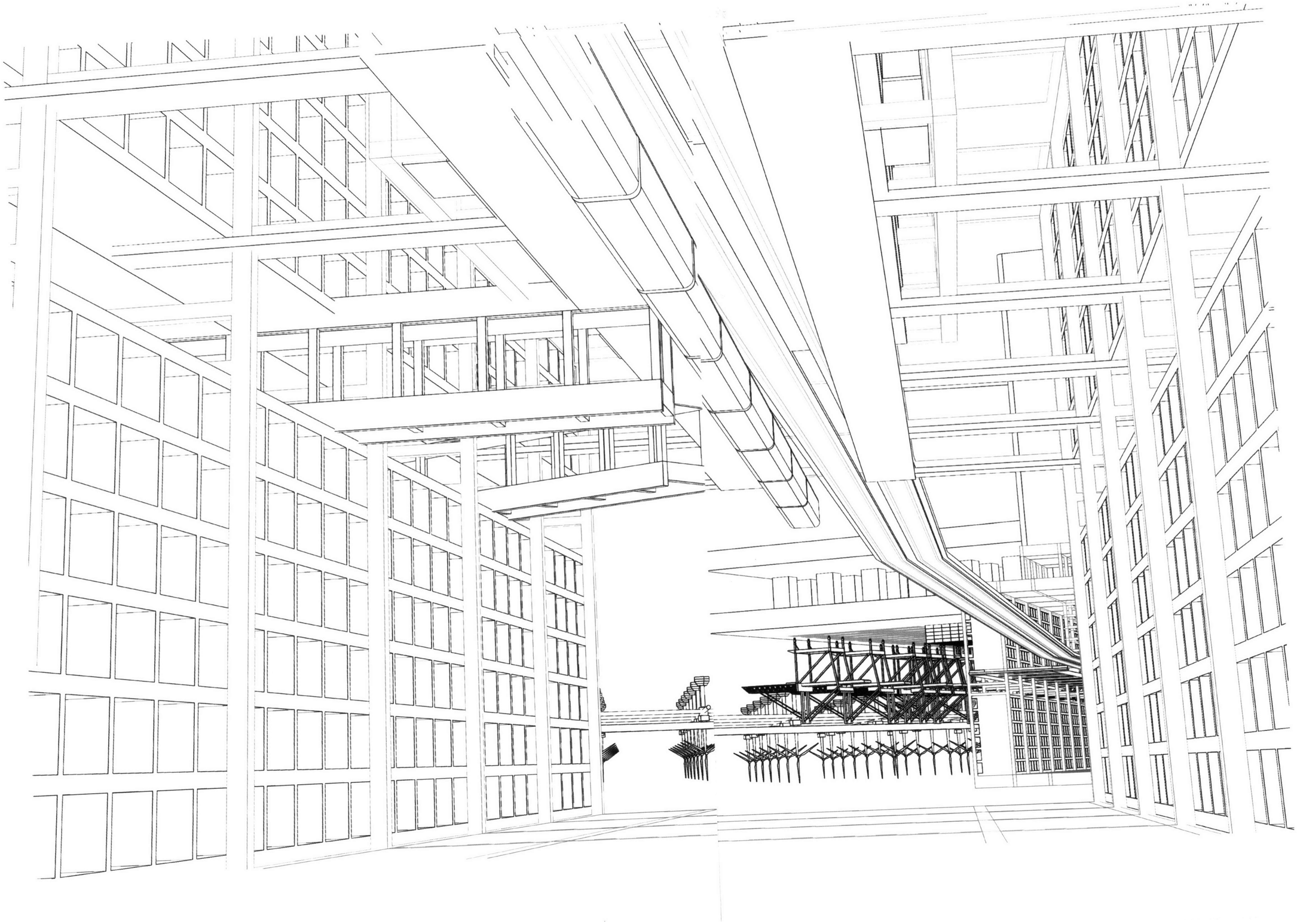


Figure 27



interior of modular station

Figure 28



modular station connections 1

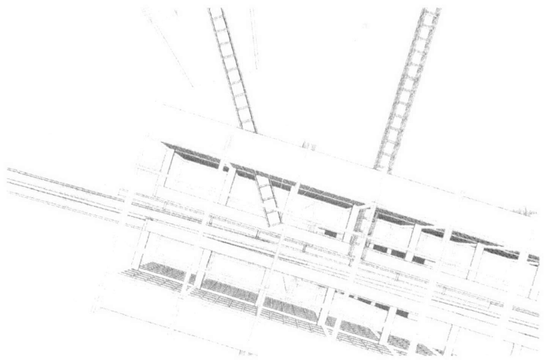
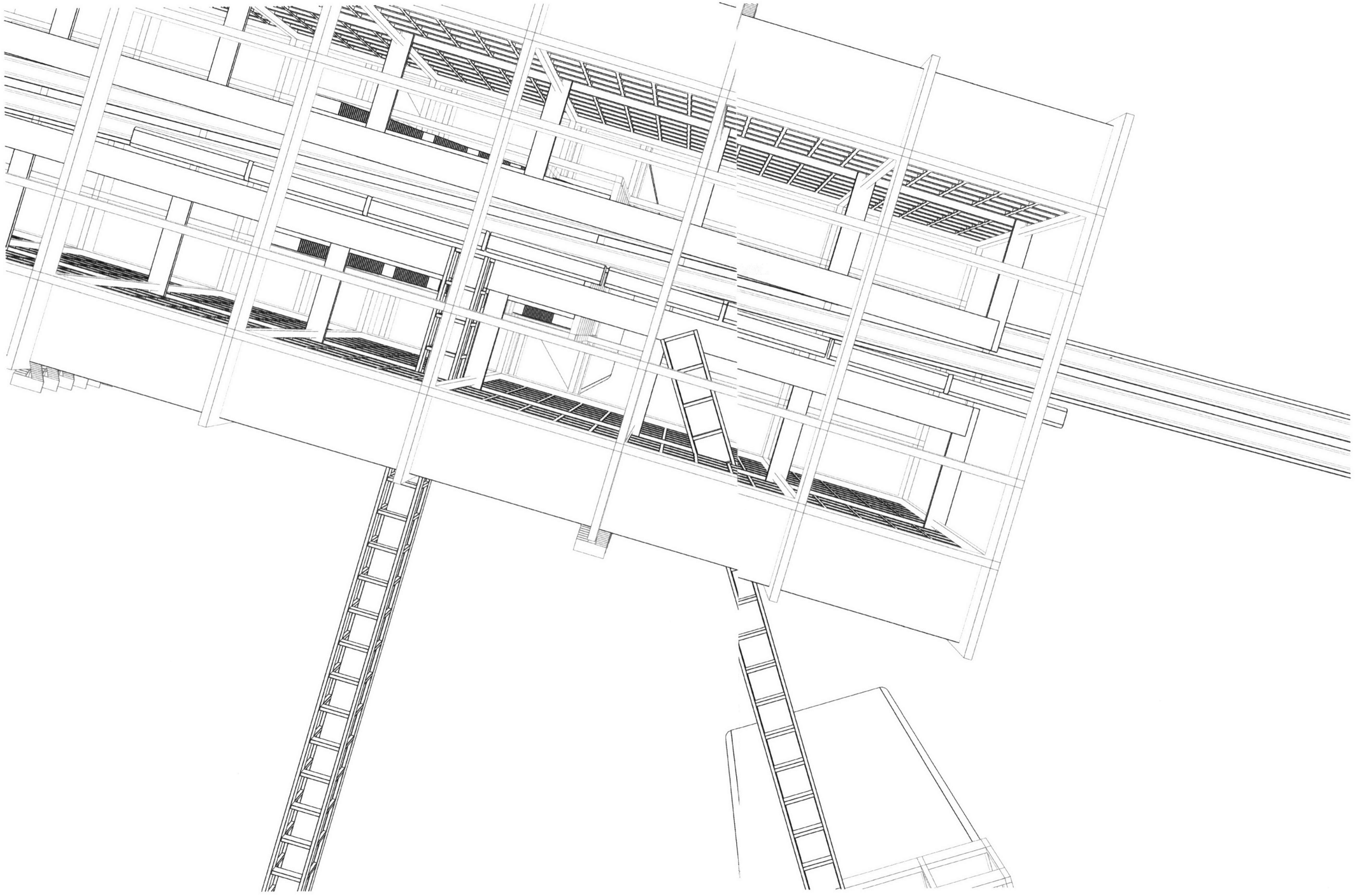


Figure 29



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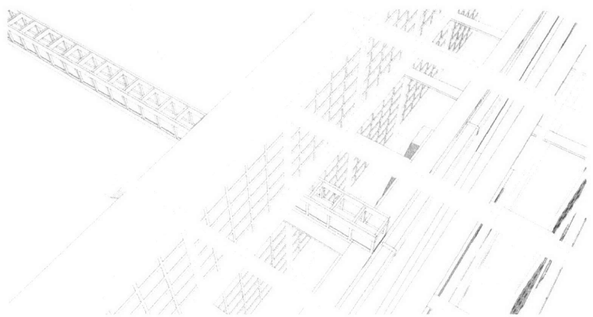

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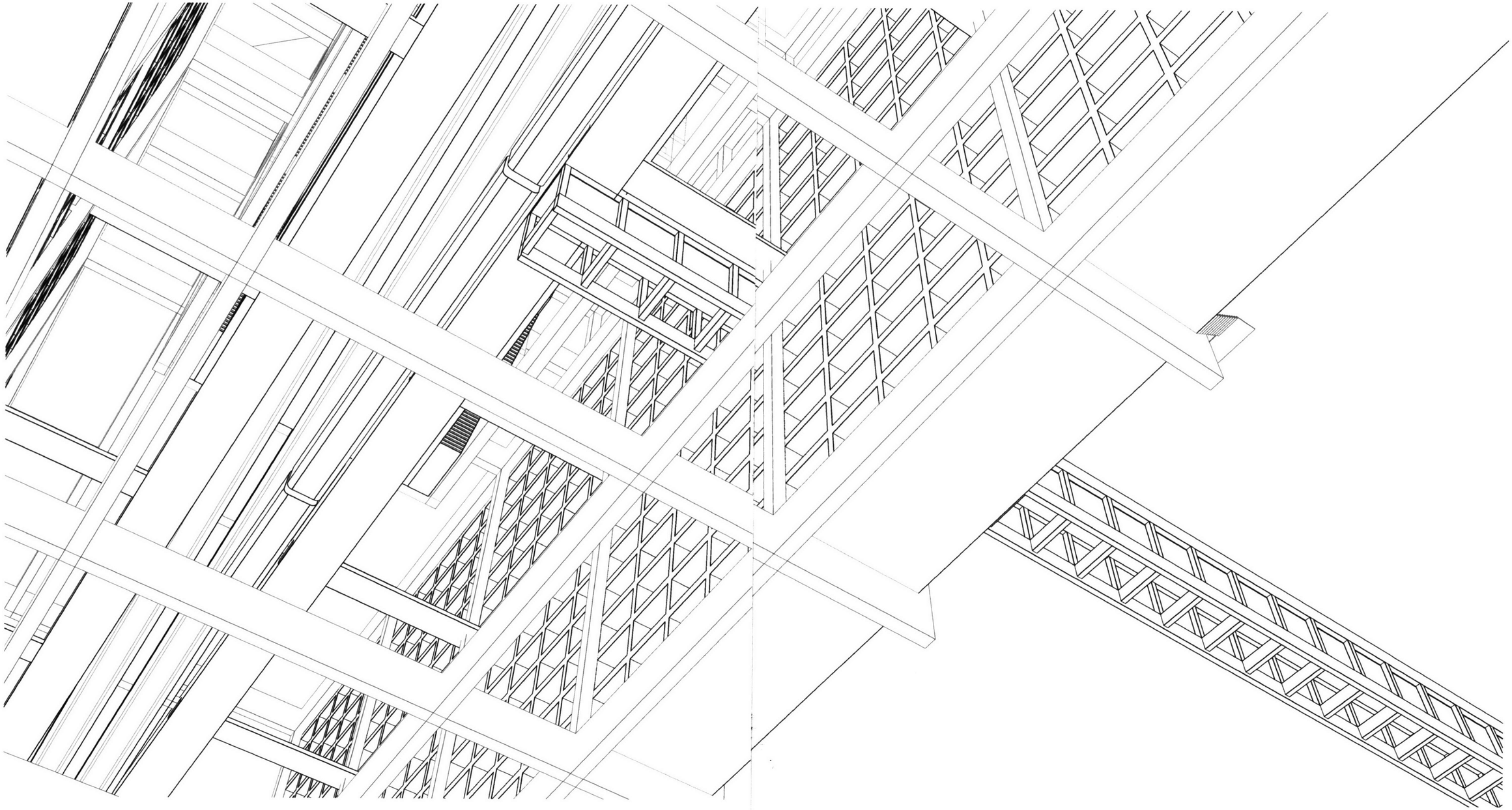

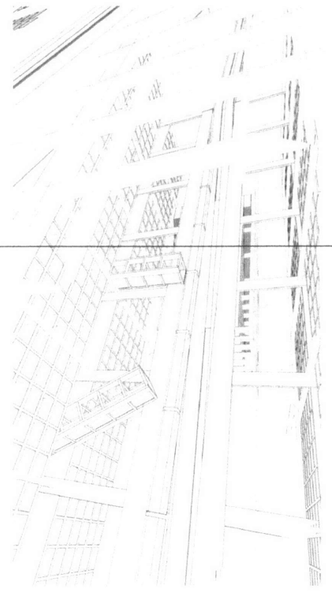

modular station connections 3

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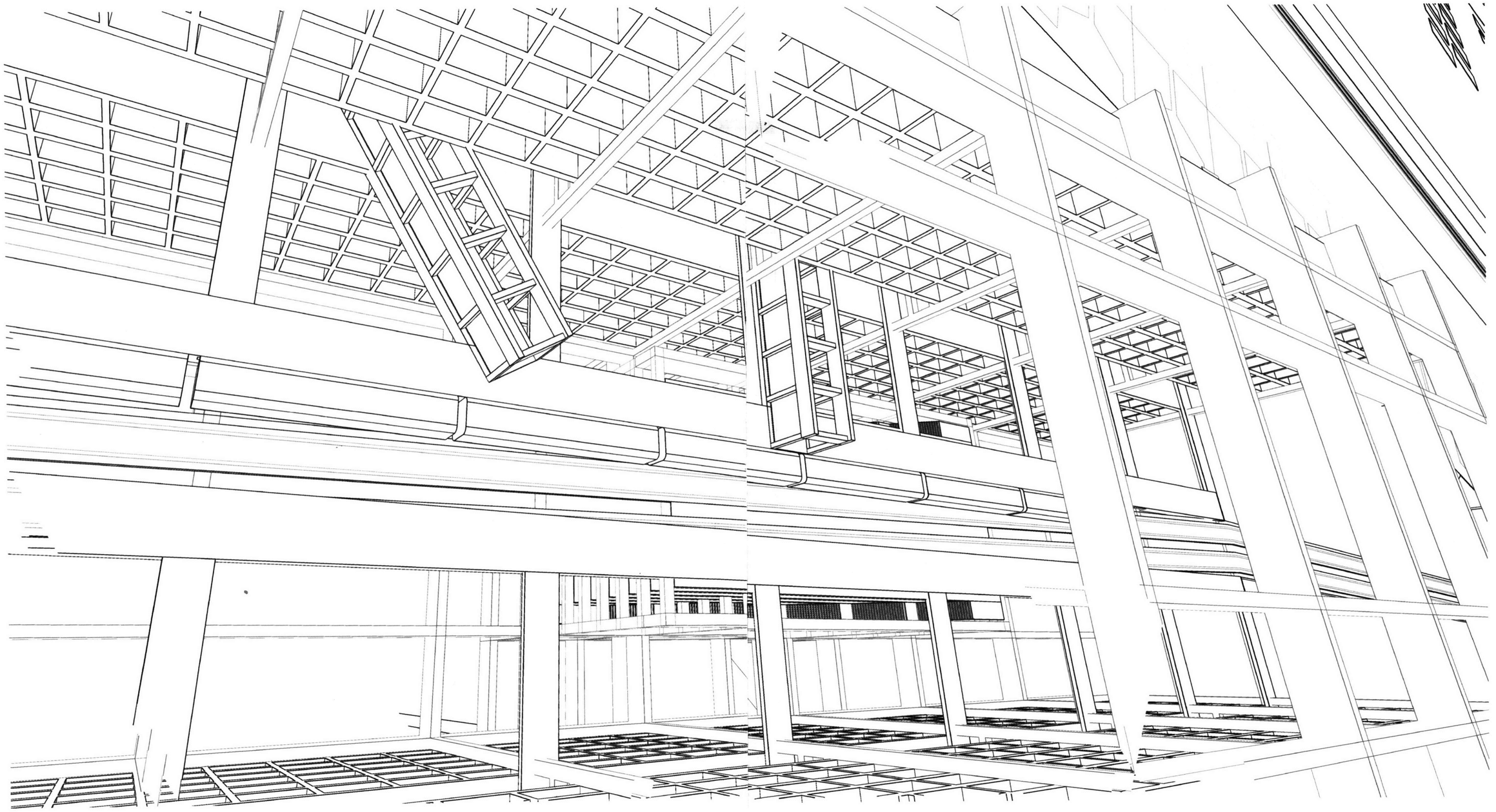
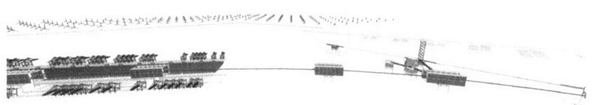


megaport panorama



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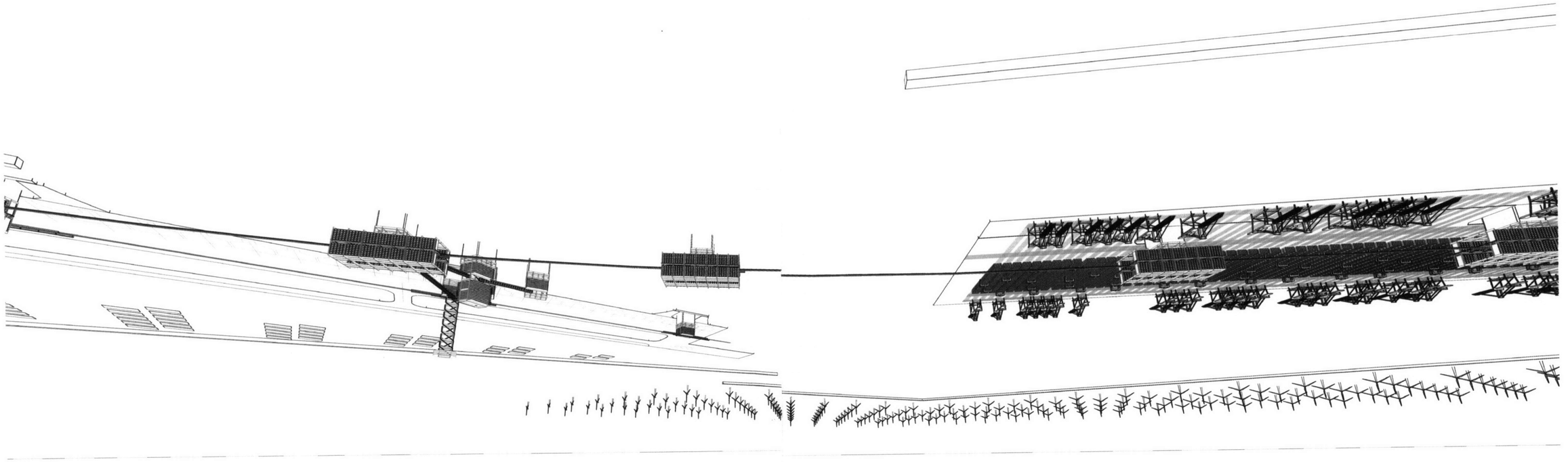


megaport container terminal

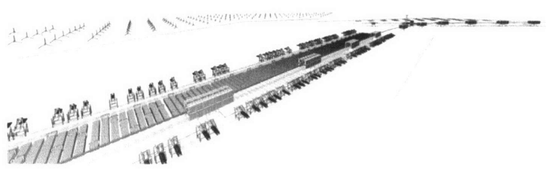
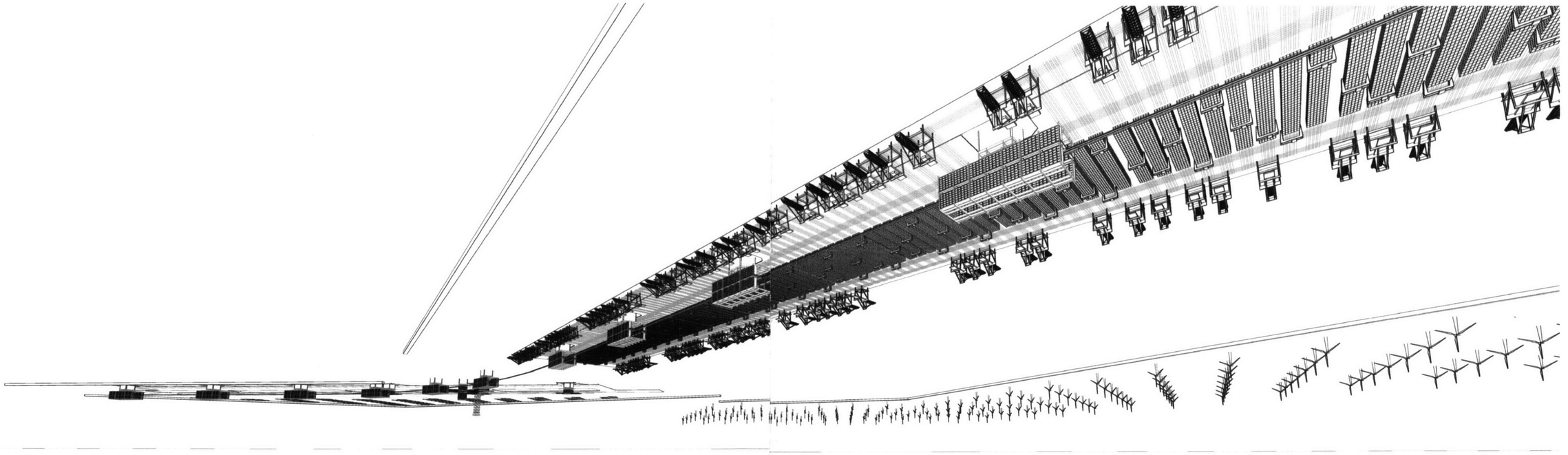
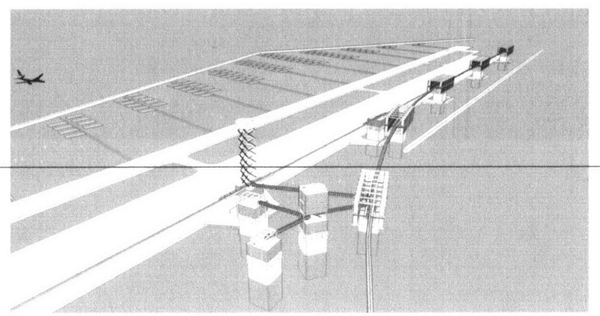


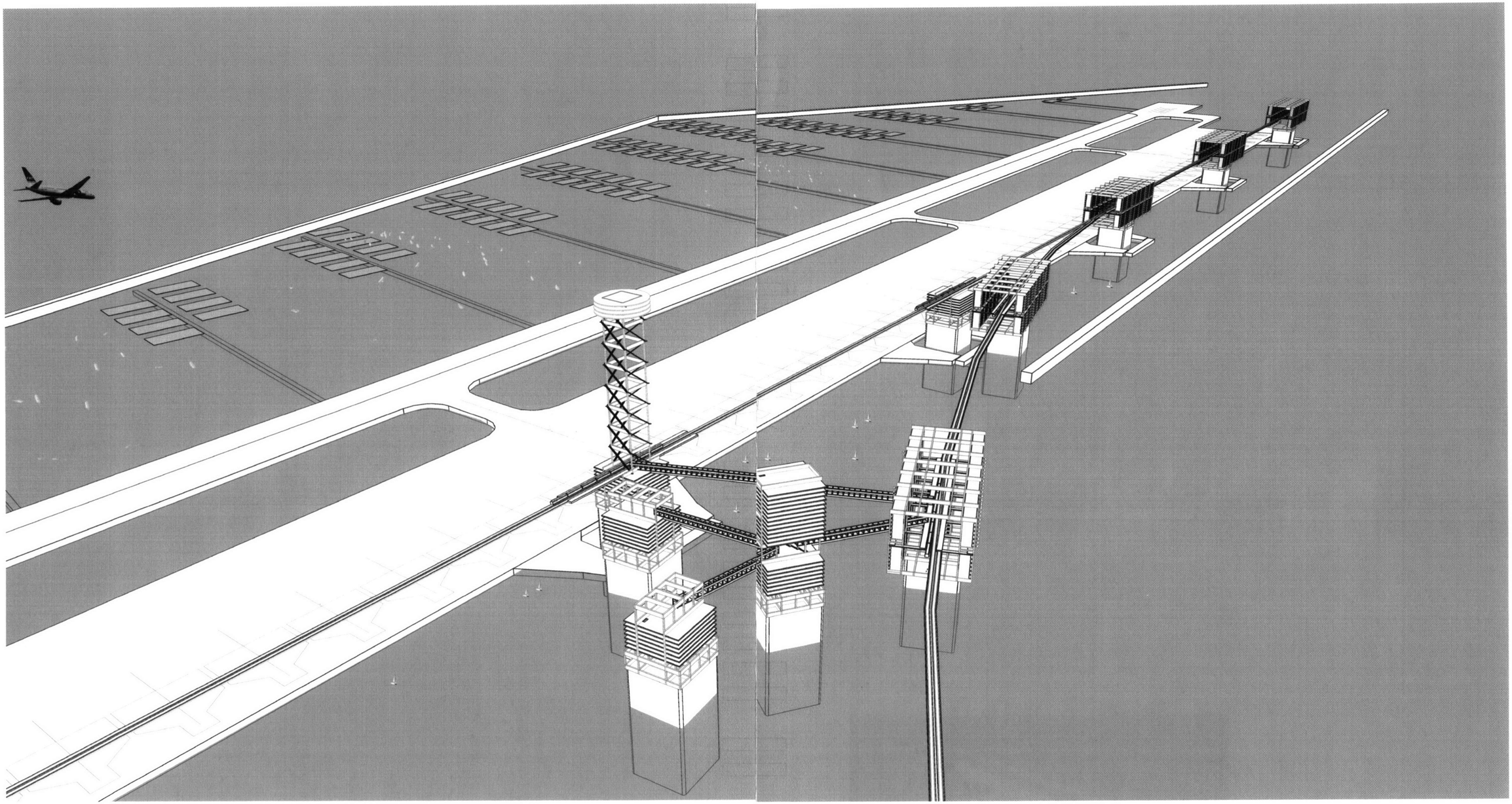
Figure 33

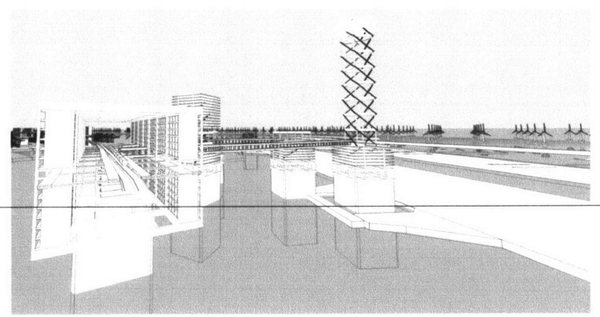




waterscape airport

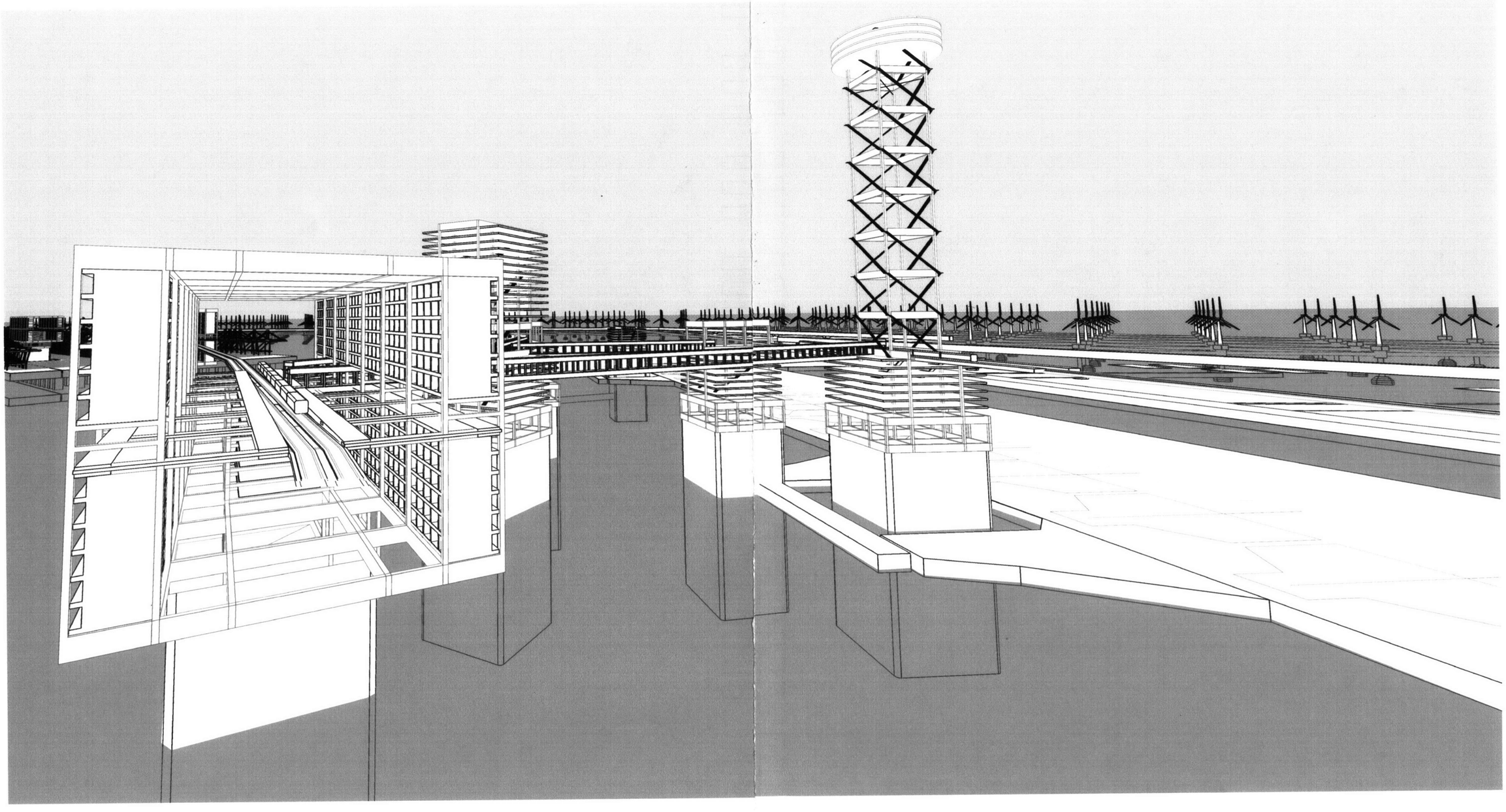
Figure 34

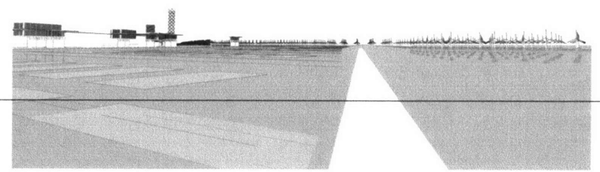




waterscape station/command center

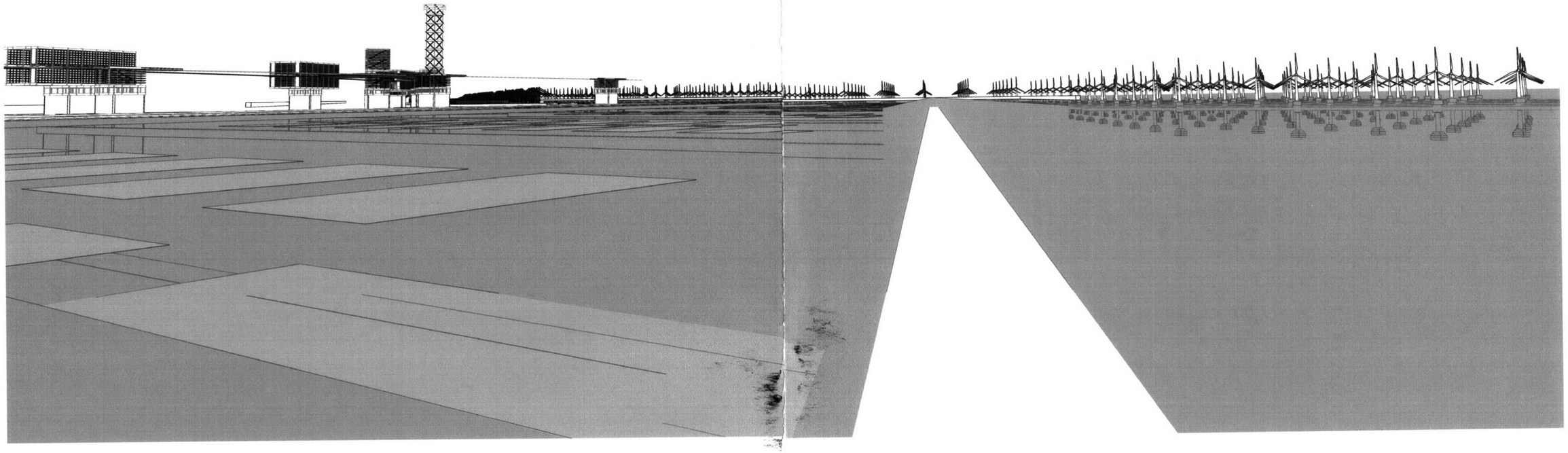
Figure 35

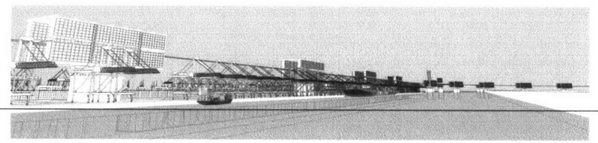




waterscape from breakwater

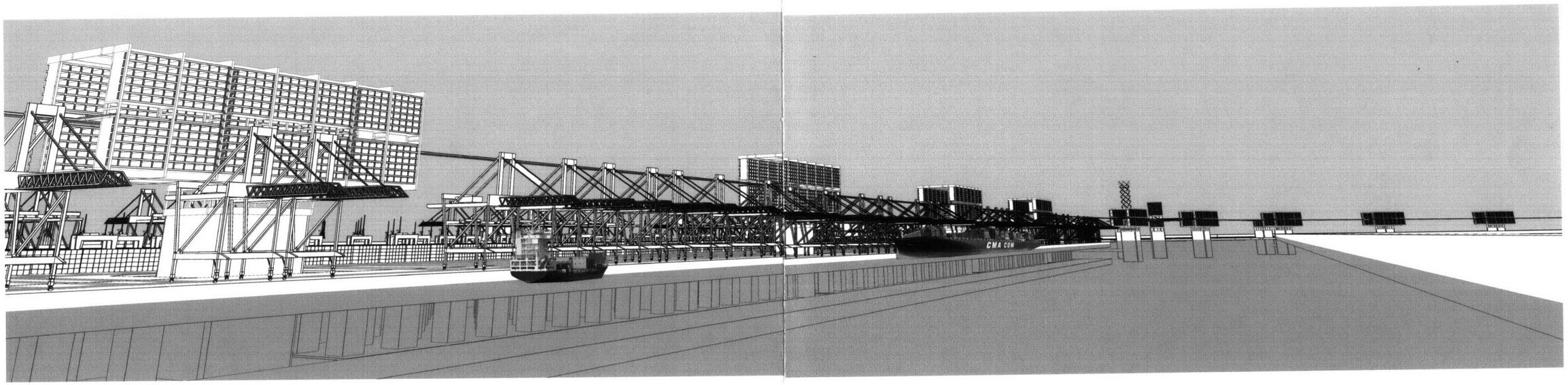
Figure 36





ultra large containership lane

Figure 37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Megaport Business Plan

Executive Summery

Market Analysis

Strategic Market Entry

Executive Summery

Megaport is a shipping port furnished for transoceanic containerships in the Arabian Sea. The port functions primarily as a switchboard between transoceanic containerships and feeder ships servicing local ports. In being a floating offshore structure, the Megaport saves transoceanic containerships one to two days travel into land ports. Megaport is purely a transshipment port.

Transshipment is the fastest growing market in the shipping industry. In 2005, 108 million TEU were transshipped, accounting for more than 27% of container handling.1 An annual growth of 9% is expected in the container handling market until 2015.2 Transshipment is expected to account for increasing percentages of the annual growth of the container handling market.

Container transport is gaining increasing significance in the logistics management of high value goods trade. Containerization (putting goods in containers) is increasingly becoming a favorable mode of shipping goods. The standard container box has the advantage of being handled in large quantities fast and at a low price per ton of cargo. Furthermore, shipping companies are finding it significantly cheaper per TEU to use ultra large containerships (8,800 TEU) for transoceanic shipping than to use typical post-panamax containerships (6,800 TEU). Therefore there is a skew in the order books of shipyards worldwide towards ultra large containerships (over 9,000 TEU).

The frequency of exchange of goods today is at a higher level than it was ten years ago. In the new business model, the hierarchical vertical organization of businesses is replaced by a horizontal meshwork of subcontractors. Decentralized assembly lines necessitate an increase in the frequency of the exchange of goods. It is believed here that the new business model has direct effects on the container handling market, which too has been on a strong growth over the past decade.

Ports are currently expanding to accommodate the growth in the number and sizes of containerships. However, since the rate of port construction is slower than the building and delivery of ships, ports are reacting today with overload and bottlenecks. In a time when the container handling market is expecting to be on an impressive steady growth, the inability of many ports to accommodate ships comes at a high opportunity cost. The Megaport project proposes an alternative for port construction, which would significantly reduce the lag time between port expansions and the building and delivery of ships. As a floating structure, Megaport is constructed in shipyards at rates comparable to that of ships. Furthermore, the modularity of the Megaport can flexibly accommodate for the changing dimensions of containerships.

This plan establishes a platform for Dubai Ports World to adopt the Megaport as a specialized entity in its network of ports in the Arabian Sea region. Transshipment is an offshore activity, where all transshipment operations at port are offshore. Transshipment ports are independent in their operations from cities and act today as autonomous global entities. Megaport as such is literally an offshore transshipment port.

1 Eric Heymann, "Container Shipping: Overcapacity inevitable despite increasing demand". A study by Deutsche Bank Research, 25 April 2006, 3.

2 Heymann, 1.

Market Analysis
Market Segments

The chosen launch market is the transshipment market segment with provisional facilities for added-value activities in the form of warehouses for logistics. The choice of transshipment is based on three primary factors.

First, the container handling market continues to be a strong growth market. The growth is attributed to the transshipment market segment. In the next decade, major infrastructural propositions will be made to exploit the horizontal meshwork of world trade, which has been emerging in the past decade. The market for transshipment will be a major marker in the future business environment. Design propositions which introduce effectiveness into the logistics of transshipment are only recently emerging. Megaport is the proposition of a new infrastructural feature for transshipment.

Second, container shipping is increasingly becoming into the preferred mode for the transportation of goods. In gross tonnage container ships account for 14% of seaborne transport.3 However, the share of container ships is significantly higher when considering the value of goods per unit weight transported. Goods transported in bulk and roll on/roll off carriers are currently being considered for the shift to containerization. The fast loading and unloading of containers, and the short turnaround times makes container transport the most effective mode of seaborne transport.

Third, bigger ships are being built and the capacity of the global container fleet is increasing by 50% every year in 2006, 2007, 2008. Ports worldwide are undertaking major expansions to accommodate for the change in the size and form of the global container fleet. The rate of terminal construction however is not compatible with that of ships resulting in serious bottlenecks at major container ports. There are reports of ships having to wait outside of harbor for a few days before they can be accommodated. The Megaport has the advantage of being constructed at the same rate as ships. It is built in shipyards and floated to its final mooring location at sea.

Target Market

80% of world trade is seaborne. Container transport and handling represent significant market segments in seaborne trade. Container handling today has a larger market share than container transport. In 2005, 400 million TEU were handled compared to only 114 million TEU transported.4 Transshipment forms the fastest growing segment of the container handling market, and the fastest growing market of the shipping industry. The proportion of transshipment as percentage of container handling increased from 11% of container handling in 1980 to over 27% in 2005.5

The growth in the transshipment market segment reflects a fundamental shift in how world trade is conducted since the late nineties. Businesses not only efficiently make a product or perform a service, but effectively manage the processes which are involved in delivering the product or service. The managing of logistics and supply chain are today important organizations in laying the strategy of any business. The steady growth of the container handling market over the next decade is concurrent with the emerging world trade meshwork where the new business model is only beginning to take effect. Transshipment will continue to have increasing portions of the ship handling market as result of the decentralization of the manufacturing, assembly and customization of traded goods.

The global infrastructural form is changing, and the built environment will inevitably react to the change. New forms will inevitably emerge, or entrepreneurs will propose strategies for the exploitations of the new infrastructural environment. The Megaport is a strategic form of the near future. The proposal is immediately prepared to take full effect in the ten year to come. The Megaport is a new competitive strategy in a newly emerging infrastructural world.

4 Heymann, 3.

5 Heymann, 3.

Market Trends
Logistics

Since 1997, observers have noticed the growth of world trade as increasing portion of the world economy. Today world trade is growing at a rate twice that of the world economy. The substitution of the centralized vertical organization of businesses by a decentralized horizontal organization is believed here to have had a major role in stimulating the container handling market. The awareness of businesses in the late nineties of the critical role of logistics management in achieving competitive advantage was concurrent with the growth in the shipping industry. Over the past decade the world has seen fundamental changes in how world trade is conducted. The hypothesis here is that the decentralizing of manufacturing and assembly lines has promoted the frequency of exchange of goods, which in turn had a proportional impact on the container handling market.

The emerging meshwork in world trade is only the beginning of what is developing to become a worldwide infrastructural environment. The meshwork is rapidly replacing the traditional hierarchical business model and its growth into full operation has been observed over the past decade in the fields of transportation and telecommunications. The Megaport is intended to be a fully operational transshipment port in the new infrastructural environment.

Containers

Containers are gaining increased portions of seaborne trade. The fast loading and unloading of containers makes container shipping a desirable mode of transport. The short turnaround times gives container shipping significant cost cutting advantages. Goods transported on bulk carriers or roll-on/roll-off ships are recently considering the use of containers. Some car manufacturers are currently experimenting with the use of shipping containers as an effective way of shipping cars. Furthermore, efforts are underway to modify the forms of air freight continuers so they can be efficiently stowed into shipping containers. The box is the most efficient form for the transport of goods, and its standardization gives containers a competitive advantage over other modes of transport.

Ships

Shipyard order books are focused on ultra large containerships. Ship charters use ultra large containerships, with capacities over 9,000 TEUs, in transoceanic activities, while smaller ships, up to 2,500 TEUs, are used in feeder services between local ports. According to Ocean Shipping Consultants, the transport cost per TEU when using a ship with a capacity of 8,800 TEU is 13% less than when using one with 6,800 TEU.6 A research group has found that hypothetical post-Suezmax containership with a capacity of 18,000 TEU would cost 30% less than a ship with a typical capacity of 5,000 -6,000 TEU.7

In 1999, the number of ships on order books dropped significantly compared to earlier years. When the shipping industry picked up again in 2002, the number of ships delivered was still less than those delivered prior to 1999. Since more than half the ships delivered were ultra large containerships, the capacity of the container fleet was actually on a strong increase since previous years. According to the order books of shipyards worldwide, ships delivered in 2006, 2007, and 2008, did and will increase the capacity of the global container fleet by 50% every year. The phenomenon necessitates ports worldwide to keep up with the growth of the global container fleet.

6 Heymann, 5.

7 N. Wijnolst et al. *Malacca-Max: the ultimate container carrier* (Delft: Delft University Press, 1999)

Facilities Analysis
Container terminals

Container terminals worldwide must accommodate for the increase in the number and size of the global container fleet. Ports all around the world are currently undertaking major expansions, dredging deeper and building new terminals. Accordingly major transshipment ports are invested in the expansion efforts. The growth of the container handling industry has also formed competitive interest among lesser transshipment ports, which are today the most heavily invested ports in the expansion of their facilities. Almost all port expansions are land based involving dredging and the construction of artificial land. Artificial lands take 2 to 3 years to fully stabilize. Terminal operators have to project farther into the future than do shipping companies due to the length of time necessary to found a new container terminal.

Already certain ports around the world are constantly overloaded (e.g. ports along the west cost of the United States). There are cases where containerships have to wait several days outside of harbor before they can be unloaded and reloaded with new cargo.8 Port expansion and improvement plans are already underway; however there will always be a lag time in keeping up with changes in the global container fleet. Unlike the construction of ports, shipyards only need several months to build and deliver a ship. Thus there will always be a lag time before ports are able to accommodate any major changes in the form of the fleet.

Increasing number of ports will be unable to accommodate the physical requirements of growing ship sizes. Ship dimensions of concern are draught (the nominal depth required underwater), beam (ship breadth) and length. Today, the only harbors able to accommodate the 21m draught of the hypothetical post-Suezmax containership (18,000 TEU) are the ports of Singapore and Rotterdam. The average draught of terminal basins worldwide is 13m, which is short from the 16m necessary for satisfactory accommodation of the expanded container fleet.

The economies of scale at many terminals worldwide have reached saturation and terminal expansions have become no longer economic. In the race to increase capacity, many ports with saturated terminals are building complete new terminal facilities. In doing so, ports are investing into major infrastructural ventures which will be in competition with similar ventures by other regional ports.

The numerous inefficiencies of container ports are opportunities for alternative propositions. Currently ports are only reacting to the changing nature of the global infrastructure, primarily in the size and numbers of containerships. Instead of reactions to the changing environment, ventures undertaken by ports under a specific terminal operator can be easily consolidated to have a strategic existence in the newly emerging infrastructural environment. The Megaport is precisely strategy, not reaction.

Competitor Analysis

The Megaport is intended primarily to be a transshipment port for ultra large containerships. The ports of Dubai and Salalah are the major transshipment ports in the Arabian Sea region, which fulfill transshipment activities in the region. On a worldwide scale, they ranked in 2004 as the 8th and the 12th busiest transshipment ports respectively. The top 15 busiest transshipment ports in the world accounted for 60.5% of the transshipment market. The average market share of each port is 4%. If Singapore is taken as an anomaly (16.2% of market share), then the other 14 ports only average 3.2%. Although location is a significant factor in establishing the position of Singapore, its dominance of the transshipment market is accurately attested to by the added-value activities it offers manufacturers and its highly skilled human capital. The fact that Singapore is the major logistics center for seaborne trade makes the city into the uncontested leader of transshipment in South East Asia and the world.

Of the global market share, the ports of Dubai only account for 3.0% and the port of Salalah accounts for 2.1%. Both major transshipment ports in the Arabian Sea region are below average. Although Dubai dominates the Middle East shipping industry by 60%, it cannot claim to be the Singapore of the Middle East. What Dubai precisely lacks are infrastructure for added-value activities and the skilled human capital, on which Singapore established its dominance. It can be safely assumed here that ports in the Arabian Sea region cannot account for even 10% of the transshipment market. The region suffers the lack of infrastructural features which reconcile its skilled human capital and global industries and businesses. The opportunity to become the next Singapore of the Middle East is still open for competition.

Strategic Market Entry

Megaport is intended for Dubai Ports World (DP World). DP World is a multinational corporation and a major port operator in the world. The corporation is invested in the operation of over 20 terminals worldwide. In the Arabian Sea region, DP World is operating terminals in Dubai, Fujairah, Jeddah, Djibouti and Aden. It is rightfully invested in each of the ports it operates, eliminating competitive rivalry in the region and becoming part of the shipping industry oligopoly.

Megaport is proposed here as DP World's offshore terminal. Portions of DP World's investments in the expansion and improvement of terminals in the Arabian Sea region can be readily consolidated to create an offshore floating terminal for the transshipments of transoceanic containerships.

Megaport is an alternative for port expansion plans. Ports worldwide are expanding their facilities in response to the growth in transshipment. Specifically major transshipment ports and emerging competitive ports in the Arabian Sea region are expanding and dredging their facilities to accommodate the changing form of the global fleet. Based on the increased portion of ultra large containerships in the future global fleet, we have conservatively estimated that 63% of current port expansion plans in the Arabian Sea region target transoceanic containerships and the transshipment market. Expansions in the Arabian Sea region for the transshipment market total to 9.25 million TEU per year, a full port facility comparable to the Jebel Ali Port in Dubai. Megaport is the introduction of a specialized transshipment port for transoceanic containerships, which consolidates a 9.25 million TEU annual capacity.

Megaport is a modular concrete and steel construction built in shipyards and floated to sea. The rates of the construction of ships and ports are not compatible. A port is a geological project of artificially filling land for port construction. A ship on the other hand is built in shipyards as a prefabricated steel construction. Port projects have to be planned over several years. Port builders have to project further into the future of world trade than do ship builders. While a new land terminal takes between 2 to 3 years to built, a floating modular port facility only takes 6 months to complete.

Megaport is not a hierarchical entity, but an entity which introduces a new level of specialization in the emerging infrastructural environment. During its operation, the Megaport will be associated in the global trade meshwork. It will play an integral role as part of the network of DP World terminals and create strategic alliances with ports in the region. Megaport itself is effective strategy for logistics management.

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Addendum

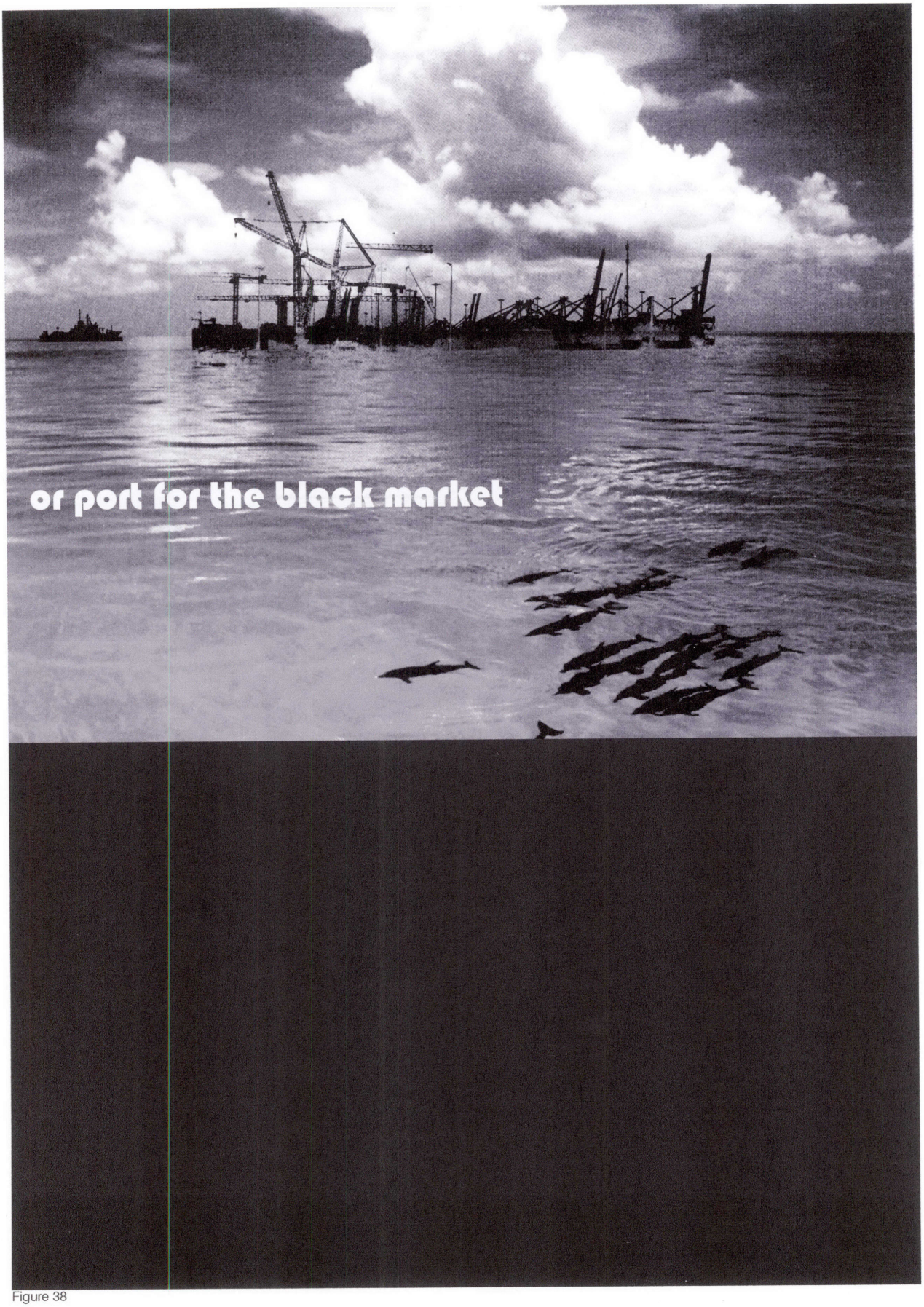
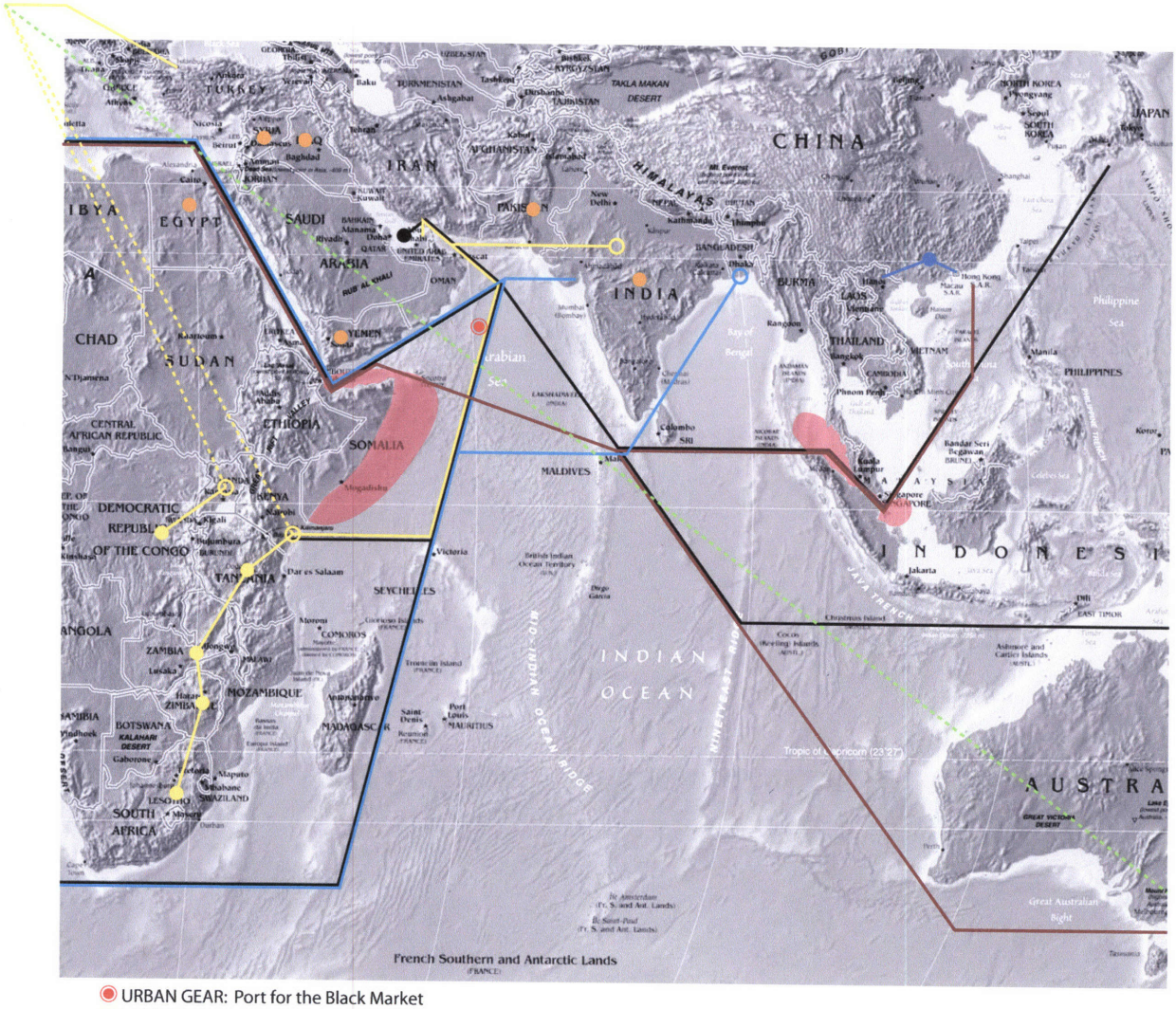


Figure 38



dotted lines indicate transportation modes other than ships.

Figure 39

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The law is an external system of classification which differentiates the network into a legal and an illegal. The law is the constitution of social norm. By focusing on the legal, the law creates for its subjects an incomplete model of the infrastructural network. It illegalizes a portion of the network and renders its unacknowledged. The law resists the environment in the effort of states to monopolize the service economy, to protect its professions, intelligential properties, and capital. It is a political resistance that is only sustainable through reinforcement and maintenance. The illegalization is strategy of control over the market: a strategy which resists market forces.

The illegal network begins as a parasite on the infrastructural network. It uses and abuses the network's loopholes to carry on illegal infrastructural flows. The illegal network becomes into a prosthetic to the infrastructural network, creating interdependence between itself and the network. It becomes indifferentiable from the network, or was it ever separated? The global infrastructural network simply cannot be sterilized. That would be the eradication and the shattering of the map that had formed between the [illegal] networking forms and their environments. Their elimination would therefore throw the infrastructural network into disrepair. Enough with the differentiation: there is no legal and illegal. Is it not the prostheticization of the parasitic form a symbiotic mechanism by which all forms assimilate into their environments? There is no differentiation: the infrastructural network is an operational whole.

Yet the differentiation creates a resistance zone in the environment. The law fragmentarily engages and disengages the environment. Architecture, on the other hand, through schizophrenia is becoming increasingly disengaged from the environment. Working in the resistance zone is architecture's reengagement of the environment in a disengaged zone. The resistance zone is the world of smugglers and outlaws transmitting constant flows of Mesopotamian antiques, ancient coins, ivory, tanned skins of cheetahs, lions and tigers, rhinoceros horns, gold, and a vast world of wealth.

Ships are the vessels on which pirates enter the sea. They are built in shipyards; sail the ocean without allegiances of any kind. They are stamped with "flags of convenience" to continue infrastructural flows in response to market pressures, even during times of warfare. In World War II, American owned shipped were re-flagged as Panamanian and were used to deliver materials to Britain. They roam to sea chartered through management companies. After two decades, the ship begins experiencing rejection from trades and ports. It is recommended that they retire in their twenties. By then rust has eaten through the steel covered by layers of paint. Oil companies refuse to use them as tankers. Ports reject ships above a certain age. Governments seize aged ships which pose a threat to their waters and auction them for parts. Management companies try squeezing a few extra years by passing inspection prior to the ship's retirement.[1] Smugglers purchase their ships in auctions and retrofit them to smuggle oil and other supplies quietly though national and international waters.

The expanse of smuggling goes beyond the large steel vessel. Smaller ships also partake in smuggling activities. They are swift and undetectable. They land in naturally formed ports and move supplies through secret channels. The concentration of supplies is rapidly transpired into the market on arrival to port.

Legal ships hide in their containers illegal cargo. A container is intercepted at some point along the logistics chain and is opened illicitly. It is then used for the smuggling of materials, substances, and supplies into legal ports.

1 William Langeweische, *The Outlaw Sea* (North Point Press. New York, 2004).

The concept of territorial nationalism carries within it the territorial constitutions and assumptions of the twentieth century, which define our world today. Territorial nationalism was the solution to the problem of Europe. The political map of Europe was a fluid map of shifting allegiances: wars. The condition culminated in World War I, the victors of which decided to put an end to such condition. From the Paris Peace Conference of 1919, followed by the formation of the League of Nations, the concept of territorial nationalism was conceived. The intention was to limit sovereign powers to a bordered territory. What becomes important is that the law of a political power is now delimited within its national boundaries.

The segmenting of Europe into nations meant that the colonies of Europe were also to be segmented. It followed that when the colonized people got their independence they unconsciously embraced the colonial segmentation becoming territorial nations. It was a political strategy of a foreign context (Europe) generalized and superimposed on the third world: a postcolonial condition. Territorial nationalism was a requirement: Any and all groups of people were to be presented as nations to receive what became 'inter'-national recognition from the United Nations.

The war ending intentions of territorial nationalism were soon taken for granted. It became apparent that there was a shift of interest: states followed territorial claims by maritime claims. There were strong economic interests in mining the resources of the earth. Countries undermined the 3-nautical miles of maritime claims granted to all countries, urging the United Nations to produce the 200-nautical miles exclusive economic zone as part of the Law of the Sea. Beginning in 1942 and concluding in 1982, the Law of the Sea came to replace the seventeenth century notion of the freedom of the sea. The sea was now allotted and claimed. Counties expanded their maritime borders up to 200- nautical miles.

Left over is a zone of international waters, the mining of which was economically unfeasible. The regulation of the zone was given to the International Sea Bed Authority, which designated the zone as a common heritage of mankind: basically public property. However such a provision is only on paper. There are no international guards policing international waters. It is a zone devoid of any and all forms of power. There is nothing here but the lawless sea.

At shore, sovereign powers enforce the constitutional law of the state. They have also legitimatized the right of the police to intervene in order to promote universal values of justice.[2] By holding society in a constant state of emergency, all social interactions are scrutinized by the state. The presuppositions of institutional dealings with clients no longer hold. The confidential relationship between the institute and client is replaced today by a confidential relationship between the institute and police.[3]

Today more than ever the illegal actions of the black market are enmeshed in a matrix of legitimate transactions. In the past black markets were isolated and small. However, today they have developed into a set of interrelated and mutually supported black markets. Such formations have not only become untraceably dispersed within the matrix of interactions, but also they network and operate at a new scale. "The Union Corse was not a criminal organization so much as a loose fraternity of like-minded souls who freely formed alliances and partnerships and just as freely dissolved them."[4] It was thus their lack of corporate

2 Michael Hardt and Antonio Negri, Empire (Cambridge: Harvard University Press, 2000), 18.

3 R.T. Naylor, Wages of Crime: Black Market, Illegal Finance, and the Underground Economy (New York: Cornell University Press, 2002), 18.

4 R.T. Naylor, Wages of Crime: Black Market, Illegal Finance, and the Underground

structure which ensured both their survival and success. It follows that black market activities cannot be quantified with any degree of accuracy except with large margins of error.

Africa is gold. Its market is Dubai and Switzerland. East Africa is gold mines from South Africa to Ethiopia, the operations of which are both formal and informal. Countries have controls over the flow of gold, yet infrastructural channels informally continue the flows. Though Kenya and Uganda are not major gold producers they are ports exporting gold to markets. Gold is smuggled from South Africa, Zimbabwe, Zambia, and Tanzania into Kenya, while gold smuggled from the Democratic Republic of Congo are exported to Switzerland from Uganda.

Gold is smuggled from Dubai to India on unsuspicious dhows. The payment back to Dubai was implemented via a centuries old system known as the havalah. Numerous black market transactions actually emulate the system. The havalah saved Arab traders from carrying large sums of money on their travels. Instead they would deposit the money at a havalah broker and in exchange get a receipt for that amount minus a fee. When at the destination they would present the receipt to an associated broker who would pay them their money.

The increasing South Asian working force sending money home from Dubai was the money generating body which facilitated the implementation of the havalah for the gold dealers. A worker would contact a havalah broker hanging out in known public spaces, and pay him the sum for which he receives a transaction code. His family uses the code to retrieve the money from an associated broker back home. The worker received a better exchange rate than market, as the cost was subsidized by the cost saved by the gold dealers. The gold dealer in Dubai is paid without physically transferring money into the country. No traces are left behind.

Informal networks have long moved from being small and isolated to becoming increasing interconnected today. One could conduct all personal transactions through middlemen without having to go through any official body. Such informal networks, including the havalah, create the infrastructural matrix which sustains illegal immigrants in developed countries. In the escape of poor economic condition or the escape of political unrest of wars and repression, people pay to be smuggled into developed countries on the prospects of a better life. The United Nations estimates the profit of people trafficking at $15 million, more than those of drug trafficking.[5] If labor is thought of as an asset, then the port is a clearinghouse where laborers come to offer their services without having to evade any legal system. The effect of such a scenario is that the port becomes into a place for networking. A hotel for the accommodation potential employers and employees becomes into a kind of storage system. A negotiations ground becomes into a space for interactions.

While storage systems are the core programmatic element of the port, a ground for negotiation is the central space for human interactions. It is difficult to generalize and claim that physical contact is required for any and all negotiations. Or to claim that in an infrastructural world negotiations are mostly settled prior to contact; and that human contact is no longer between negotiators but between infrastructural workers. Instead we recognize the full spectrum from a space for negotiations to one for prearranged infrastructural exchanges. Regardless we still consider the space a negotiation ground.

Oil is the black gold. The global thirst for fuel cannot be quenched without its supply. Against

Economy (New York: Cornell University Press, 2002), 18.

5 John Penycate, "more 29/11/2000," BBC News, 29 November 2000, <http://news.bbc.co.uk/1/hi/events/the_money_programme/archive/1999-2000/1047017.stm> (11 May 2006)

international trade sanctions during the nineties, Iraq smuggled oil to Syria, Turkey, Jordon, Egypt, Pakistan and India. Oil was smuggled across the borders by turning on a faucet on some old oil pipelines, or through tankers quietly carrying a few thousand tons of crude oil through the gulf and into the ocean. "The US was not only aware of Iraqi oil sales which violated UN sanctions... on occasions, the US actually facilitated the illicit oil sales."[6]

In April 2001, the Zainab, an Iraqi fuel tanker marked with a Georgian flag of convenience was intercepted by the Royal Navy in the Arabian/ Persian Gulf. The captain plunged twelve holes into the tanker sinking it and causing an oil spill, which closed two desalination plants in the Emirates. On the same sanctions violation, the ship had been seized twice prior to its sinking by the United Arab Emirates authorities. The age and condition of the ship violated the country's maritime laws, which entailed authorities to auction it off for scraps in Abu Dhabi. Through network channels, the ship made its way back to Iraq twice, from where it continued its attempts to smuggle oil.

Since the decommissioning of the single hull tankers worldwide, after an oil spill off the coast of Portugal, a vast pool of ships were available for the ship breaking industry. India, Bangladesh, Pakistan, China and Turkey make up 90% of the ship breaking industry. Labor laws in Europe in the 1970 made it too expensive to continue in Europe, driving the ship breaking industry out to countries where occupational health and safety standards are not enforced. Workers use their bare hands and a simple tool to scrap down a colossal ship structure.

The French decommissioned warship Le Clemenceau was sent to a ship breaking yard in India at the end of 2005. The Indian government refused the ship entry into its waters after Greenpeace and other groups highlighted its hazardous material contents of asbestos and polychlorinated biphenyls (PCB). After two months of aimlessly hanging in the Arabian Sea, the French President ordered the ship back. Yet regardless, Alang, a city in western India, has for the longest time and is still known as the graveyard of ships. It has taken on thousands of decommissioned ships and has exposed its workers for twenty years to all the toxins of old ship construction.

The ship breaking industry feeds into the larger steel recycling industry. Steel is recycled from old ships, old cars and collapsed bridge and building rubbles. Rubbles from the World Trade Center were auctioned of for $120/ton. Dealers from China, Dubai, and India bought the rubbles from which they extracted iron rods and melted the steel to be reused in the building industry. Only one fifth of the rubble is discarded.

Animals make up the capital for a trade worth billions of dollars a year. The international police body (Interpol) ranks it as the second most lucrative trade after drugs. As it stands, pound for pound a parrot pays better than drugs. Animals are shipped from Africa, Australia, and Central America to collectors in the US, UK Japan and the Middle East.

The trade in contraband electronics is a Chinese business. In the first five months of 1998, port authorities discovered $300 million worth of contraband electronic appliances. In June 2002 Vietnam's biggest smuggling ring of contraband electronics from China was stopped. The clues led the authorities to a cave used as an inventory where the electronic appliances were hidden.

The trade of antiques originates from economically and politically devastated countries on whose lands once stood a civilization of sorts. Antiques are smuggled out of Egypt, India

6 Julian Borger and Jamie Wilson. "US 'backed illegal Iraqi oil deals'," The Guardian, 17 May 2005, <http://www.guardian.co.uk/international/story/0,3604,1485546,00.html> (11 May 2006)

and more quietly out of Syria, Iraq, and Yemen. The interception of antique smuggling happens way too often making it questionable why does it still continue, unless a majority of the smuggled artifacts actually go through.

The project is a proposal for the global infrastructural network. It is an infrastructural intervention which promises new prospects for its environment. The proposal of the port in international waters establishes a position that is proponent for the privatization of the waters. The port is an investment into creating an infrastructural concentration conveniently for the currently diluted activities of the black market. It affords the black market urban gear, amenities or equipment. The development proactively creates intersections in the global infrastructural network, and as such has an activating effect on its environment.

The port claims international legitimacy. Although it exists in what is designated as international waters, it itself is an antinational zone, subjected to no national powers. The port revokes the confidential relationship between the institution and the police, insisting instead on the confidential relationship between the institution and client. It is the Swiss bank of ports.

Is there such a place as a port of convenience? The port is a place which acts as a buffer equalizing pressures in the resistance zone. There are no islands left in international waters. The port is a platform in the unclaimed water, creating a protected zone in the ocean where ships are received. The storage mass accommodates the maritime infrastructural network latching onto ships at by means of containers cranes, pipelines for oil and gas, and conveyer belts for bulk cargo. Such a system would require a redefinition of quays and the types of berths alongside them. The port precisely operates in the zone produced by the asymmetries in the legal systems of different nations.

There remains finally a presumption. The presumption throughout the proposal is that our environment is saturated with information. For it is only in an information saturated environment, that infrastructural networks are established. Demand is created through information, and the travel of information is soon followed by the transportation of goods and resources. The infrastructural networks channeling the network flows are established with varying degrees of viscosity and volatility. Regardless of how networks form, resources always seem to reach the demands. It is as if they had a life of their own. As if resources are well informed and always find a channel to the demand.

Resource have long left their origins and entered a life of continuous immigrations, going to where demand takes them. They have created the global soup of resources in an information saturated environment. Ultimately the purpose of the port becomes to facilitate the nomadic lifestyle of resources. A strange condition: Pure globalization.