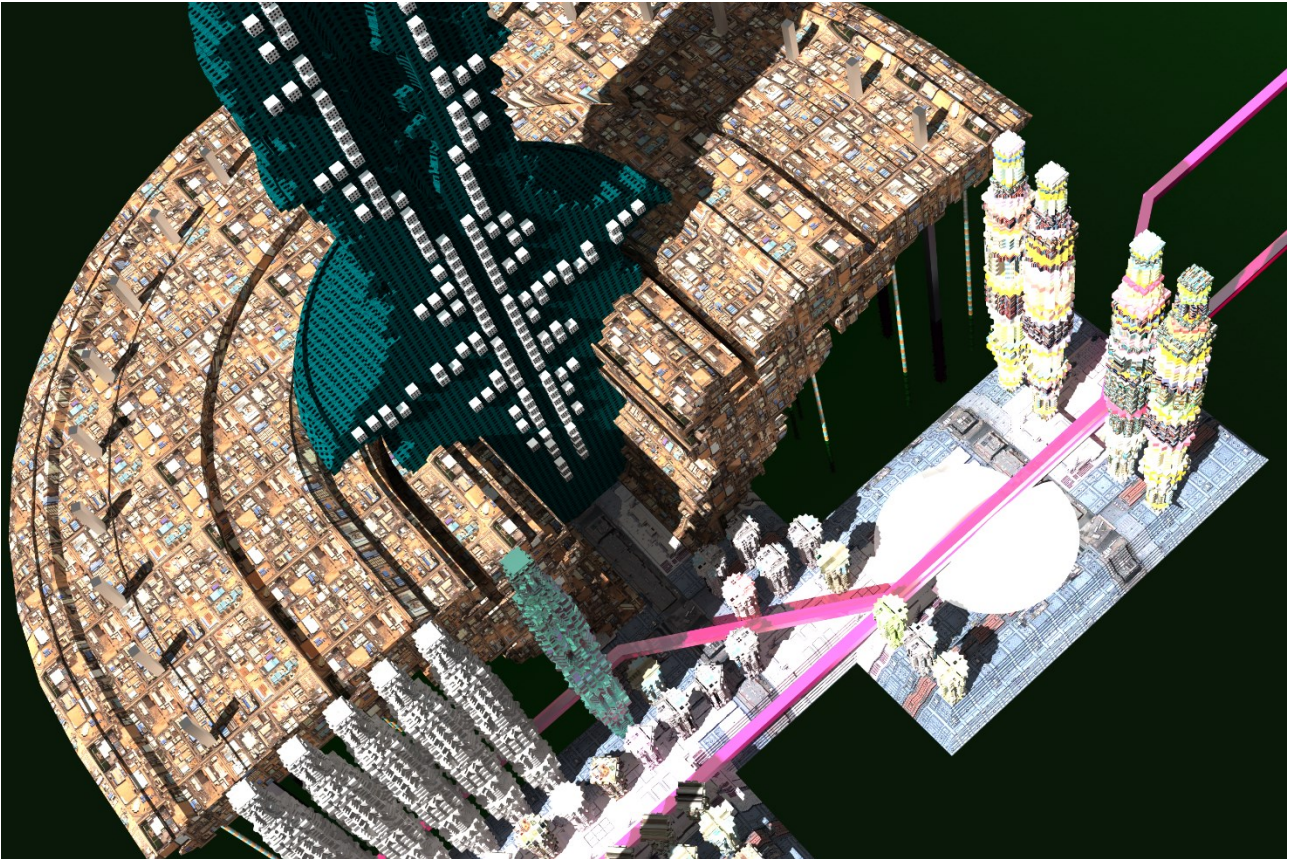


**MICHELE LEONARDI ARCHITECT**



# **DESIGNS FOR SYSTEMIC HABITATS**

# INTRODUCTION

## THIS BOOK

on line since 2012 like part of Systemic Habitats Website ([systemichabitats.it](http://systemichabitats.it)), edited by me, Michele Leonardi Architect, is mainly dedicated to architecture and urbanism. It is not a book conceived only for specialists, but for anyone interested in architecture. For example, two masters of modern architecture like *Frank Lloyd Wright* and *Le Corbusier*, were not graduates. Otherwise looking at the distant past, the Roman emperor *Hadrian*, the director of a masterpiece of all time such as *Villa Adriana near Tivoli*, not even he was qualify himself as "*graduate in architecture*", but simply like experienced architect. And not counting the architectures without architects that dot the world: from *the trulli* of Alberobello in Italy to *the tulou* in China, from *the French cathedral builders* in early second millennium up to *the oasis of Sahara* in the last millennia. Until to get to one of the oldest rights of the world: that of building your home yourself. But this does not mean that anyone can improvise as an architect, especially in our day, in the age of specialism, cloning and absolute conformism.

The meta-message included in this book is essentially aimed to the "not born old" new and old generations: don't let yourself be overcome by pessimism and by Cassandras. Don't believe in clichés and the ignorance spread by the mass media, nor in certain forms of scientific dogmatism. Because humanity today has all the knowledge available and all the modern and traditional technology to solve any real problem, including the energy transition, indeed, not a problem, but a new opportunity and a new frontier.

## WHAT IS A SYSTEMIC HABITAT?

The principles of Systemic Architectures and Constructions are exposed in my essay entitled "Toward a different habitat : 36 projects and realizations of Luigi Pellegrin Architect". However, in a nutshell, the basic assumption is that nature is systemic. It's still valid that nature is the best teacher, "*natura naturans*", without for this reason divinizing it. All this beyond the form that an architecture or a building can take, because, as is well known, the forms are unlimited. Man and society are not outside nature, but inside nature (Serge Moscovici, 1972), being themselves nature. Let us not forget.

## IN OUR TIMES

the common opinion is that architecture is something more, a kind of ornament, the superfluous for rich people. This is a big strategic error. On the opposite many past civilizations have lasted for a long time exactly because these civilizations have recognized the fundamental and organic function of architecture in the society. So here it is proposed to follow the way of *Systemic Habitats* and long-term strategies.

## IF THE

*Systemic Habitats'* intents will be emulated in the future, this will be one more step towards liberation from current building practice, given by inhuman *piece's logic, the sum that is never a sum*, which results in the anonymous modern cities: "*the grandma's old pie crust*", as rightly Frank Lloyd Wright called them, more or less.

The name for the theme we are dealing with here is not random. *Habitats* indicates the spaces of living, the places where people live and carry out their activities; from the basic living cell, to the architectural organism, up to the urban and territorial scale. While the adjective *Systemic* indicates that *the components of a given architecture or construction make system with each other*.

## THAT'S ALL?

No, because the evolution of a project is never linear. It has no limits, it is not predictable. Two, three good ideas and you can create a world, a new dimension for people. It's wasted time to enunciate a recipe ready to use for any occasion, or formulate a program, or define an algorithm. Therefore, here and in my e-book we rather indicate a direction, a method among the many possible and not "the method". Examples are given by realized and unrealized projects. George Bernard Shaw (1856-1950) suggested that "*for every complex problem, there is always a simple solution which is wrong*". In other words, architectural research cannot be channeled and limited by theorizing of any kind.

The history of architecture and urban planning shows how long any formalism last: not for long, having been born old, an example, the Post Modernism. Time before the postmodernist formalism, one master of modern architecture like Le Corbusier, about his famous Modulor, a system of architectural proportioning he conceived and based on human dimensions, it seems to have said paradoxically: "*Le Modulor? Je m'en fiche! Quand cela ne fonctionne pas, il ne doit pas être appliqué.*" The Modulor? I don't care! When it doesn't work, it shouldn't be applied. In other words his clear rejection of any formalism. So it is a matter to define an architectural language for contemporary life. It's a question of raising the qualitative level of common building practice.

## ALL THIS IS POSSIBLE

*only by following the mother road of continuous architectural research*. Since we are always talking about *organic architecture*. Although I believe I have traveled a new road, it is one of many branches of a tree that goes from Sullivan to Wright, from Le Corbusier to Pellegrin, and many more. There are no shortcuts, at least for us.

We stop here, at the doors of an unknown future.  
While its seeds are already here and now, spread between us.

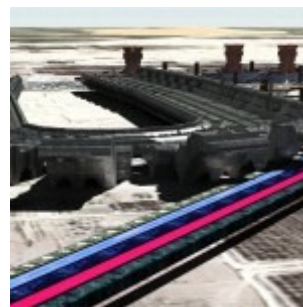
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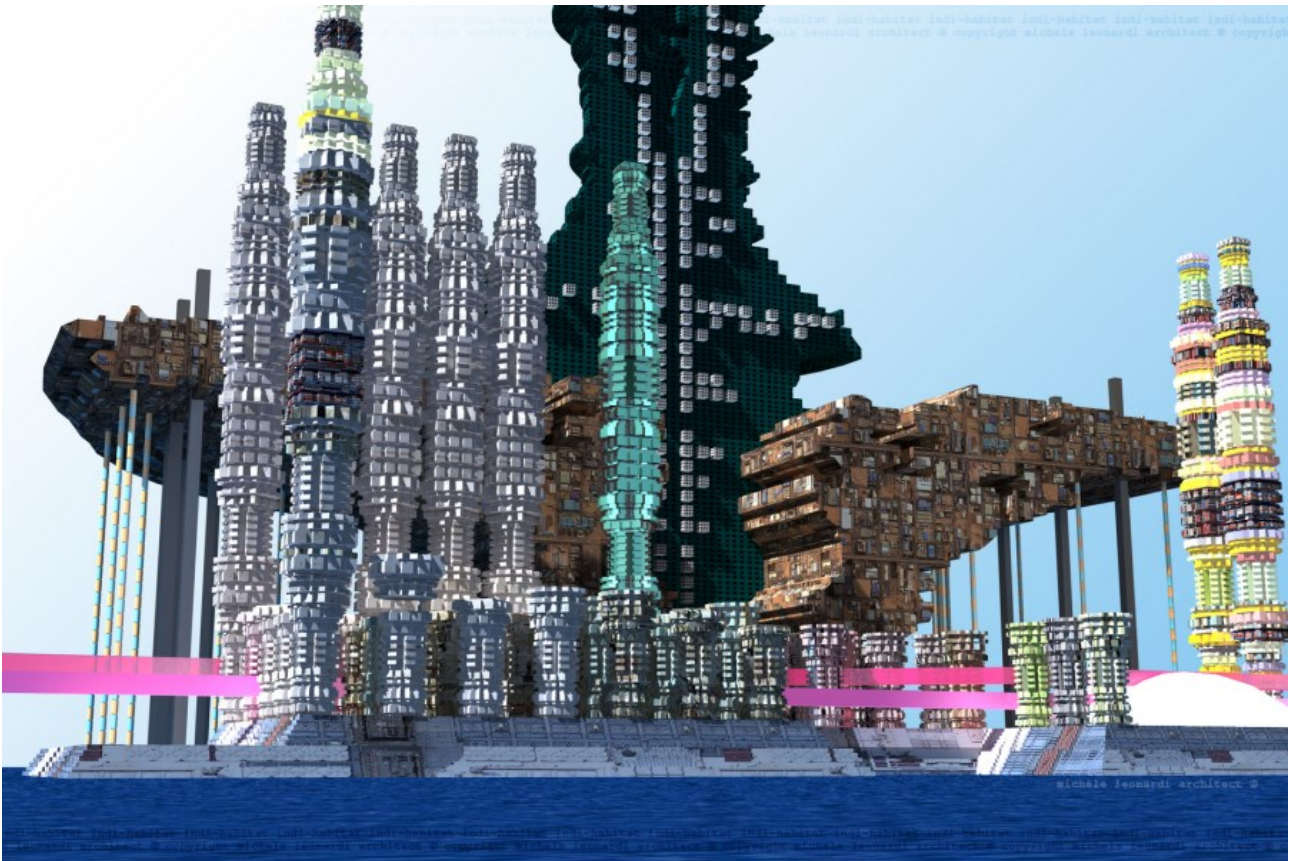
# DESIGNS FOR SYSTEMIC HABITATS

In the following pages are displayed some different territorial poles (centres), located in various latitudes, designed to provide a range of services to communities of the vast surrounding areas, and primarily linked via railways. While the architectures of territorial poles are made in steel and reinforced concrete or pre-compressed concrete, also with presence of specific prefabricated modules, instead the architectures in the regional area are built with traditional local materials. According to the geographical position, buildings could be made of clay or rather in adobe brick, in pisé, or in local stone, or in wood obtained from cultivated forests, etc. All materials are recyclable, low cost, depending on local conditions. Lastly below is also shown a modular system for low density housing, what I called "Solarys Livingbox", and which is alternative to the ordinary "definitive" houses, with all their disastrous consequences, like the death of soils covered by concrete and asphalt. More detailed descriptions on the following pages.



# THE INDI HABITAT

by Michele Leonardi architect © 2004; November 2011 reloaded.



# The Indi Habitat



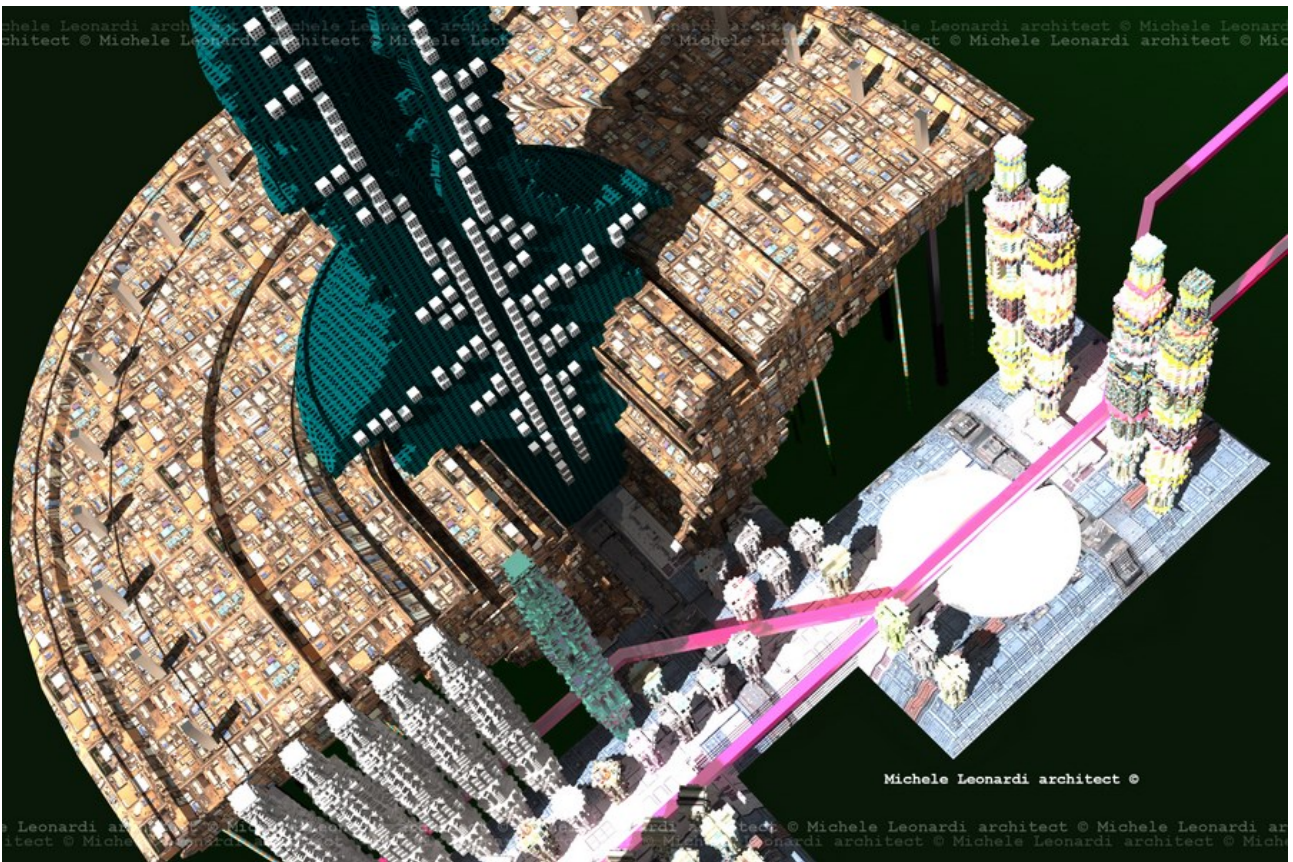
## THIS TERRITORIAL POLE

designed to provide a range of services to a vast rural surrounding area, is ideally located in India. It is a full pedestrian habitat, no cars and motorcycles always in the way. Cars and trucks can only circulate on the underground level, shown on the drawing is flooded level, since it could be imagined as an inundation during the monsoon season. So all trade activities are located below the ground, whilst all other functions are carried the highest levels.

## IN THIS HABITAT

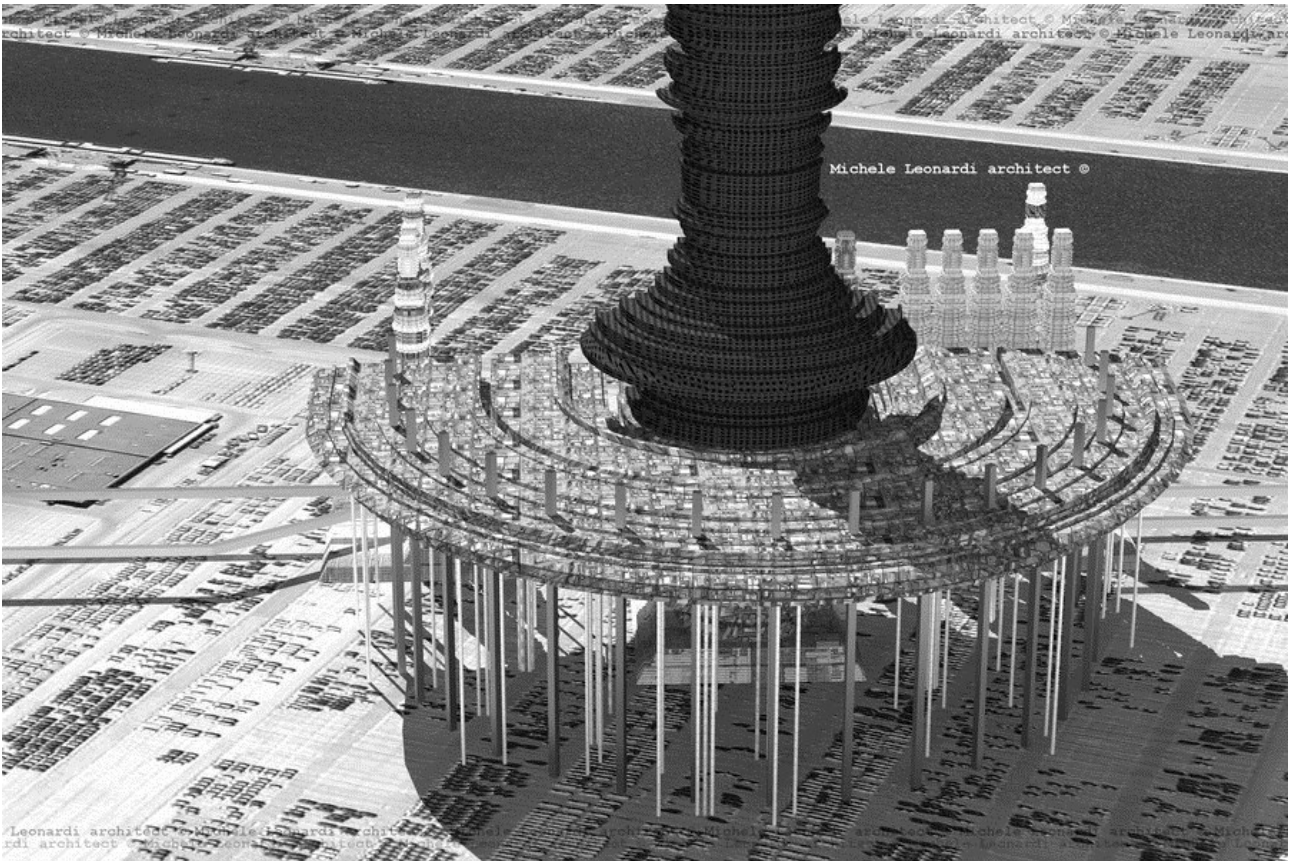
in addition to a limited number of "permanent residences" are also many "holiday houses", designed to accommodate visitors from other the areas served by this territorial center for a limited period of time, for people who need to prolong their stay for business reasons like trade, hospital or medical assistance, banking, law services, and so on. But in general it will be the doctor, the lawyer, the bank clerk, the judge, the specialist, etcetera, who will move in the surrounding territory to offer their services; all aimed to reduce excessive mobility, as far as possible off course. This would allow a strong dynamic organization to the entire surrounding territory, and to maintain traditional housing in rural areas and in small villages at a low market price, so to prevent depopulation of the same and the formation of what we call today a "contemporary city": a monster of asphalt and concrete, good for cars but not for humans. As mentioned in the introductory pages, automated mobility like railways, but also waterways where possible, would be

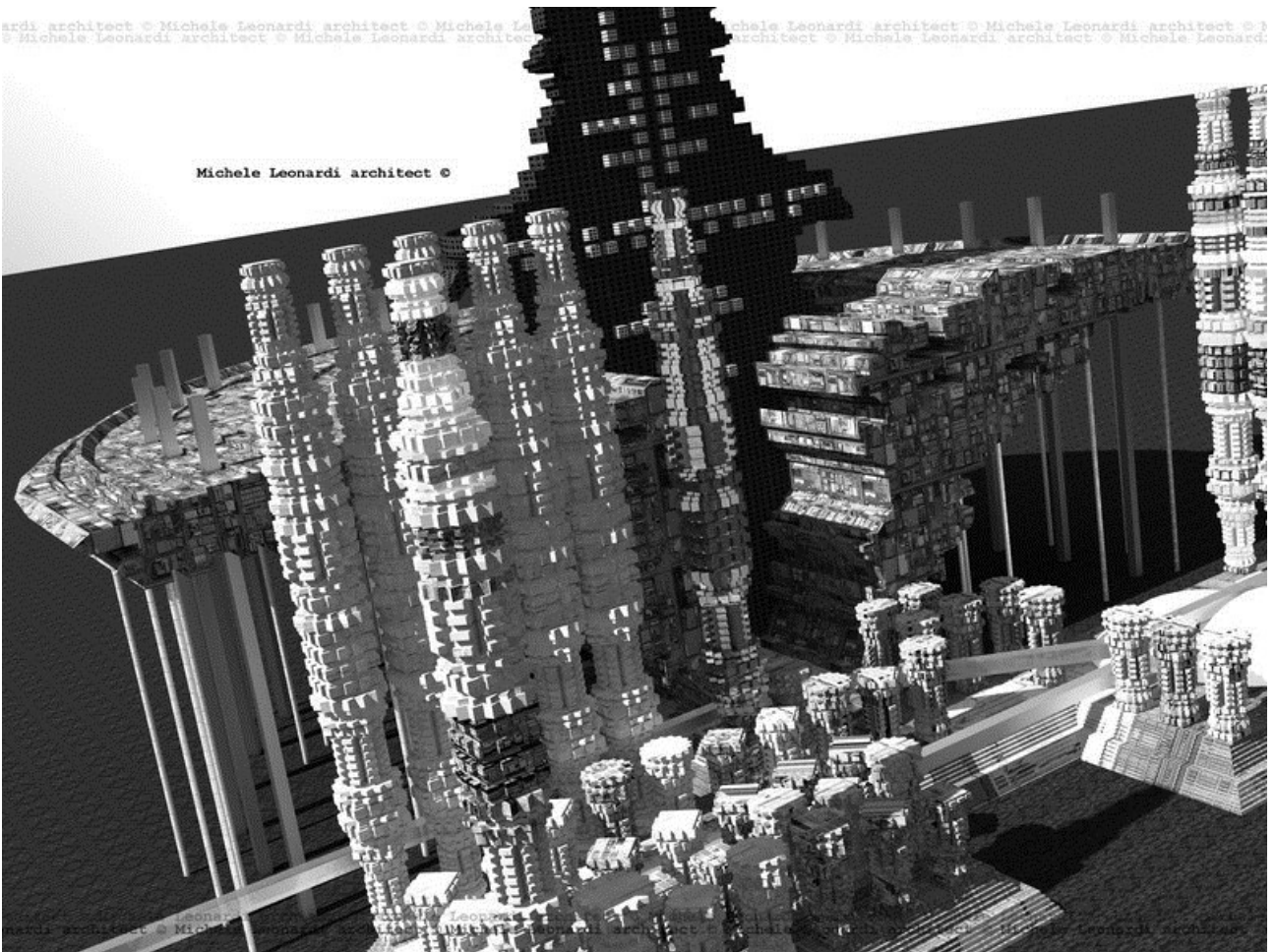
the main link between the pole and its territorial context. All people and goods would move via this railway vectors after reaching points of modal interexchange, a station or a local port linked to the grid and the collective automated transportation system.

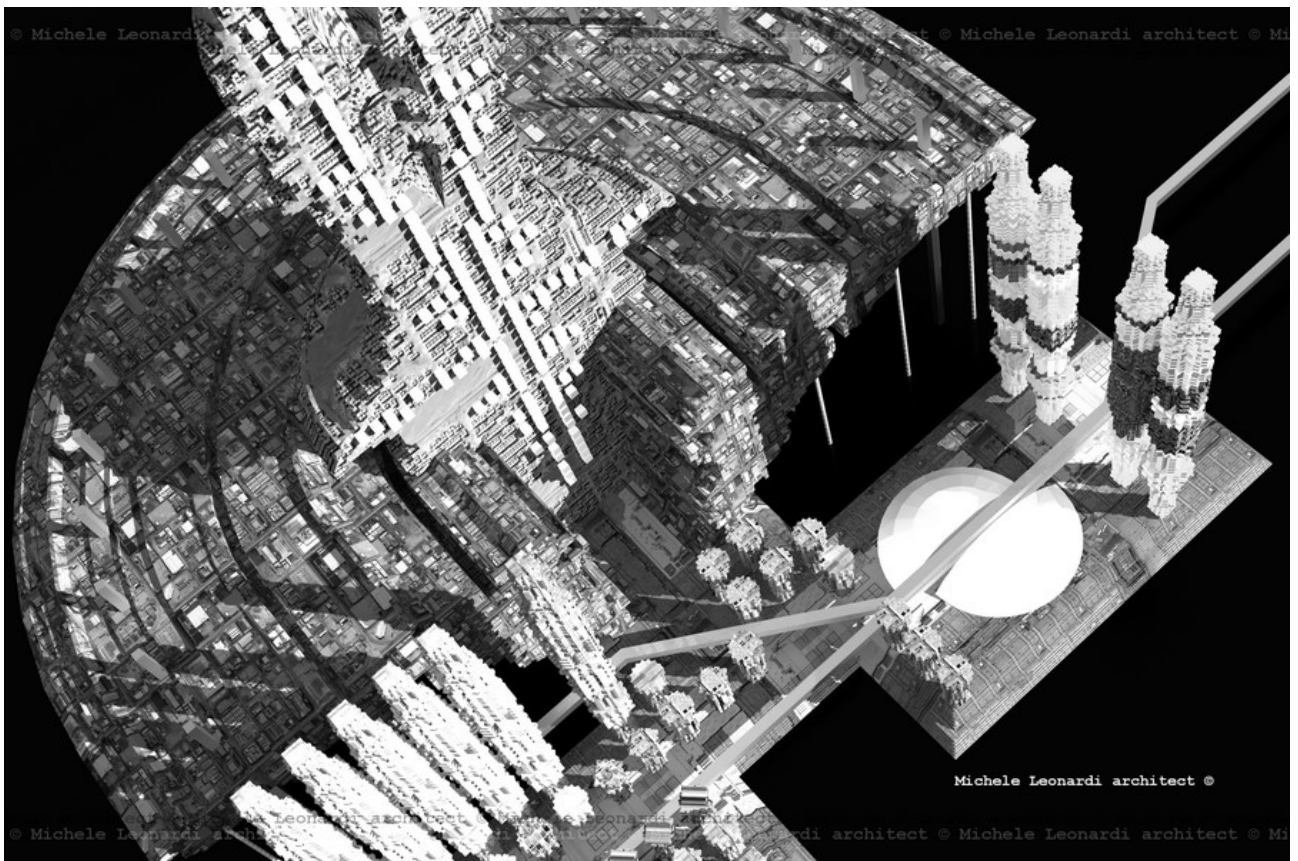












# SOLARYS LIVINGBOX

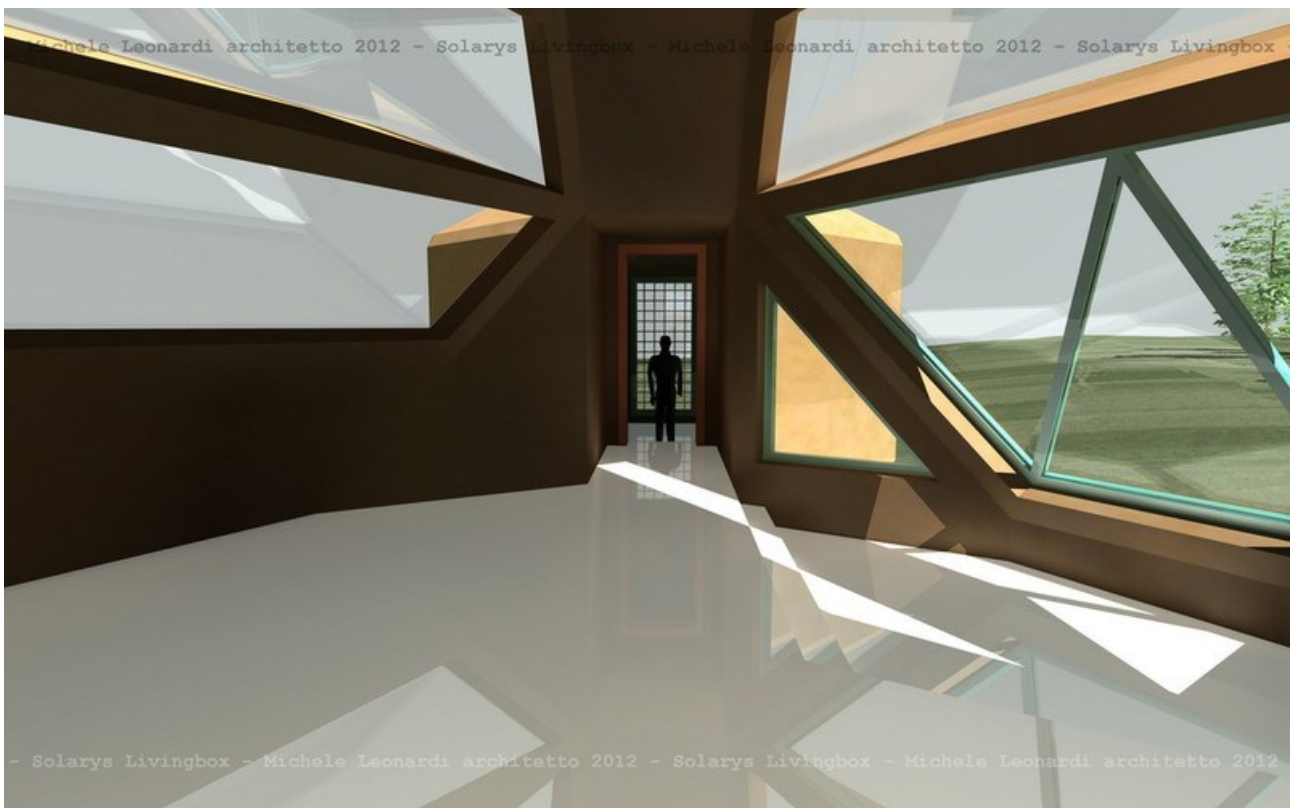
*The Solarys Modular System*

*by Michele Leonardi architect © 1995; in August 2005 reloaded.*



## SOLARYS

is conceived as minimal preassembled living units linked by a similar system to those of train carriages. Such standardized link allows interconnection between various symmetrical, asymmetrical spaces of different shapes and functions. This is possible by using special trucks, as shown in the images. Each livingbox can also be partially or entirely preassembled before delivery at less cost and quicker than being built on site.





## ANOTHER

feature of Solarys is the formation, space, and constructive reticular system of “sandwich panels”, held by large metallic hinges. The number of units involved and shapes depends on the individual’s needs, so each “livingbox” can be of different size too. The first advantage of a modular system is that it can be built over time and, for example, starting just with an open kitchen plan, a bedroom, and a bathroom. Therefore, the next benefit for “first buyers” is a reduced initial budget. Instead of standard cubes, all spaces can be uniquely and geometrically shaped. And lastly, it is possible to relocate with the entire system or simply detach a single unit for extraordinary maintenance.

*all rights reserved © Michele Leonardi architect*



## I PUBLISHED

my project first time in November 2005 on the "Livingbox" international competition for prefabricated houses. Then I submitted my project to many house prefabrication companies, however none of them ever answered me. But here below is the demonstration that my prefabrication house system was valid, that is my project is feasible, because recently the company **M.A.D.I.** has marketed a project of "M.A.D.I. HOME FLATPACK" by the Italian architect Renato Vidal, who demonstrates more generally that the folding system is valid and effective:





# Solarys Livingbox

*Il Sistema Modulare Solarys  
di Michele Leonardi architetto © agosto 2005.*



## I VANTAGGI

per chi vi abita. Solarys è concepito come un sistema di unità abitative minime prefabbricate tra loro componibili per mezzo di un collegamento standardizzato simile a quello che si ha tra le carrozze dei treni. Questo sistema permette così di collegare tra loro ambienti diversi, simmetrici (come quelli dei disegni qui riportati), asimmetrici (qui non riportati), di differenti forme e con funzioni diverse. Così secondo le esigenze di chi vi andrà ad abitare si avranno pochi o tanti ambienti, poche o tante “livingbox” Solarys, alcune grandi, altre più piccole.

In questo modo il primo vantaggio per chi vi vuole abitare è quello di realizzare la casa un poco alla volta, modificandola nel tempo, magari iniziando con pochi nuclei Solarys: lo spazio soggiorno-cucina, una camera e un bagno.

Un secondo vantaggio è conseguentemente la possibilità di non dovere affrontare una spesa iniziale eccessiva nell’acquisto della “prima casa”.

Un terzo vantaggio, è di poter vivere in spazi insoliti che non siano gli ordinari parallelepipedi massificanti. Un quarto vantaggio è la possibilità di poter traslocare con tutta la casa, o scollegare una singola unità e trasportarla in officina per le manutenzioni straordinarie. Ciò sarebbe possibile con camion speciali, come quello indicato nelle immagini del sistema abitativo Solarys. Le singole livingbox Solarys possono essere prefabbricate parzialmente o totalmente in fabbrica, oppure possono essere



oppure in relazione all'elevata disponibilità di una determinata materia prima, per esempio il legno derivato da foreste coltivate, ecc.), si potrebbero anche realizzare in legno.

Ma si potrebbero anche utilizzare altri materiali, cioè mediante tubi in plastica riciclata.

Di più, c'è sempre la possibilità per il sistema costruttivo Solarys, di utilizzare soluzioni ibride, per esempio in ferro riciclato e plastica riciclata.

E' inutile anticipare in questa sede tutti i dettagli esecutivi, perché il Sistema Solarys si può realizzare in diversi modi, secondo i materiali da costruzione disponibili all'origine nell'officina di fabbricazione, o piuttosto secondo i materiali disponibili a livello locale per quanto attiene alle finiture.



## SULLA

prefabbricazione del Sistema Solarys. Il sistema Solarys può essere prefabbricato parzialmente in fabbrica, o in una officina artigianale, “a piccoli elementi”, mediante la realizzazione dei soli pannelli sandwich con aste preassemblate, od anche dei soli elementi costitutivi i pannelli. Sarà così possibile il trasporto mediante containers, dalla fabbrica al luogo ove sorgerà la casa, mediante camion, ferrovia, via nave.

Qualora il singolo pannello dovesse avere dimensioni ragguardevoli, sarà sempre possibile realizzarlo con telai metallici piani di dimensioni inferiori, da solidarizzare successivamente sul posto ove sorgerà la casa. Ciò comporterà soltanto un maggiore impiego di aste metalliche interne ai pannelli.

Per quanto riguarda la prefabbricazione totale delle singole livingbox del sistema Solarys, questa comporterebbe l'utilizzo di camion speciali, come già avviene per il trasporto dei componenti dell'aereo del consorzio Airbus, o meglio ancora come avviene negli Stati Uniti, ove però vengono spostati “su gomma” interi palazzi.

# Solarys Livingbox

*Le Système Modulaire Solarys*  
par Michele Leonardi architecte © le mois d'août 2005.



## LES AVANTAGES

pour ceux qui choisissent le Solarys. Solarys est conçu comme un système d'espaces minimaux préfabriqués et modulaires, componibles entre eux par une connexion normalisée similaire à celle-là qui se produit entre les wagons d'un train. Ce système permet ainsi de joindre entre eux les différents pièces, soient symétriques (comme dans les dessins de cette page), ou plutôt asymétriques (pas représentés ici), pièces qui peuvent avoir les plus différentes formes et fonctions. De cette façon, selon les besoins de ceux qui y habiteront, il y aura beaucoup ou peu de chambres, peu ou plusieurs de "Solarys livingbox", certains plus gros, d'autres plus petits.

Par conséquent le premier avantage pour qui habite dans un logis comme-ça, c'est de réaliser sa propre maison peu à peu en progression, et de pouvoir la modifier jour après jour, peut-être en commençant par un nombre essentiel d'unités Solarys: l'espace séjour-cuisine, une chambre et une salle de bains, cet-à-dire que trois unités Solarys.

Un deuxième atout est donc la possibilité de ne pas dépenser beaucoup d'argent pour l'achat initial de sa première maison. Un troisième avantage est qu'on pourra vivre dans des espaces inhabituels, pas dans une commune boîte d'anchois.

Un quatrième avantage est la possibilité de déplacer toute la maison (ses modules) dans autre endroit, ou encore de déconnecter une seule unité et la transporter à l'usine de l'artisan locale pour la manutention extraordinaire; ou encore une fois, de la déconnecter de l'ensemble de la maison pour la manutention, sans avoir des problèmes de poussière etc. Le déplacement des différentes unités serait possible avec des camions spéciaux, comme celui-là indiqué dans l'un des dessins de ce système logement Solarys . On pourra préfabriquer chaque Solarys livingbox partiellement ou totalement dans l'usine et après la déplacer, ou plutôt des simples ouvriers pas qualifiés pourront bâtir les unités Solarys directement sur place comme une normale maison, de toute évidence avec des coûts plus élevés ou plus de temps pour la bâtir.

Pourtant un autre avantage ce serait de pouvoir: commander un modèle spécial directement à l'usine industrielle de la préfabrication, ou de le fabriquer par soi-même, ou de le commander des m

odèles personnalisés à des artisans locaux, petits ou moyens entrepreneurs locaux du secteur bâtiments. Enfin, il y a encore un autre possibilité grâce à la préfabrication légère (partielle) ou à celle-là totale: il serait possible de choisir entre un discret numéro d'unités Solarys de base, en personnalisant ensuite sa maison avec des unités additionnelles créées et réalisées selon son propre goût et ses propres exigences.







hitetto 2012 - Solarys Livingbox - Michele Leonardi architetto 2012 - Solarys Livingbox - Michele Leonardi arcl



**SOLARYS**  
MICHELE LEONARDI ARCHITECT

STANDARD INTERCONNECTIONS

**LIVINGBOX**  
RETICULAR SANDWICH PANEL  
RETICULAR SANDWICH PANEL  
RETICULAR SANDWICH PANEL  
RETICULAR SANDWICH PANEL

**YOUR SPACES**

FORME DIVERSE PER UN UNICO SISTEMA COMPONIBILE

**UNIQUE FORMS IN A UNITARY SPACE SYSTEM**  
STEPS TO ANOTHER HABITAT

**SOLARYS**









Les panneaux sandwich sauvegardent le système statique des barres, et ils sont soutenus par les mêmes barres, lesquelles peuvent être des tuyaux métalliques en fer, ou en aluminium, plus légers, ou, en fonction de différents exigences régionales en matière de construction (à cause du taux d'humidité relative élevé, ou selon la grande disponibilité d'un particulier matériel de construction, par exemple le bois de forêt cultivée, etc.), par exemple en bois.

Mais d'autres matériels sont possibles pour le réaliser, par exemple en tuyaux de plastique recyclé.

Encore il y a toujours la possibilité d'utiliser des solutions hybrides, par exemple en fer recyclé et plastique recyclé.

Il est inutile de définir ici tous les détails d'exécution, car le Système Solarys on peut le réaliser de différentes façons, selon les matériaux édiles disponibles à l'origine dans l'usine industrielle, ou plutôt au niveau local vis-à-vis de ses finitions.



## LA PRÉFABRICATION

avec le Système Solarys. Le Système Solarys on peut le préfabriquer partiellement dans des usines de dimension industrielle, ou quand même dans une petite usine artisanale, à travers de la réalisation des seuls panneaux sandwich avec ses barres réassemblées à l'intérieur, ou encore, on peut préfabriquer seulement les éléments constructives élémentaires qui composent les panneaux. De cette façon il sera possible de transporter tous ses composants préfabriqués dans des containers avec des camions, trains, bateaux, de l'usine jusqu'au lieu où on va appuyer la maison Solarys.

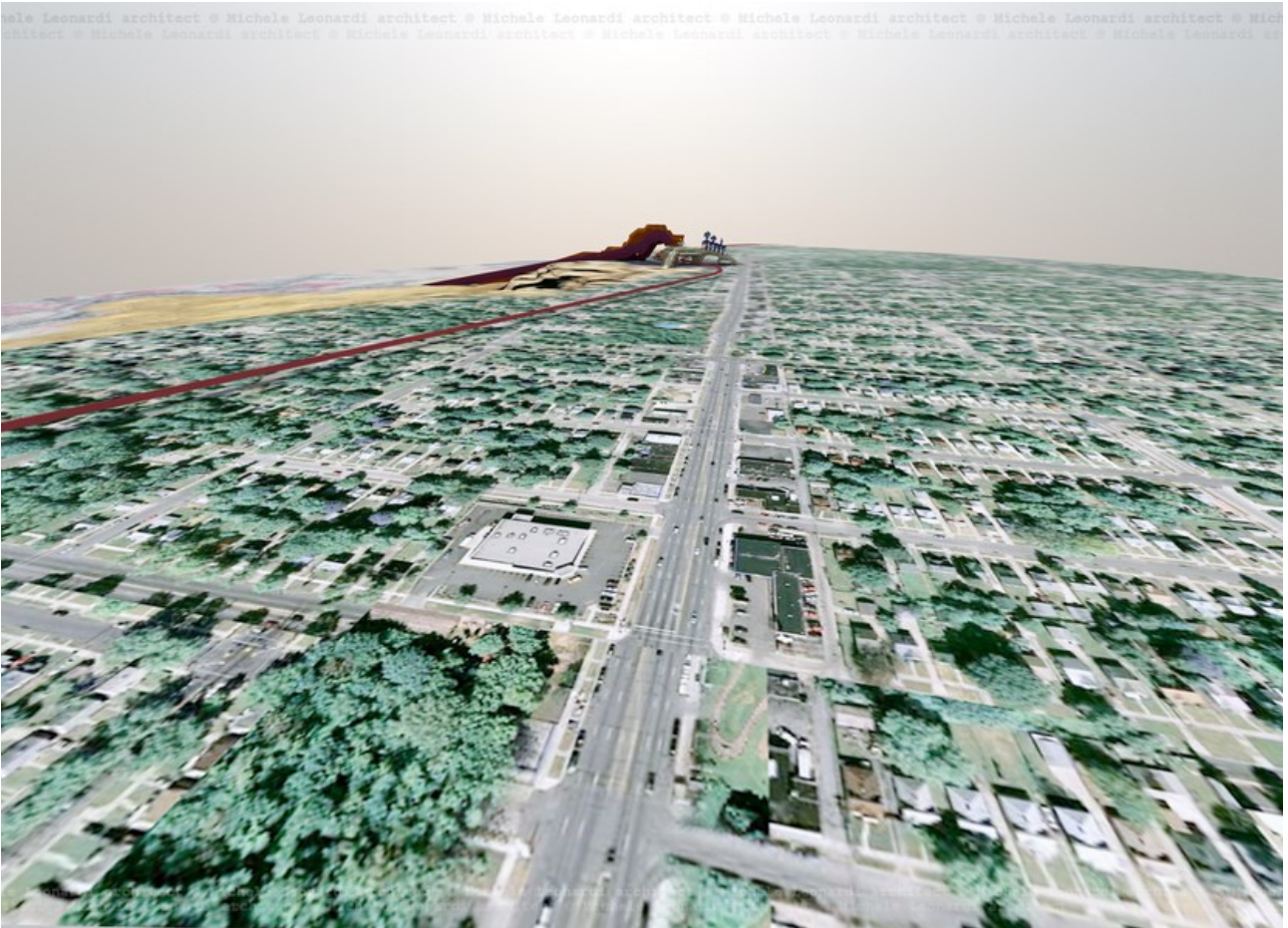
Au cas où un panneau a une taille considérable, il sera toujours possible le réaliser avec des châssis métalliques planes de dimensions inférieures (rien d'autre qu'un ensemble de structures isostatiques triangulaires), qu'on ira les joindre dans une seconde phase sur place, après les avoir transportés à la destination finale.

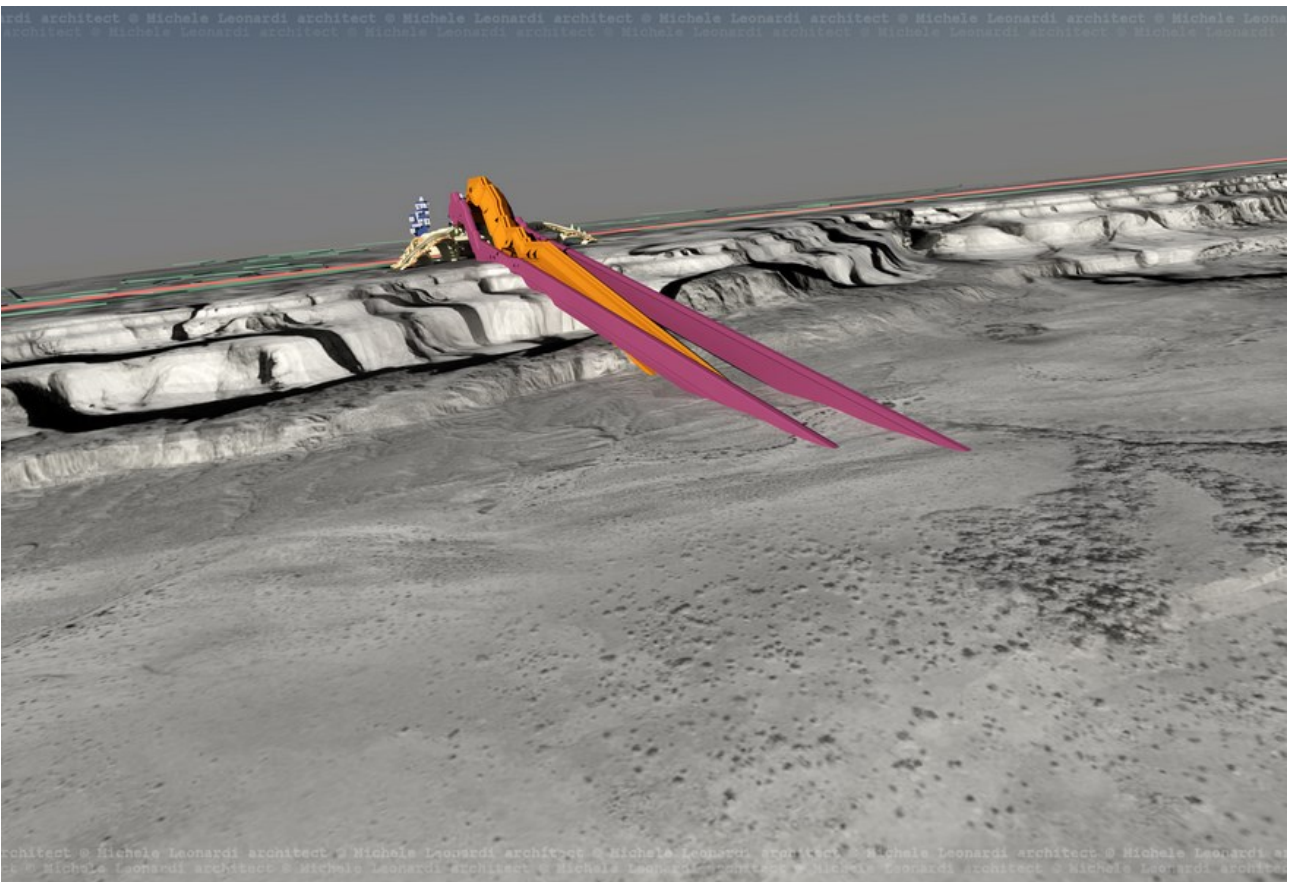
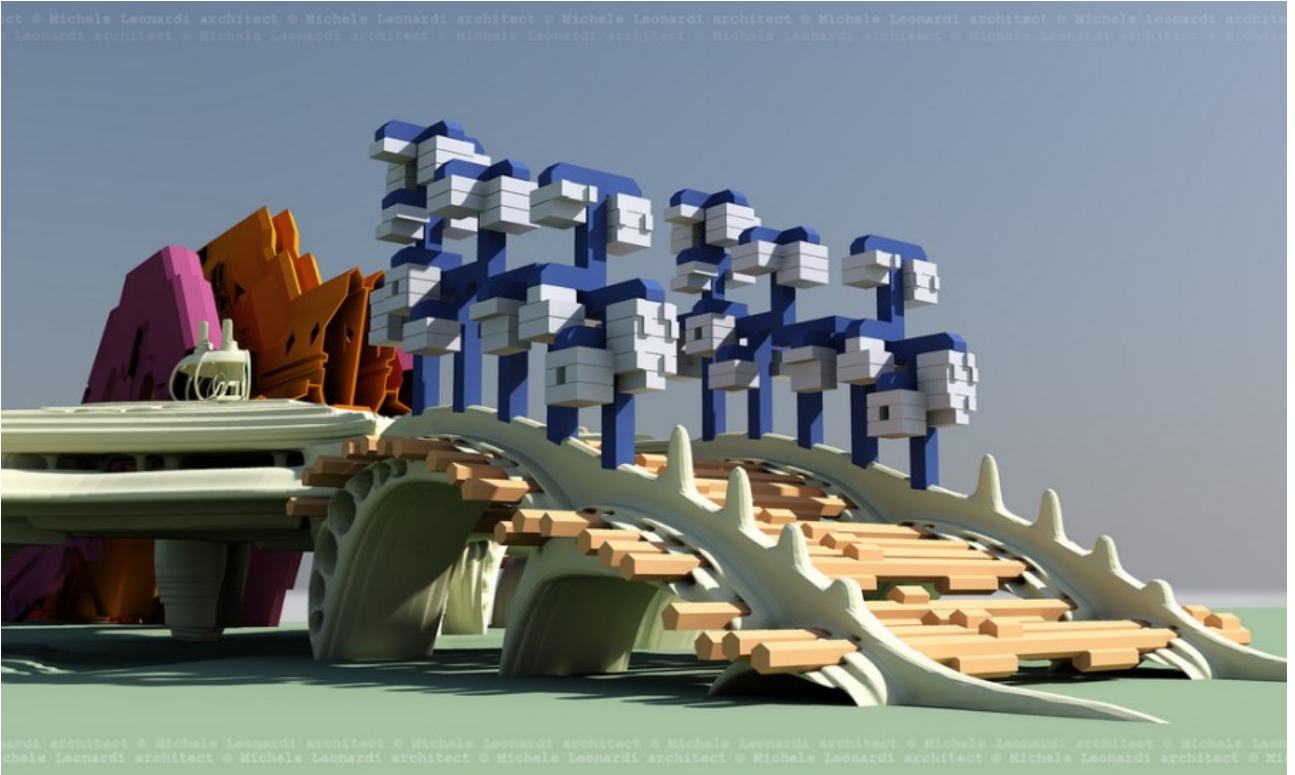
Pourtant au regard des panneaux de grande dimension, il suffit d'utiliser plus de tuyaux internes aux panneaux, un nombre majeure de tuyaux.

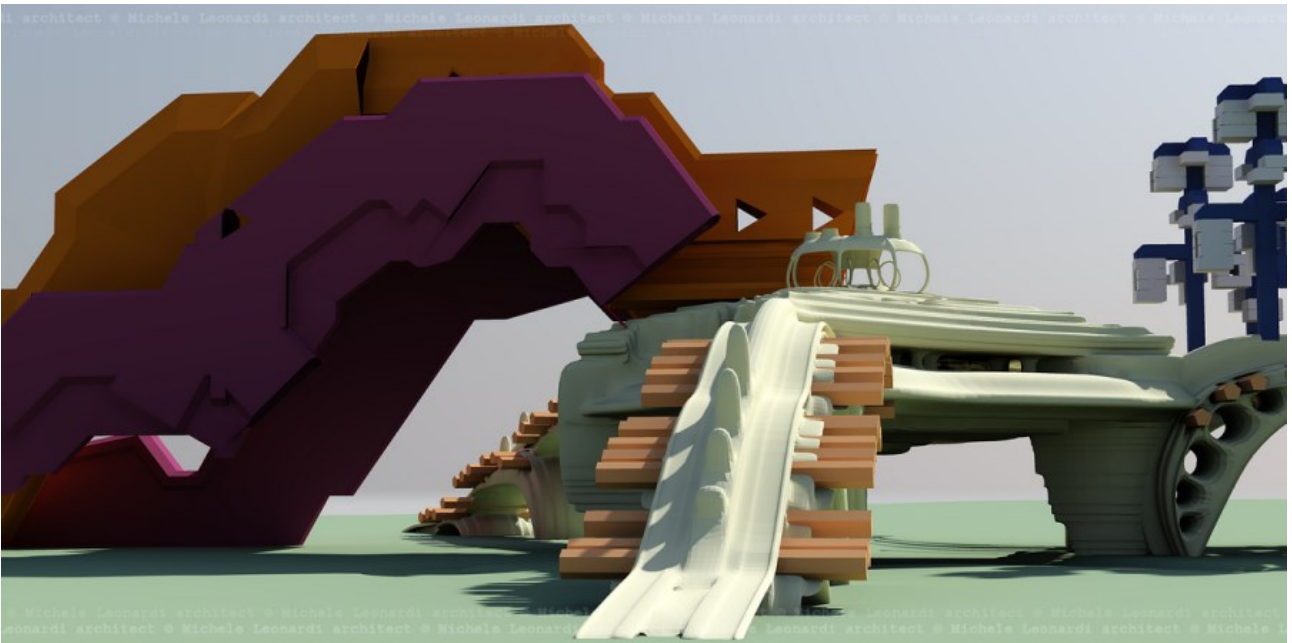
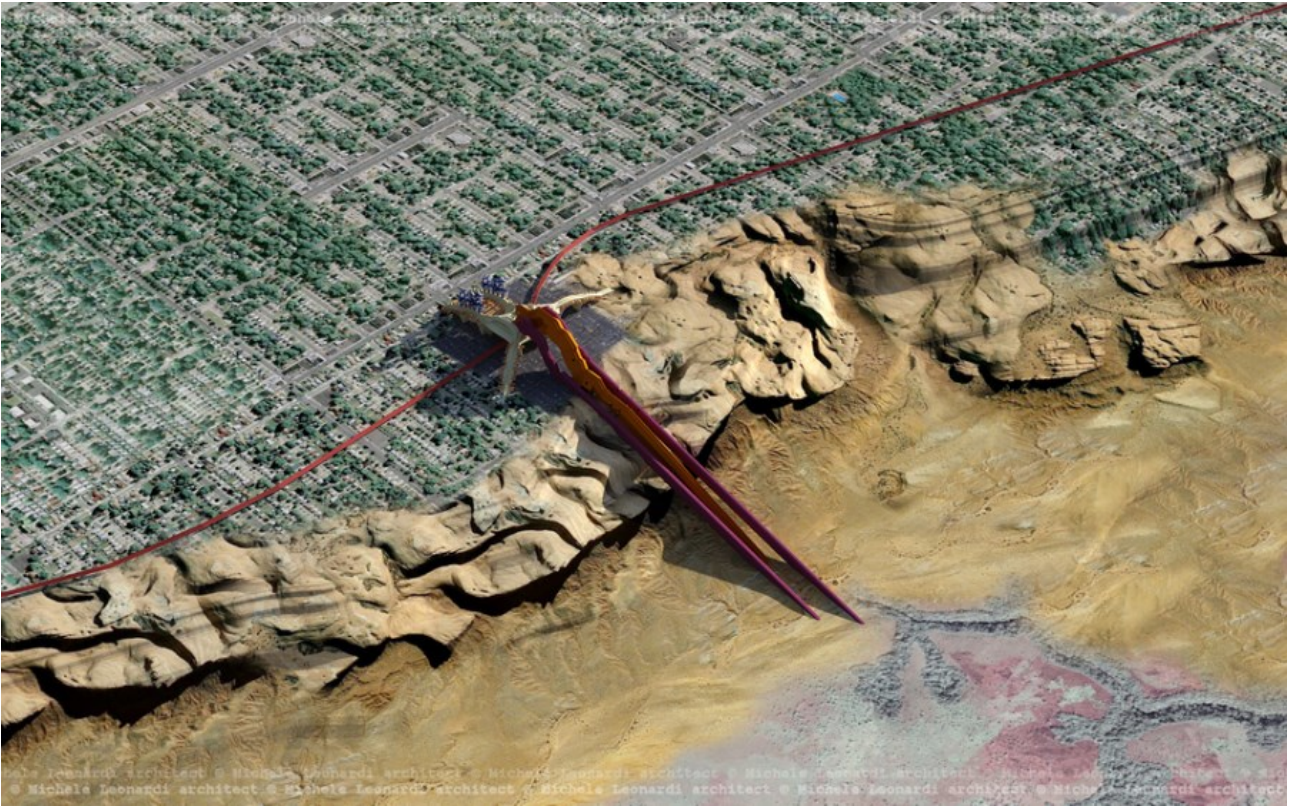
Vis-à-vis de la préfabrication totale de chaque unité du Système Solarys, ça comporte l'utilisation de camions spéciaux, la même chose qui se passe avec le transport de certaines composant de l'aéroplane Airbus, ou encore mieux comme exemple, la même chose qui se passe aux Etats-Unis où on déplace avec des camions spéciaux un entier bâtiment.

# THE DRAGON STATION

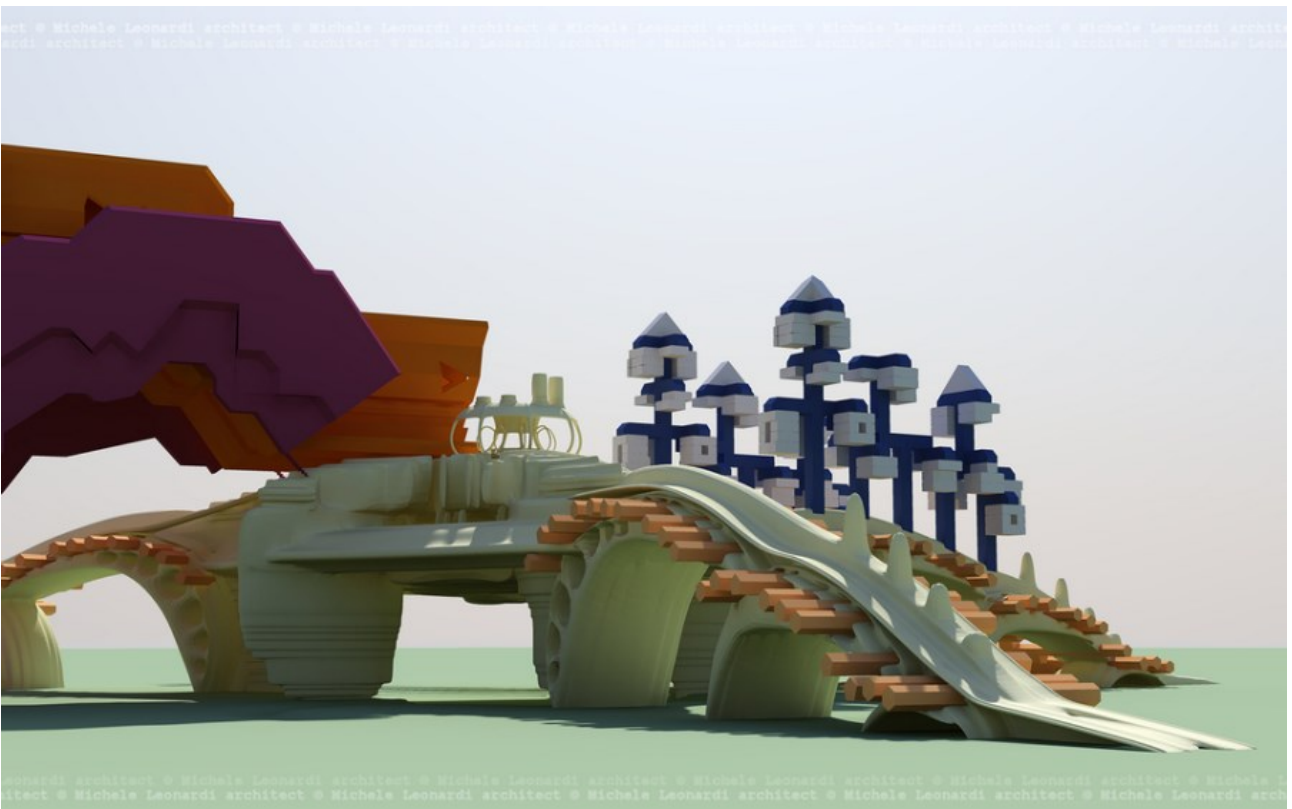
*by Michele Leonardi architect © December 2013.*

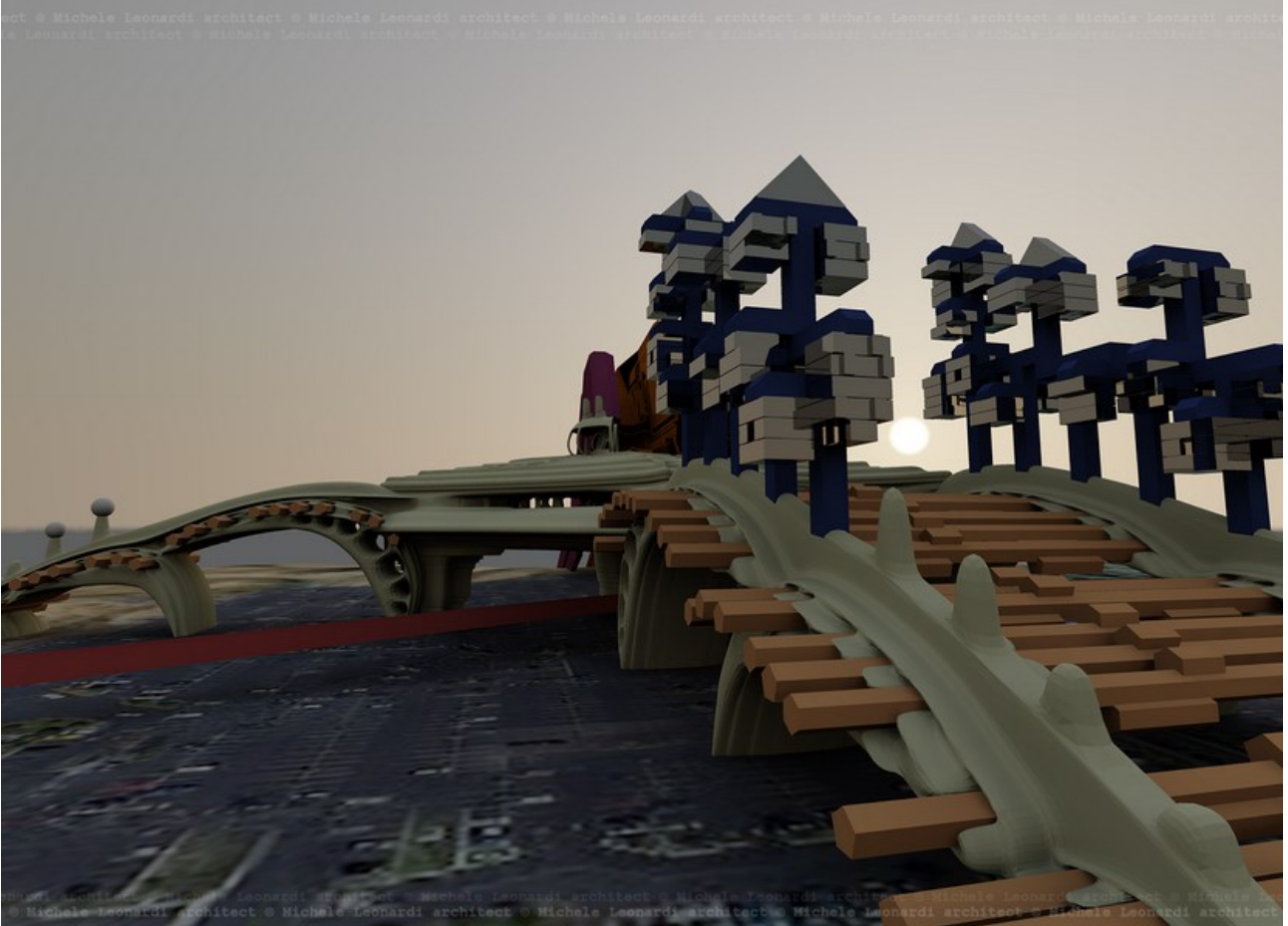










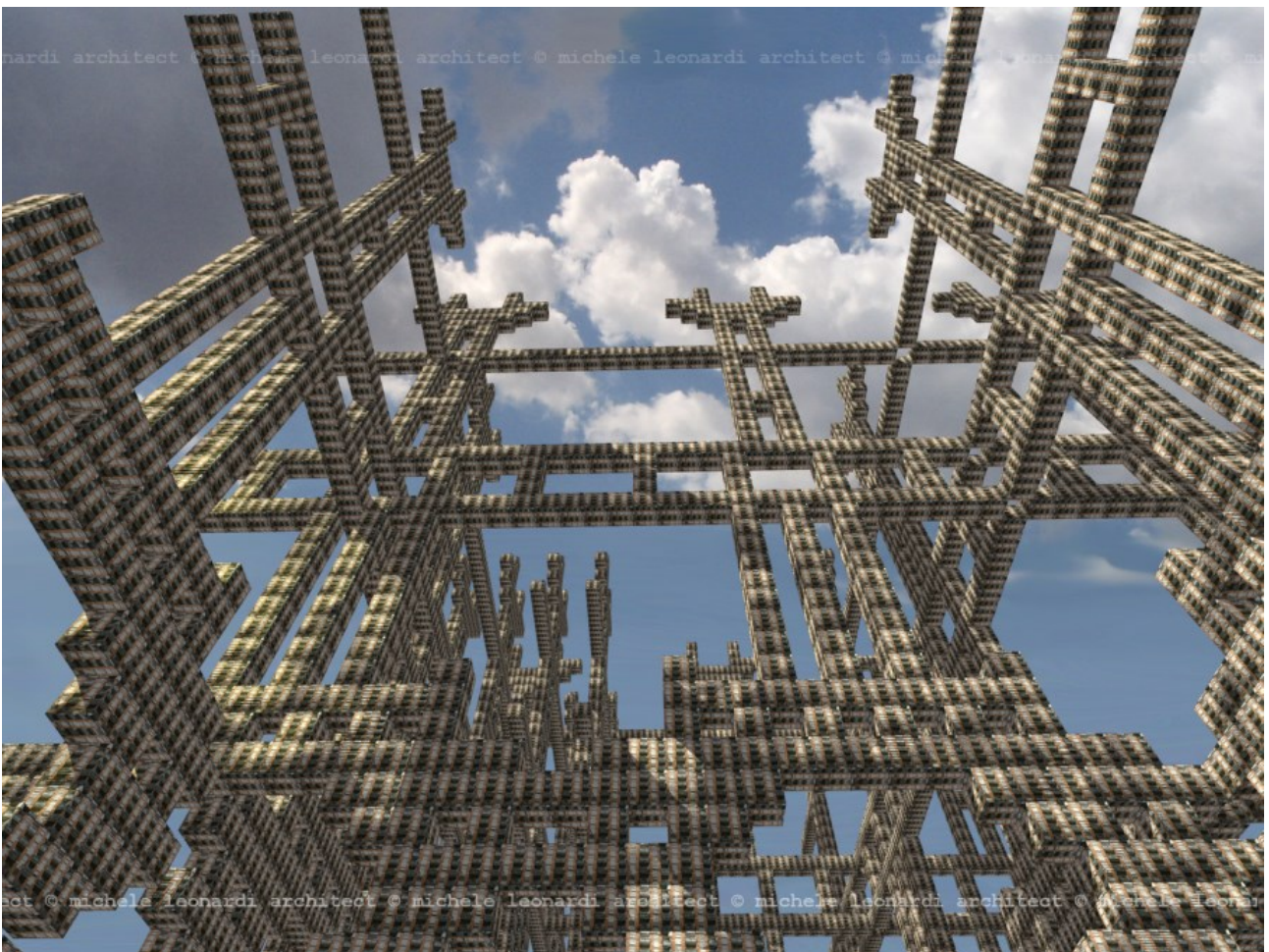


# **THE DRAGON STATION WITH Residential Cells & Office Units**

*by Michele Leonardi architect © December 2013.*

# THE CRANE VILLAGE

*by Michele Leonardi architect ©  
April 2007 – the concept; January 2014 – reloaded.*

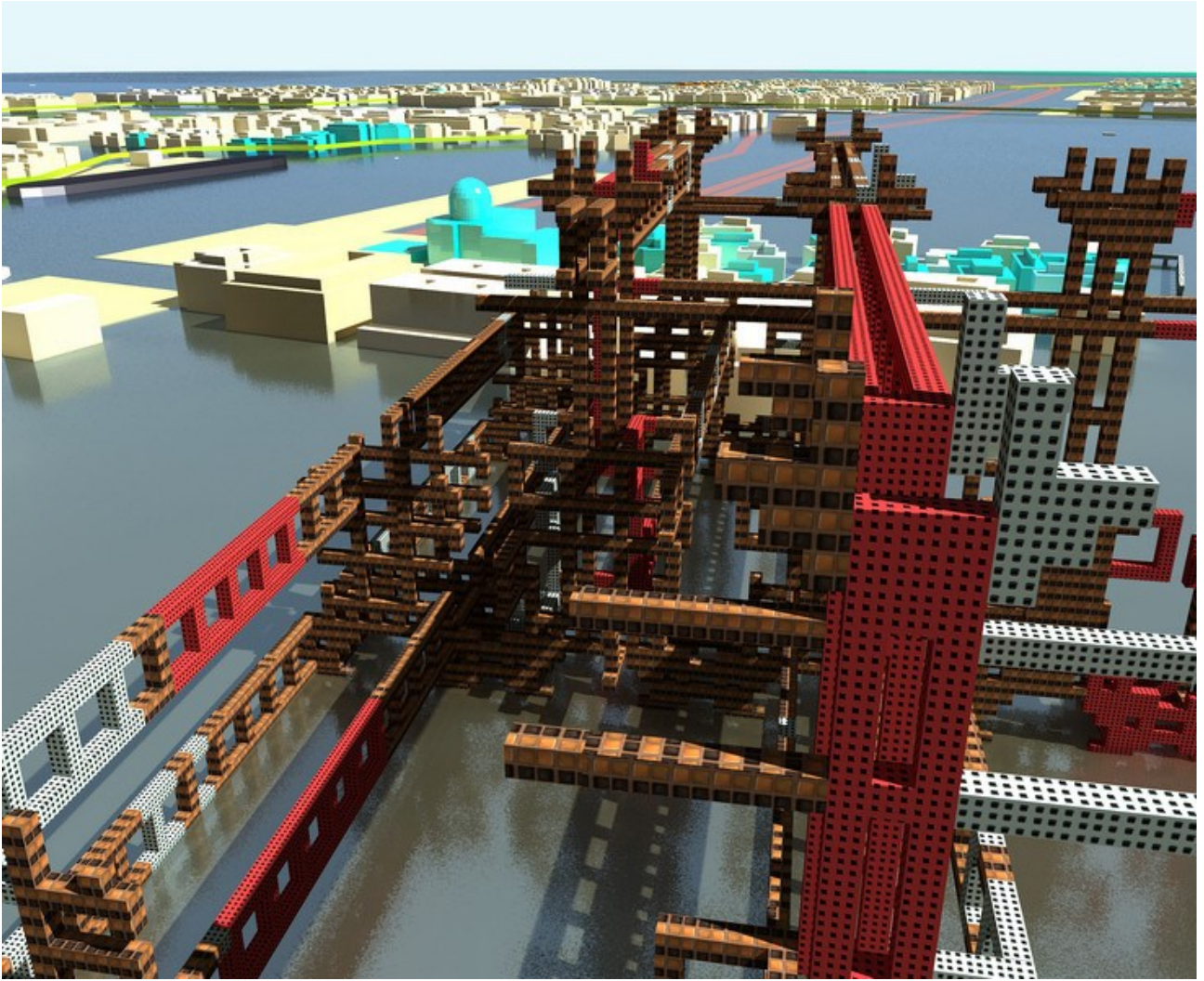


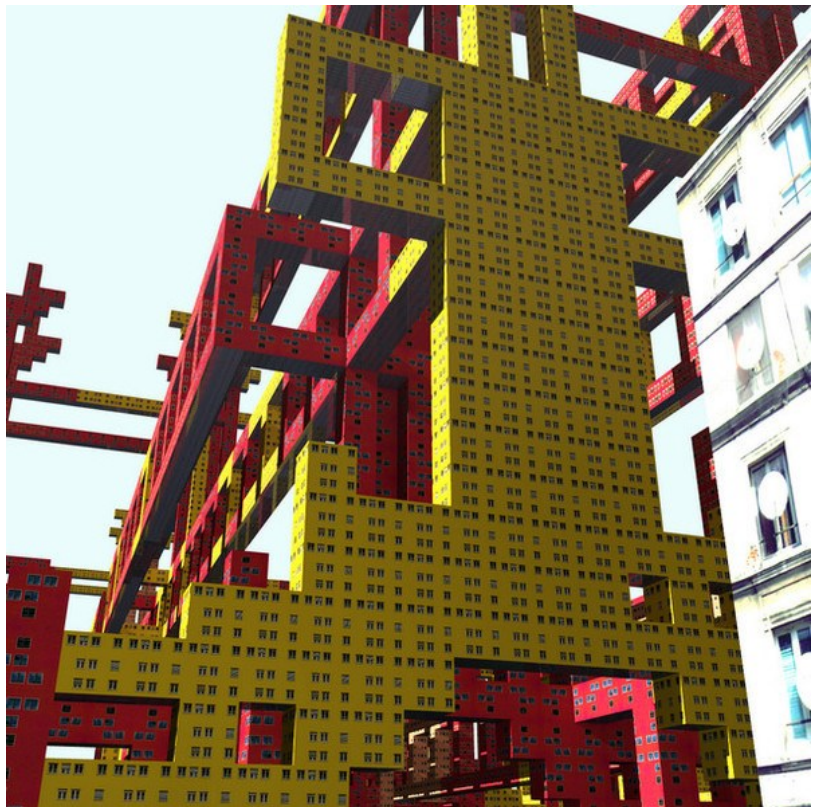
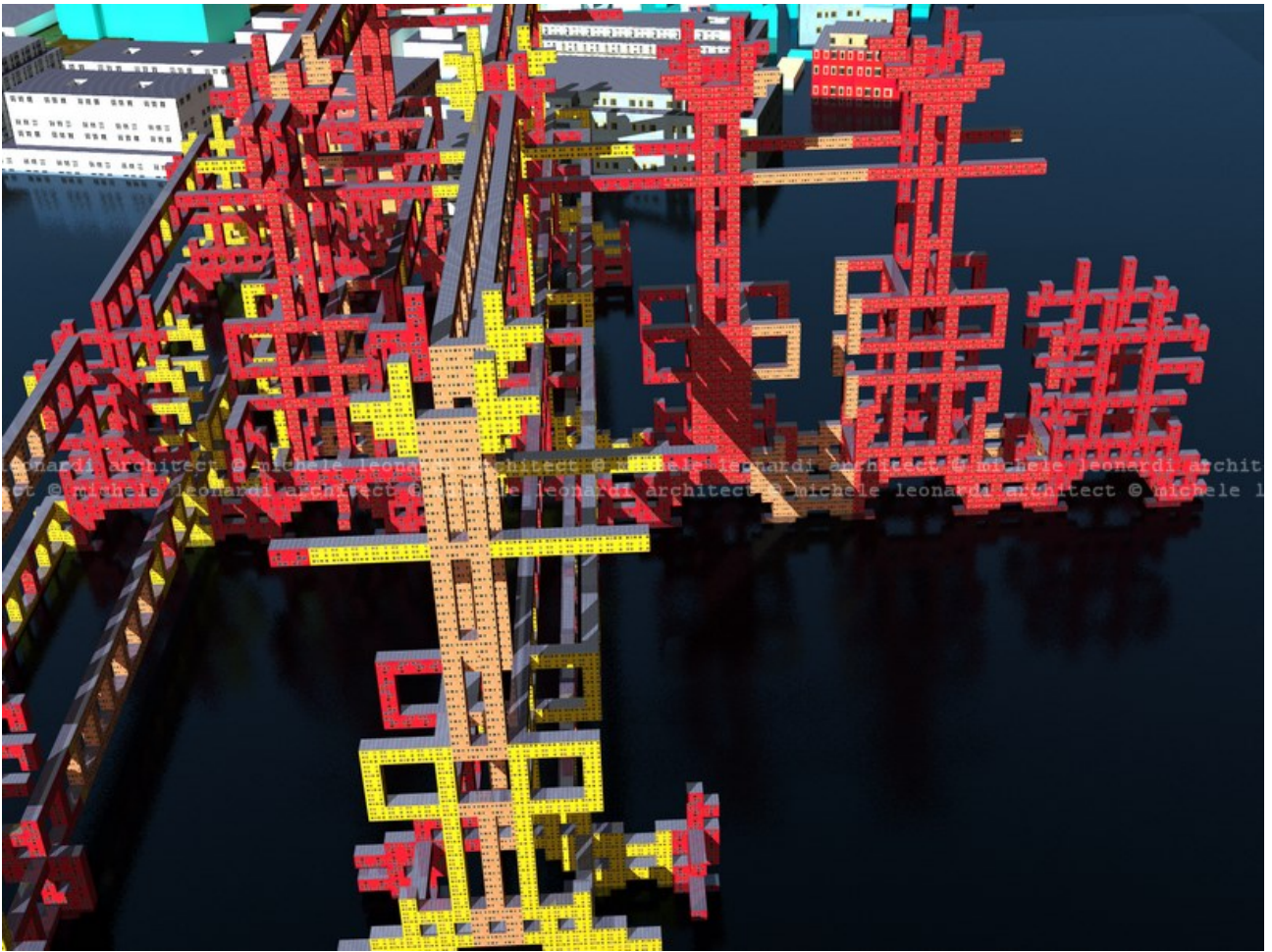
*April 2007, the concept.*

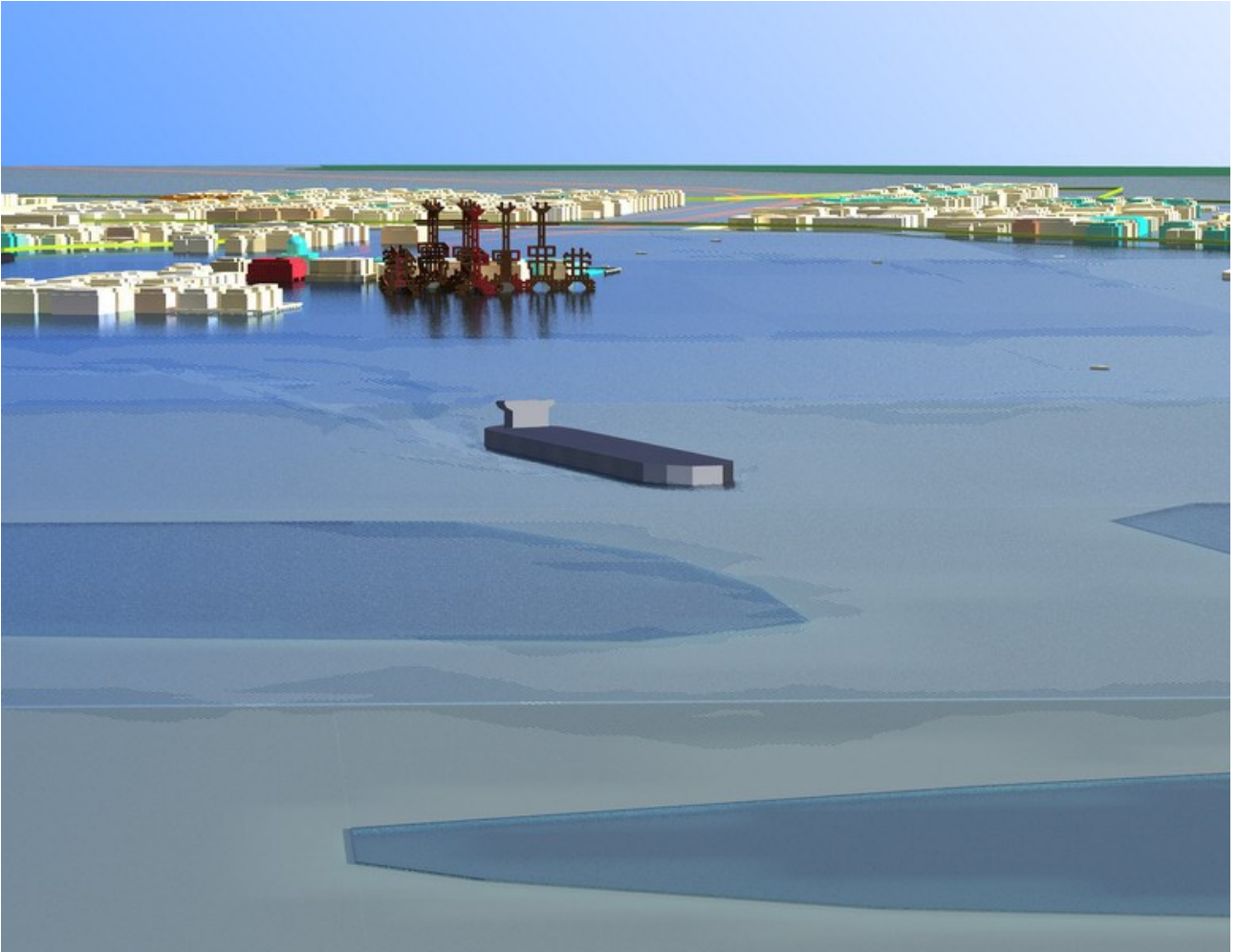
By Michele Leonardi Architect ©

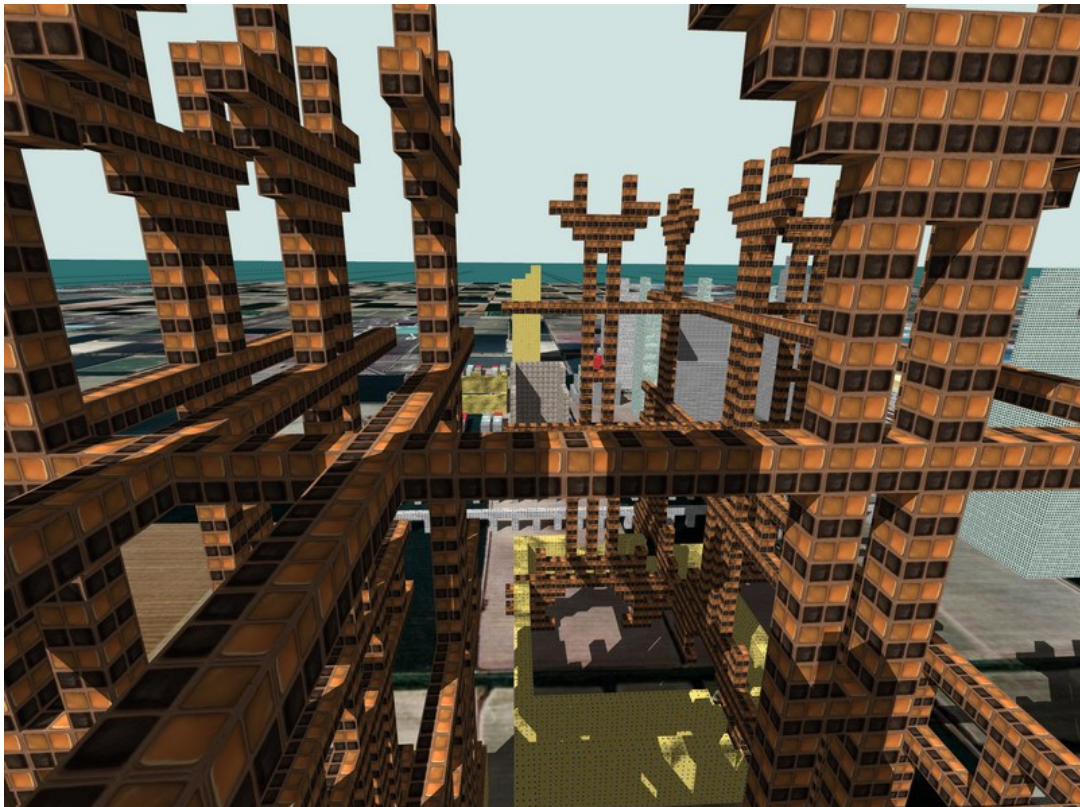
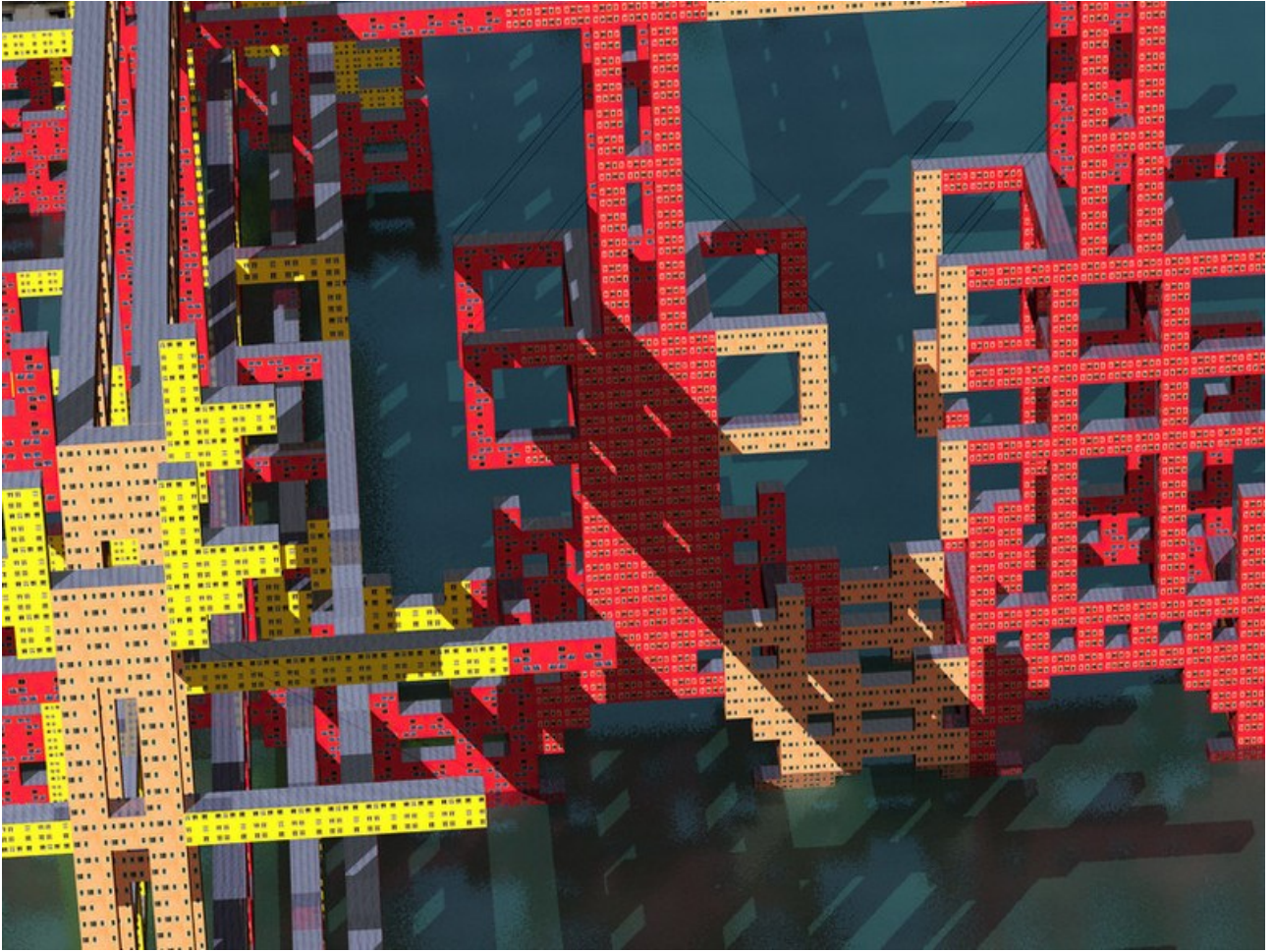
*January 2014, reloaded.*



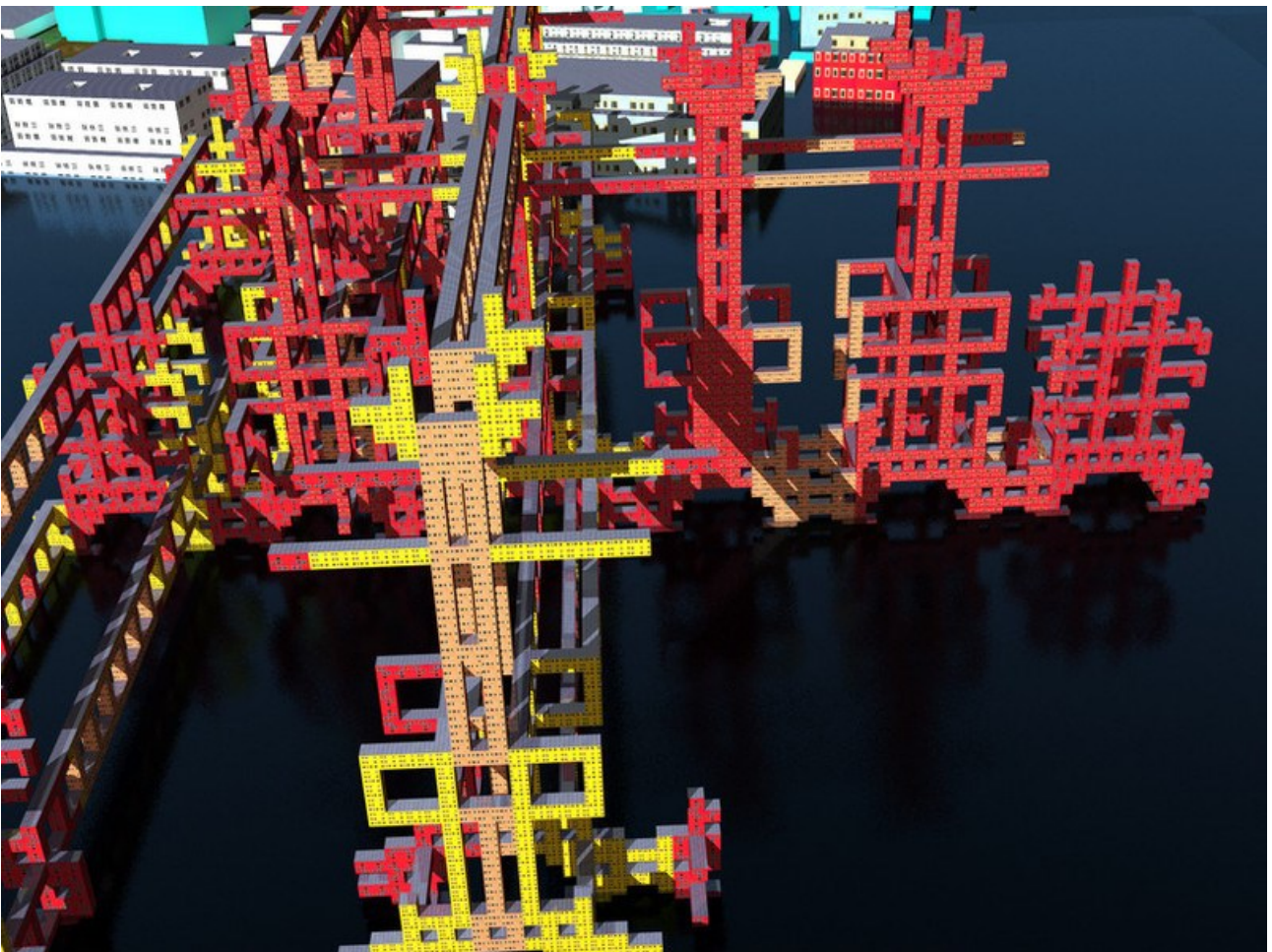
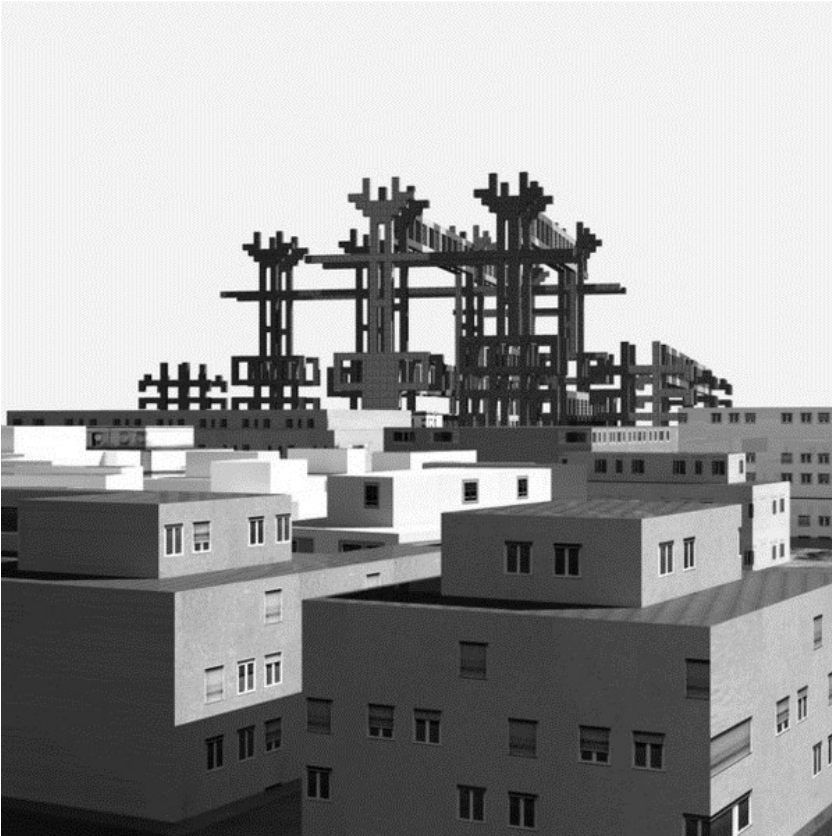


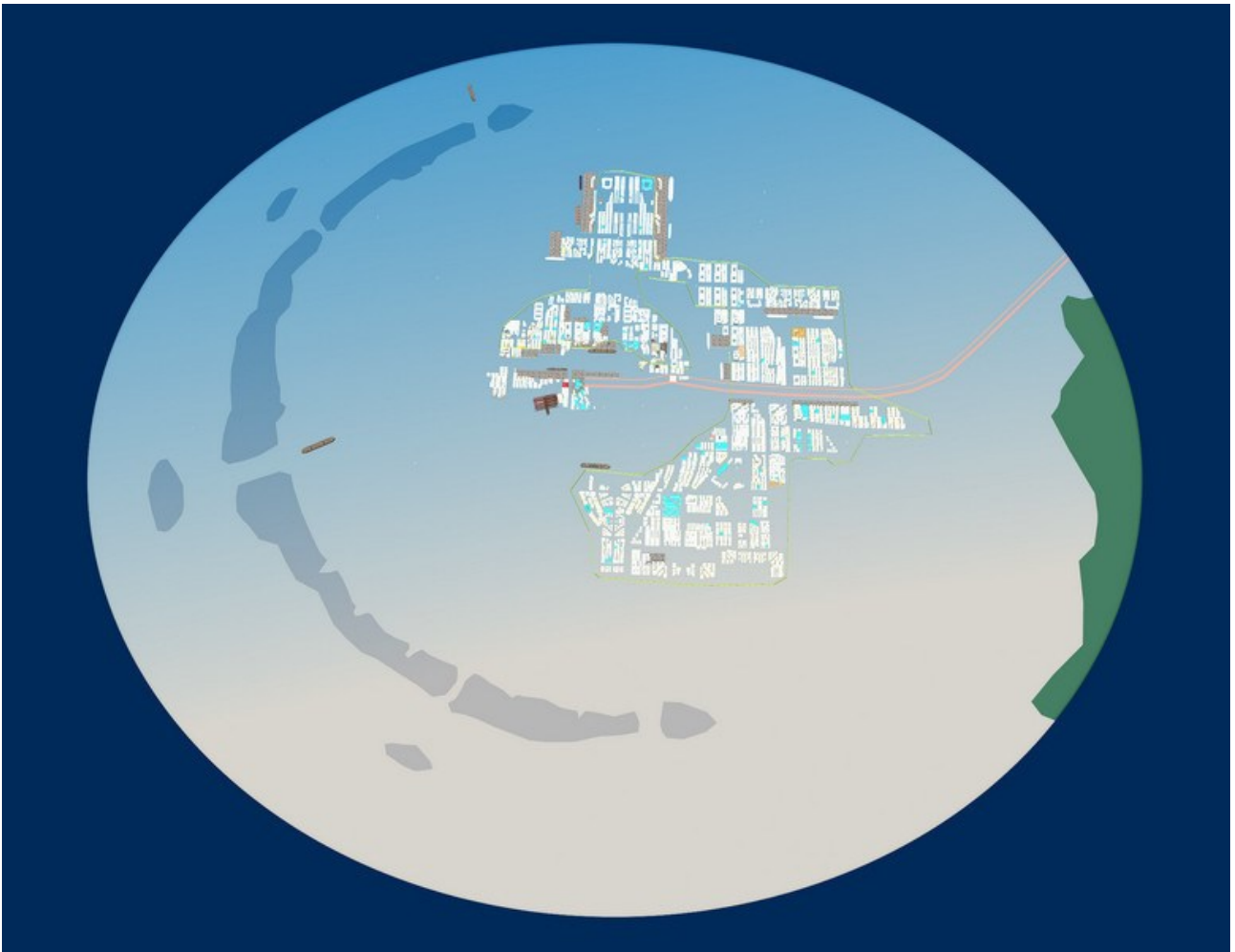




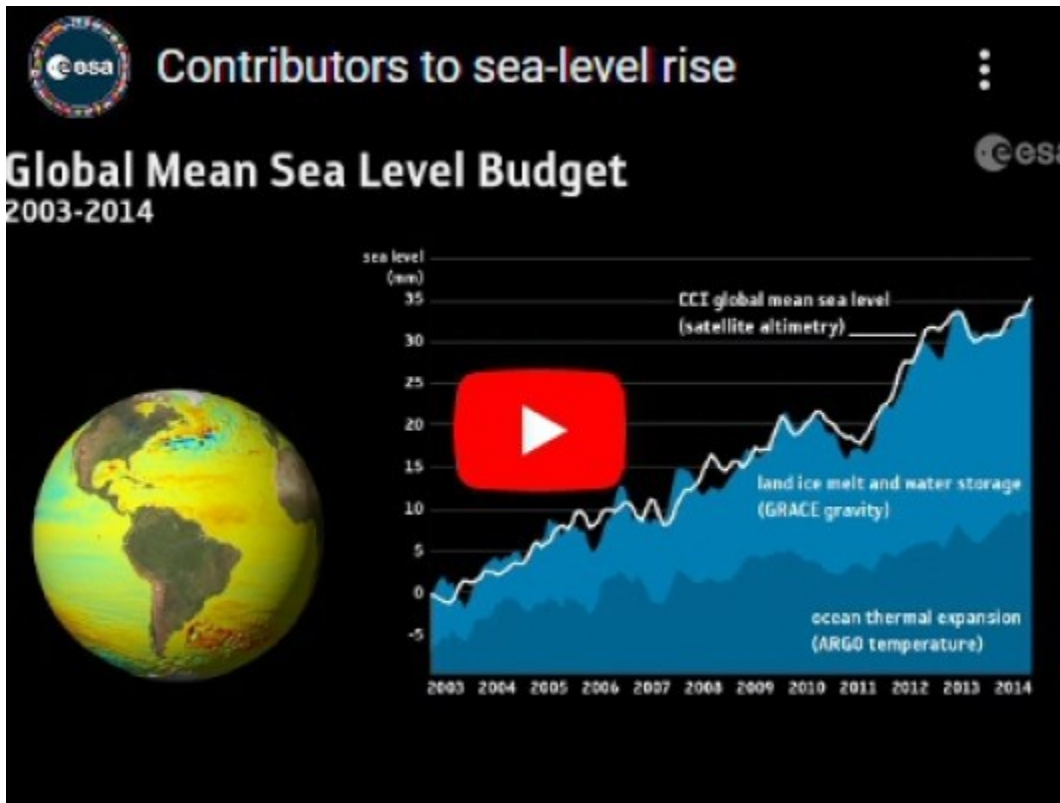




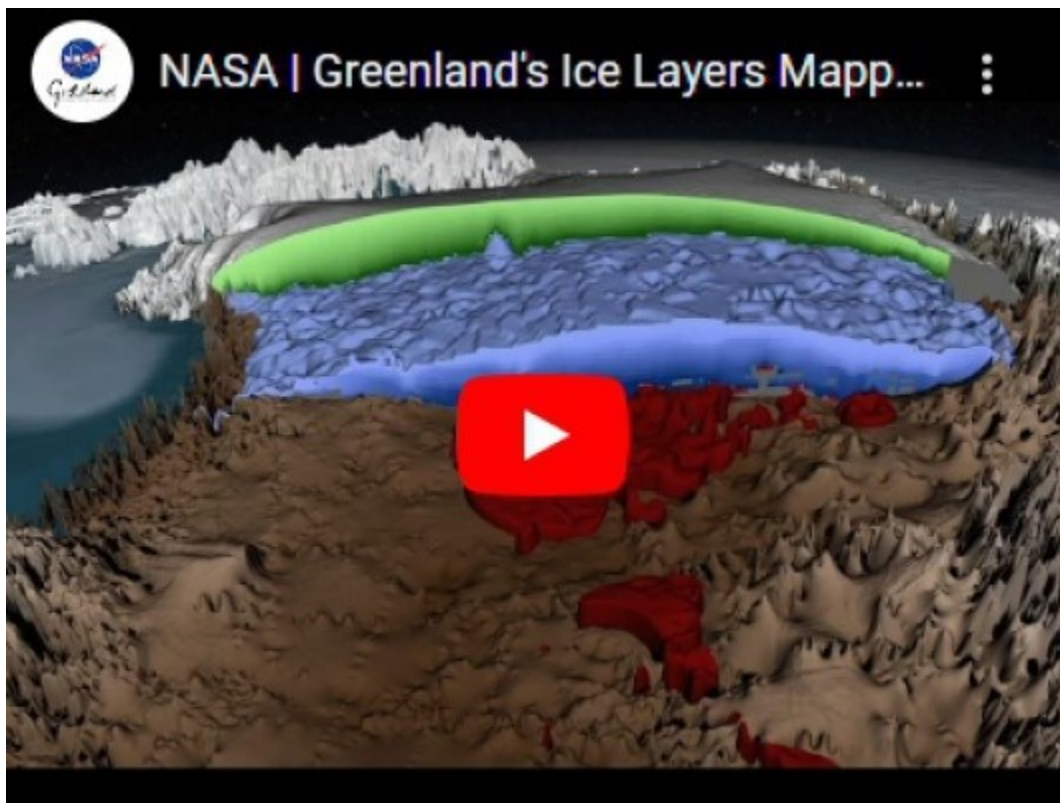




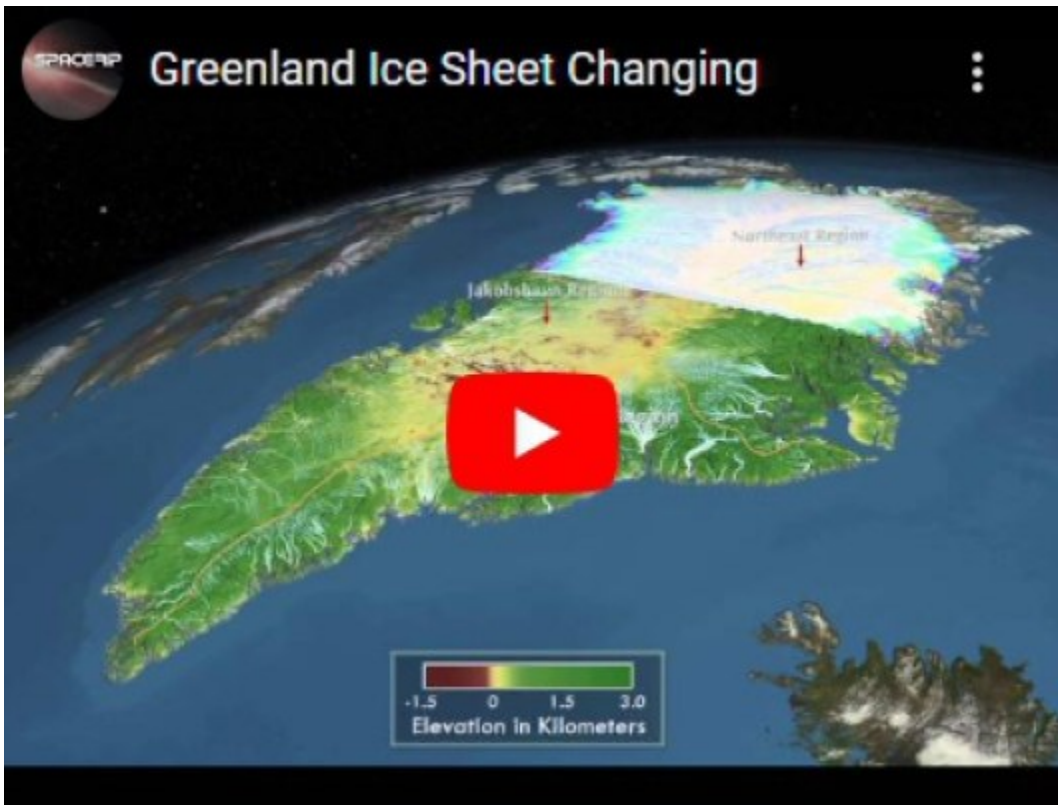
- [ESA CCI sealevel website](#), European Space Agency-Climate Change Initiative ;
- [ESA Sea-level rise](#) ;
- [ESA Sea-level rise and us](#) ;
- [ESA Sea-level rise is not uniform](#) ;
- [ESA Causes of sea-level rise](#) ;
- [ESA Contributors to sea-level rise](#) :



- [NASA-National Aeronautics and Space Administration, U.S.A.: "Greenland's Ice Layers Mapped in 3D", 2015:](#)



- [NASA-National Aeronautics and Space Administration, U.S.A.: "Greenland Ice Sheet Changing", 2014:](#)

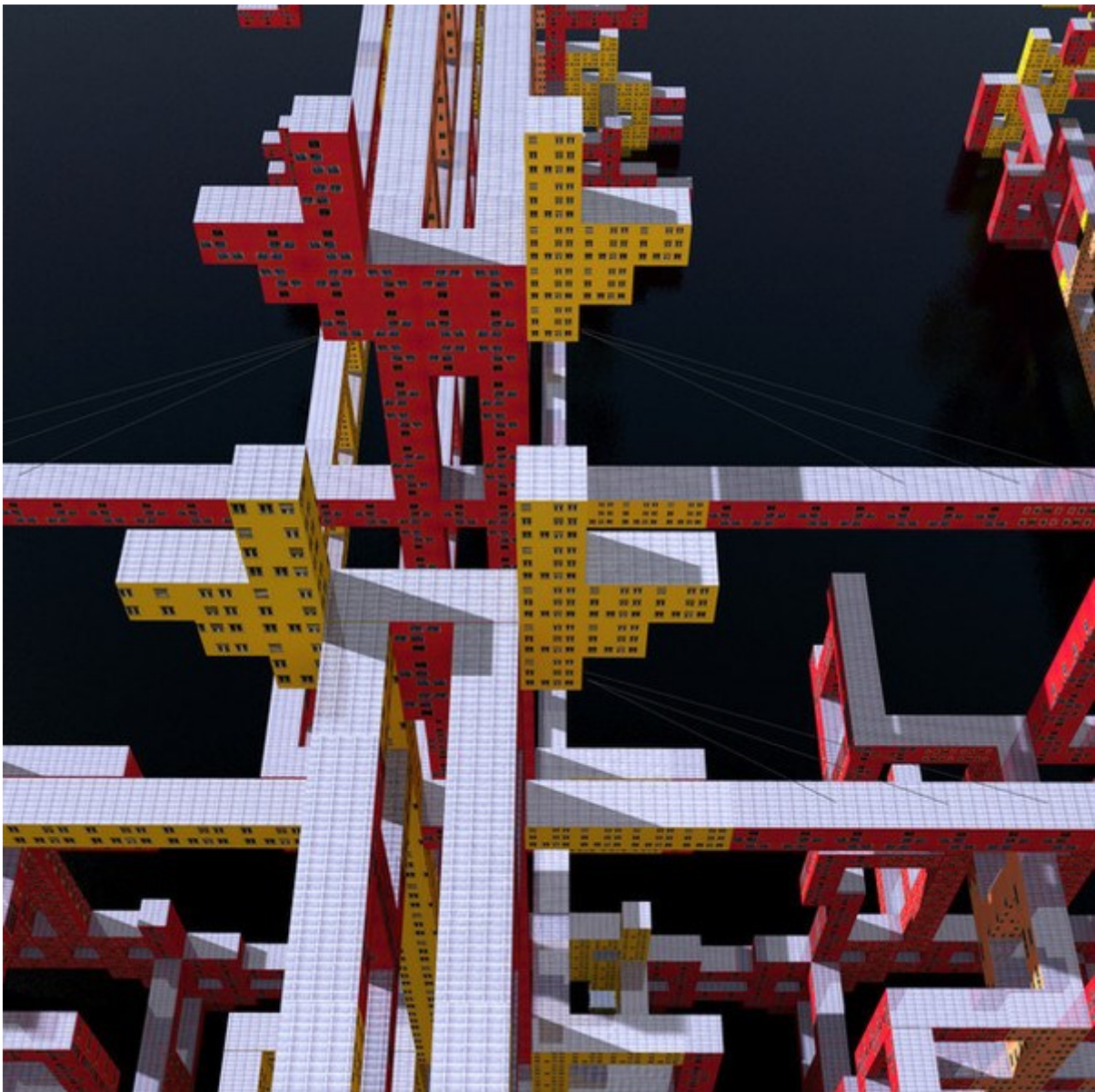


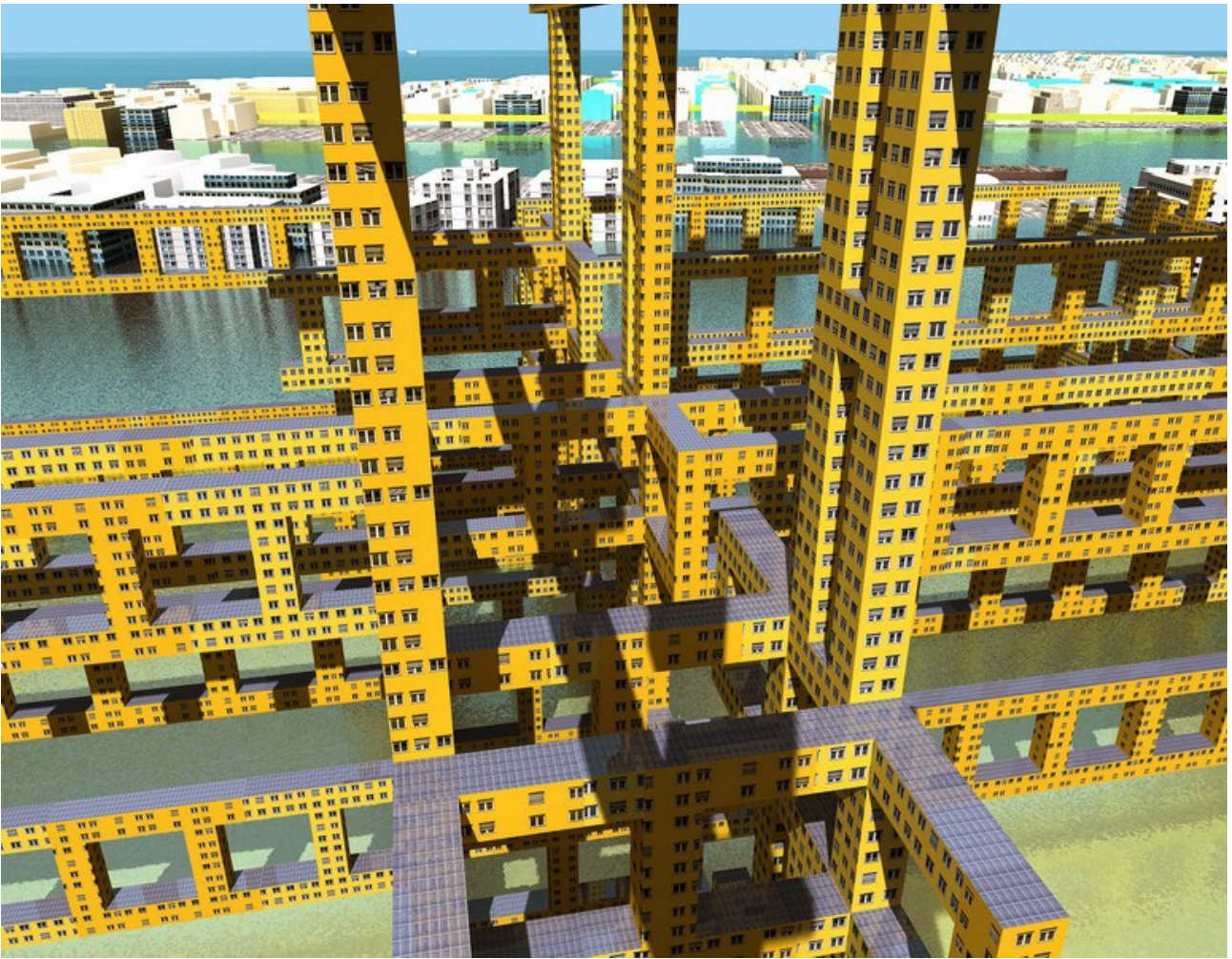
- **NASA-National Aeronautics and Space Administration, U.S.A.:** "The Bedrock Beneath", 2013:



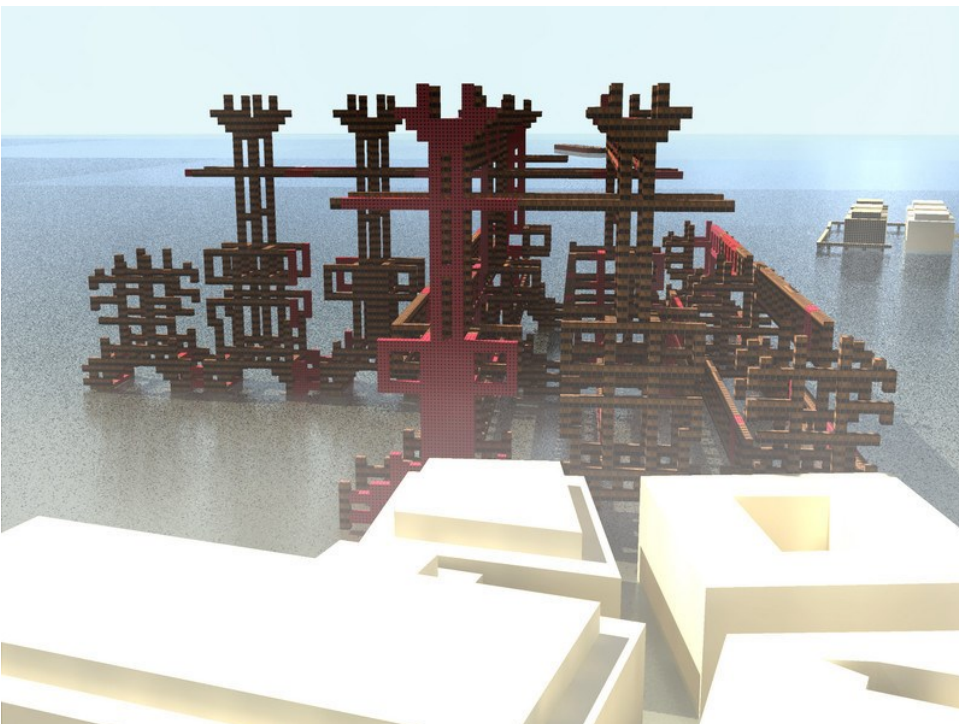
# THE CRANE VILLAGE

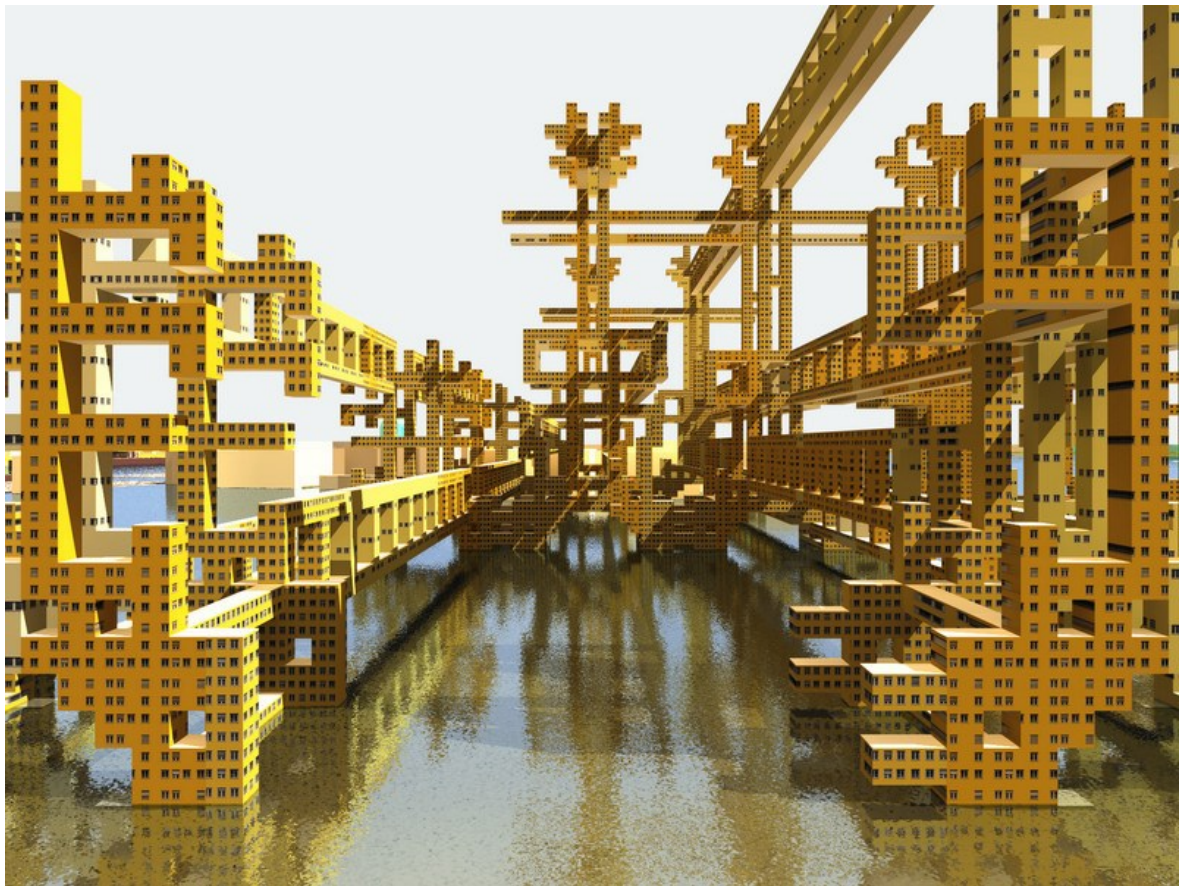
*by Michele Leonardi architect ©  
April 2007 - concept; January 2014 – reloaded.*

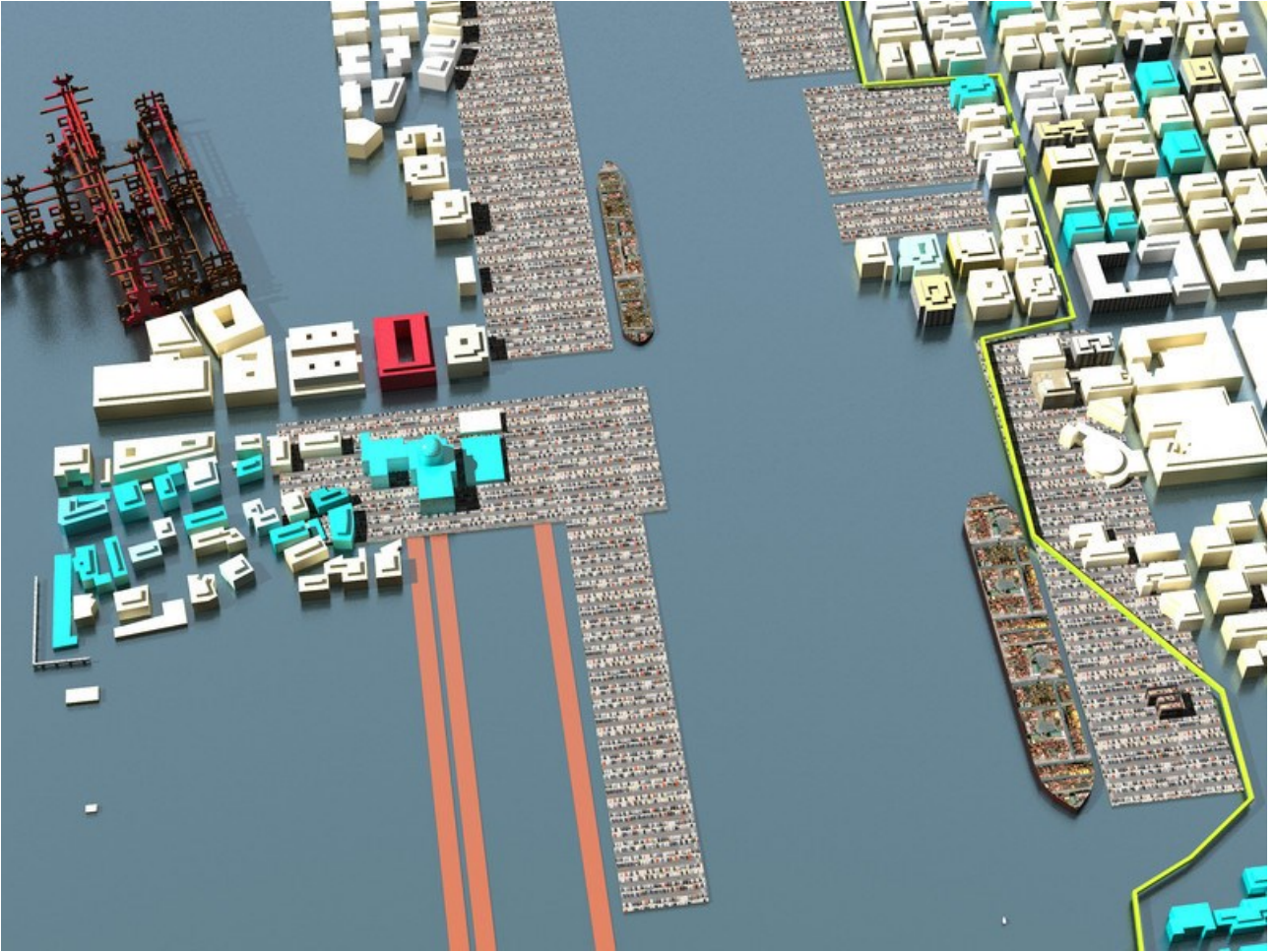




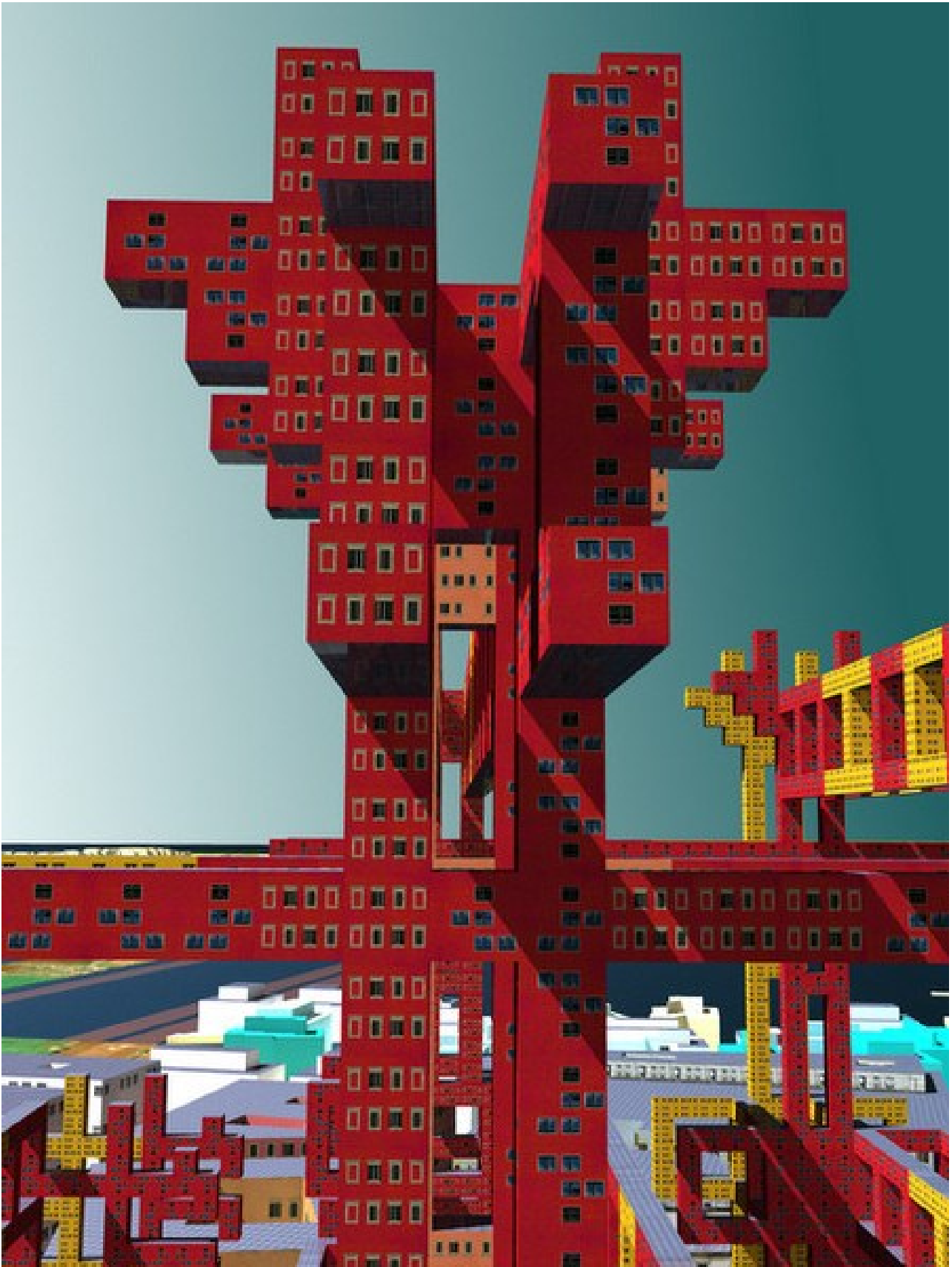
*design and renderings  
by Michele Leonardi architect © all rights reserved*

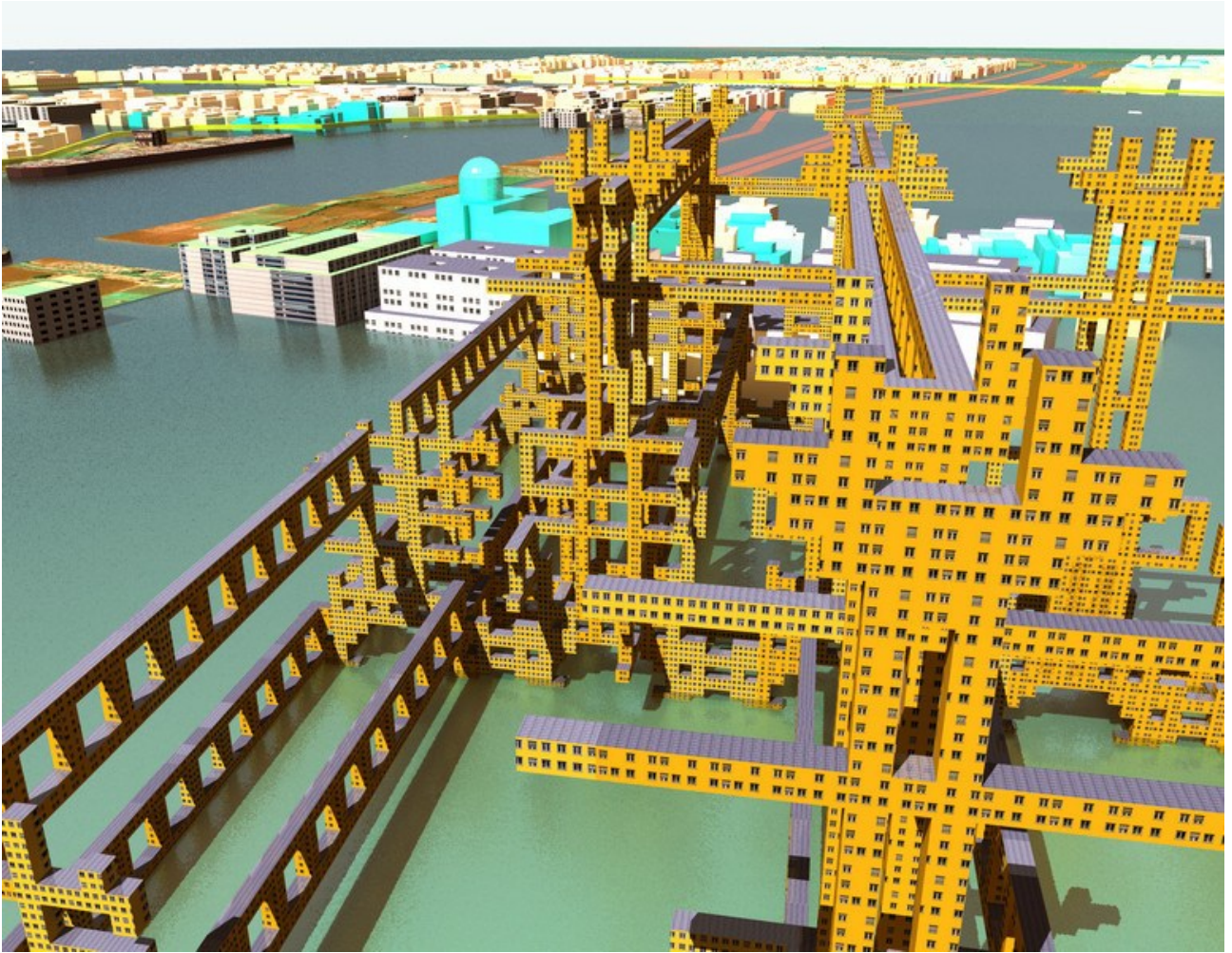


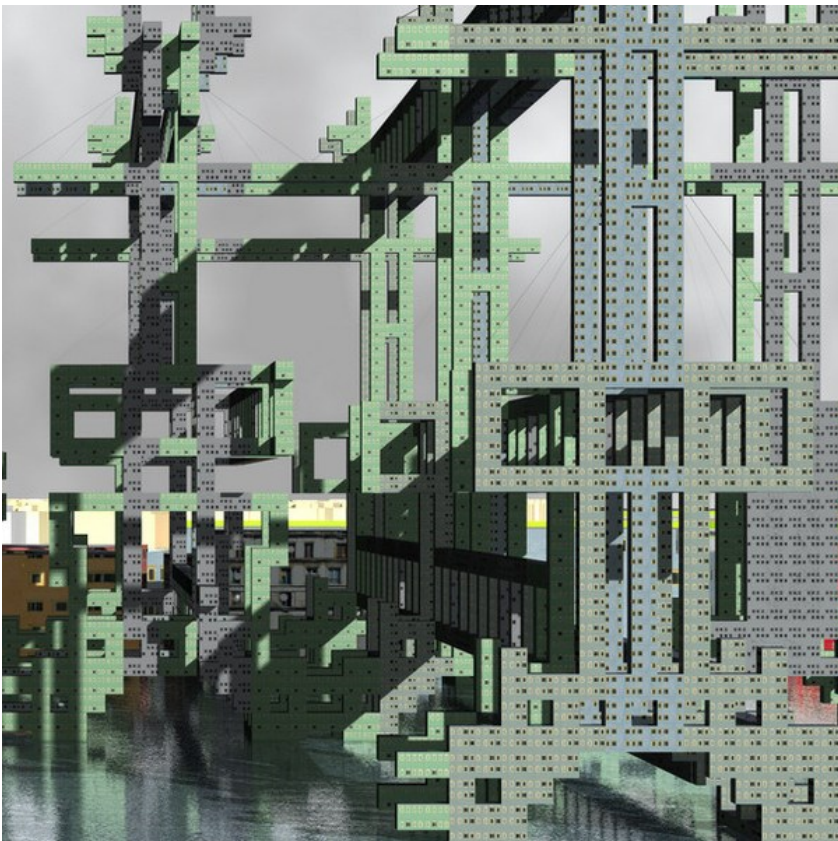


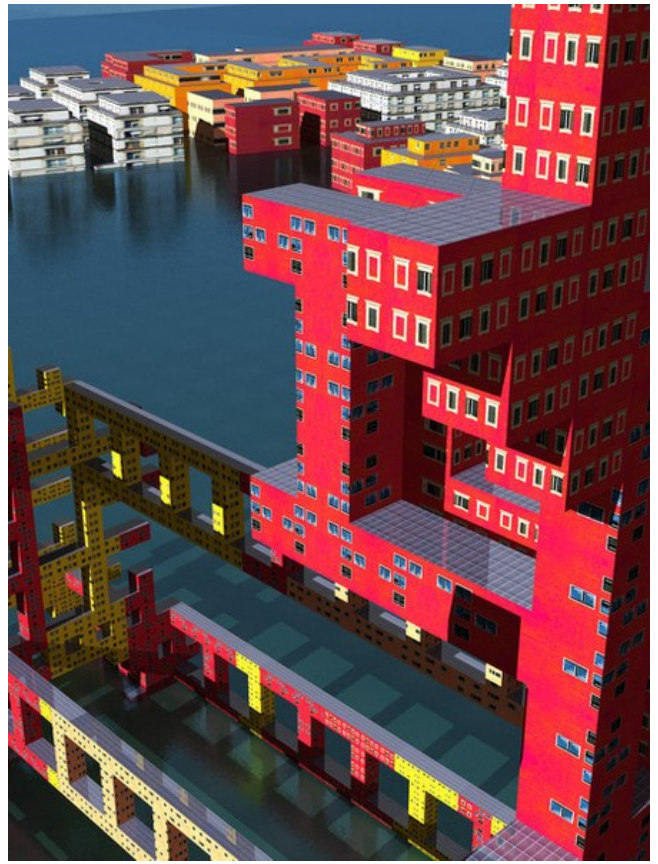




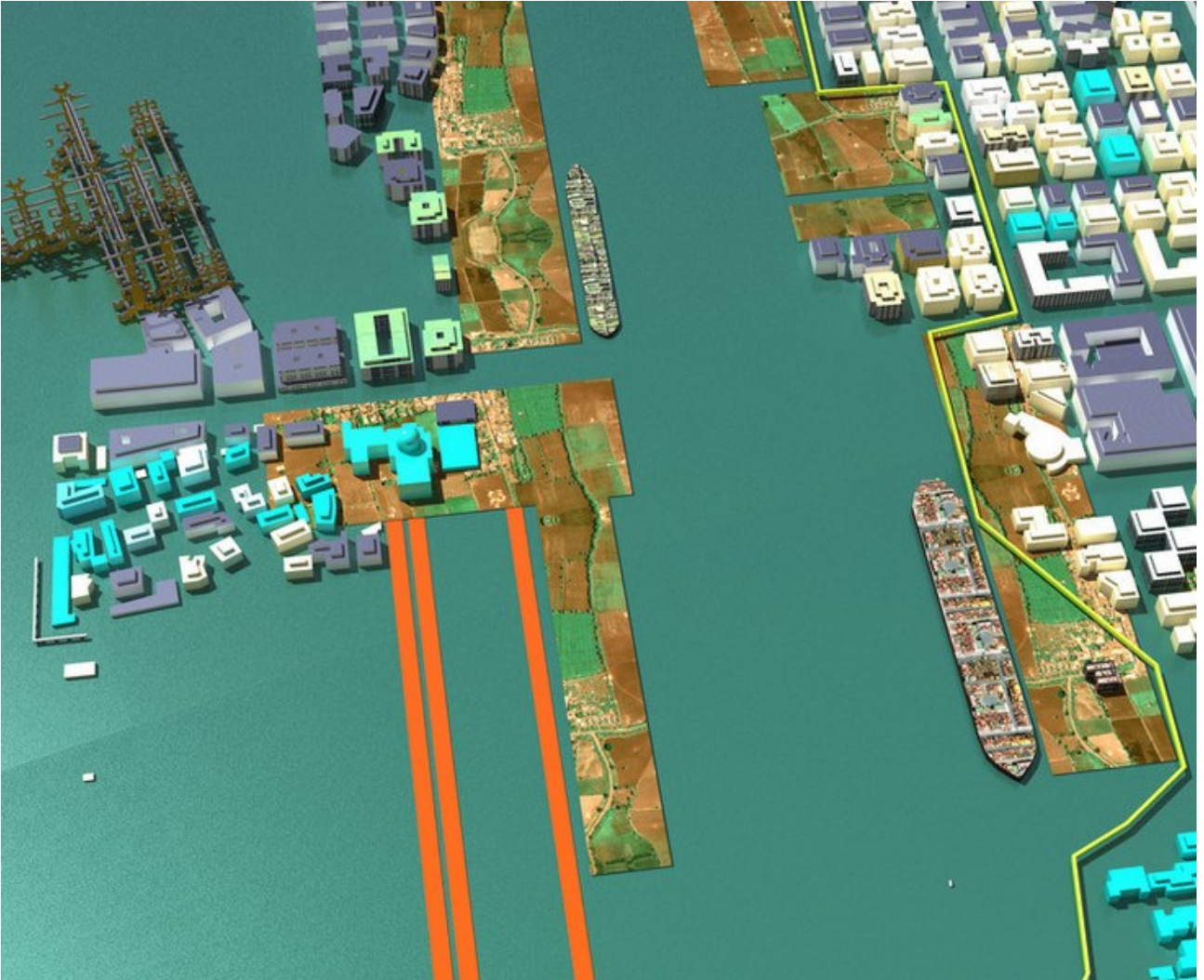


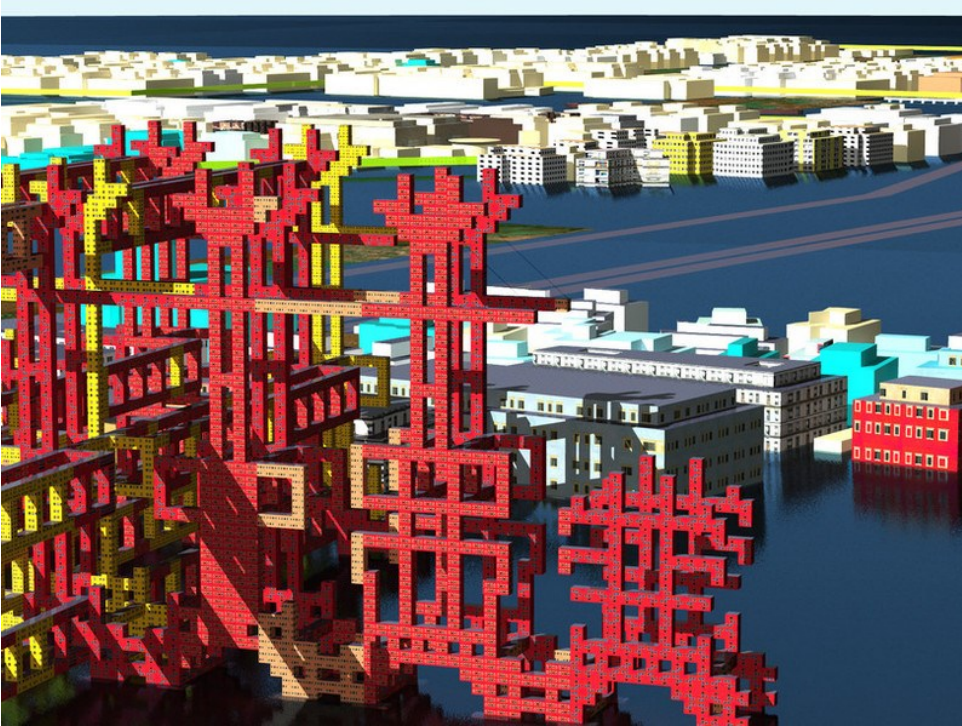


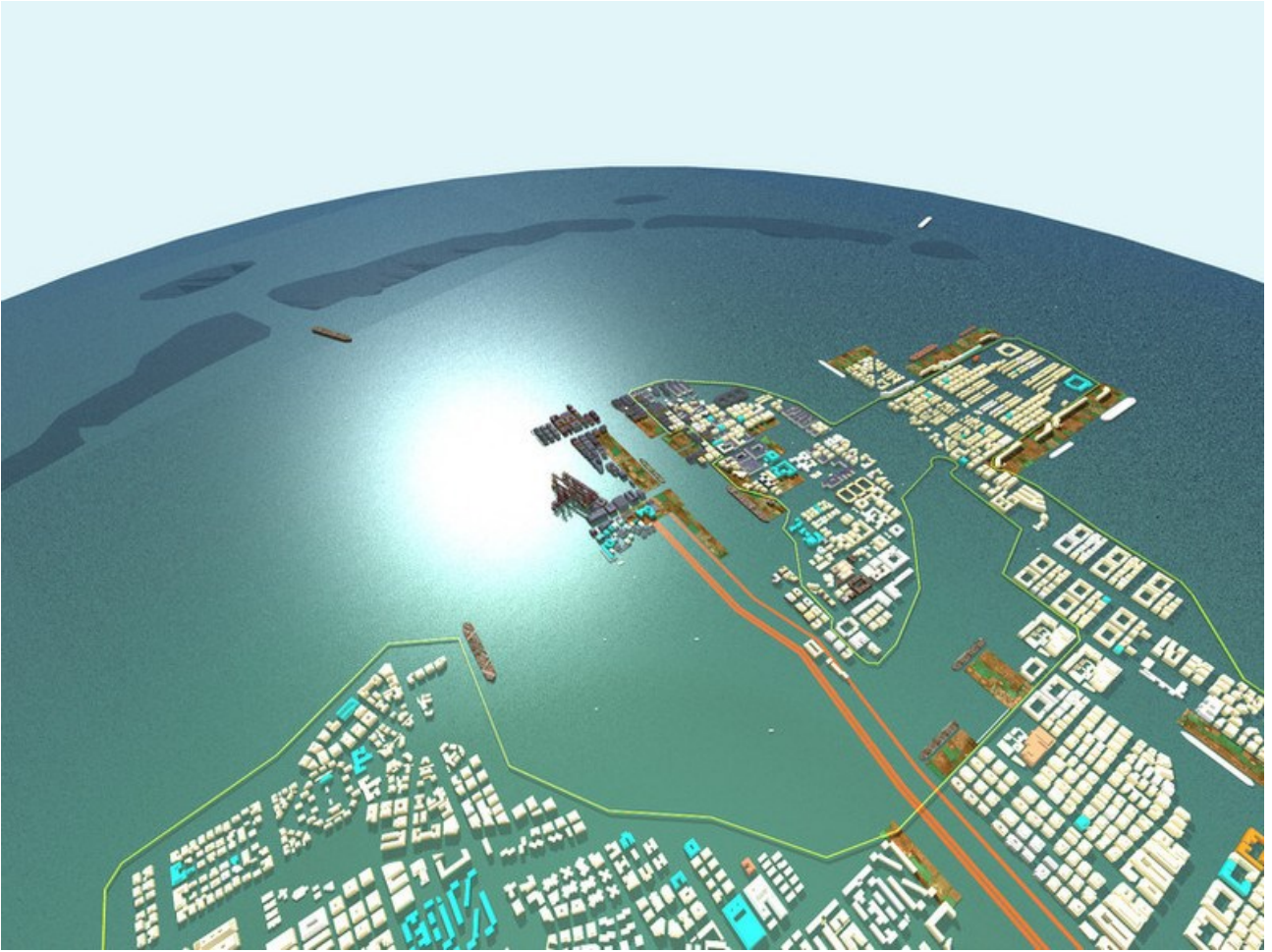














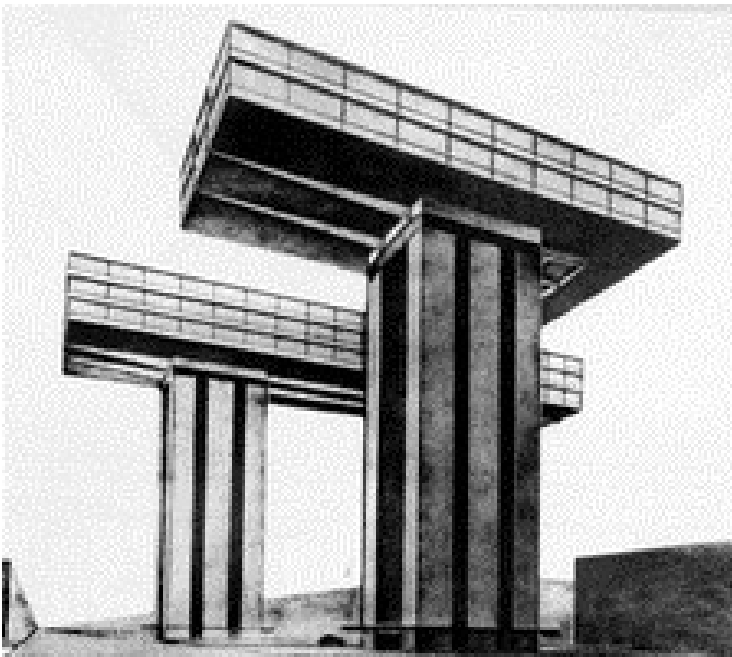
# REFERENCES

Below are some references of the collective imaginary regarding projects that have characteristics similar to the "Crane Village" concept.

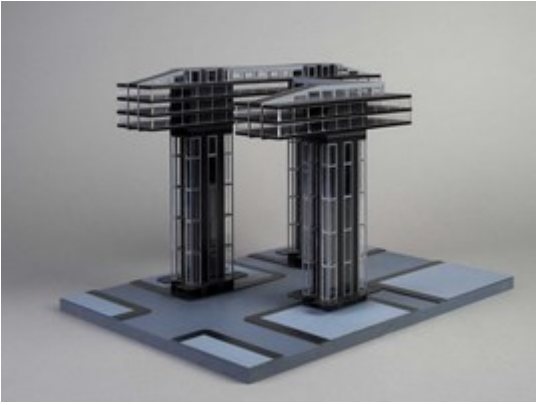
Actually, when I imagined Crane Village in 2007, but also when I reworked it in 2014, I didn't have any of the following projects in mind. In fact, I had started from something completely different.

That is I started from the idea of a wooden building, on a much, much smaller scale, intended for a Scandinavian location in Northern Europe. I was thinking about the Vikings, blacksmiths and shipwrights, and about the Russian Orthodox churches. A building as tall as six men stacked on top of each other, or a little more. And wooden. So nothing to do with the excellent, intelligent and "DIY" children's games of Meccano and Lego (miniaturized systemic constructions to play). Nor with certain representations of simplified skyscrapers present in the magnificent works of Mordillo. Nor could I have thought of certain skyscrapers near Central Park in Manhattan, New York, that did not exist at the time. Nor did I even think of the time to the following fabulous, visionary, eternal projects and realisations, who tell us that the way is already open. "Alea iacta est", the die is cast.

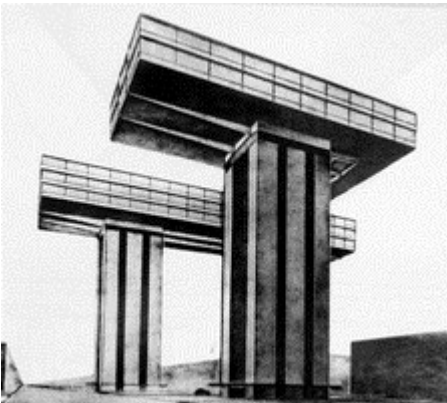
To say another, in particular on the horizontal photovoltaic panels depicted in the Crane Village renderings: still in 2014 there was no similar commercial product, as far as I knew then and still, but a few years later exactly the panels came out on the market horizontal photovoltaic systems, while before to achieve their purpose they had to be installed inclined and towards the south. In short, it didn't take much to imagine that there would have been a subsequent improvement of this technological energy production system, an efficiency improvement, which currently allows them to be oriented almost as desired: horizontally, vertically, etc.



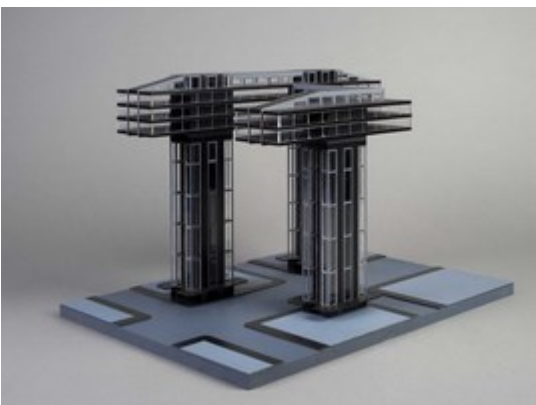
*The "Horizontal Skyscrapers" in Moskov, Russia,  
a visionary design by Lazar Markovich "El" Lissitzky Architect, 1923-1925.*



*Model of the "Horizontal Skycrapers" by El Lissitzky, 1923-1925.*



*Project for "8 Horizontal Skycrapers" in Moskow, Russia, by (Lazar Markovich) "El" Lissitzky architect, 1923-1925.*



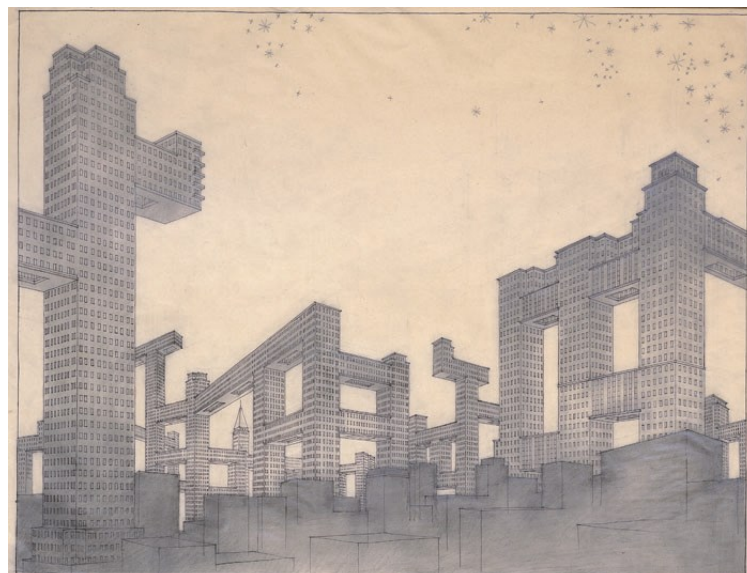
*Model of the "Horizontal Skycrapers" by El Lissitzky, 1923-1925.*

I also discovered this incredible realization later, a few years ago, maybe in 2016:  
"The Georgia Bank Headquarters" in Tbilisi, Georgia, by Giorgi Chakhava and Zurab Jalaghania architects, 1974:





Another reference: since there is no mention of it in the most important texts on the history of modern and contemporary architecture, thanks to the Internet and the website of the "Piero Portaluppi Foundation", recently, in retrospect to my conception of "Crane Village" (still only a concept), I discovered the existence of following project by the Italian and Milanese architect Piero Portaluppi (1888-1967), id est his "Hellytown", 1926:



A project which in turn brings to mind the later Torre Velasca (1958) by the Milanese Architects B.B.P.R.:

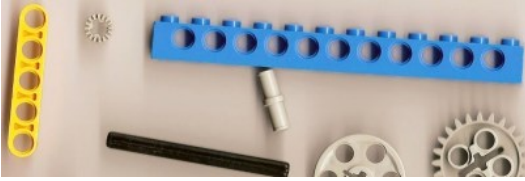


Always in retrospect, one of Kenzo Tange's (1913-2005) most futuristic and "strange" architectures comes to my mind: The Fuji Television Building in Tokyo by a master of modern and contemporary architecture like Kenzo Tange, 1996 (I have to admit that at the time I did not understand this work of Tange's, and it seemed to me almost a regression of him from the whole of his works, which are magnificent):



More references:

- 1) The "Lego Technic" components, a perfect example of "systemic constructions".
- 2) The skyscrapers in the famous drawings by **Guillermo Mordillo** (1932-2019).
- 3) And more recently the new skyscrapers in the Midtown Manhattan, near Central Park, New York, like the "432, Park Avenue" Condominium, a residential skyscraper (start 2011, foundation-2015 end):

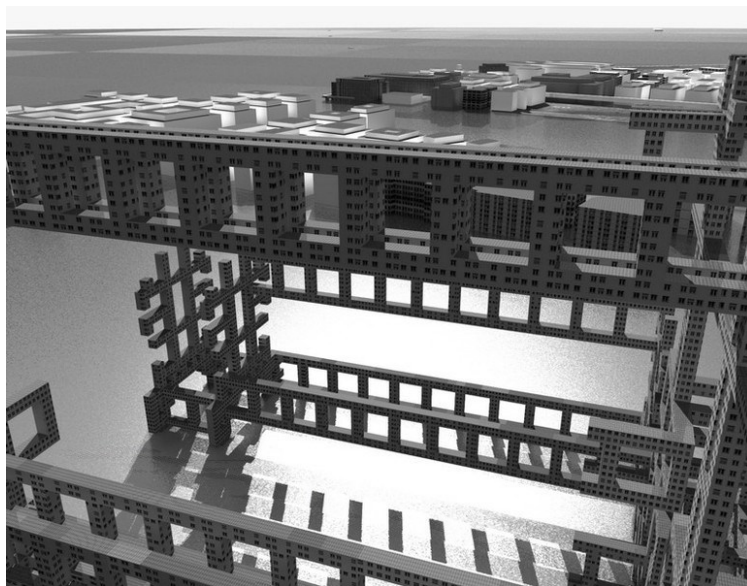


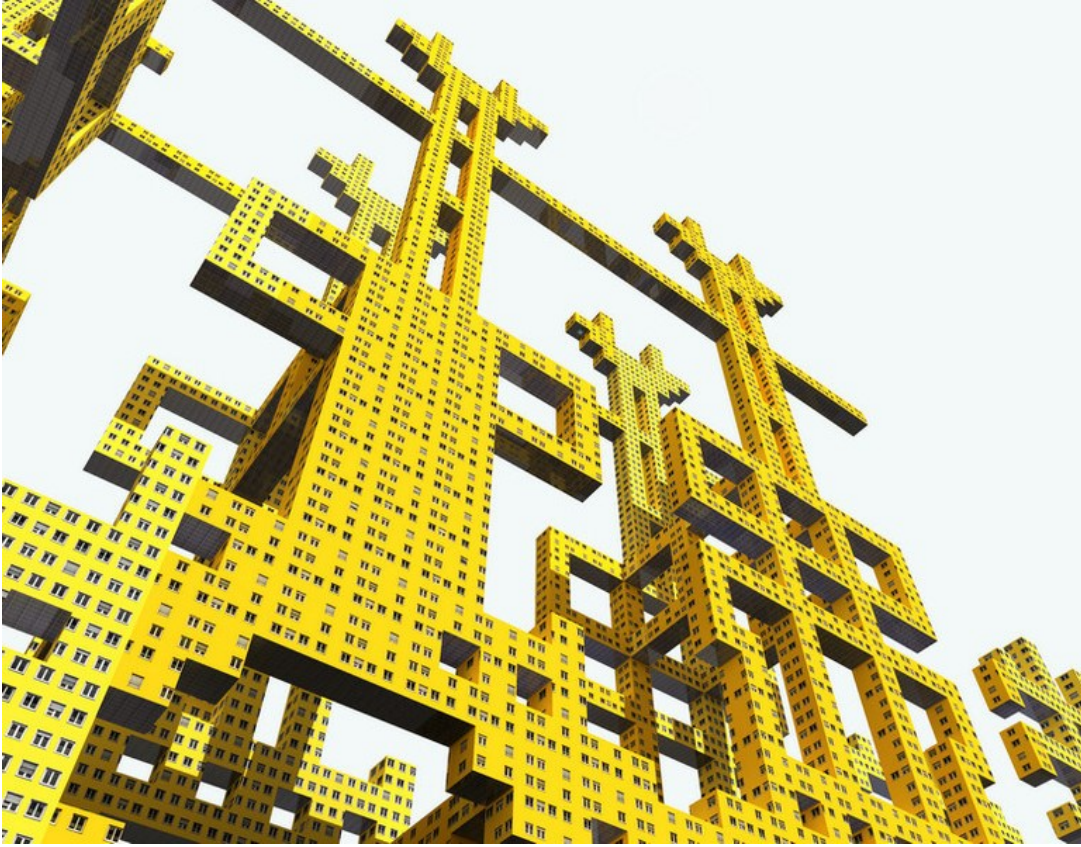
One more time, let's review "The Crane Village",  
only a concept of course, by Michele Leonardi Architect, 2007, 2014:









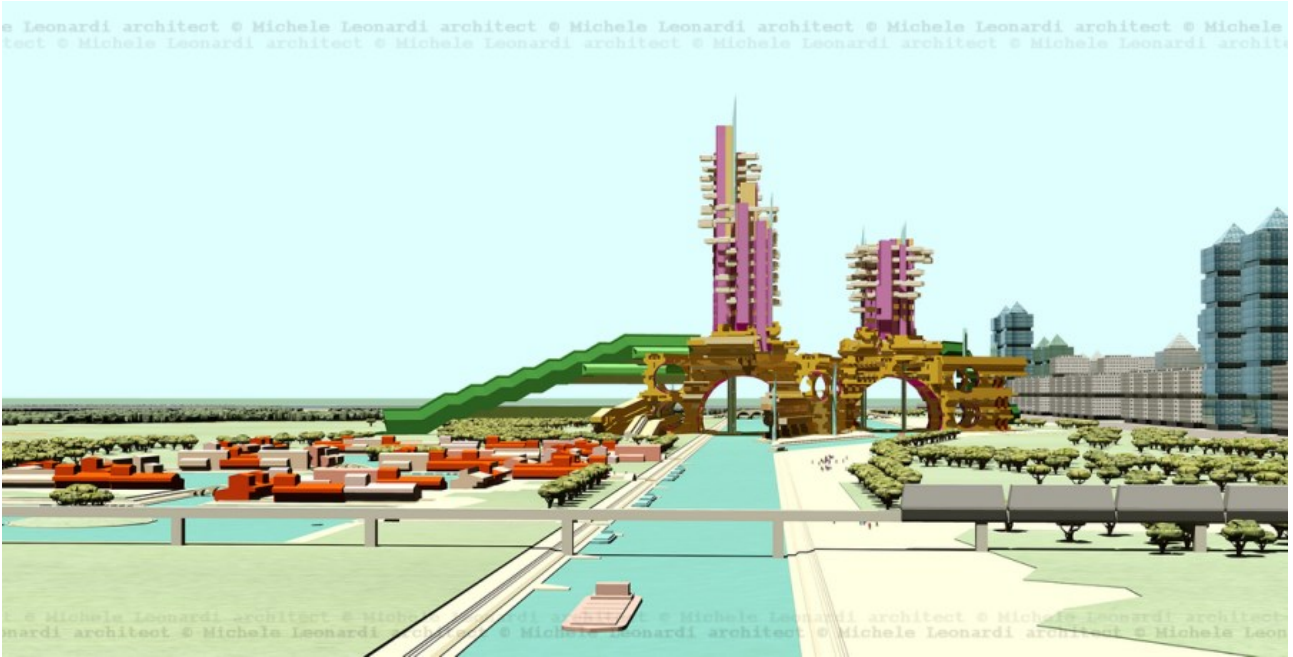


# TRANSITIONS

## from containers to the cells

*by Michele Leonardi architect © March 2014*





## THE MATHEMATICAL SUM:

$$1 + 1 = 2$$

( containers, bookcases, parkings, boxes, graveyards )

## THE BIOLOGICAL SUM:

$$1 + 1 = 0, \text{ or } =1, \dots, =4, =9, =12, \dots, \text{ etc.}$$

( cells, procreation, organisms, living systems )

## TOWARDS AN INDUSTRIALIZED HOUSING SYSTEM & PLUGIN CITY:

100% genuine contemporary architectures:



Residential "containers" in Leipzig, Germany.



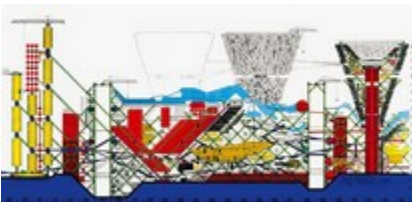
"Datoteca" in Zagreb, Croatia - Velimir Neidhardt architect, 2004.



"The Nakagin Capsule Tower Building" in Tokyo, Japan - Kisho Kurokawa architect, 1972 (demolished in 2022 c.).



"Lloyd's Building" in London, U.K., Richard Rogers architect, 1978-1986.



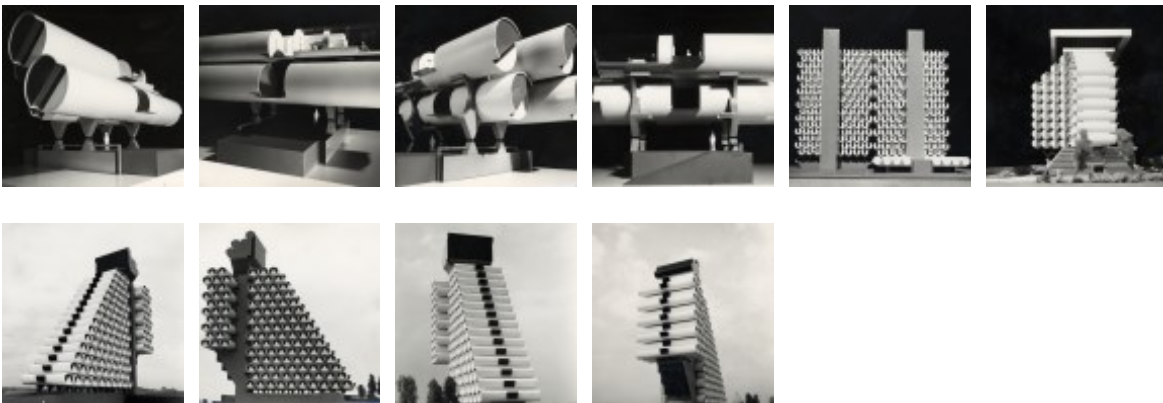
"Plug-In City", Max. Pressure Area Section, 1964, Archigram and Peter Cook architects.



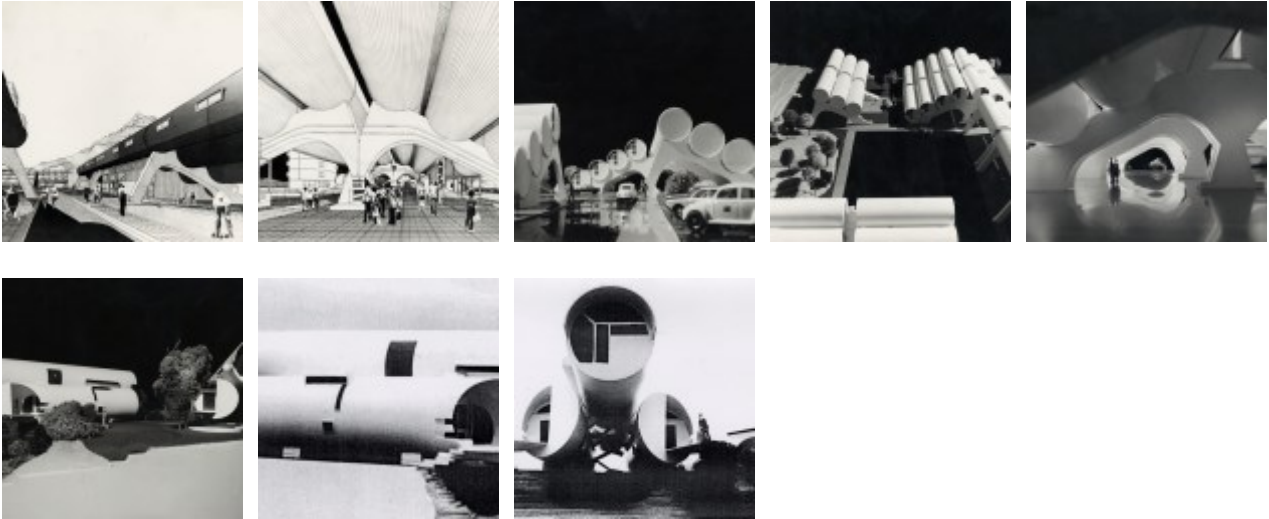
"Plug-in City" Reloaded, Alain Bublex artist, year 2000.



*Prototipo M.V.R. Monogetto Componibile* by Luigi Pellegrin architect , 1976  
**An industrialized housing system.**



**Hotel in Greece,**  
*Prototipo M.V.R. Monogetto Componibile* by Luigi Pellegrin architect , 1976.



**Emergency Habitat after earthquakes or natural disasters + Touristic Village,**  
*Prototipo M.V.R. Monogetto Componibile* by Luigi Pellegrin architect , 1976.



"Self Defence" in Paris, France,  
Stéphane Malka architect, 2009.

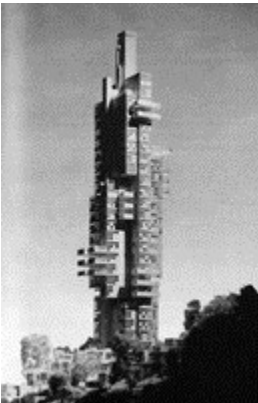


"Le Languedoc" University Residence in Rennes,  
France, O. Lucas, J. Badet, and L. Lagadec architects, 2011.



"Caterpillar House", Santiago de Chile, Chile,  
by Sebastian Irarrazaval architects, 2013.

*Hanssem Mass Housing*, Seoul, South Korea,  
by Richard Rogers Partnership architects, 1991.  
**Another industrialized housing system:**



From the book "Cities for a Small Country",  
Richard Rogers and Anne Power authors, 2000.



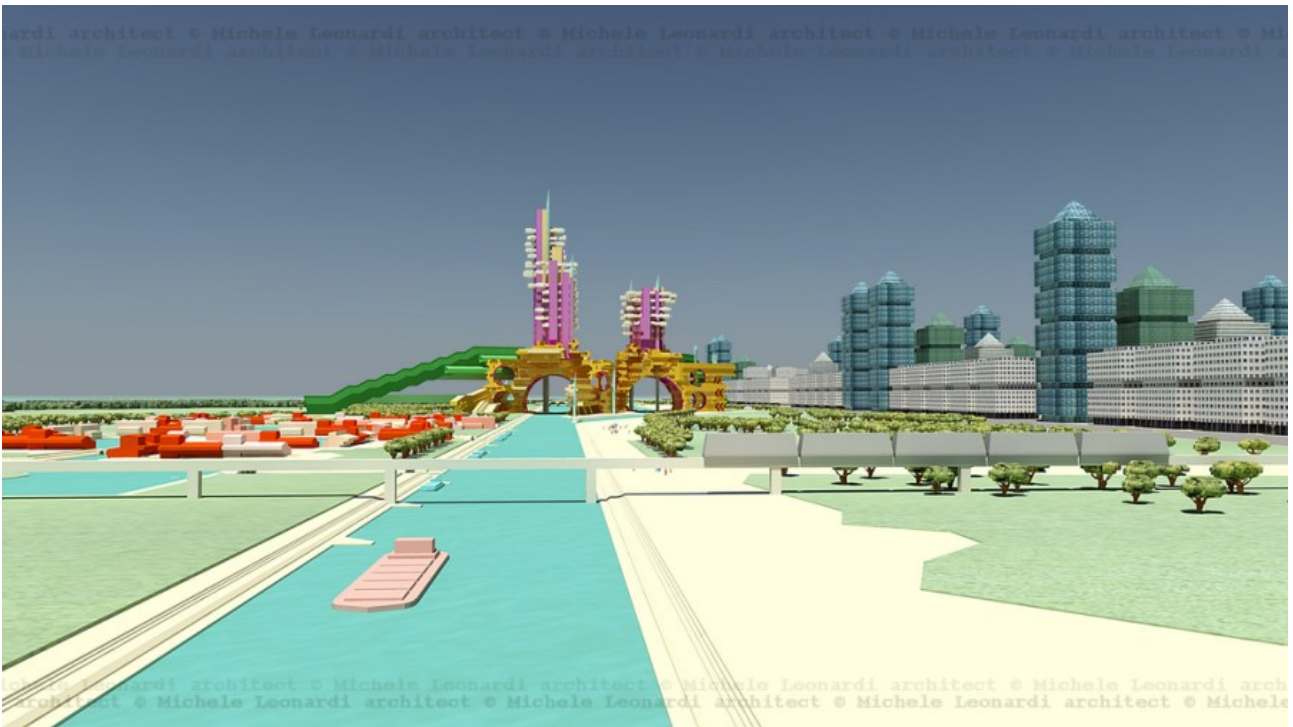
From the book "Richard Rogers + Architects",  
Editions du Centre Pompidou, Paris, France, 2007.



# TRANSITIONS

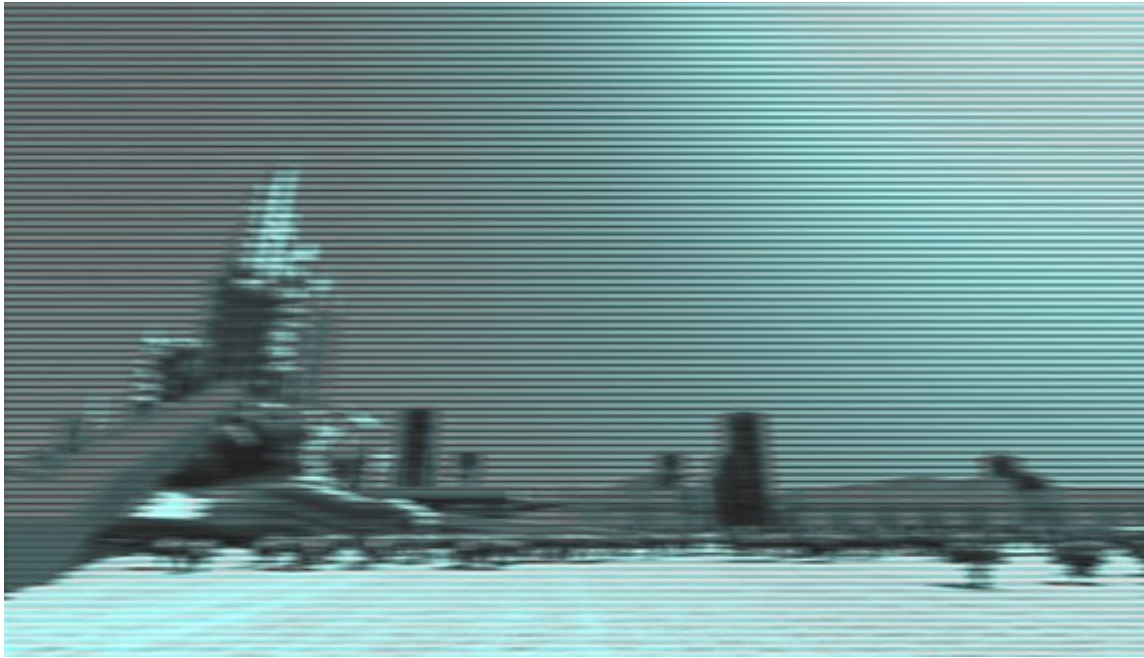
## from 2D flat-city to the 3D habitats

by Michele Leonardi architect © March 2014.



# TRANSITIONS

## from containers to the cells



# THE DEAD ARCHITECTURE

From Postmodernism to today: 40 years of lost time!

The genuine and collective architectural research has stopped to 70's, and from that time, the worldwide progress in architecture has been insignificant.

Don't you step out from logic of building box and the 2D crust: flat city, wedding cake of asphalt and concrete, cars and tombs.

This statements is not a new proposal for a new fake revivalism (= nausea), but the essence of an interrupted story. The fools have won a battle, but they will lose the war. You can not make fun neither God nor Nature for a long time. Sooner or later, the usual clever people will have to deal with the hard reality, physical, biological, and spiritual.

This is what I expose in my e-book "Verso un altro habitat" - Steps to another habitat", available only in Italian at the moment -, where I talk of need to build in a systemic way, and

**organic, looking at the context, between us and outside us. The need of a contemporary architectural language, accessible to all, first constructive, i.e. implicit in the building system, and consequently semantic.**

**Nature is systemic, dynamic, not green and embalmed! A stupid evergreen meadow spread up a metropolitan building roof is not natural, it's not even shit useful to fertilize, it's just hypocrisy. Meanwhile, we poor slaves of conformity, we pave the planet to give space to billions of expensive toys: cars, cars, cars, the new real citizens of terrestrial surface.**

**Space is not an abstract entity, space is never amorphous. Because Space of René Descartes is not just a mathematical space, but it's dynamic, living, fluid, vibrant!**

**The genius of Descartes has never conceived the physical space as the absolute vacuum, like the nothingness. He never confused the mathematical space with the physical one. The empty space at the border of matter exists only in the sick mind of who it conceives so.**

**In the past century, sixty years ago, the engineer Marco Todeschini has shown to all the world that we live in the appearances, he has ripped the Veil of Illusion: the appearances of reality, the interaction between the objective physical and biological reality, and the spiritual subjective reality. The hypocrite contemporary World has ignored it.**

**In the past century the architect Luigi Pellegrin has shown that it's possible to build to the scale of Gods, that is, the Human Scale. Another time the hypocrite contemporary World has ignored it.**

**The Man is not a machine, the Man has a will of its own, a spirit in a body, in an incredible biological machine, he has the free will, despite its strong material limitations. We can do very great things, even though we are very small in this infinite and mysterious universe.**

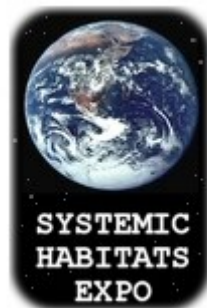
**The worst thing that can happen to a person and a civilization is only the spiritual death.**

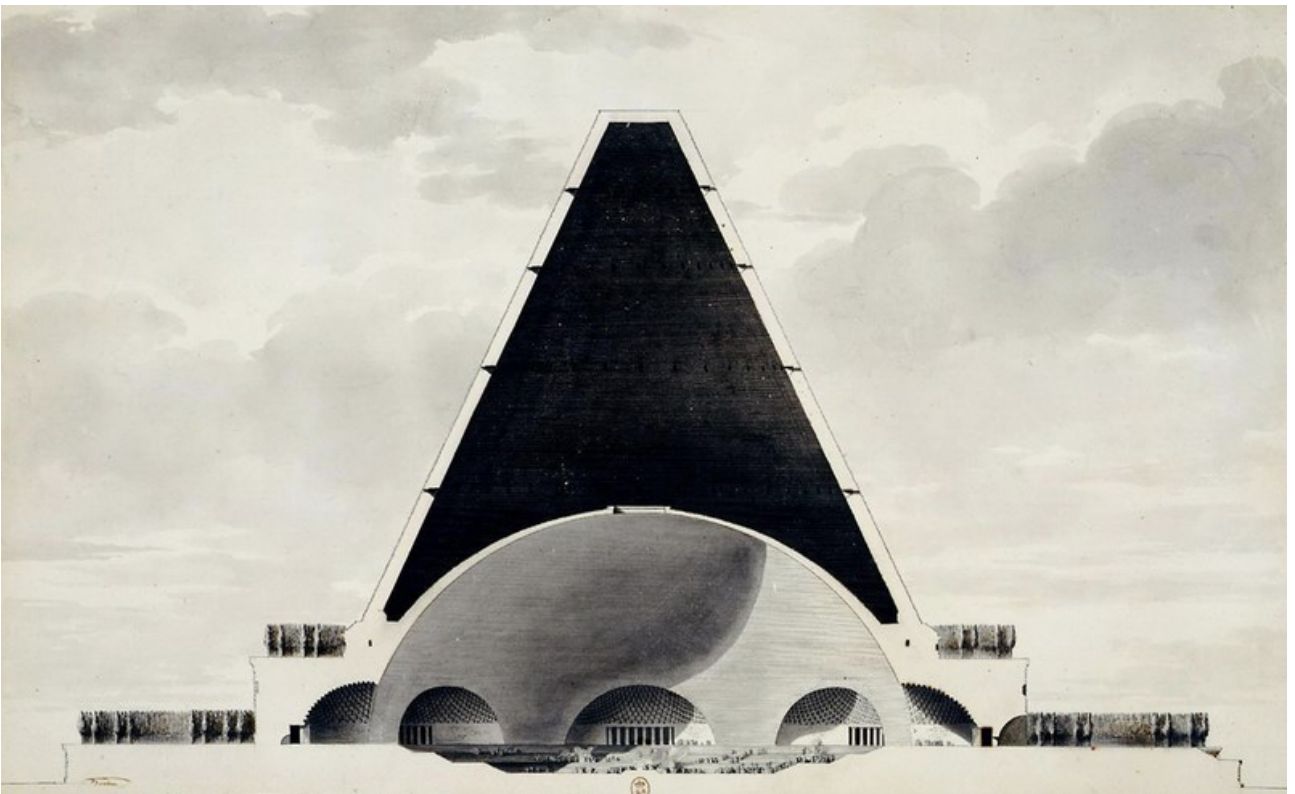
**Therefore: stay forever young, stay visionary!**

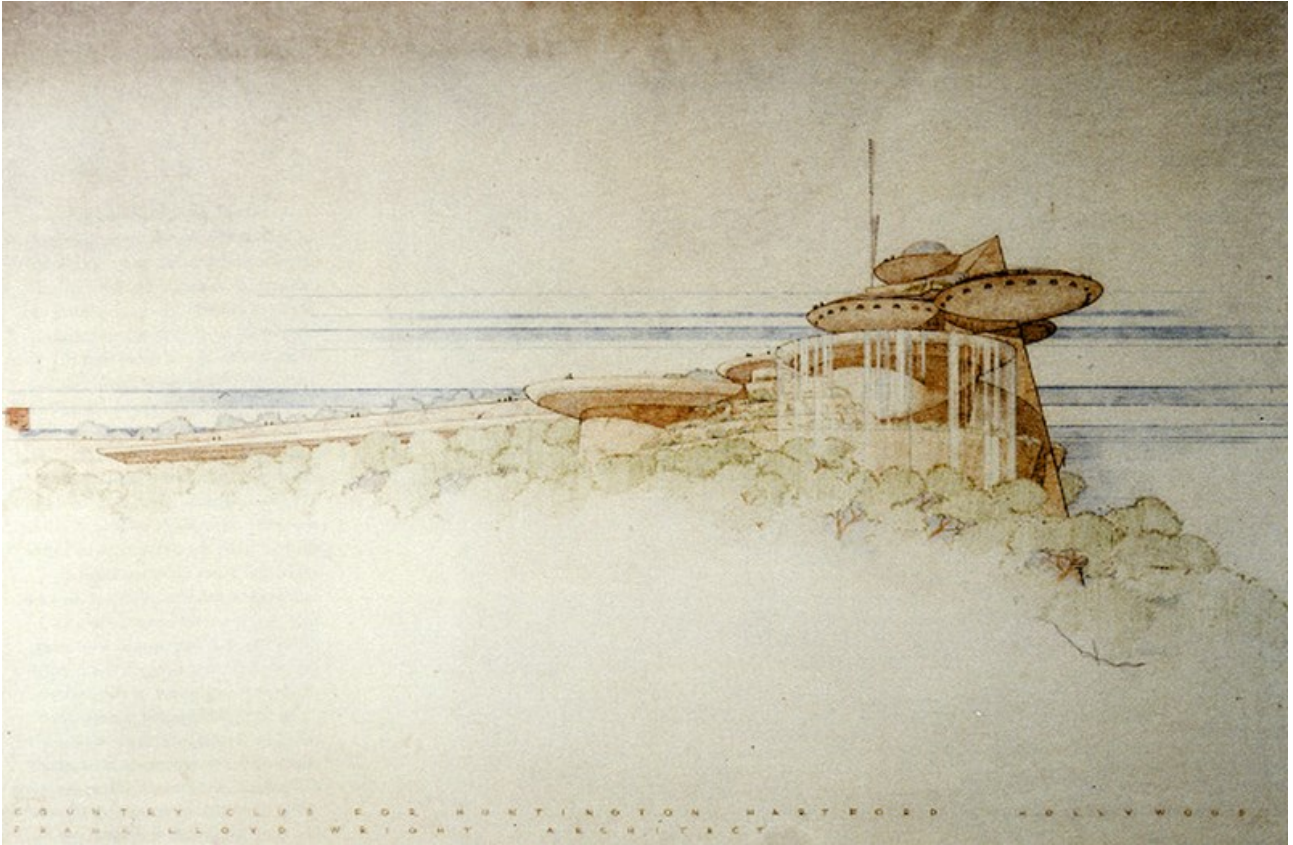
**Your “little” drawings are the measure of your terrible power.**

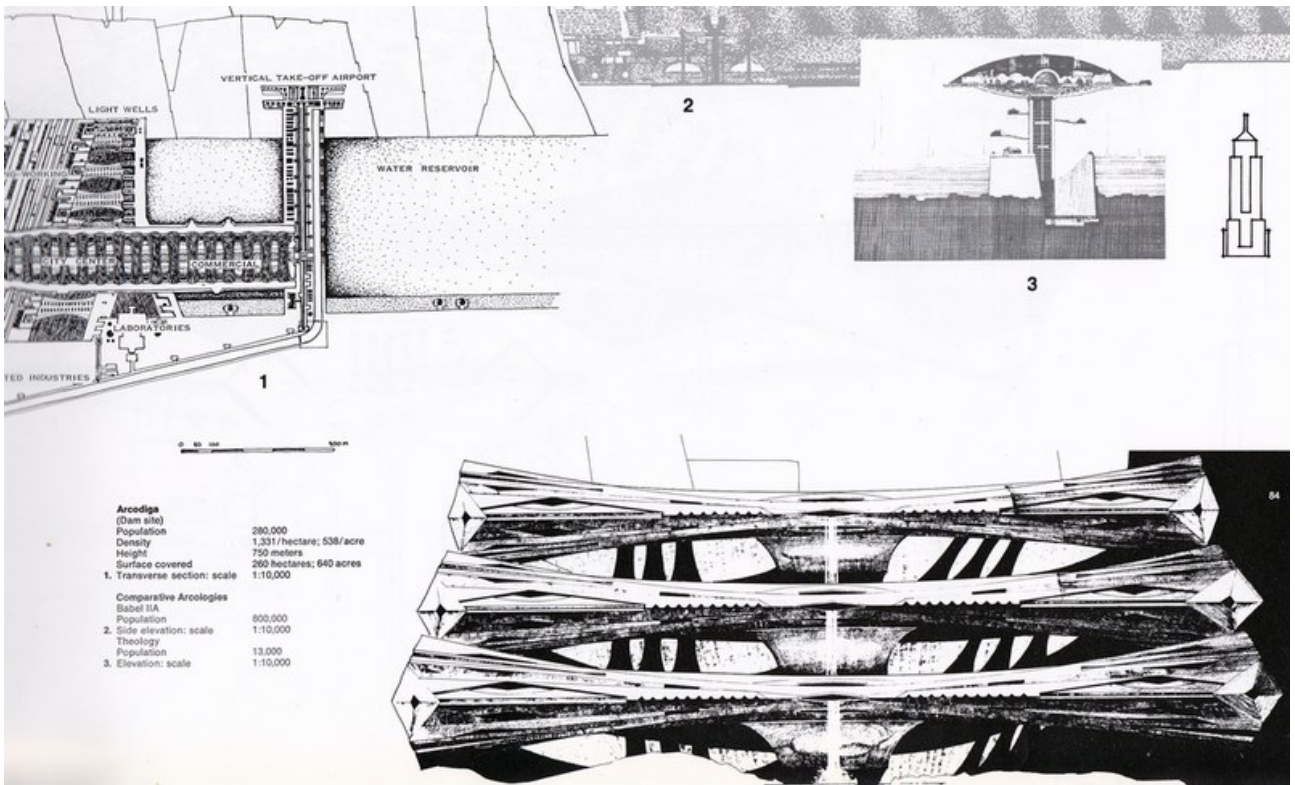
**Because your little drawings are very scary to the hypocrites, because they know that where we are going, they are useless their empty frivolous words.**

**Future needs dreams and desires. Without Vision there is not Future, without Future there is neither Present.**





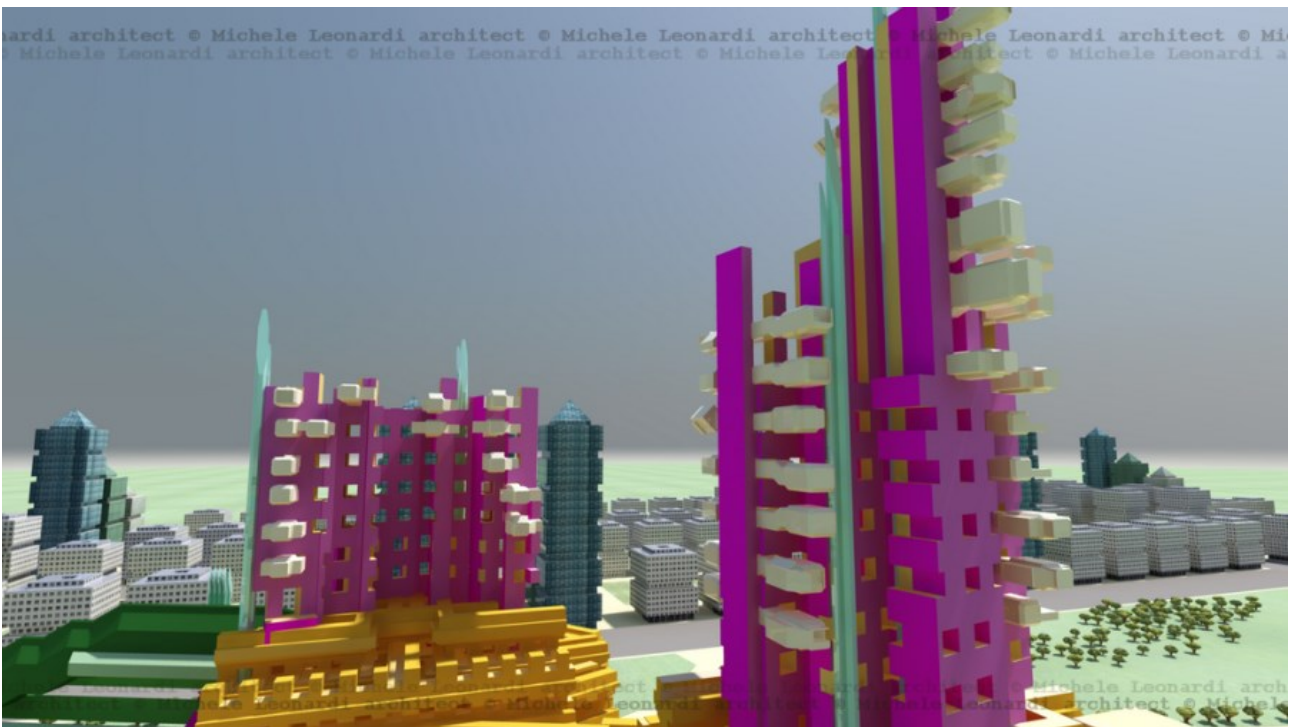




# TRANSITIONS

## from containers to the cells

*by Michele Leonardi architect © March 2014.*



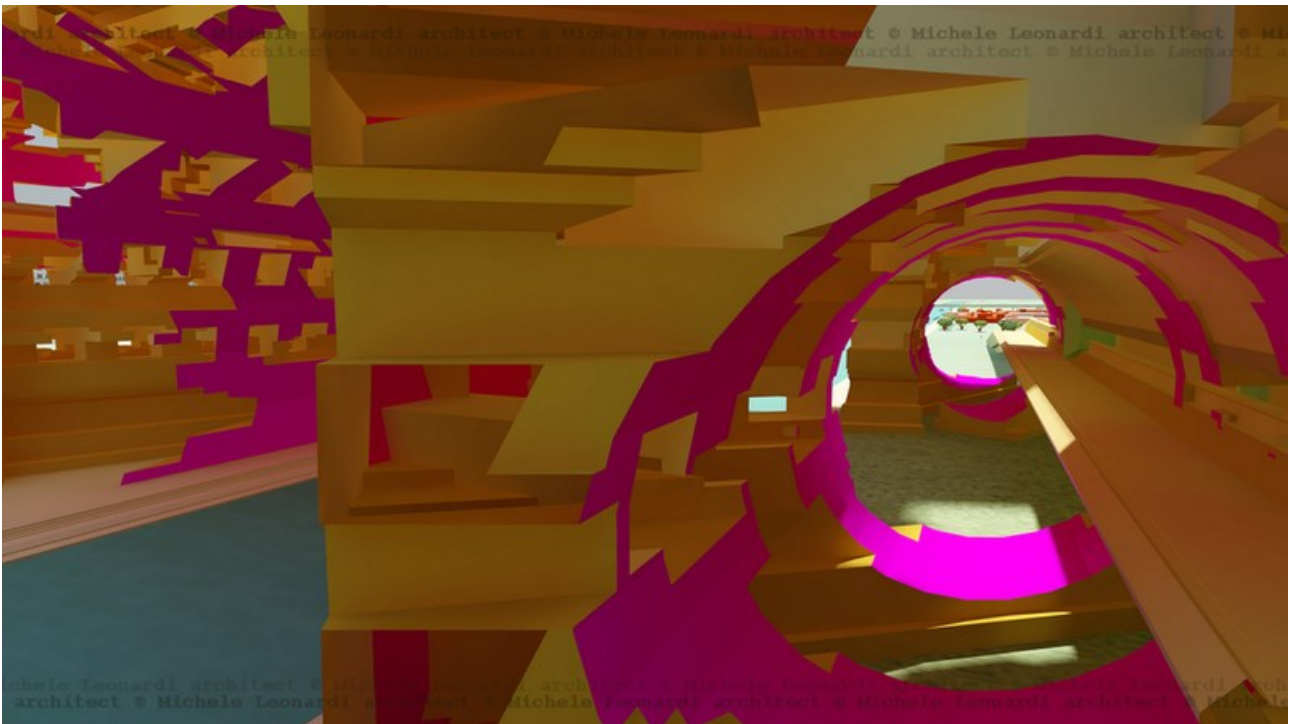
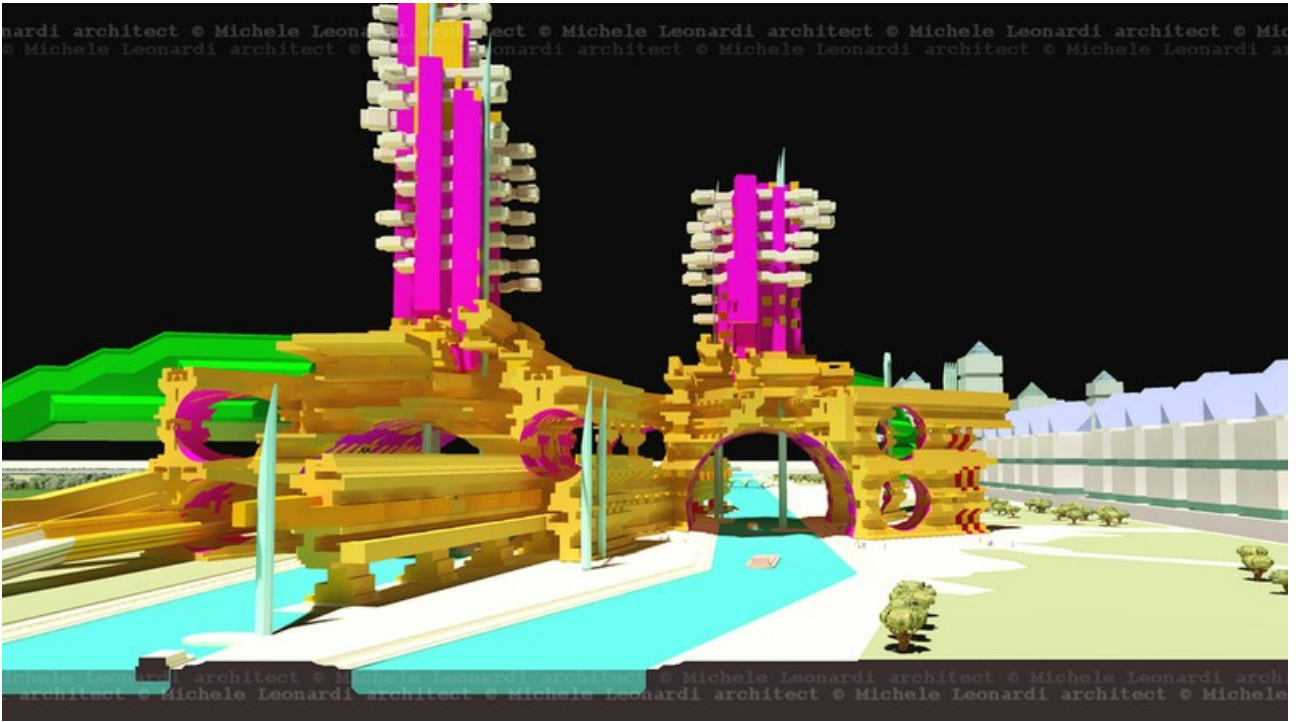


## NO CITIZEN

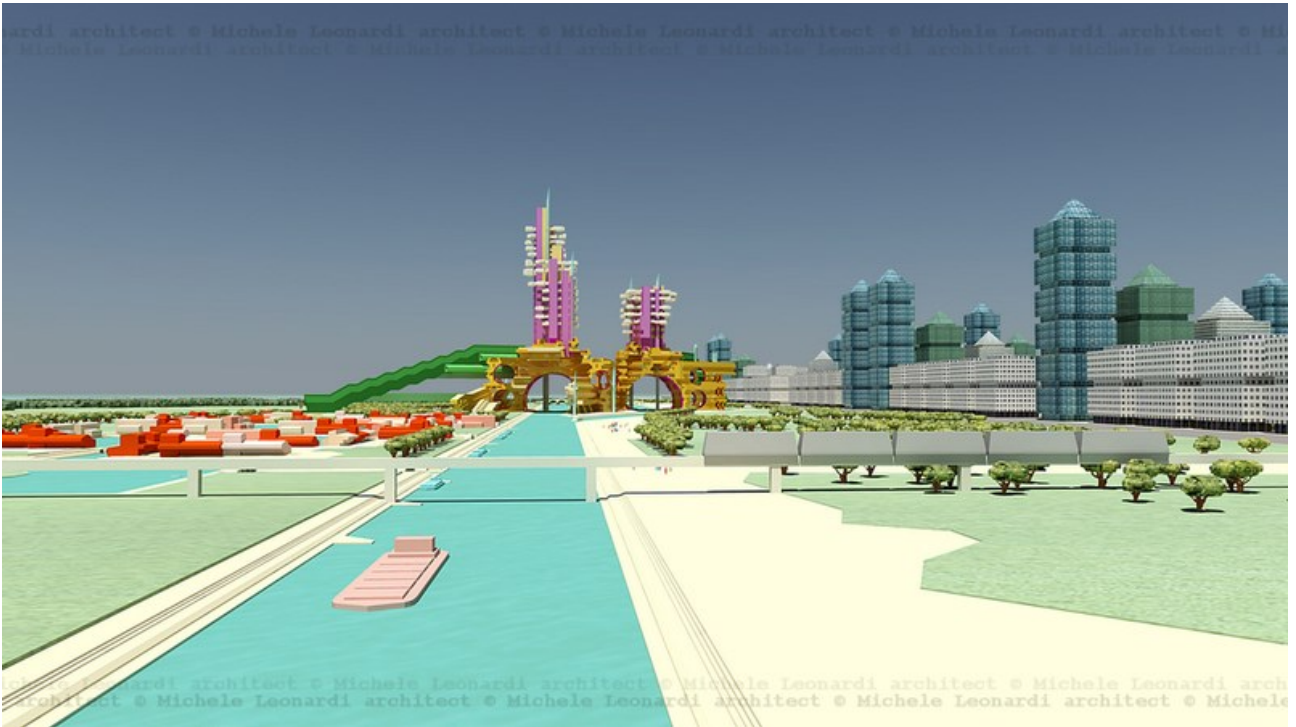
will never be happy in the 2D flat city, even with lots and lots of money. No success will make him never happy, as long as it shall live this 2D lie. Here also the Family is crushed by the 2D flat urban crust (Frank Lloyd Wright continues to teach). But the spirit of man will corrupt this dirty crust without soul. The ancient Chinese proverb says: "If you sit by the river long enough, you will see the body of your enemy float by". And the Chinese people are always right. Instead we expect the end of the modern Tyrannosaurus Rex, "The Cube-Building Rex", and that of his sad canned progeny.

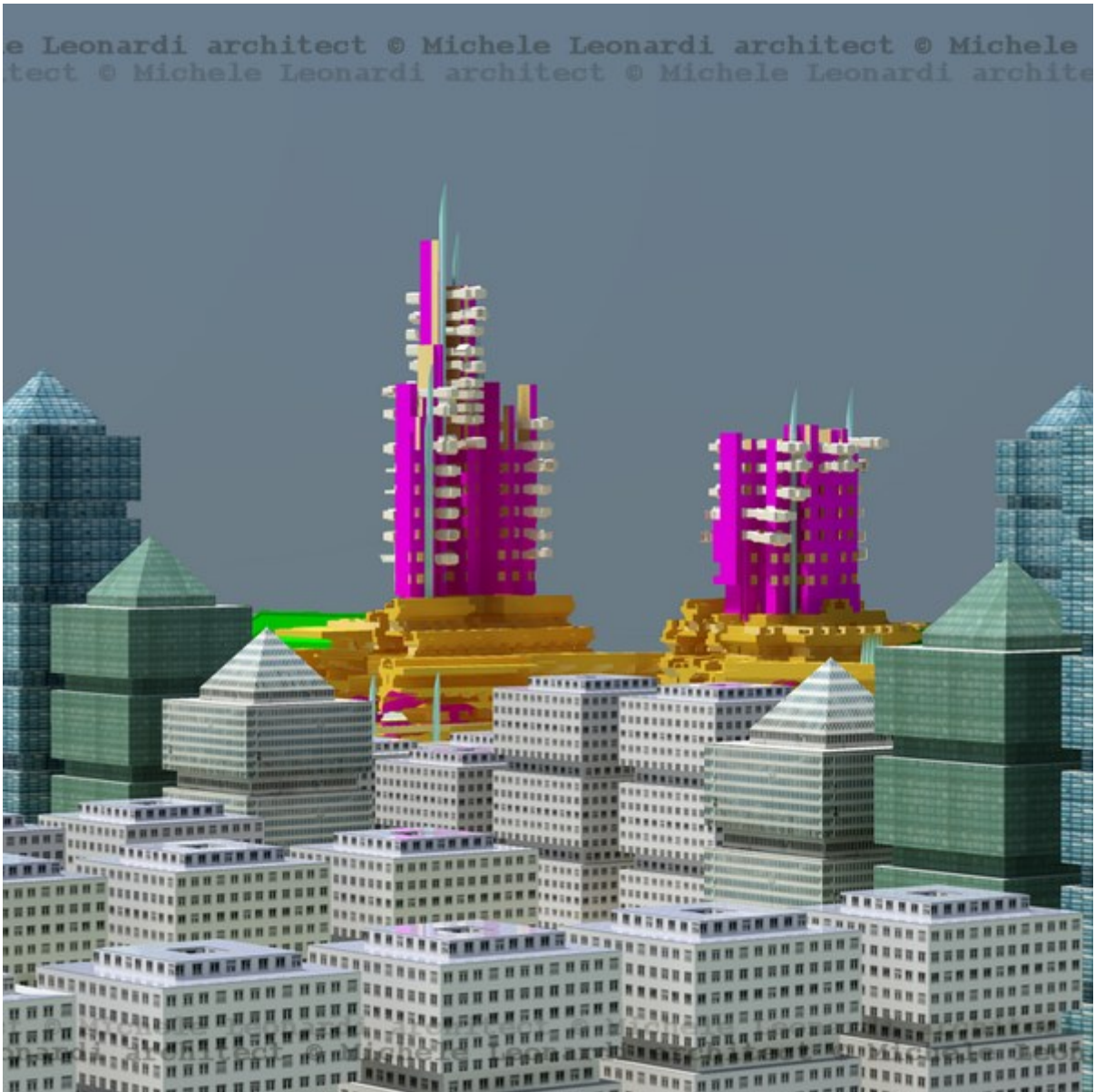
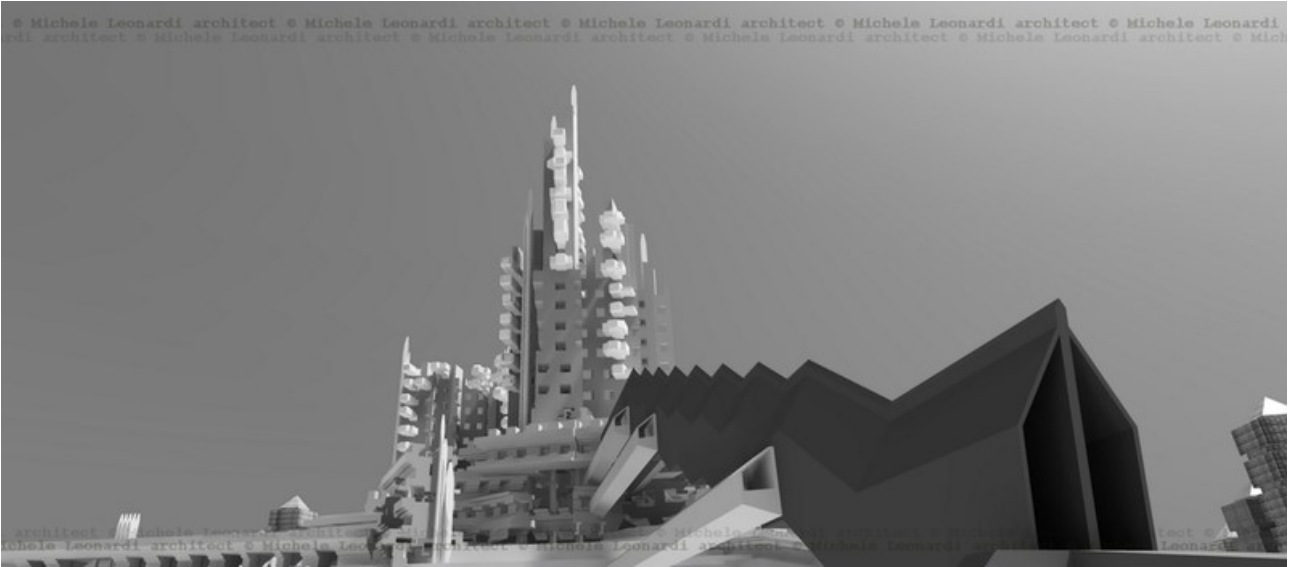


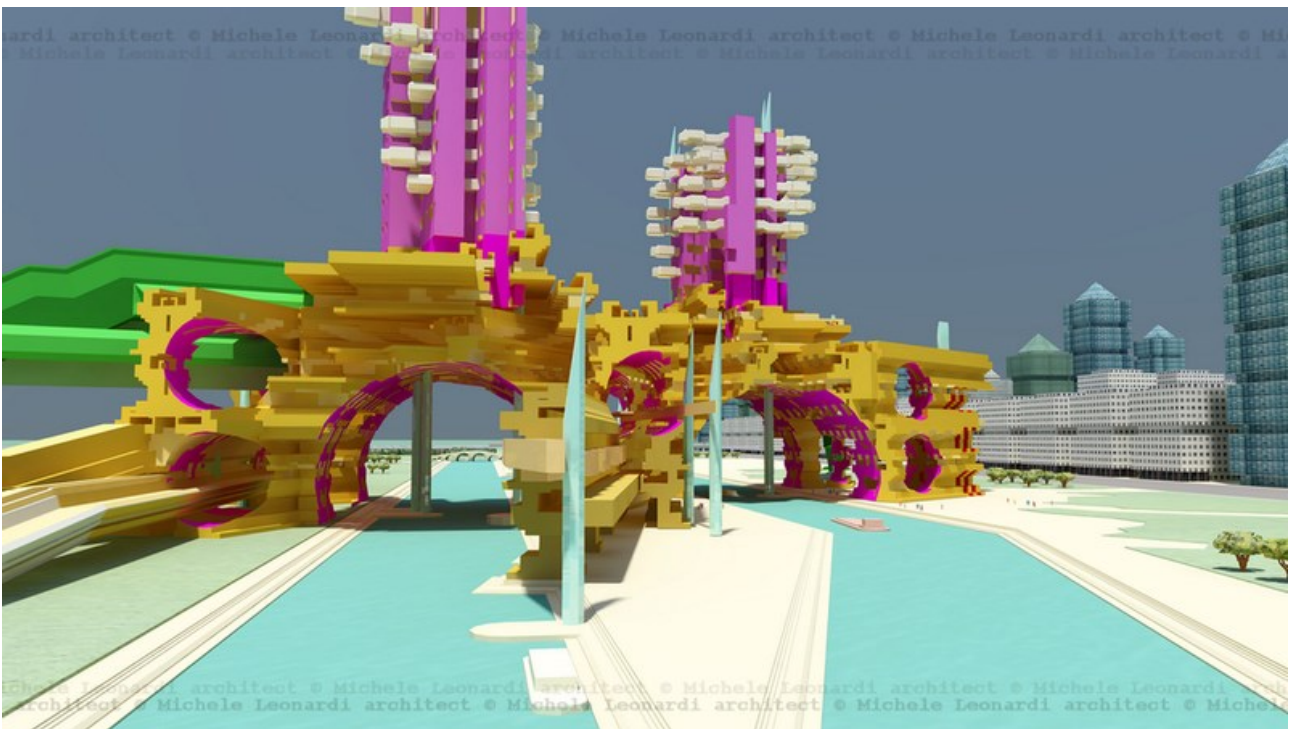
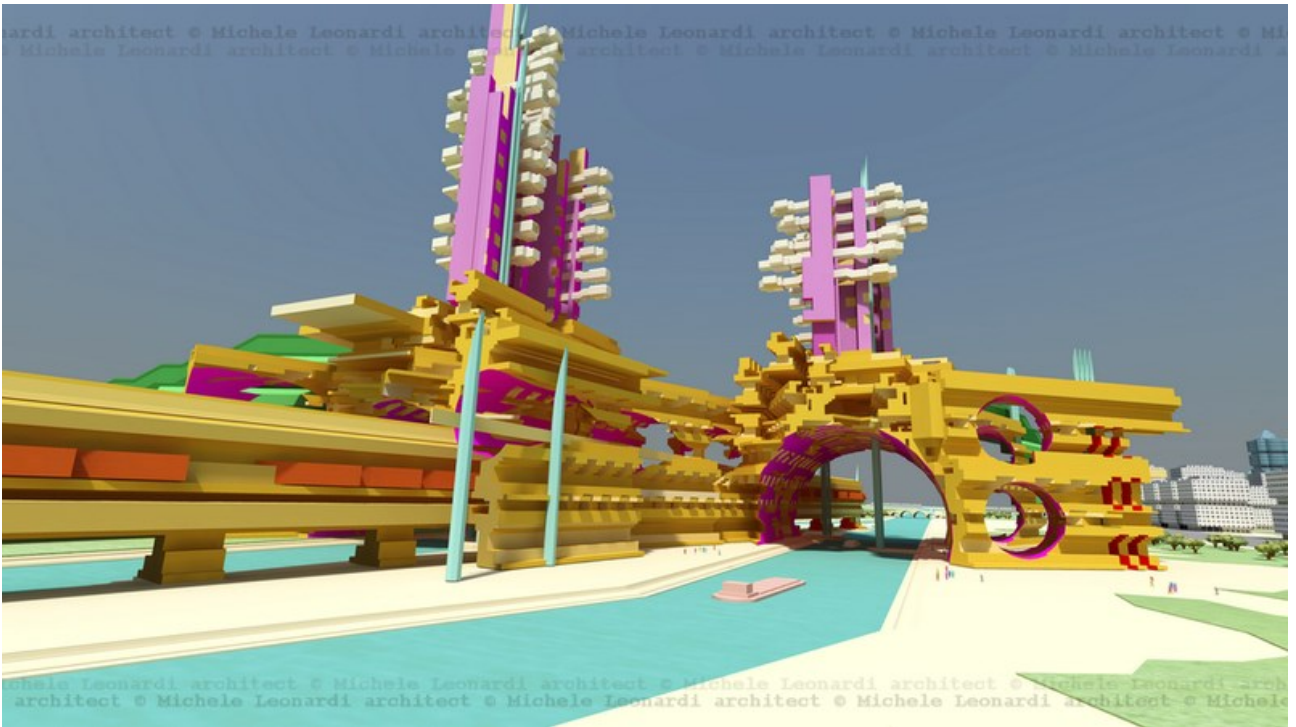


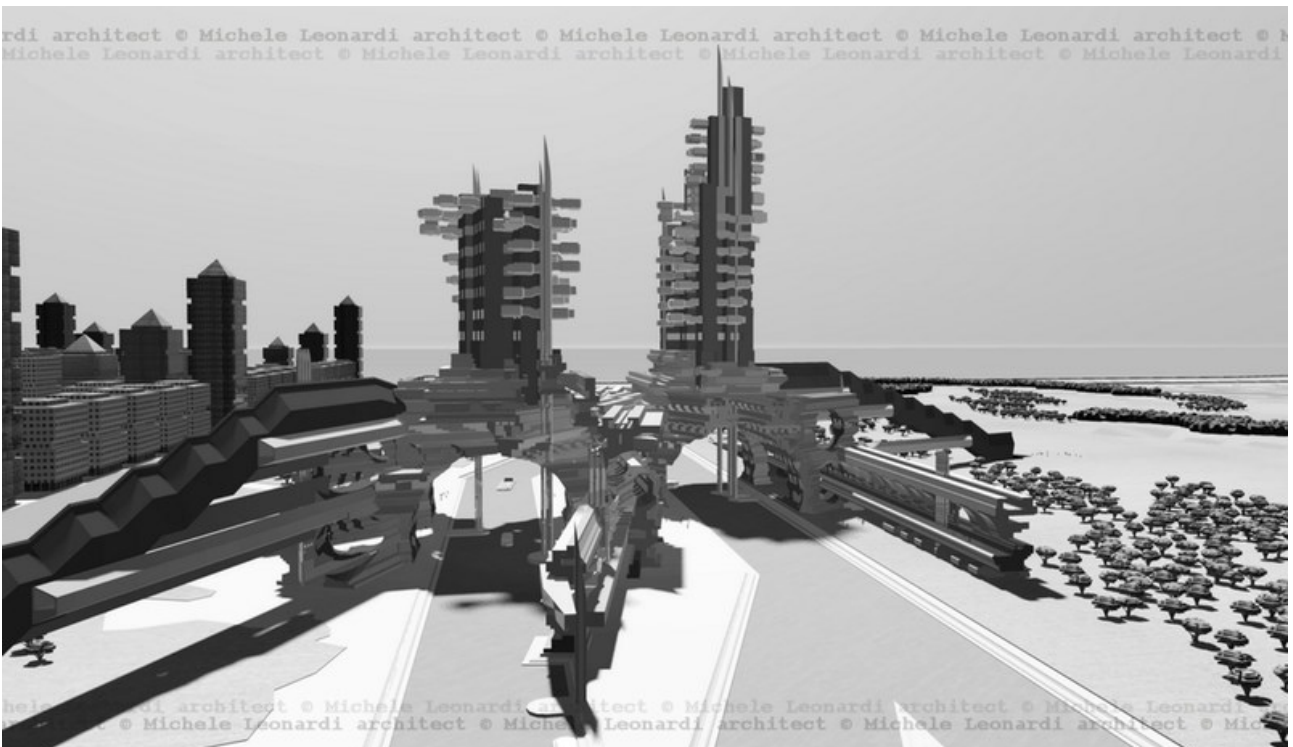
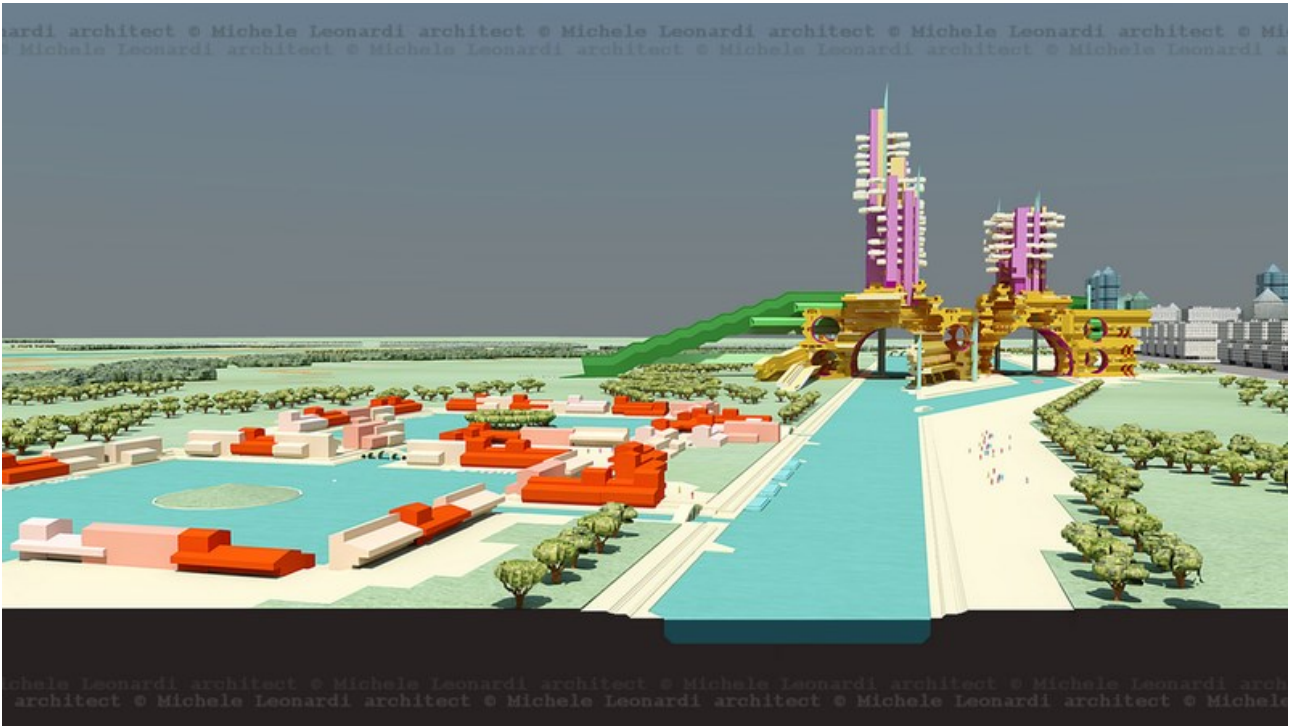


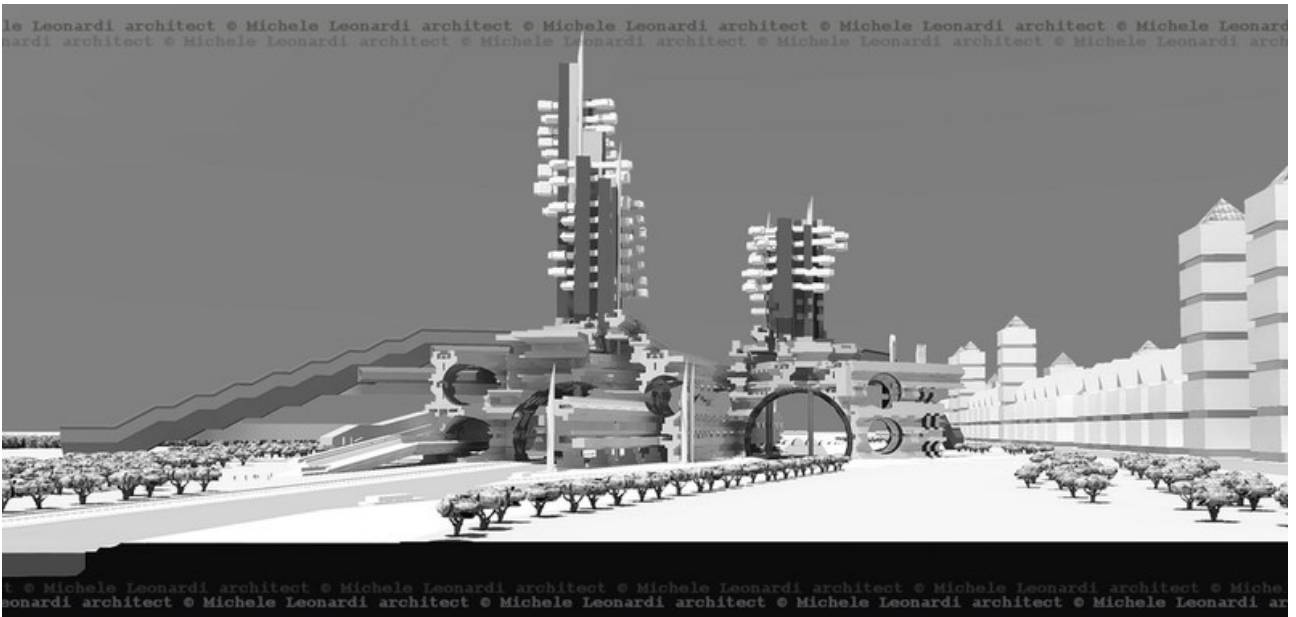
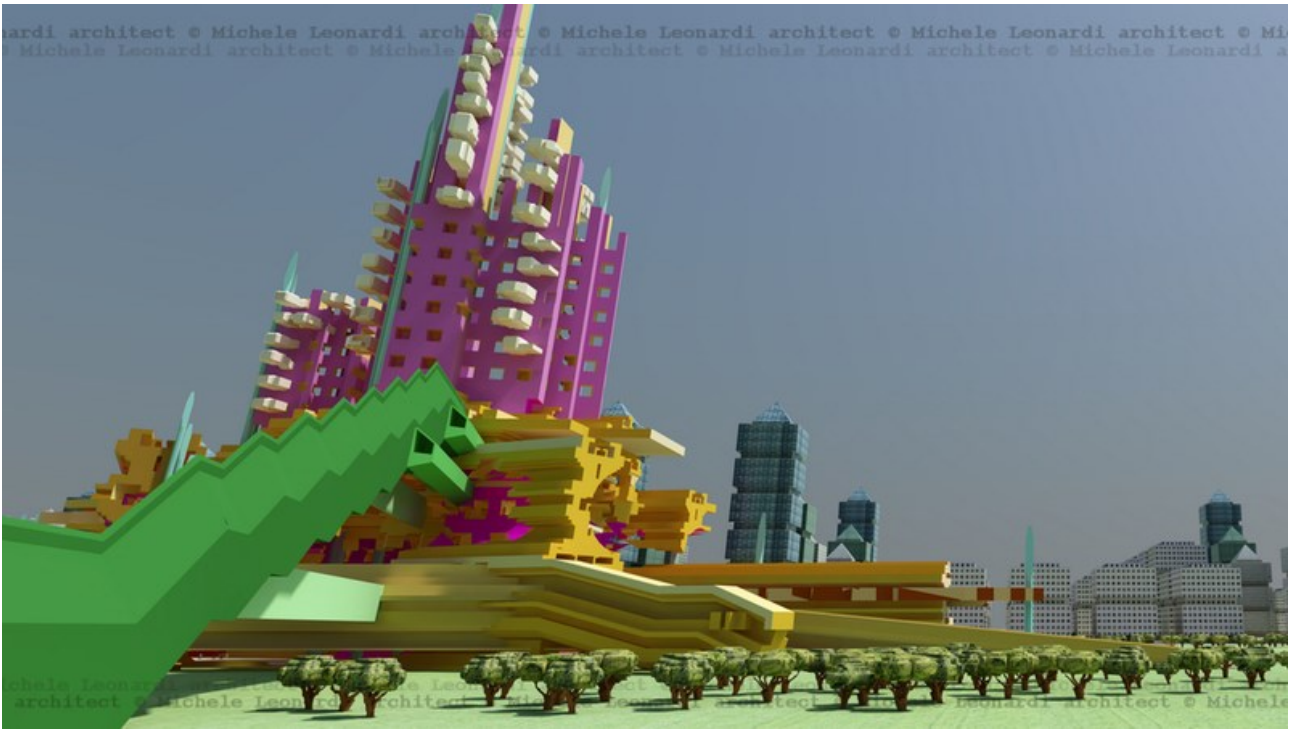


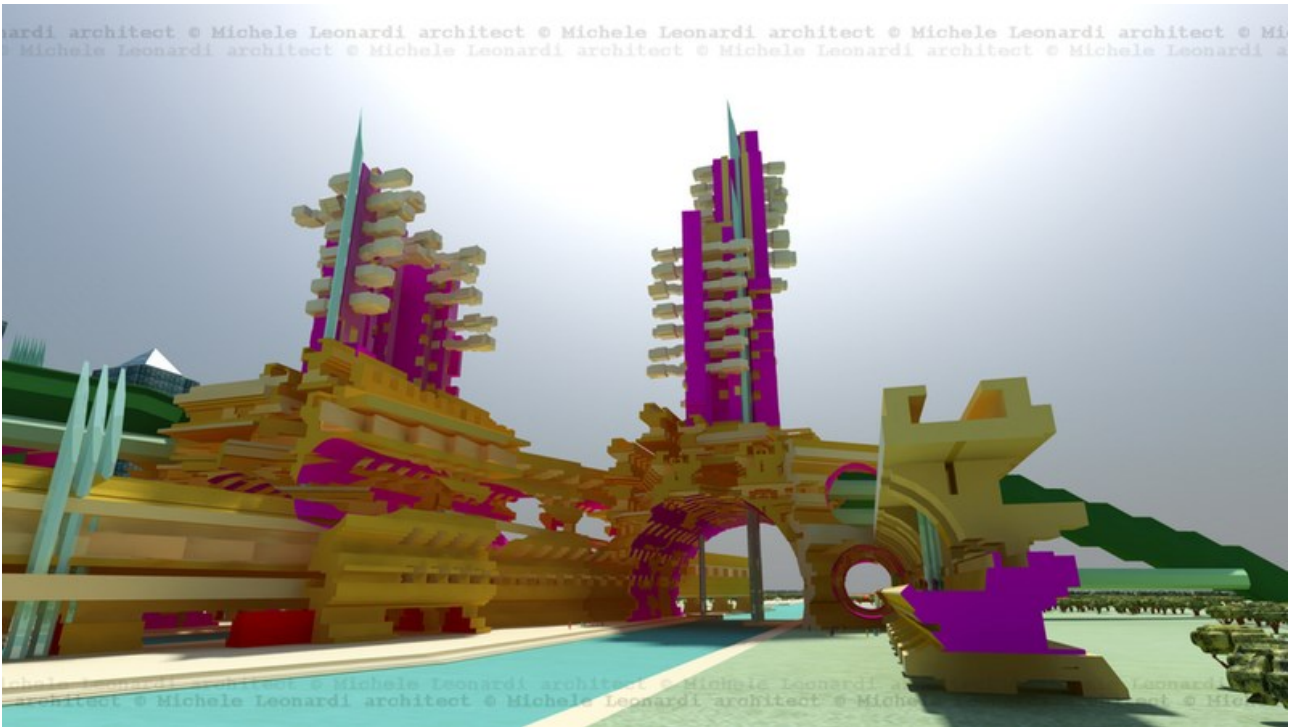






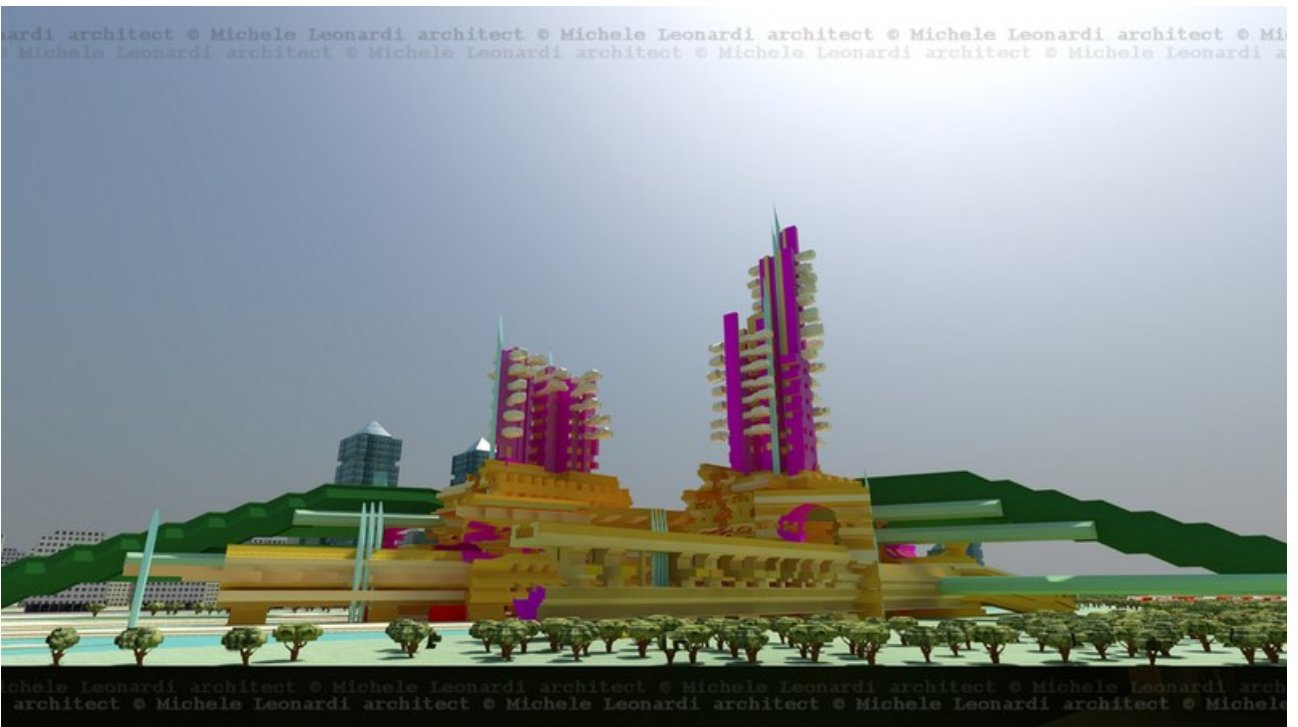
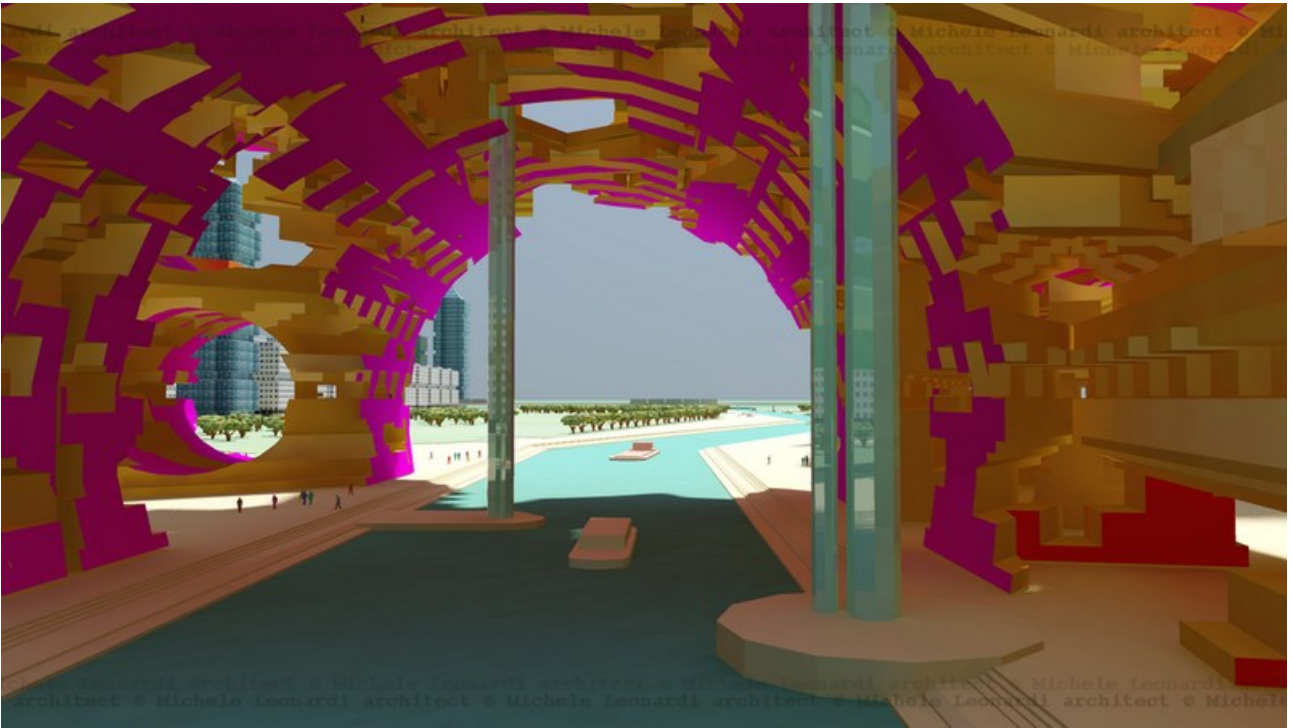


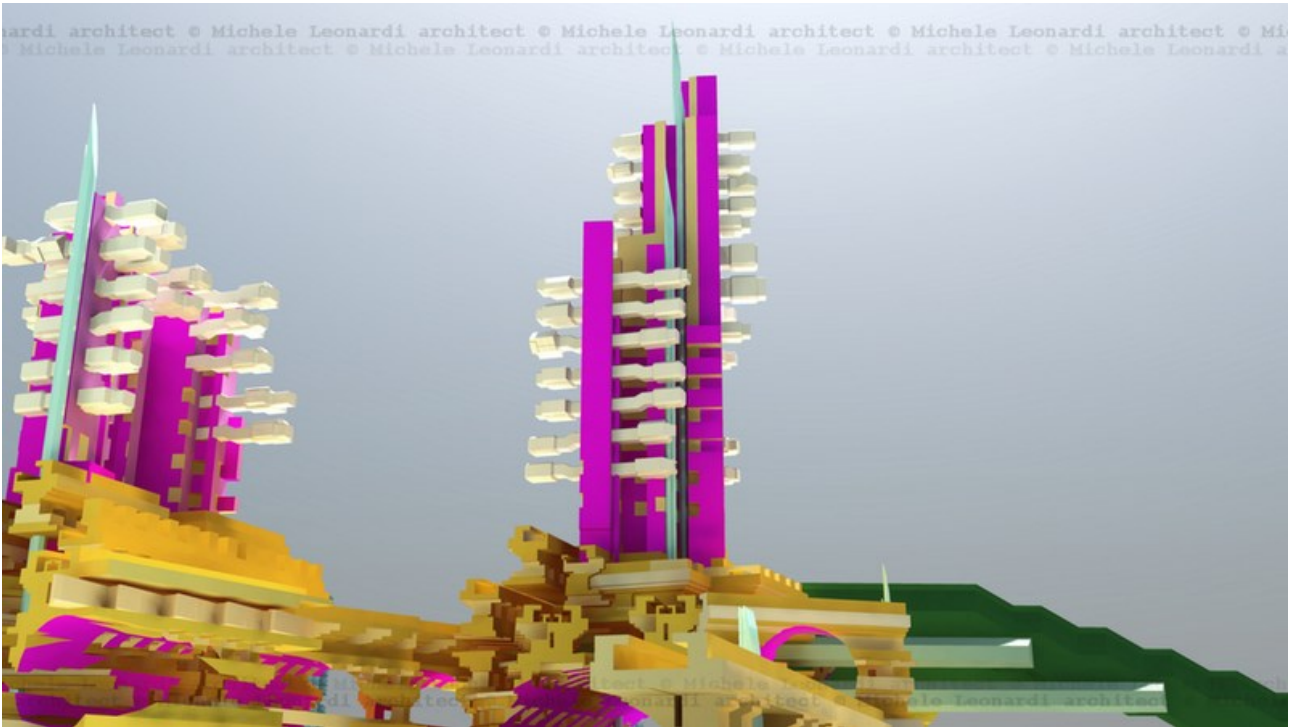




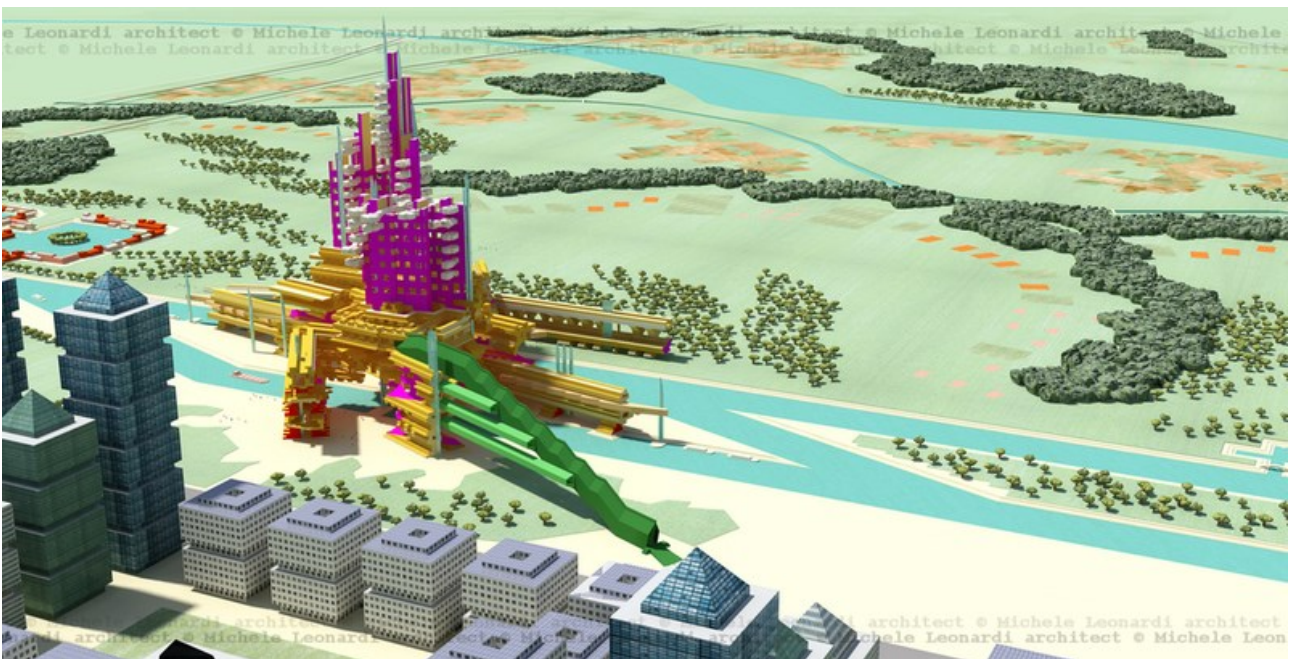










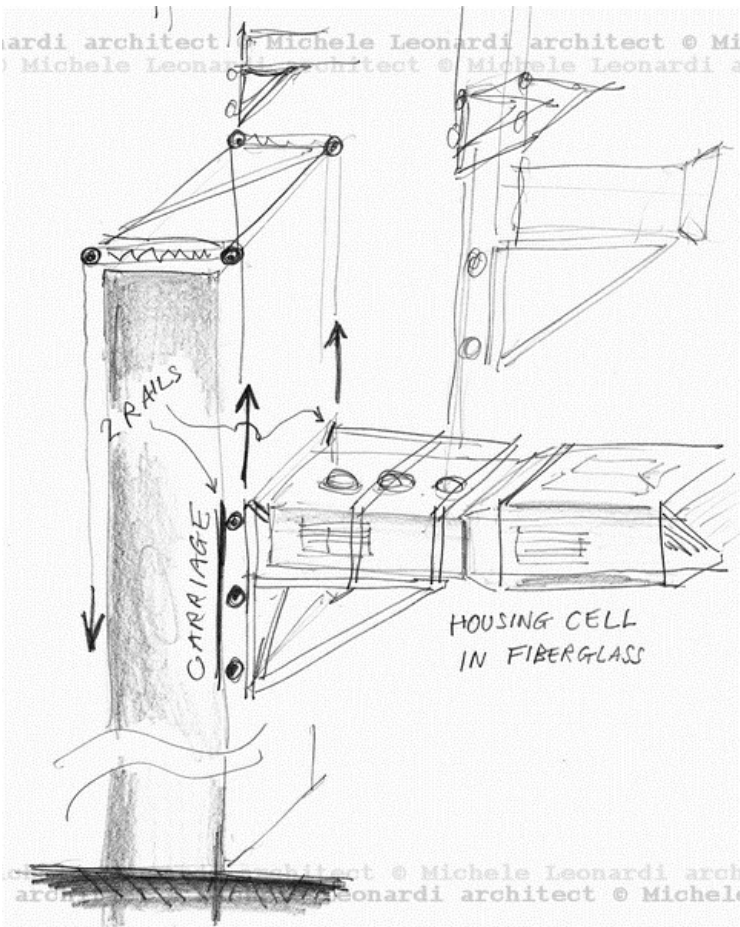


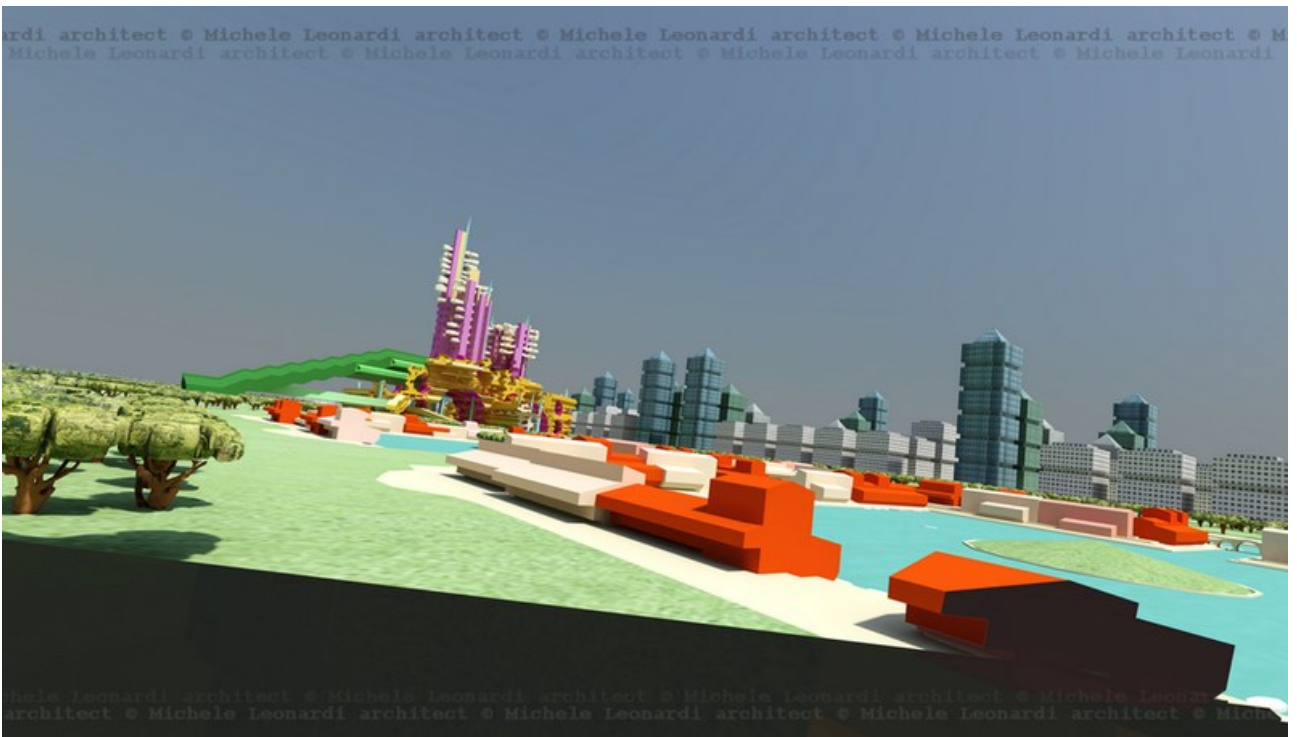
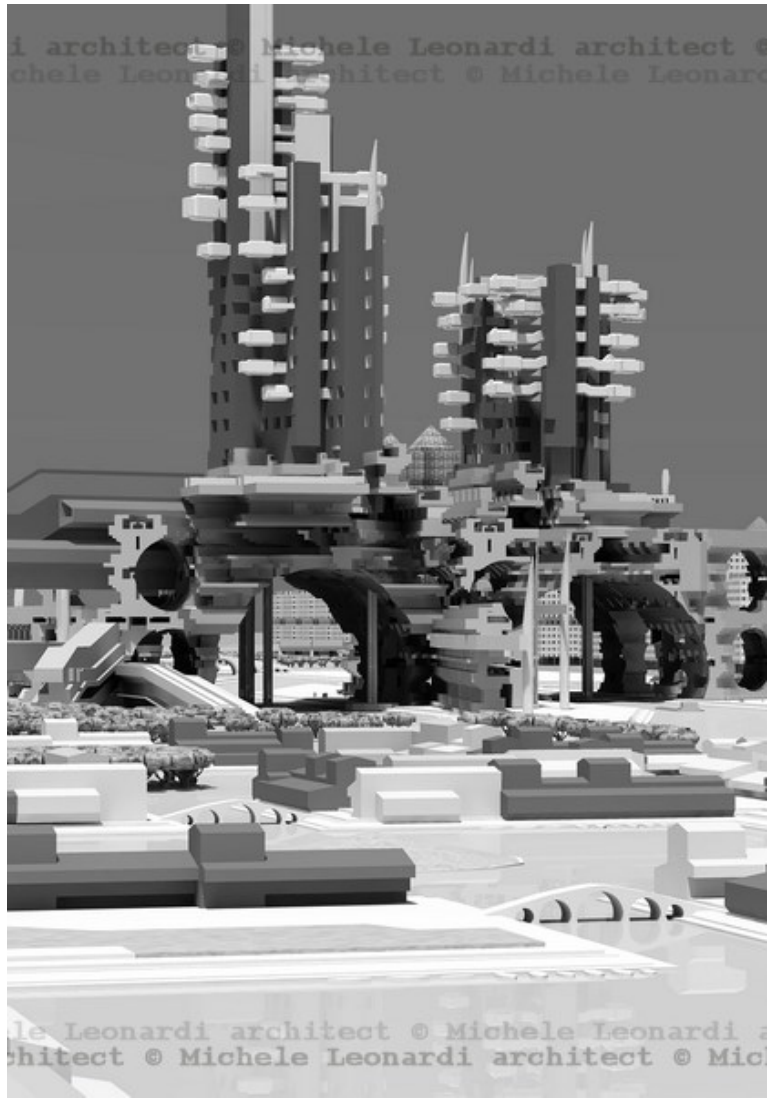




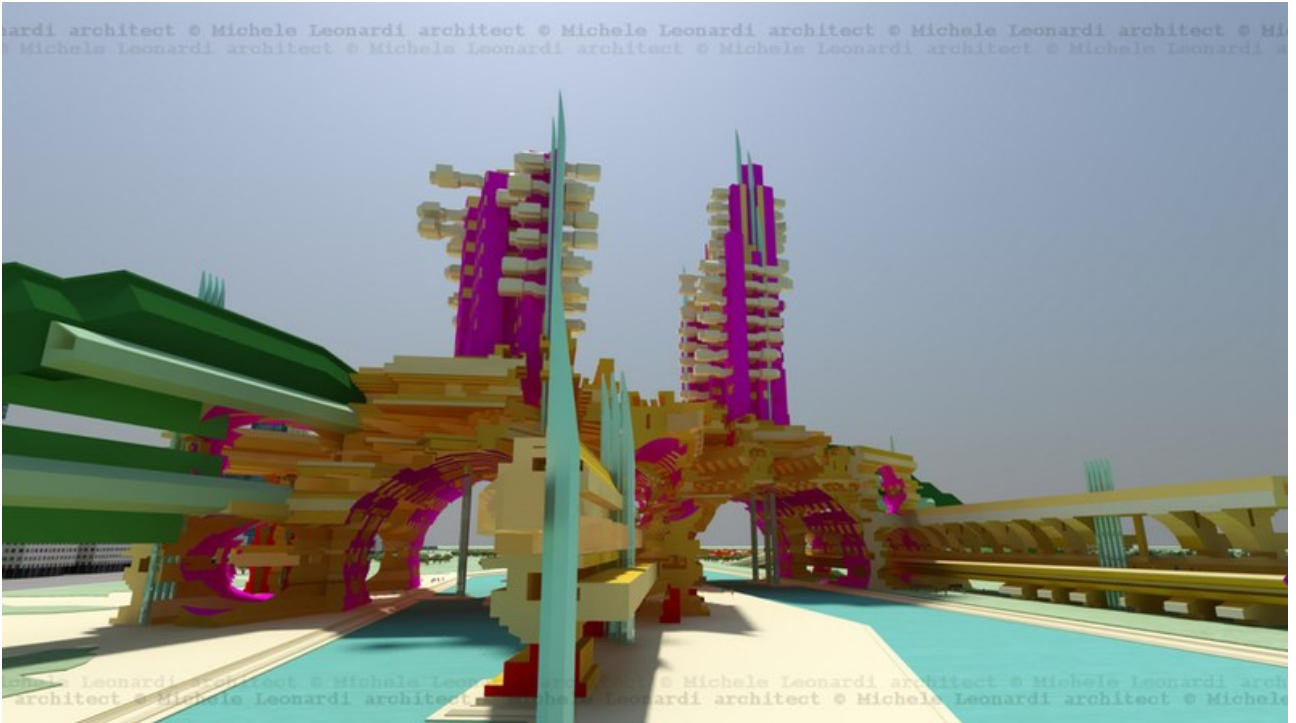
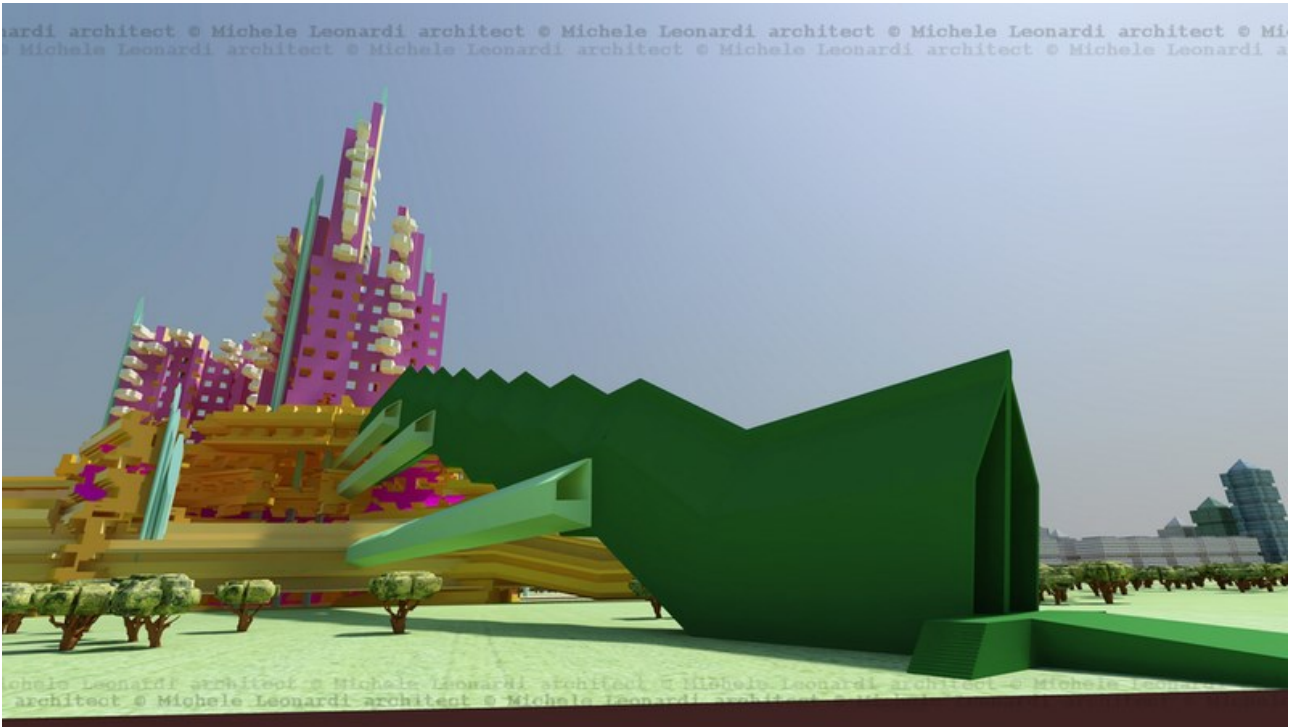


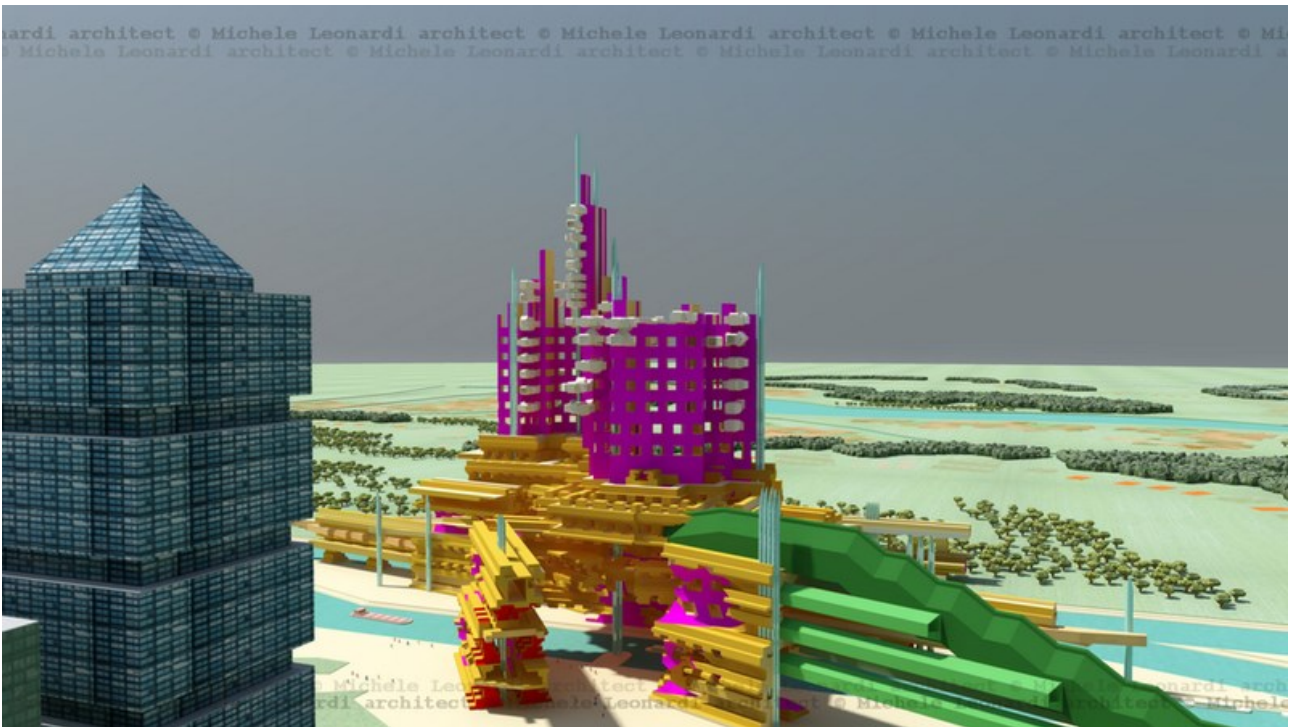


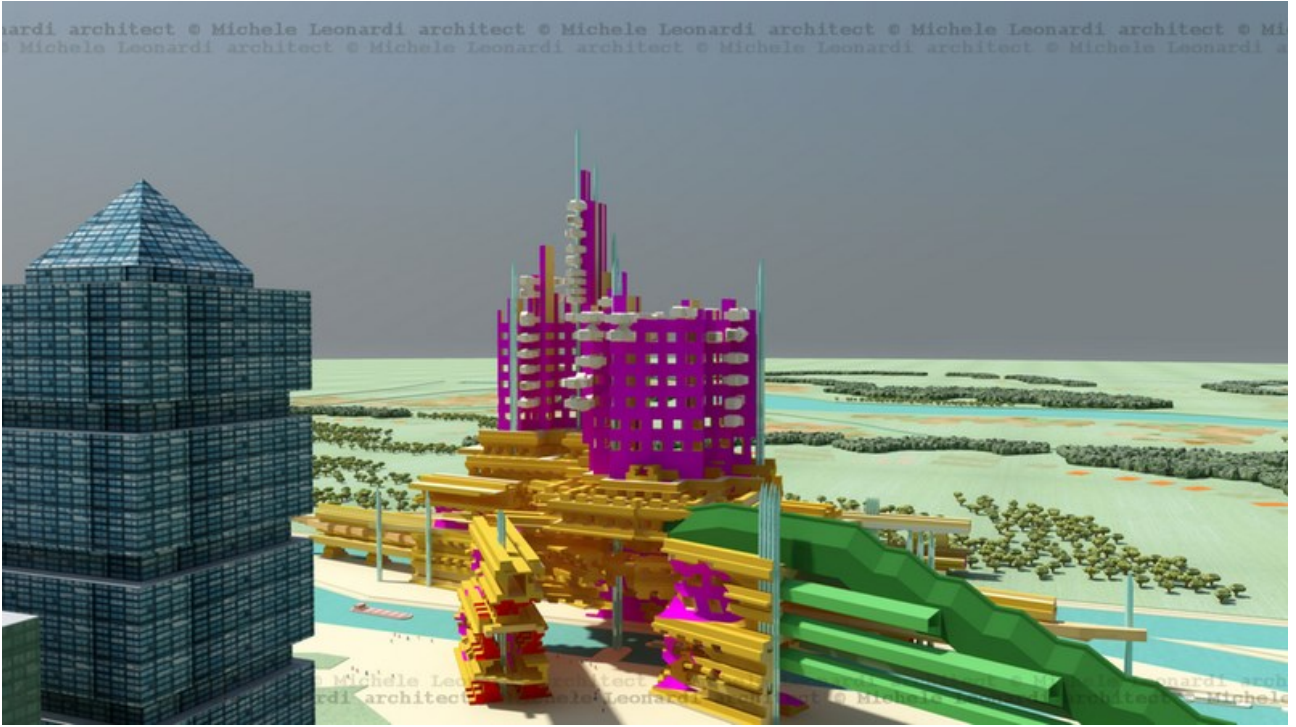


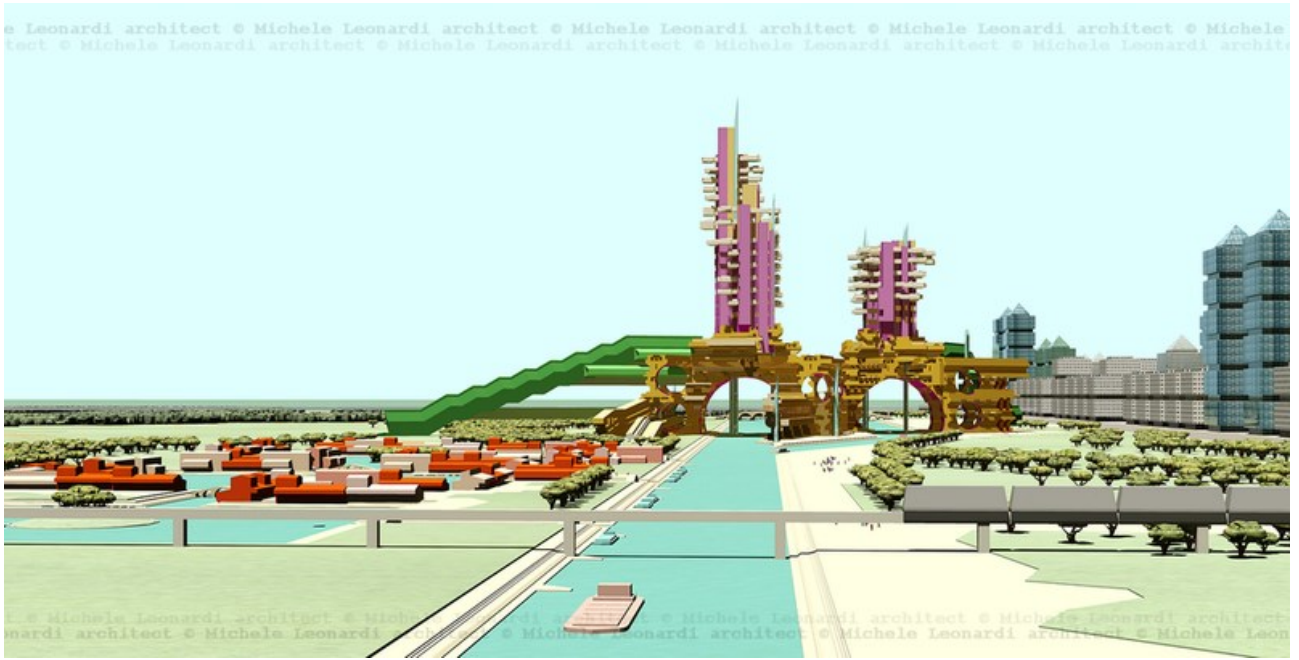
















# MACRARCHITRAVE

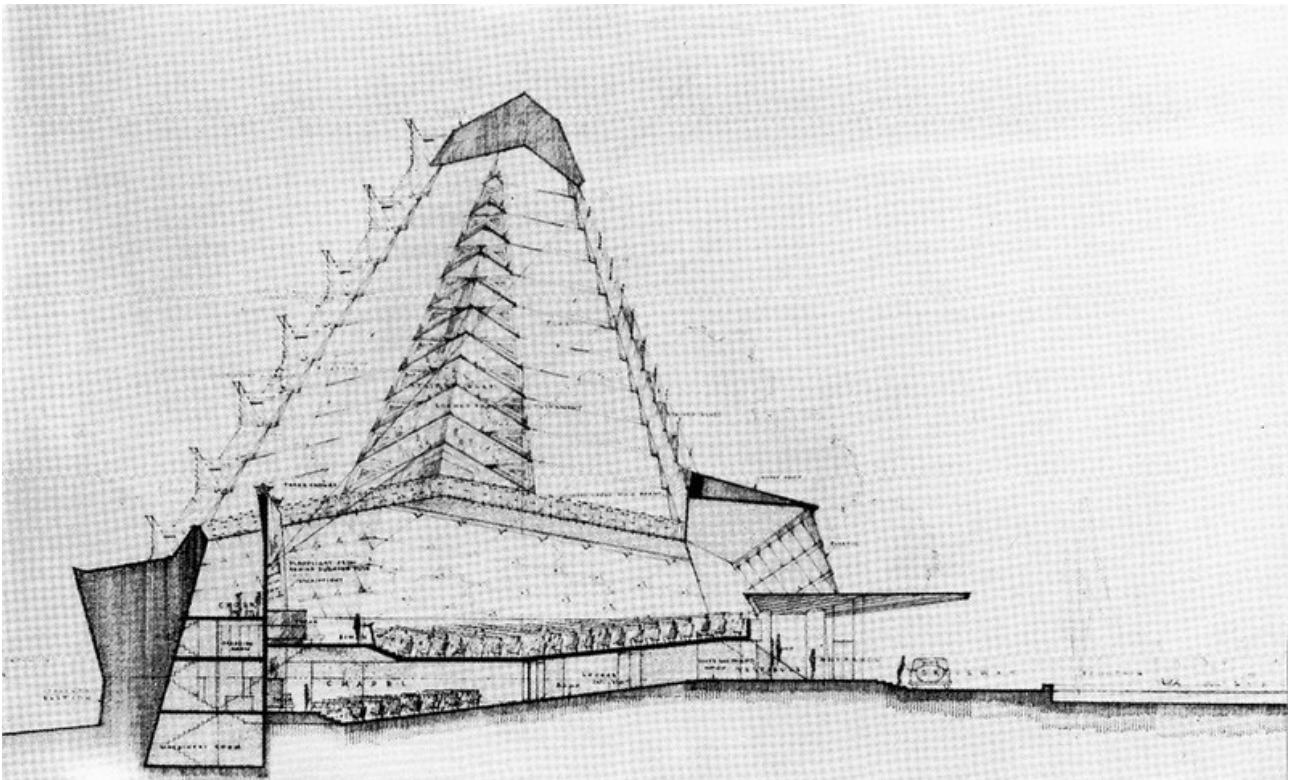
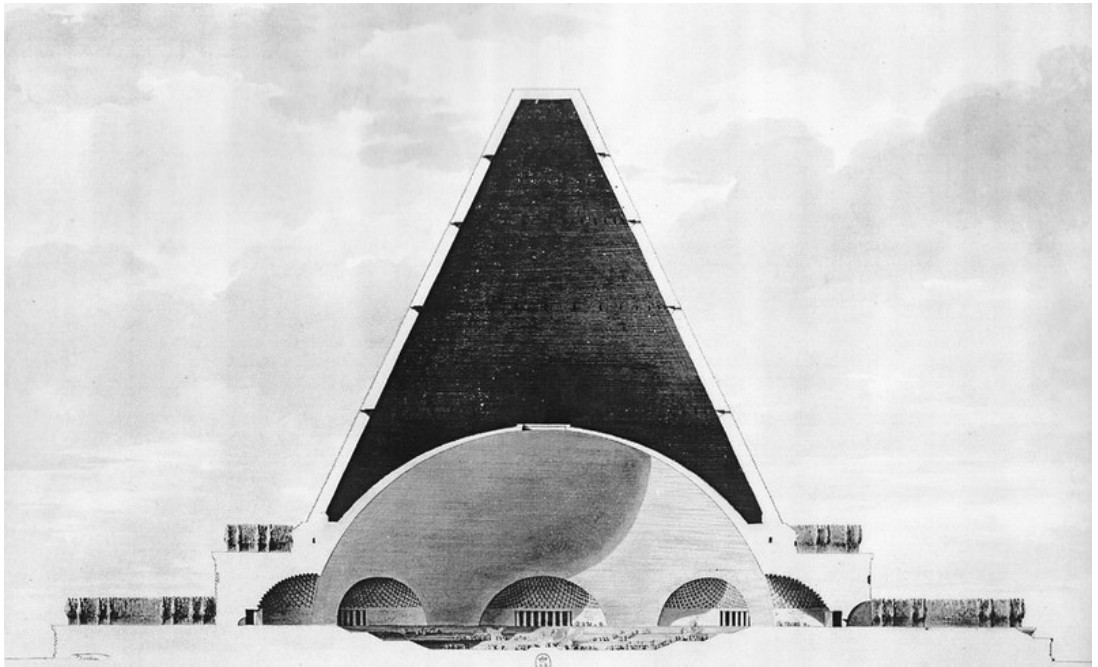
by Michele Leonardi architect © 1999 - concept; February 2014 – reloaded.

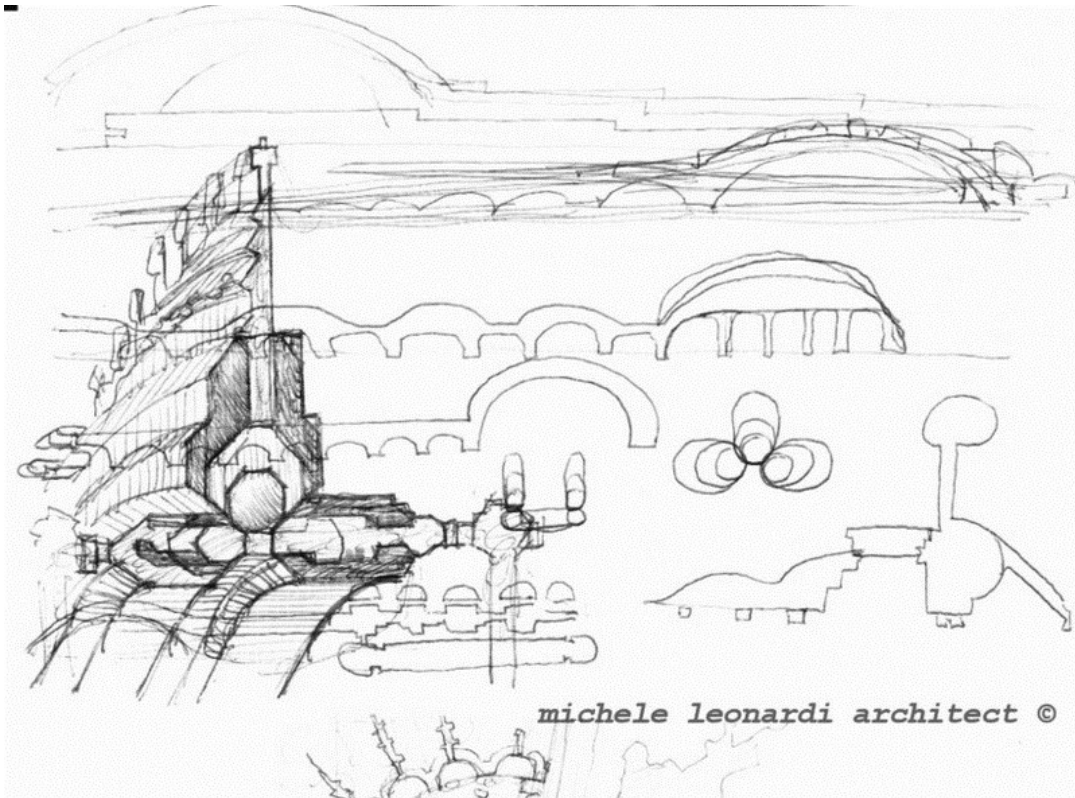
*unfinished, preview*

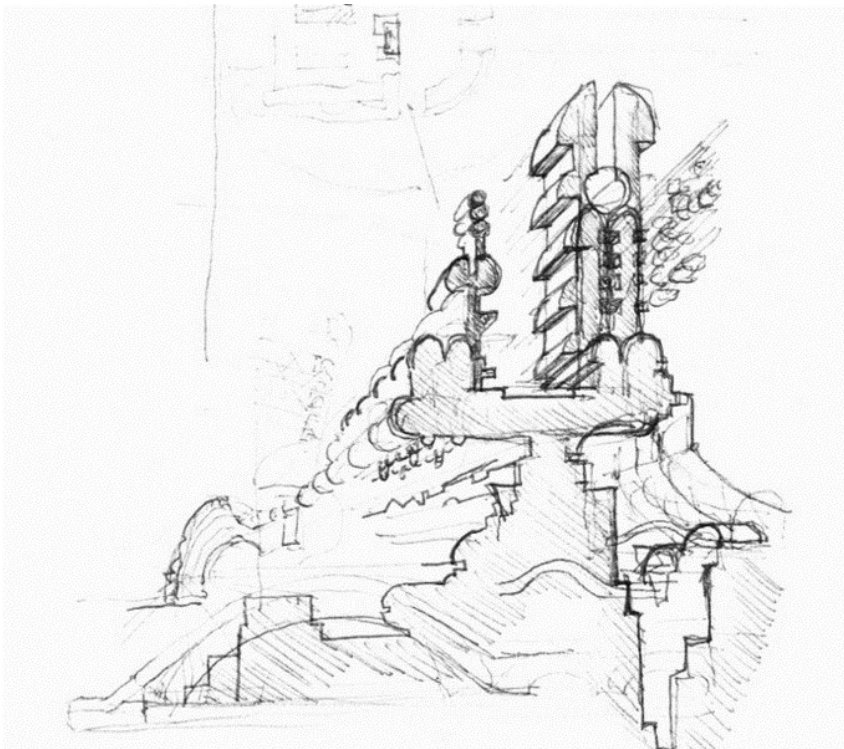


*"The Macrarchitrave and The Boullée Core".*

# The genesis of Macrarchitrave :









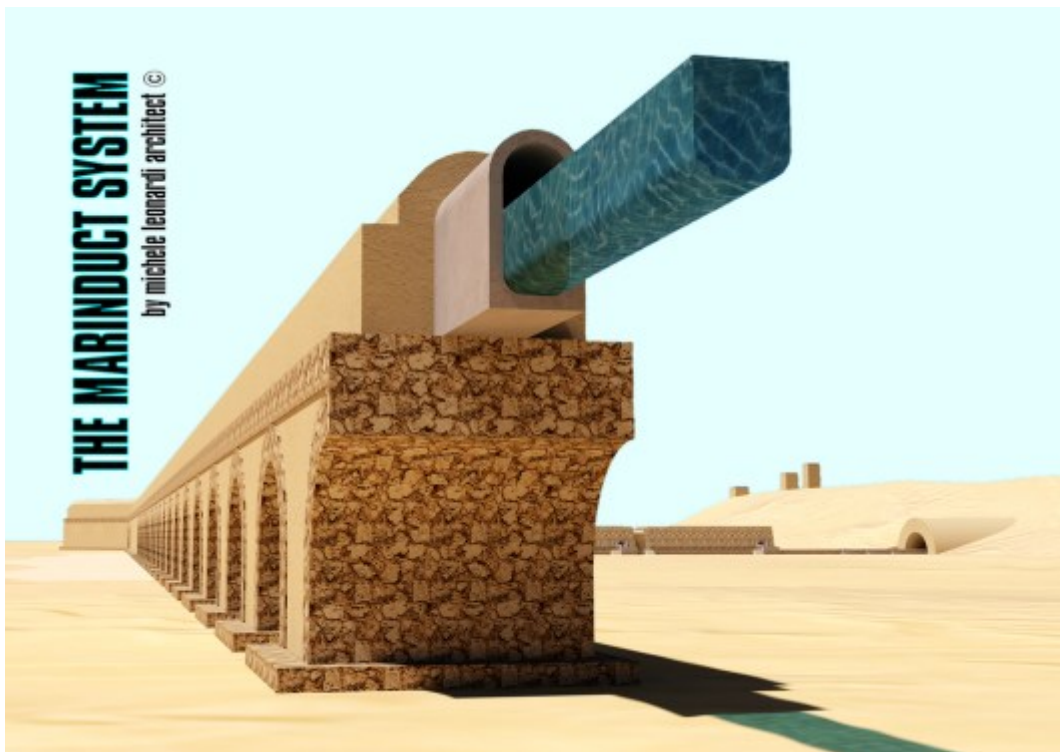




# THE MARINDUCT OASIS SYSTEM

THE MARINE WATER AQUEDUCT AND OASIS SYSTEM  
FOR NEW HABITATS IN THE DESERT  
BY MEANS OF DECENTRALIZED DESALINATION UNITS

*by Michele Leonardi architect © 1996, concept. July 2019, designs.*





## THE MARINDUCT:

**The Marine Water Aqueduct and Oasis System** for desertic areas of the world connected to the sea: Sahara, Arabian Peninsula, deserts of Persian Gulf, Iran, Pakistan, South India, Australia, Andean Pacific Coast, South California, Texas, etc.

## WHAT'S THE NEWS?

- 1) Already at the beginning of the last century, in some European cities there were marine aqueducts used mainly for street cleaning.
- 2) In Hong Kong, the Hongkong & Shanghai Bank Building (Norman Foster and Partners architects; completed in 1985) is cooled with a sea water system for the air-conditioning. This skyscraper is linked to the bay by a 7-meter-diameter tunnel, 350 meters long, with a capacity of 1,250 liters of sea water per second.
- 3) In the Persian Gulf countries the sea water is taken from the sea, desalinated in the large plants, then the fresh water thus produced is transported, even at a great distance, up to the cultivations irrigated with "fossil" water, where finally the fresh water is introduced into the same aquifer to recharge it, as well as evidently to remineralize it.
- 4) It is not a mystery that the pools of many tourist resorts located by the sea and in desert areas, are fed with seawater.

## SO WHAT

**is the news? And where is the difference?**

**1) The news are the decentralized desalination units in the artificial oasis.**

The Marinduct translates and distributes sea water, which is desalinated locally, in new oases to be built in the desert. So there is no a large centralized desalination plant and after fresh water distribution, but each local unit, each small or large community, desalinate its own quantity of sea water to be used.

**2) The Marinduct is implemented over time as needed, by new lines addition (new parallel Marinducts), anyway gradually, functionally. There is no colossal initial spending of money to make this great work, in progress. In a second moment, wanting to increase the mass flow rate of Marinduct, it's also possible to foresee the duct duplication in height, vertically, with a second or even a third internal single duct per Marinduct.**

3) Sea water does not need exceptional treatments to be moved over great distances. It is treated initially, close to the withdrawal zone, by filtration and sedimentation (fish, jellyfish, algae, plastic, sand, ... whales, supertankers, islands, etc.).

4) **The primary purpose of the Marinduct is obviously to feed with water the new oasis created in the desert. Salt water, yes, but it's always water.** The oases are not natural, they do not grow like the mushrooms, but are made and kept "alive" by the men of the desert. And even the dunes, which protect the palm trees from the wind, are also these artificials. Even the palm groves are created and maintained by the oases' inhabitants. The palm groves in turn provide shade and protect the underlying crops from the strong solar radiation.

The Marinduct forms an unique system with the new oases scattered in the desert, to which it distributes the seawater. Sea water that in each oasis is desalinated and used for crops, and of course by the inhabitants of the new oases.

5) **But the ultimate goal is to create new innovative habitats, supported by the basic fabric of the new oasis cells. That is new alternative habitats to the usual jam spread on a slice of bread (cities growing with asphalt symphonies), jam that we see all over the world for about a century now.**

So: do you go to the desert to export the usual grandmother's jam that we collect in our cities? No. We go to the desert with respect for a place where we can still understand what is essential and what is superfluous.

6) The Marinduct-Oases System allows to colonize the desert conceptually in a traditional way, more respectful of the environment and of the "sacredness" of the desert.

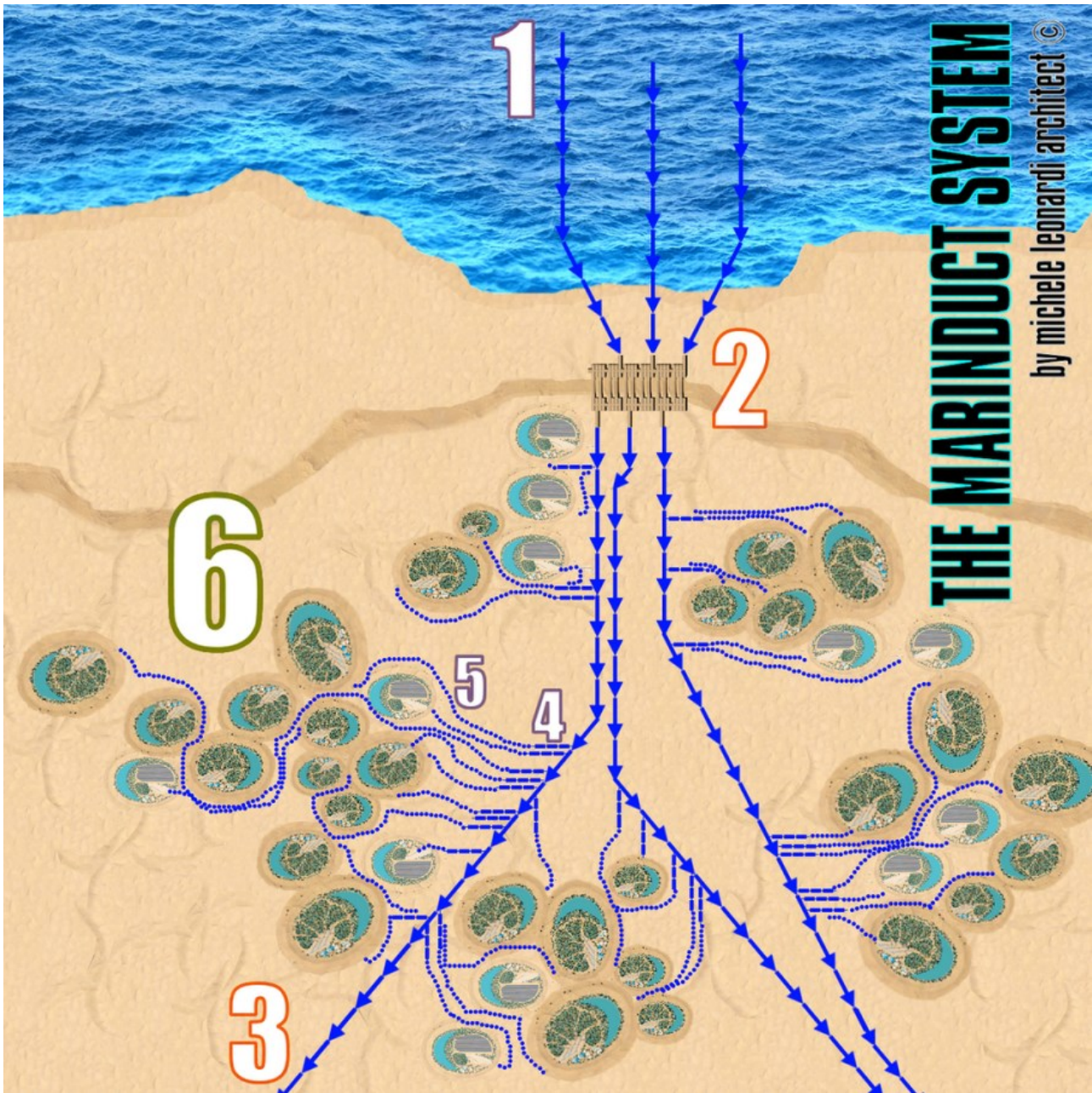
7) So the "Marindotto-Oasis System" allows to "terraform" the desert, but precisely following the "Oasis Model", as defined by the architect and urban planner Prof. Pietro Laureano. By the way remember that, for example, it is always he who has allowed us to understand the value of the multi-millennial city of Matera, a bioclimatic city, later declared an UNESCO World Heritage Site, in 1993, while previously in Italy it was commonly believed that the "Sassi di Matera" was synonymous with underdevelopment and inhuman housing conditions.

8) Ultimately the "Marinduct Oasis System" is a great new challenge for humanity, increasingly in need of fresh water supplies and new habitats. Therefore it is a sort of test for the future, when perhaps one day a new humanity, projected into the boundless spaces of the universe, will transform sterile and uninhabited planets.

9) **The weak point of the "Marinduct Oasis System" is the constant supply of sea water. But even in countries where fresh water abounds weather and rainfall are not a constant over time.** In fact the weather is by definition changeable, there are always periods of drought even in non-desert areas, and there are also the fearsome floods and tornadoes. In short, the rain is not perfectly controlled to our liking as it happens for the opening of a tap. And if everyone opens the taps at the same time, the water starts to run low. And if everyone opens the taps at the same time, the water starts to run low again.

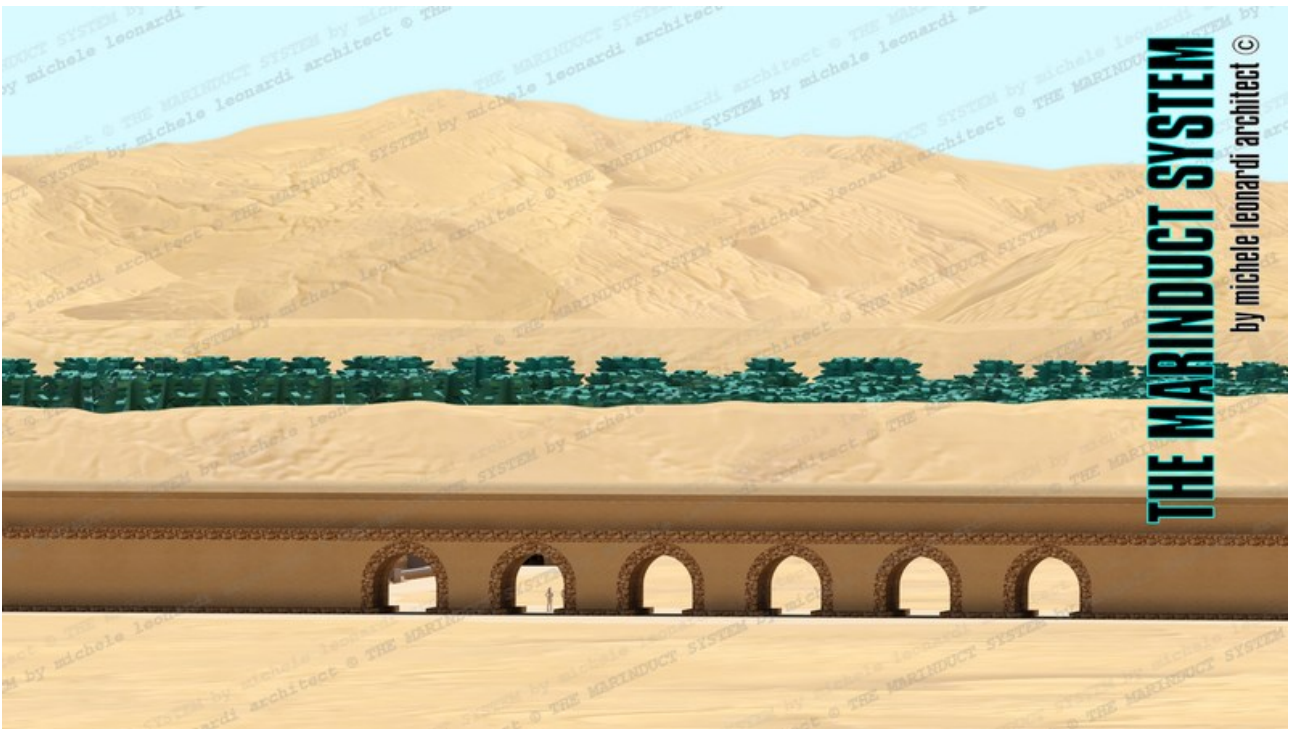
As already mentioned, in order to guarantee a more or less constant flow of water through the Marinduct and across the desert, there would be more pipelines in parallel. Certainly all this requires stable political conditions in the different countries in which the Marinduct would take place, and the absence of war conflicts.

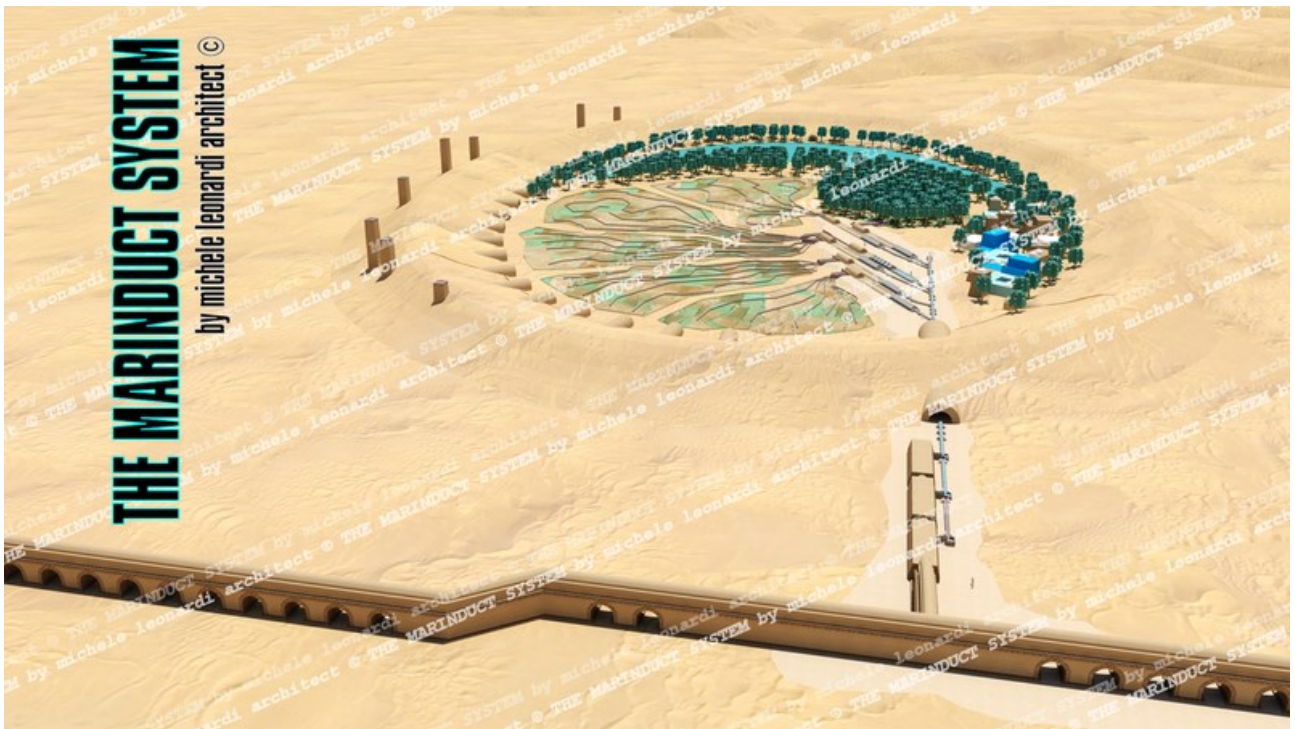
But the same can also be said for those happy lands where fresh water abounds, more or less, because even in those countries a war can cause the same great problems. And then the Marinduct is not a political project, off course it's architecture, it's nature created by man, and stop.

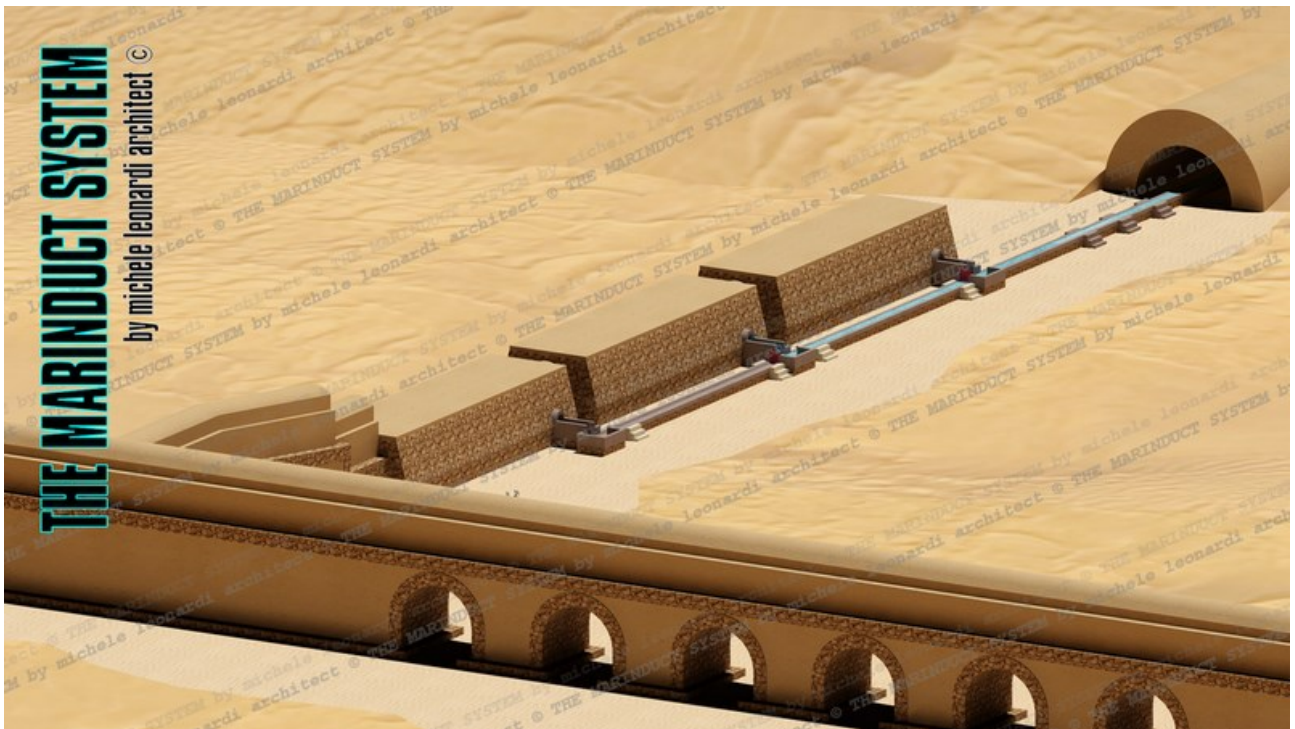


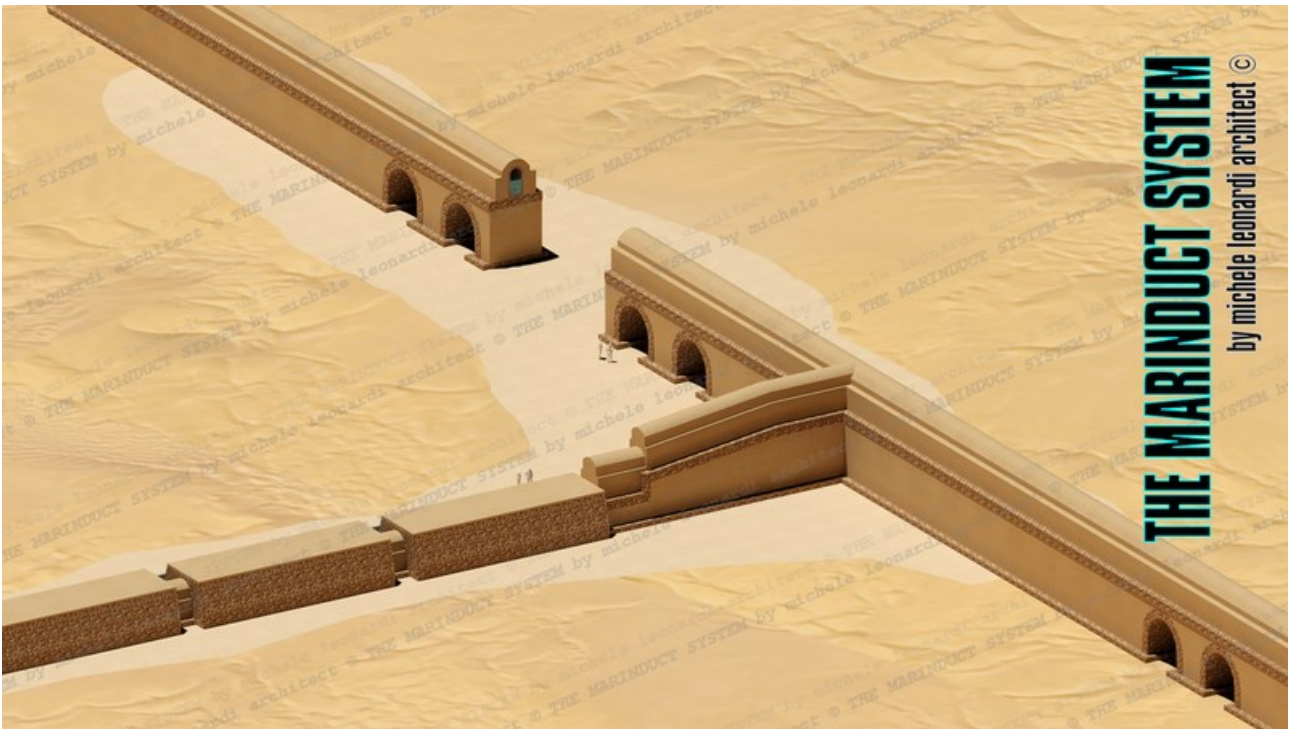
## Legend:

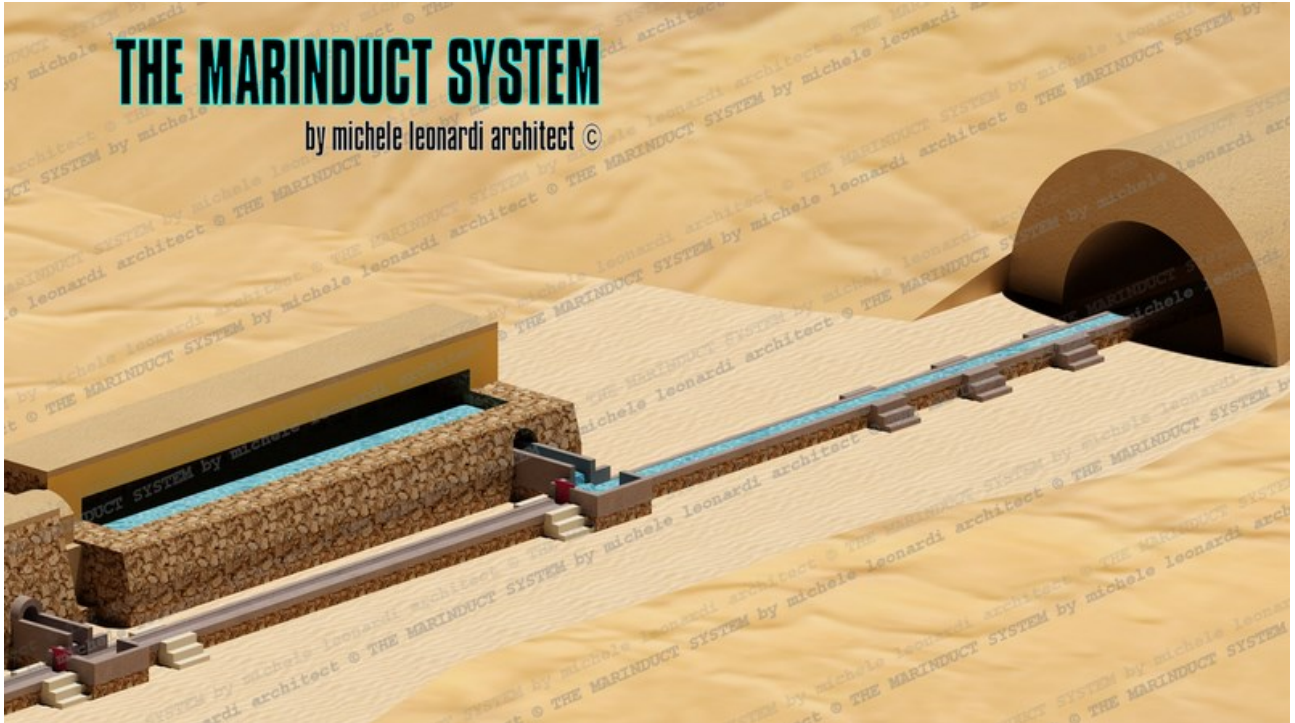
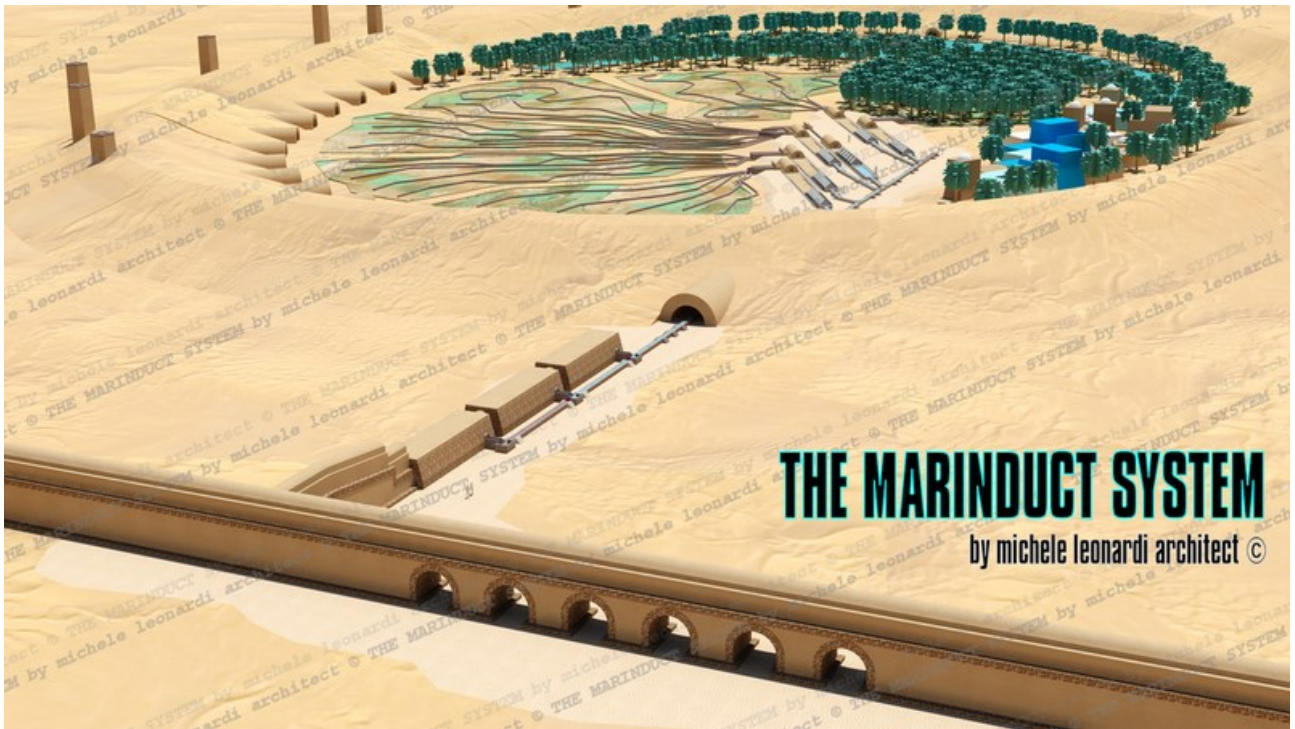
- 1) Sea water pumping. 2) Sea water lifting plant. 3) The Marinducts.
- 4) Local accumulation, compensation and distribution tanks.
- 5) Local conduits for the new artificial Oases in the desert.
- 6) The new artificial Oases - the decentralized desalination units, realized by artificial dunes.















## THE OTHER

### features of Marinduct System:

**10) The interior walls of the Marinduct are covered with a concrete of the same or similar composition as the hydraulic concrete of the ancient Romans, i.e. the "Roman concrete".**

In fact the Roman concrete is very resistant, because millenniums away there are still the intact remains of the maritime works made with Roman concrete: harbor docks (Roman port of Cosa in Italy, Tuscany; port of Santa Severa, Lazio, Italy; port of Claudius in Fiumicino, Lazio, Italy; etc.), building foundations (the remains of Nero's Villa in Anzio, Lazio, Italy), fish farms (Villa of Tiberius in Sperlonga, Lazio, Italy), etc., [see the bibliography](#).

Therefore covering the interior walls of the Marinduct with a modern concrete similar to Roman concrete, there is no need to use expensive special materials resistant to the degrading action of sea water.

**11) The Marinduct would be built as much as possible using local inert materials, as well as by construction in Geopolymers, those defined and invented by Prof. Dr. Joseph Davidovits. Only the binder agents of inert materials would be transported from great distances. But since binders in general are a smaller percentage of geopolymeric compounds and not, the transport of the binders themselves would not be particularly expensive economically and technically. Instead the fresh water, necessary for the construction of geopolymeric concretes, would be produced in the frontier oases, as the Marinduct is implemented, prolonged, enhanced, doubled, tripled.**

**12) The idea is not to make a giant and pharaonic Marine Water Aqueduct. The Marinduct "grows" by adding single Marinducts built in parallel: by duplication, triplication, etc. In other words, each line / vector is a module.**

This offers several advantages. An implementation of the Marinducts regulated by an effective immediate necessity, ie based on the creation of new Oases in the desert. The opportunity to periodically close Marinduct sections to perform maintenance, using in the meantime a nearby parallel linked line of Marinduct (more or less parallel). Ecc.

13) The salt water distributed by the Marinducts would be locally desalinated in the various oases in various ways: by means of solar systems, desalination plants powered by photovoltaic systems, or, in the areas where hydrocarbons abound, even by means of oil or gas powered plants.

14) As a final by-product of the desalination of sea water, there would obviously be sea salt, which could be used - always locally - for the preservation of food products or in any case marketed even at a great distance, even for industrial uses (chlorine production, etc.).

15) In any case, spills of sea water in the desert and deposits of excess salt mass disposed at random should be avoided, in order not to pollute the fossil, or non-fossil, water table of the desert, and to avoid dispersing salt dust in the desert environment .

16) **In the following page is illustrated a description of my project for a desalination (solar) greenhouse by collecting the condensation water.**

In this project the desalination greenhouses are included in a new oasis with crops. But if the presence of solar desalinators involves an excessive dispersion of salt in the oasis, with consequent contamination of the cultivated land, there is a simple solution: the solar desalinators can be realized in a separate oasis, adjacent to the inhabited oases and the oases with the crops.

17) The new artificial Oases in the desert would also be functional to the migrations of birds, which "in return" would contribute to the "biological contamination" of the oases themselves: pollination, insemination by their guano (seeds from other oases, from other natural habitats, etc.), implementation of biodiversity.



## WE MUST

**respect the desert in the process of creating the new habitats.** Desert is nature, it's alive, it's a "sacred" place. **The desert and arid areas are not evil to be transformed into good, that is, into "green",** into vegetation cover.

Probably **deserts have their very important function in the terrestrial climate and ecosystem.** So: it takes moderation and common sense. A "green wall" in the desert is fine (as in Africa or as China is doing), a system of oasis in the desert is good (like the one proposed here), **but you should never think of turning the desert into something that it is not,** against nature.

## SECOND,

as showned in the drawings of "The Marinduct Oasis System": **no cars always in the way.** Then no asphalt and roads, because the stench of civilization - or rather, incivility -, must never reach the desert. And artificial lighting only inside the new artificial oases.

**The only means of transport allowed in the new habitat of artificial oases will be: our feet, camels and trains,** the latter for the great essential movements of goods and people.

In other words, the new oases will not be a new colonization system followed by the construction of the usual stupid new cities.



# THE MARINDUCT OASIS SYSTEM

DESERTS AROUND THE WORLD,  
IN A WORLD FULL OF (SALT) WATER

## The Sahara, North Africa



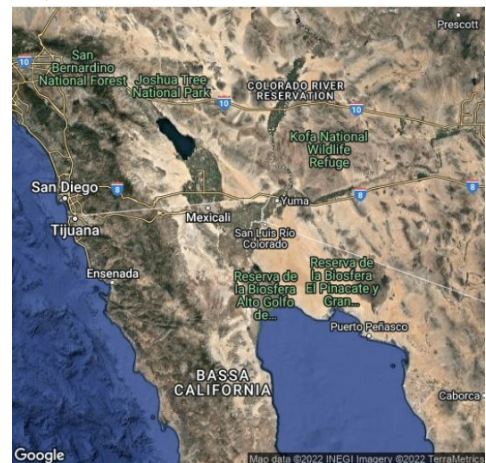
# "The Empty Quarter", Arabian Peninsula



# Persian Gulf, United Arab Emirates



# California, North America



## The Outback, Australia



## The Kalahari Desert, South Africa



Etc.



Etc.



Etc.



# THE MARINDUCT OASIS SYSTEM

THE GREENHOUSE SEAWATER DESALTER  
FOR THE DECENTRALIZED DESALINATION

*by Michele Leonardi architect © 1992 ca., concept. July 2019, designs.*





## AS ALREADY

mentioned above, in each new oasis the sea water is desalinated by its inhabitants, using the most appropriate type desalination of plant: solar distillation, vapor-compression distillation, electro dialysis membrane, etc.

Moreover, various low-cost desalination systems already exist on the market, for non-industrial uses, that is, to manage small masses of salt water to be desalted (brackish water greenhouses, desalination solar panels also arranged in series, etc : see the **bibliography** ).

The same applies to the energy supply system of the desalination plant, for which a separate site will be set up, but nearby, in a special new artificial oasis, with photovoltaic energy plants, or hydrocarbons (gas, oil).

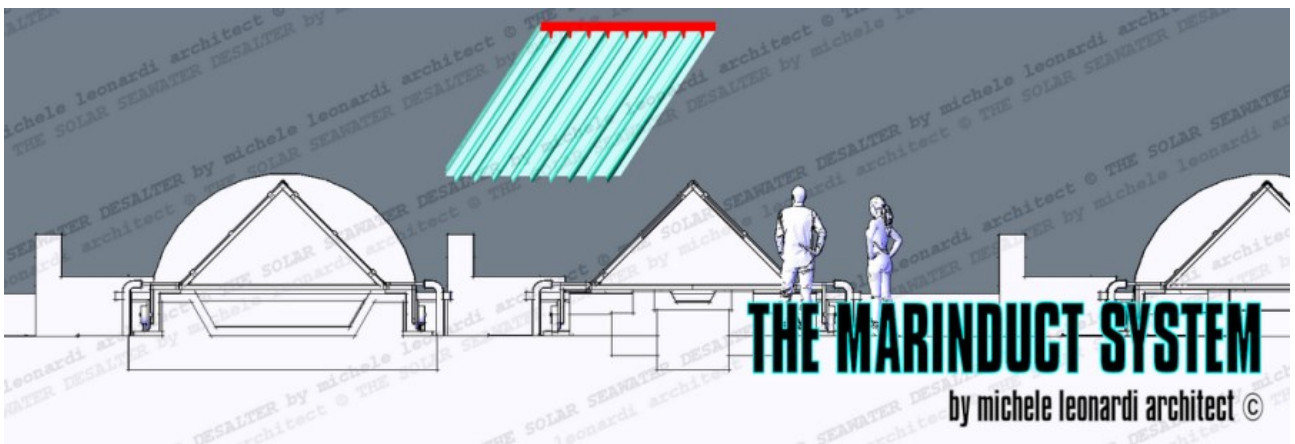
Here, instead, we propose a rudimentary, low-cost desalination plant, useful for very small communities, such as that of small oases. **It's simply a low, long greenhouse with a salt water basin at its base.**

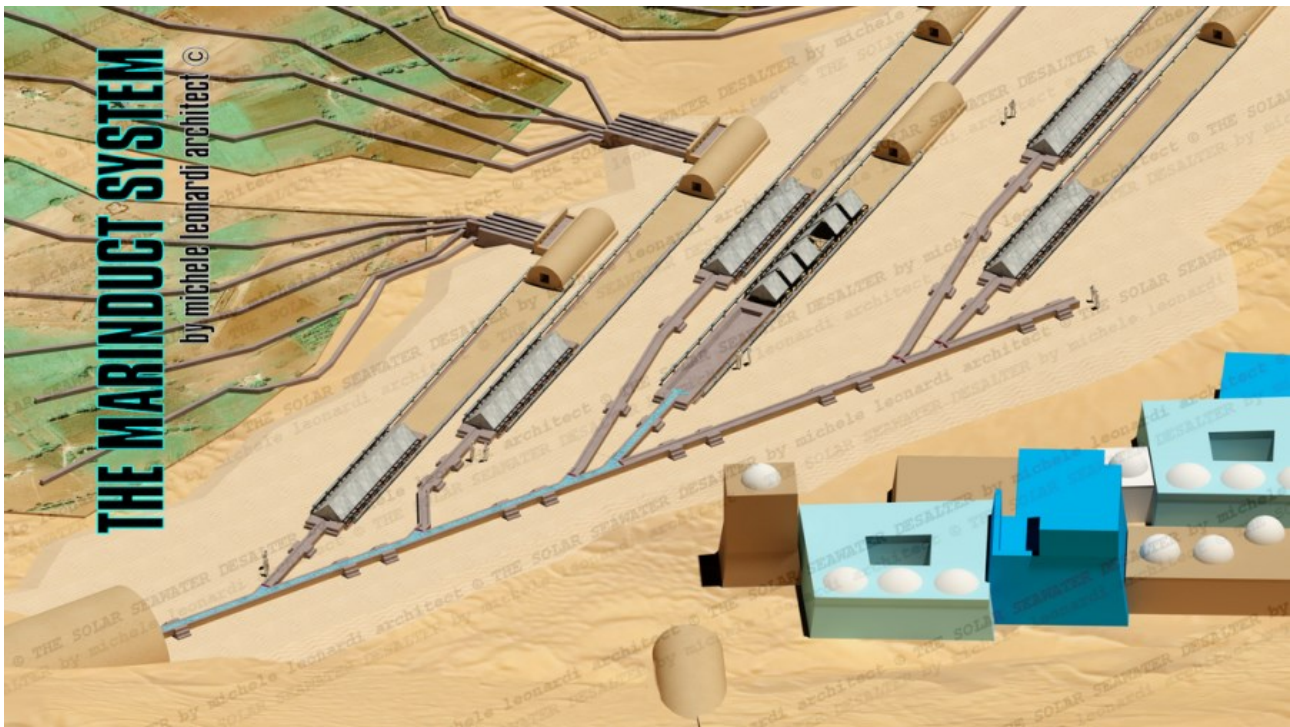
**So this solar energy desalter (ie evaporative type) works on the simple principle of the greenhouse effect.** It is a greenhouse that increases the temperature of the sea water contained in an internal basin, until it evaporates gradually. The steam, **the water vapour that gradually forms and condenses on the glass walls of the greenhouse, it is then diverted to a collecting duct, through the dripstones of the glass in the greenhouse.**

These dripstones are nothing more than continuous indentations, knurling, the grooves of the windows themselves: the glass in the greenhouse is lined internally, as can be seen in the drawings below. **Finally, nothing special, the condensed water collected in the ducts is diverted to another pipe parallel to the mobile greenhouse trucks, and equipped with individual mobile connections, and from there sent to a water tank for collecting the fresh water.**

**How is fresh water purified and mineralized?** Simply by further filtering, ie through the sand, according to the well-known "**Venetian well**" principle. In fact, if with this system the Venetians have supplied themselves with water for centuries, it is not clear why we now have to pose so many problems to use an equally simple system, at least conceptually, given that the solar watermakers we are talking about here certainly do not manage the large masses of salt water that manage the large industrial desalination plants serving large cities and large desert communities; industrial desalinators must be equally large in terms of construction, management and maintenance costs.

In fact, here we are dealing with small communities of desert inhabitants. In this case industrial desalinators are not needed.





Above, in this picture is shown the structure of the greenhouse desalinator here proposed, and its mode of operation, can be understood.

Sea water is introduced into the greenhouse water tank, the basin.

When the sea water has evaporated, the modules with undercarriages that make up the greenhouse are disconnected, and then they are moved along the rail, so you can work in the tank, for pick up the salt left in the basin. ( In reality the process is a little more complex, but we skip other steps, such as the residual brackish water, which will be poured into a second tank, open to the sky, adjacent to the first, at the end of obtaining the final secondary by-product, that is, sea salt).

Why are mobile modules necessary? **Because inside the greenhouse it is so hot that no one can work inside it. Instead in this way the carts are moved on rails, and during the day, in the morning, or even at night, you can work in the water tank by removing the salt or the remaining brackish water.**

Obviously, at the end of the process, ie at the end of the evaporation of the sea water, other greenhouse opening systems would be possible: by means of two tilting glass walls, with hinges, or even with an entire tilting greenhouse module on hinges, rather than movable with a greenhouse module along a track.

But in my opinion the rail system is the simplest and the best.

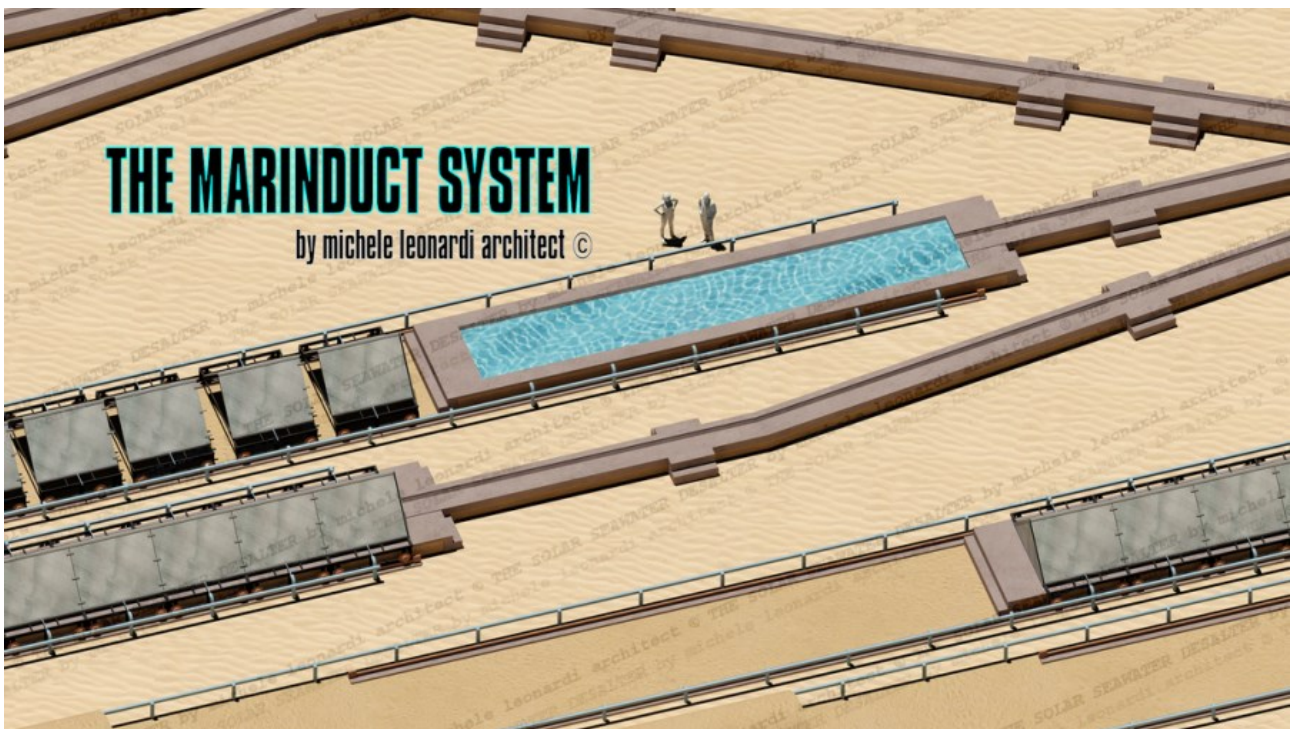
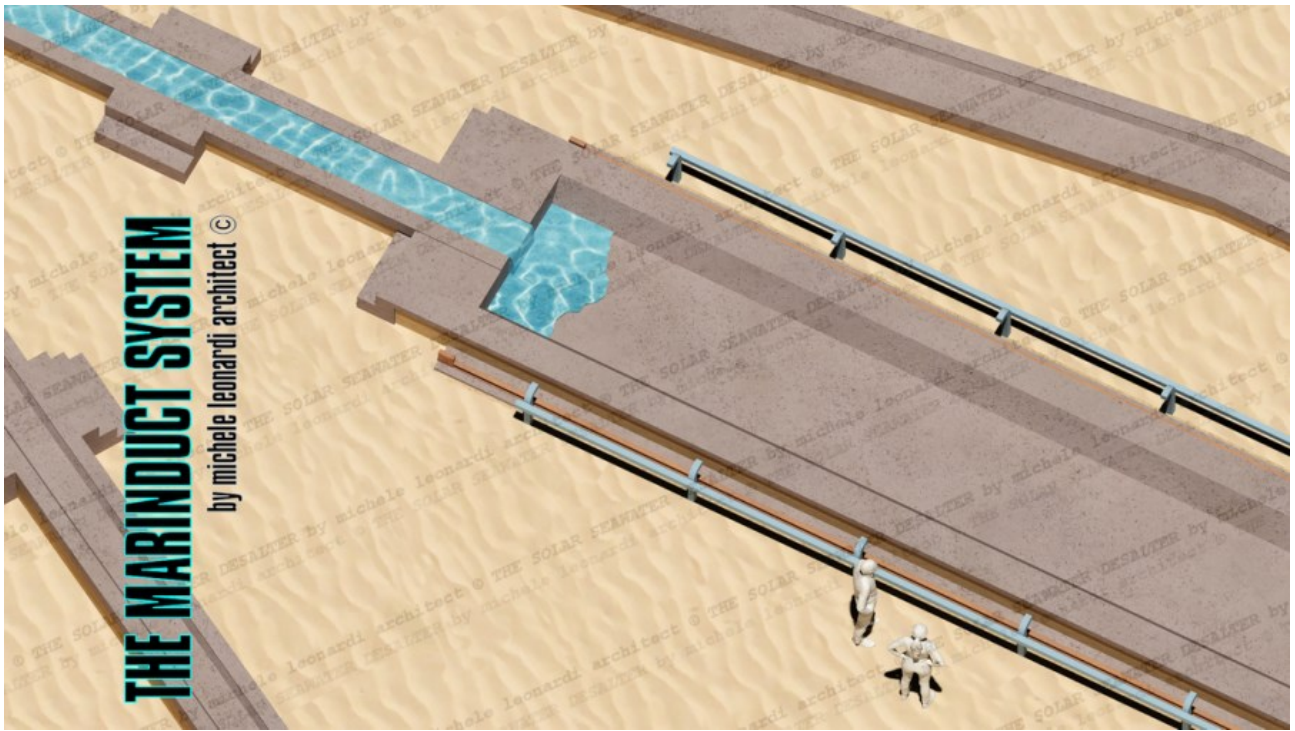
Another important thing, already mentioned in the previous pages: if the solar desalinators were to contaminate the soil of the oasis with too much salt dust, it is possible to create an artificial oasis specific for the desalination greenhouses, naturally positioned near the basic oasis, that is the one with crops and dwellings.

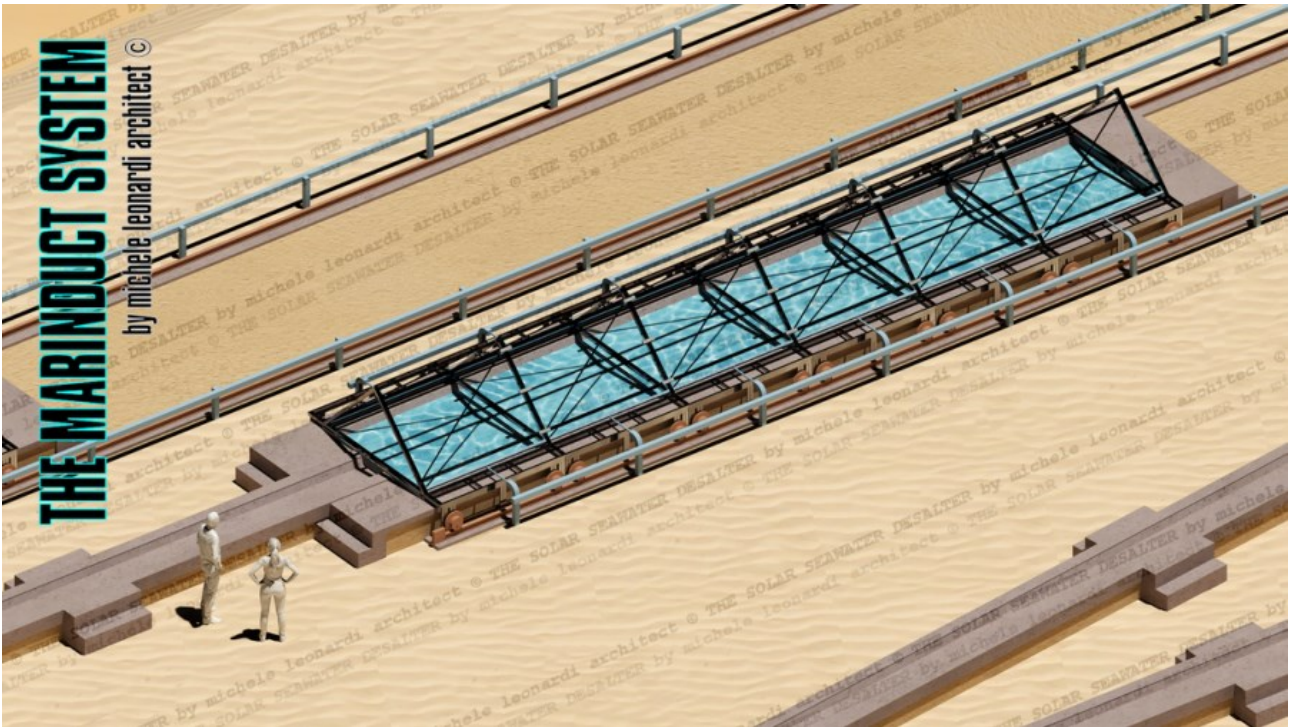
# BELOW

the various phases of the whole process, always in broad terms:

**1-A) The still cold sea water is dispensed and diverted into the greenhouse basin:**

(Sea water must be kept cold along the entire course of the Marinduct, from sampling at sea to the local cisterns of each oasis, for many reasons which we fail to mention here, so as not to be lengthy; local cisterns are useful for accumulation, compensation, regulation of water flow, etc.).



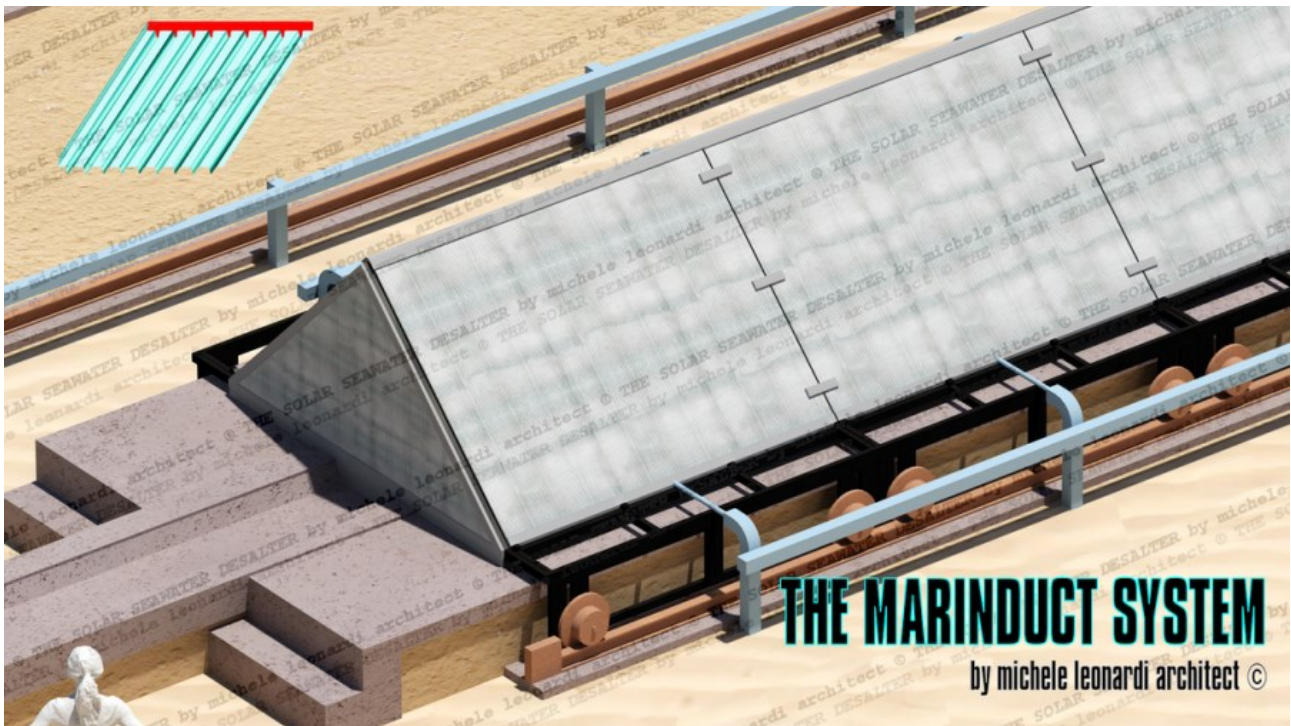


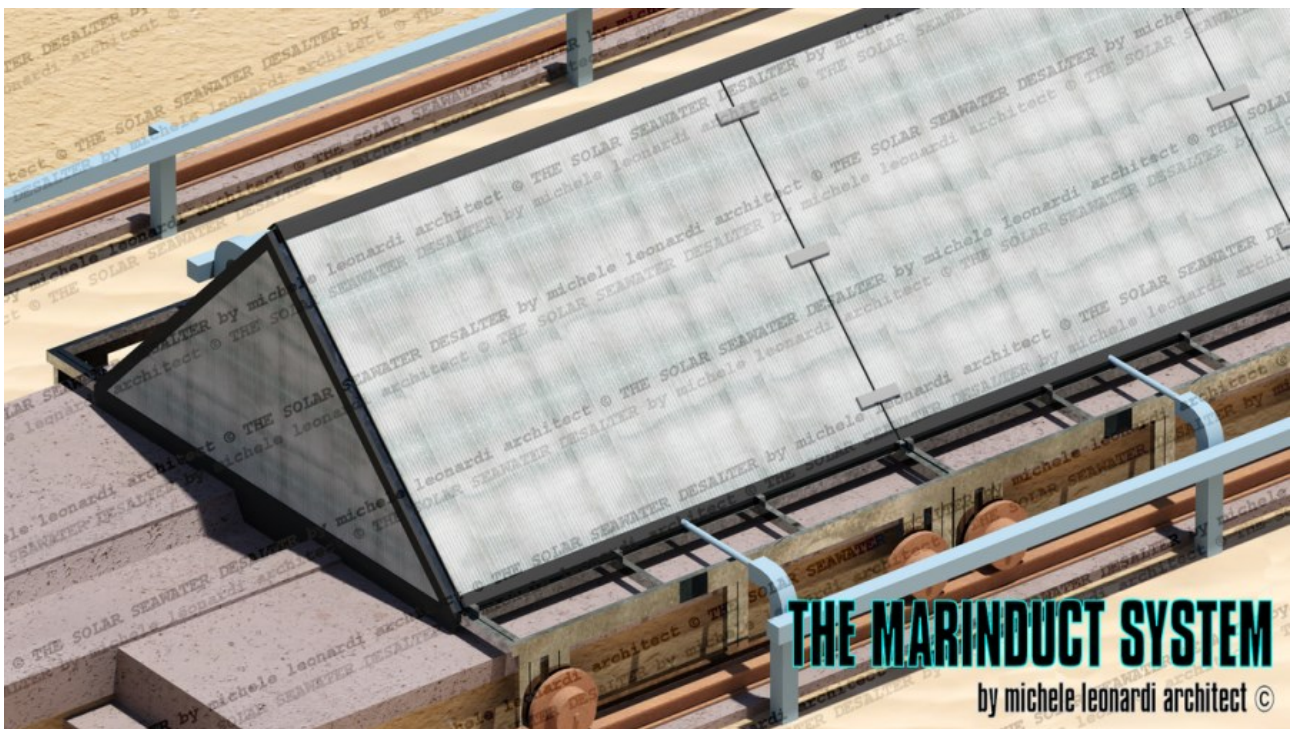
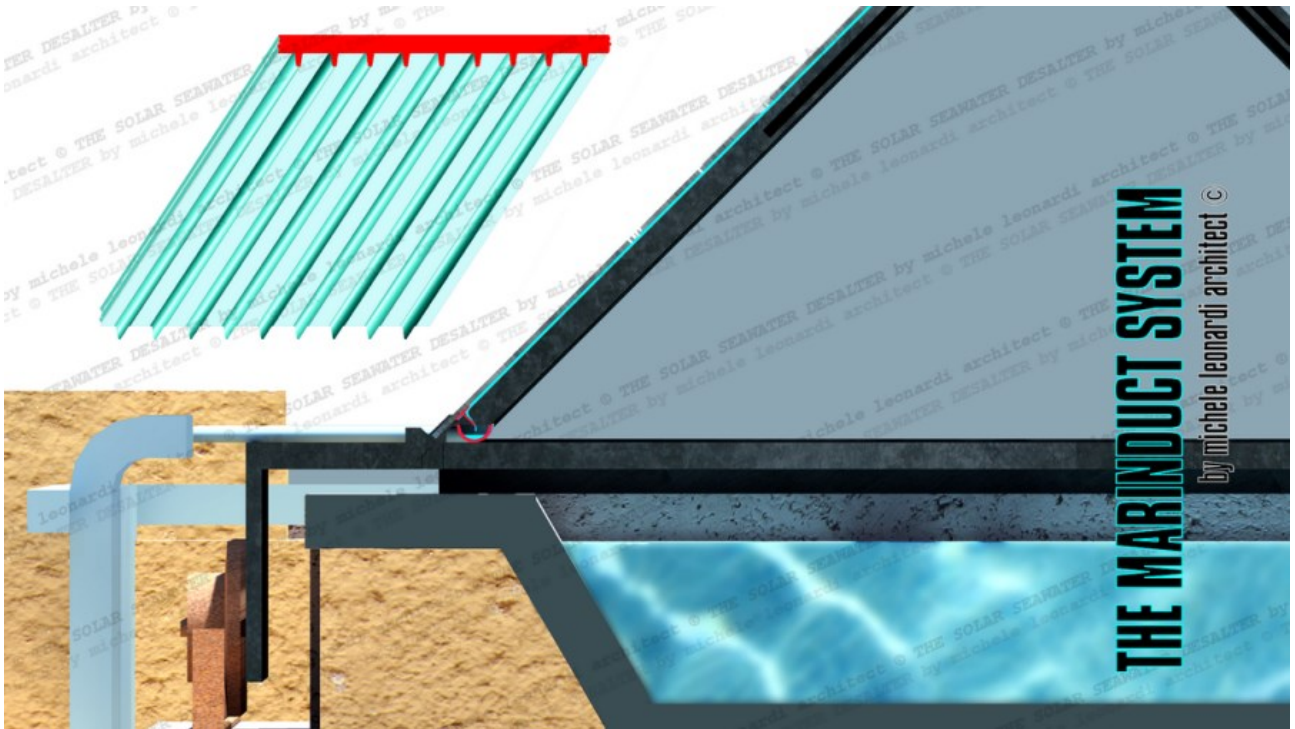
1-B) In this first phase, the single greenhouse trolley-modules are actually already positioned above the tank, and already attached to each other, as illustrated in the following drawing below. In fact the two drawings above serve only to show where the seawater mass ends up.

1-C) The single greenhouse trolley-modules are fitted with gaskets, otherwise it is obvious that water vapor would escape from the "trap" of the greenhouse.



2) The condensation water slides along the serrated internal walls of the glasshouse, up to an internal rain gutter - but inside the greenhouse, like you can see in the drawings -, and from there it is diverted towards a longitudinal pipelines outside the greenhouse, connected by means of furniture tubes to each greenhouse module.









**3) As a secondary by-product, at the end of the evaporation of sea water, sea salt is directly obtained** (or, as already mentioned, a brine to be further processed in a side open-air basin, until nothing else remains but sea salt).

Once the sea water has evaporated - or once the brine has been transferred to a second open-air basin - it is useless to waste time carefully scraping the surface of the salt-encrusted tanks, so later the water tank will be filled again with salt water.



**4) The two external pipelines are connected to a cistern for collecting the fresh water extracted.**

**In reality, as already mentioned, the plant will be slightly more complex,** because the water will be conveyed to a first cistern with a bed of sand, to be filtered and mineralized, and from here it will then be sent to a second final cistern, arranged in series and coupled, for the accumulation of fresh water.



5) All the ducts, cisterns, tanks, etc., along which the sea water flows or is contained, are covered with hydraulic concrete of the same or similar composition as that of the extremely resistant Roman concrete.



6) The wheels of greenhouse modules and the rails will be of common iron. But even the metal frame of the single greenhouse module can be realized by the use of simply iron, since the sea water not in motion (waves, coasts, beach, ecc.) has a reduced capacity of corrosion.

## BUT... CAN IT WORK?

Have you ever had a shower in a shower cabin? And in a sauna? Have you ever been inside a greenhouse for tropical plants? In this kind of places the steam and water condensation are everywhere.

So ... with all the sun that there is in the middle of the desert, the water condensation inside this kind of desalination greenhouses certainly is not missing! Of course, only the experimentation can give a real answer, but there is a good chance that it will work, it's evident.

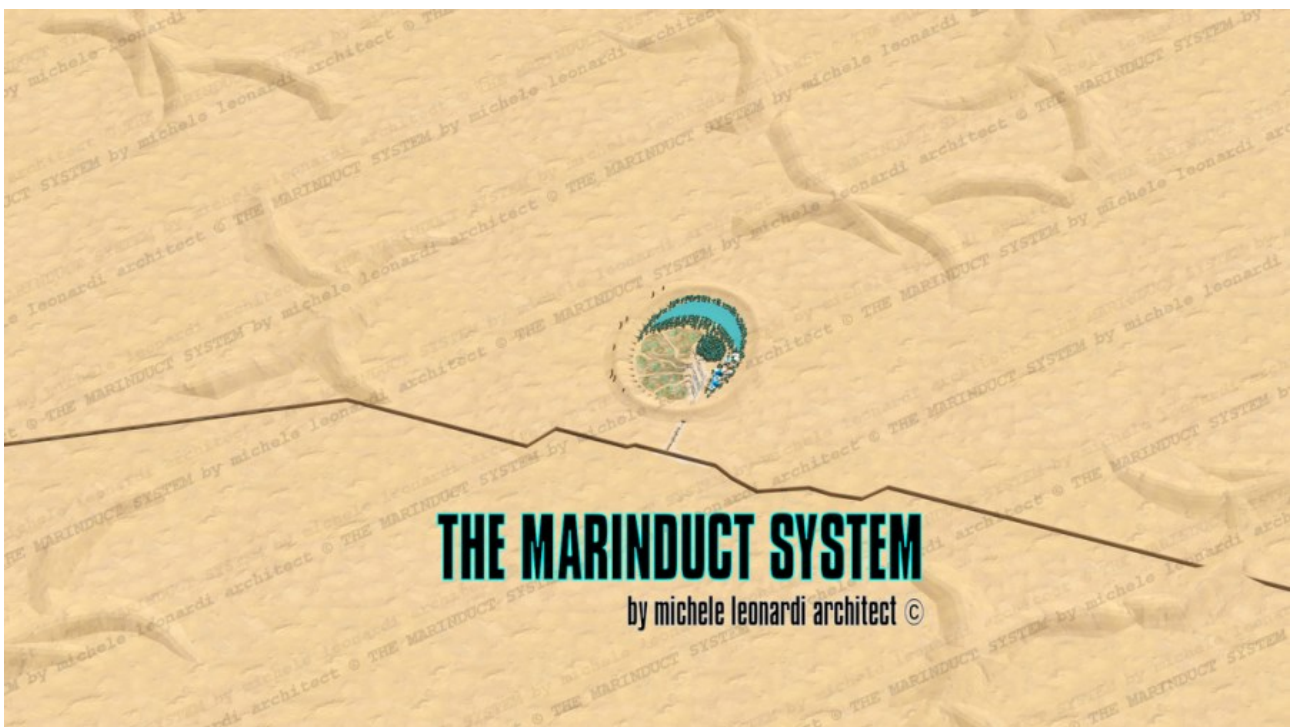
## 2024, FOUR YEARS LATER...



# THE MARINDUCT OASIS SYSTEM

THE NEW OASIS HABITATS  
BY MEANS OF DECENTRALIZED DESALINATION UNITS

*by Michele Leonardi architect © July 2019*



## AS ALREADY

written about the "**Oasis Habitat**", in general the oases in the desert are not a natural phenomenon, as most people think it, because they are the product of a millenary culture, the result of a long adaptation of some people to extreme living conditions.

In the oasis everything is artificial, like the drainage and administration of water-resource, like the palm grove that create a local microclimate.

Even the dunes are artificial, both to create along with palm trees a local microclimate (crops' shading, reduction of evapotranspiration) and to protect palm trees and crops from wind and sandstorms.

## SO, HERE,

what do we propose again?

## 1st WE PROPOSE

**the integration between the new oases and Marinducts, or rather the creation of new oases, through the supply of desalinated sea water on site, according to the needs of the individual oases.**

Not a large initial desalination plant, and then a normal freshwater aqueduct, on the contrary a Marinduct and many little desalination stations, associated and functional to the various new oases. In this way work is created locally and the various communities of the individual oases are directly responsible.

**To the question: "Why depend on the Marinducts for the supply of fresh water?", one answers in this way: "Why depend on the limited reserves of fossil water?"** Or even so: "Why depend on an aqueduct powered by a large industrial desalination plant?"

## INDEED

**the Marinduct does not exclude the use of drained or pumped fossil ground water, nor the use of large industrial desalination plants,** indispensable for the large urban aggregates that arise in the desert and arid areas. **The Marinducts are one more,** they are an additional possibility of finding water for new and old habitats in the desert.

**It could be objected that the supply of sea water through the Marinducts is a weak point for the communities of the oases, which would depend totally on the Marinduct.** But as we have already said in the previous pages, nothing prevents the accumulation of fresh water in the reservoirs in the oases, in order to deal with water emergencies in case of temporary interruption of the water supply from the Marinduct.

And then what to say about the great problems that even the happy irrigated lands of the world have, those where the water (rainwater, groundwater, seasonal glacier thaw, snow thaw, lakes, rivers, dam basins, etc.) is not in short supply?

Unfortunately even in those happy lands there are great problems and therefore great dependencies, dependence on an ideal steady state that in reality does not exist, since the weather and climate change by definition, otherwise it would be a dead planet like the Moon, Mars, Venus, Mercury. So even in the happy lands full of fresh water they are big problems: floods, tornadoes, frosts, hail, and on the contrary, seasonal droughts or even prulungate over the years, even for decades ... it's part of life!

**Ergo, "there is no rose without thorns", the Marinduct has a weaknesses, it's right, but it also has a great strong point: the seawater, although salty, is not scarce in our Planet Earth, so much so that rather it should be called Planet Ocean.**

## 2nd WE PROPOSE

**in embryonic form also the possibility of creating large underground spaces below the artificial dunes;** hypogeous spaces at the service of the community, usable for specific activities, as well as for cooling the houses of the oases.

All this is represented schematically in the drawings of this page as a large circular tunnel with transverse secondary tunnels. Still in these drawings, we mention the fact that the large tunnel is connected to the air intakes oriented to the prevailing winds, that is so-called "**wind towers**". Furthermore, the lower part of the large circular main tunnel can be used for accumulating excess fresh water. Water mass in turn useful for thermal and bioclimatic regulation in underground spaces. But also to humidify the indoor atmospheric air in the oasis houses.

Therefore, before making the artificial dunes, tunnels and underground spaces are built, as well as the windtowers and lightwells. Later these buildings, destined to community and specific activities, they are covered with a big sand mass.

In this way the dunes over the hypogeous spaces, this sand mass becomes a big shield compared to solar radiation, because acts as a thermal insulator.

Also, more importantly, the mass of the artificial dune thus guarantees (with its thermal capacity) the delay and a noticeable reduction of the daily and seasonal temperature changes inside the underground spaces, or perhaps even a constant indoor seasonal temperature (since in any case there are exchanges of atmospheric air between inside and outside).

However the sand masses of artificial dunes, with their thermal capacity and a certain degree of air permeability, even if minimal, probably work however as local thermoregulators for the concavity of artificial oases and for all that they contain.

For all of the above we can conceive the artificial oases with artificial dunes like big shields with respect to the extreme desert environment, as well as large containers. But since the artificial oases are vital spaces placed in the middle of the extreme environment of the desert, we can conceive the artificial oases also as big uteri, large placentas, uterus for their inhabitants.

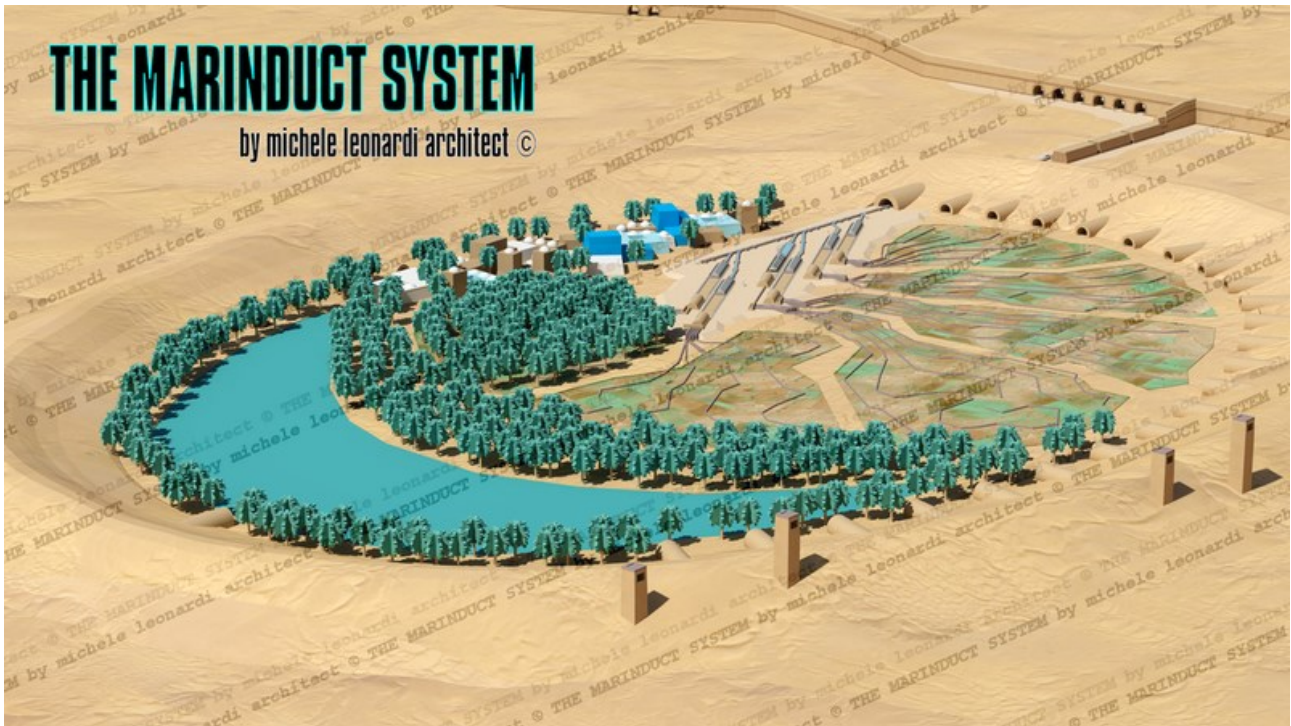
Not by chance for this and for many other reasons, related to long-term environmental sustainability, the Prof. Arch. Pietro Laureano proposed in one of his books ("The Inverted Pyramid:") "**The Oasis Model for the Planet Earth**", indeed, it has entitled it just like that.

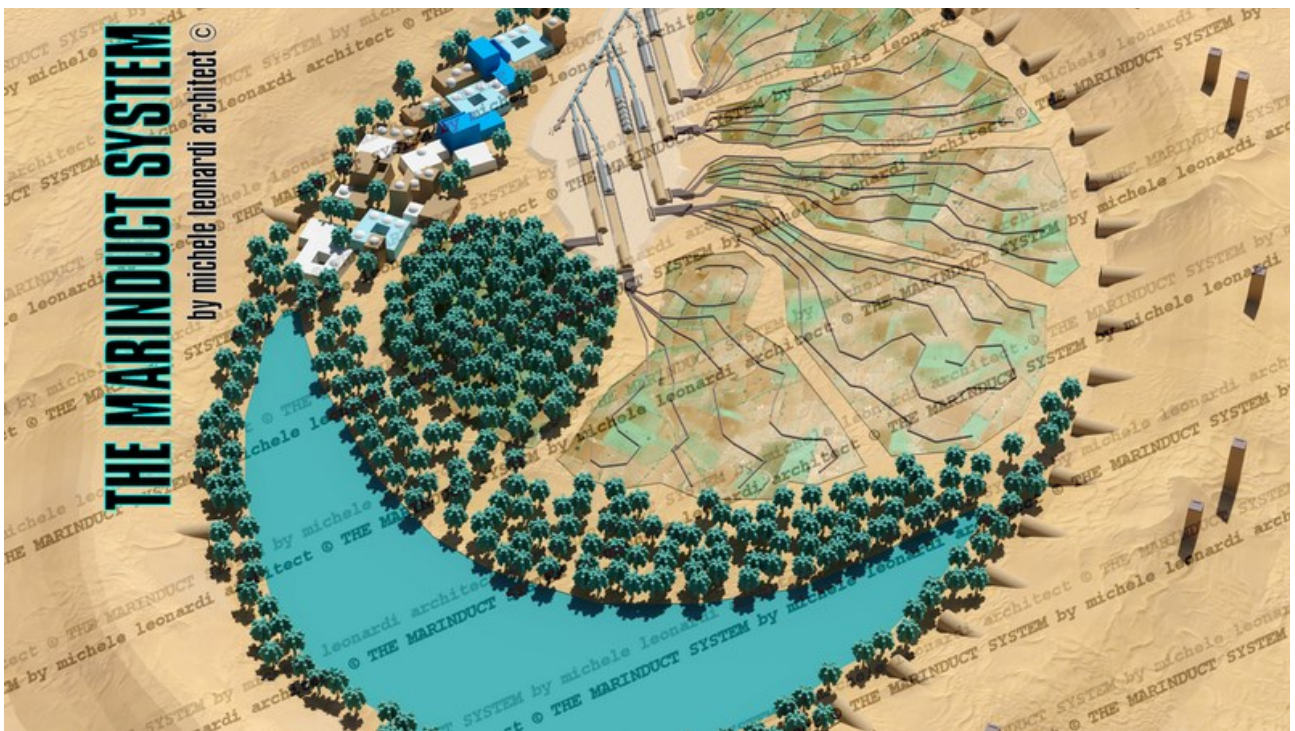
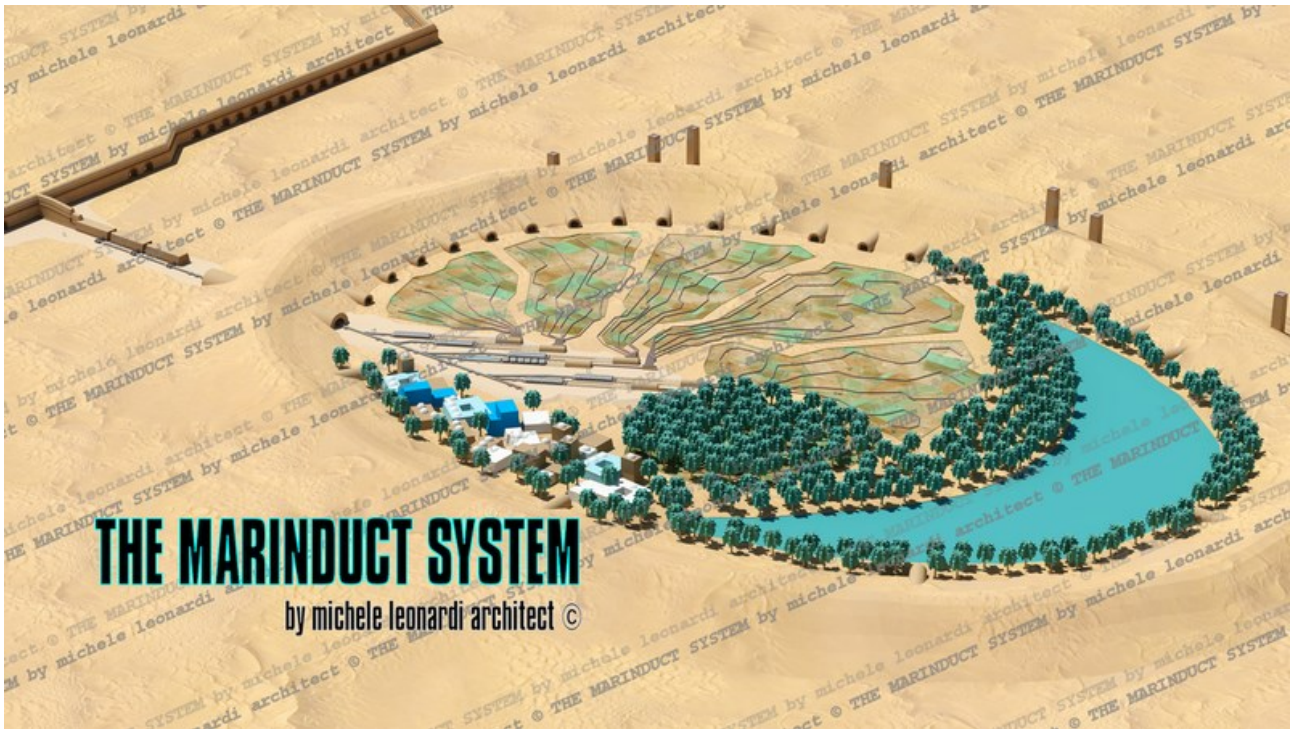
## 3rd THE SALT,

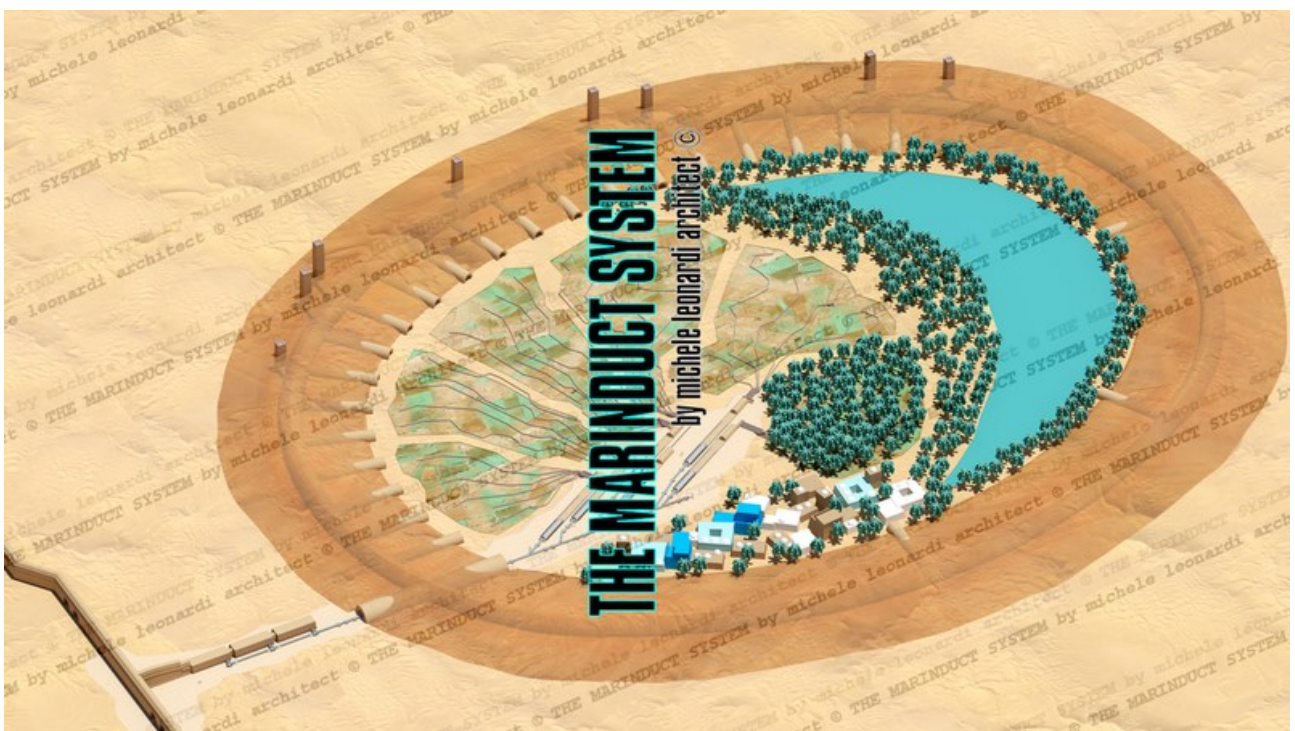
by-product of seawater desalination, it could also be used as a building material for homes, as well as for storing food, or for exporting it to food or industrial use (chlorine can be made from salt, etc.). Or again, so as not to contaminate the desert with salt dust dispersed by the wind, and not to contaminate

the soil, small oases can be created for the salt storage, and equipped with a concavity, a bottom, waterproofed.

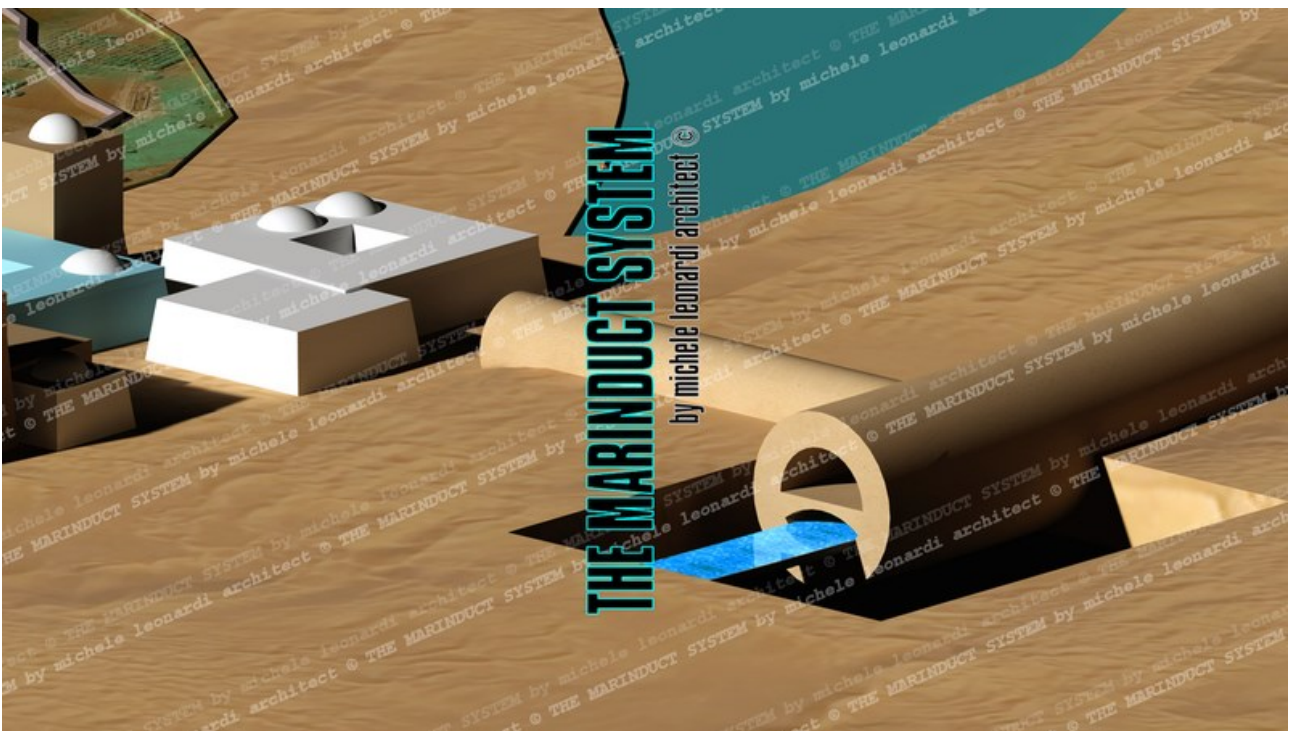
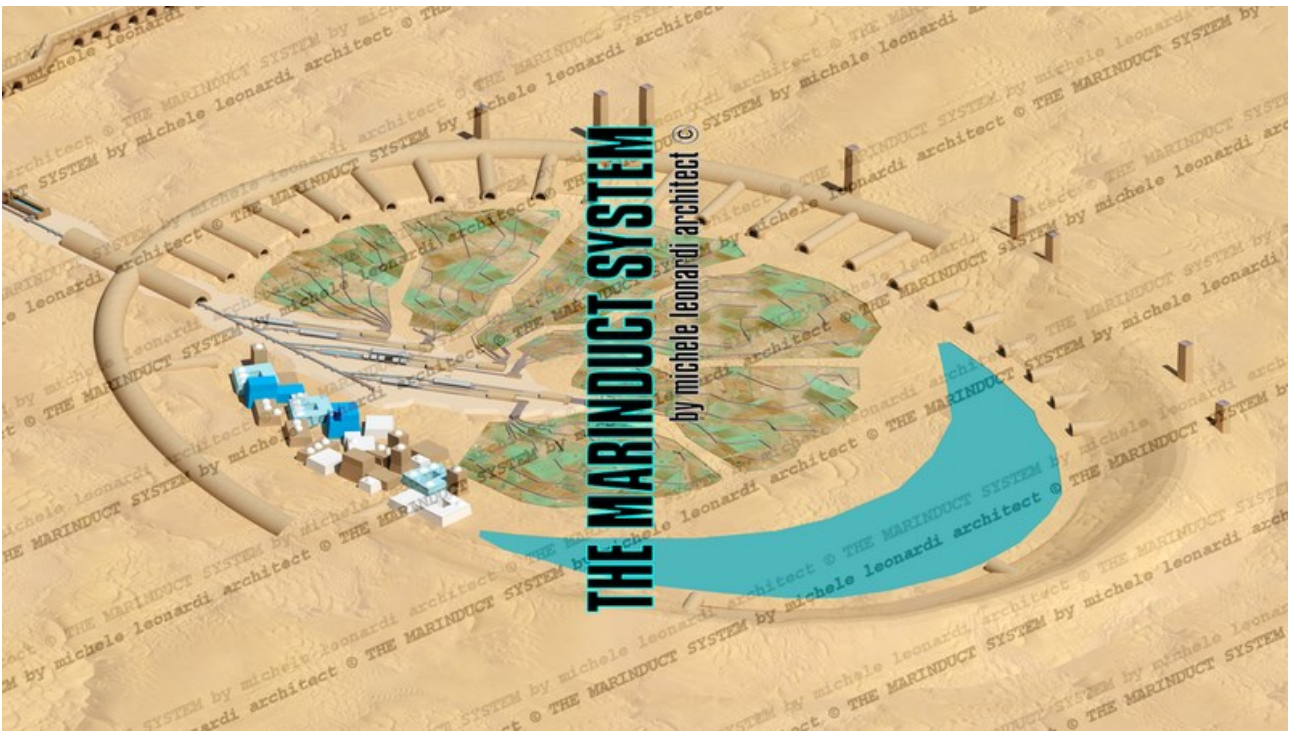
### The organization of Marinduct Oasis System











The Marinduct Oasis System  
at dawn

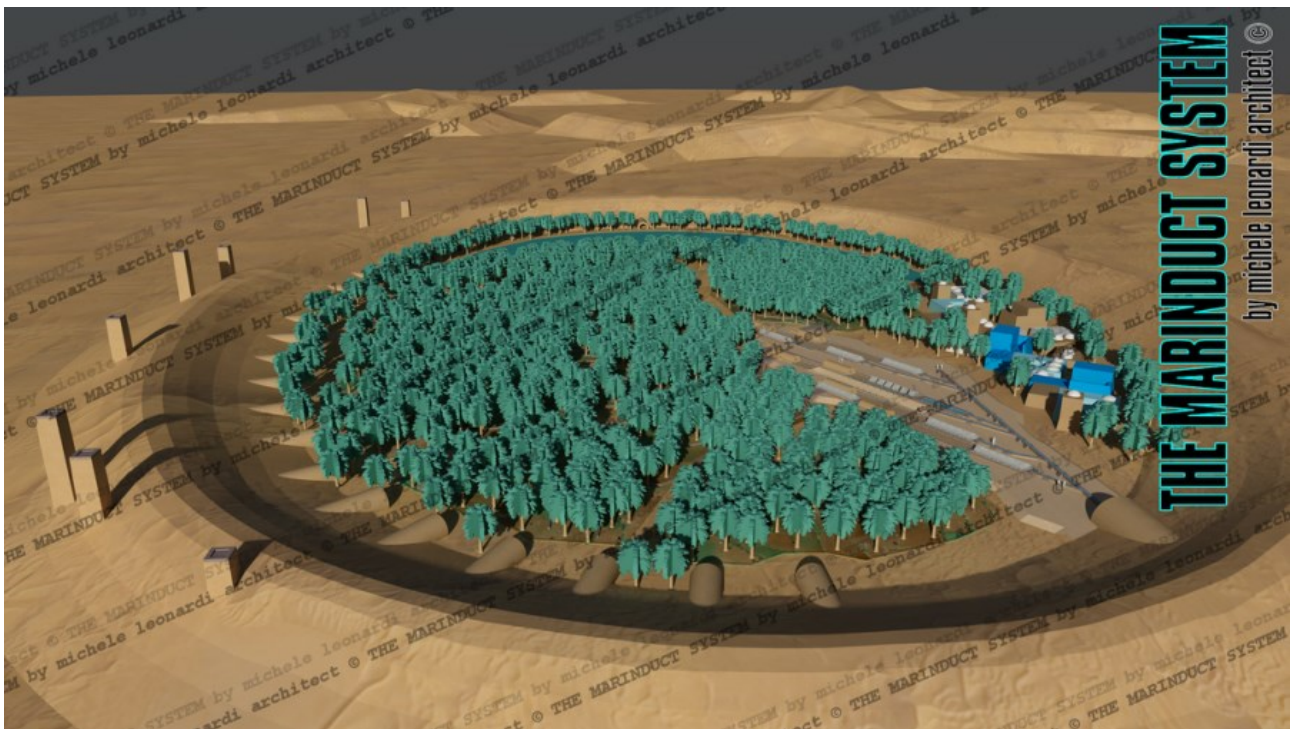


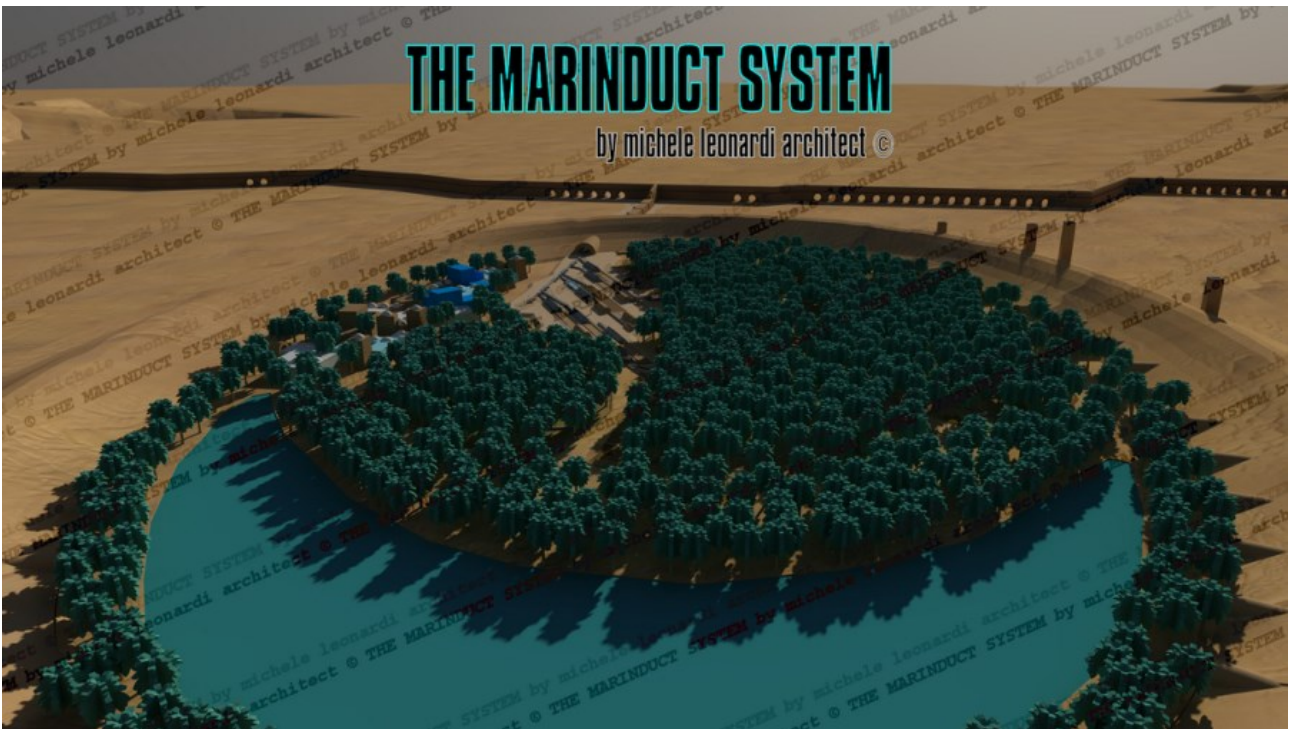
## The Marinduct Oasis System by day





The Marinduct Oasis System  
at the sunset

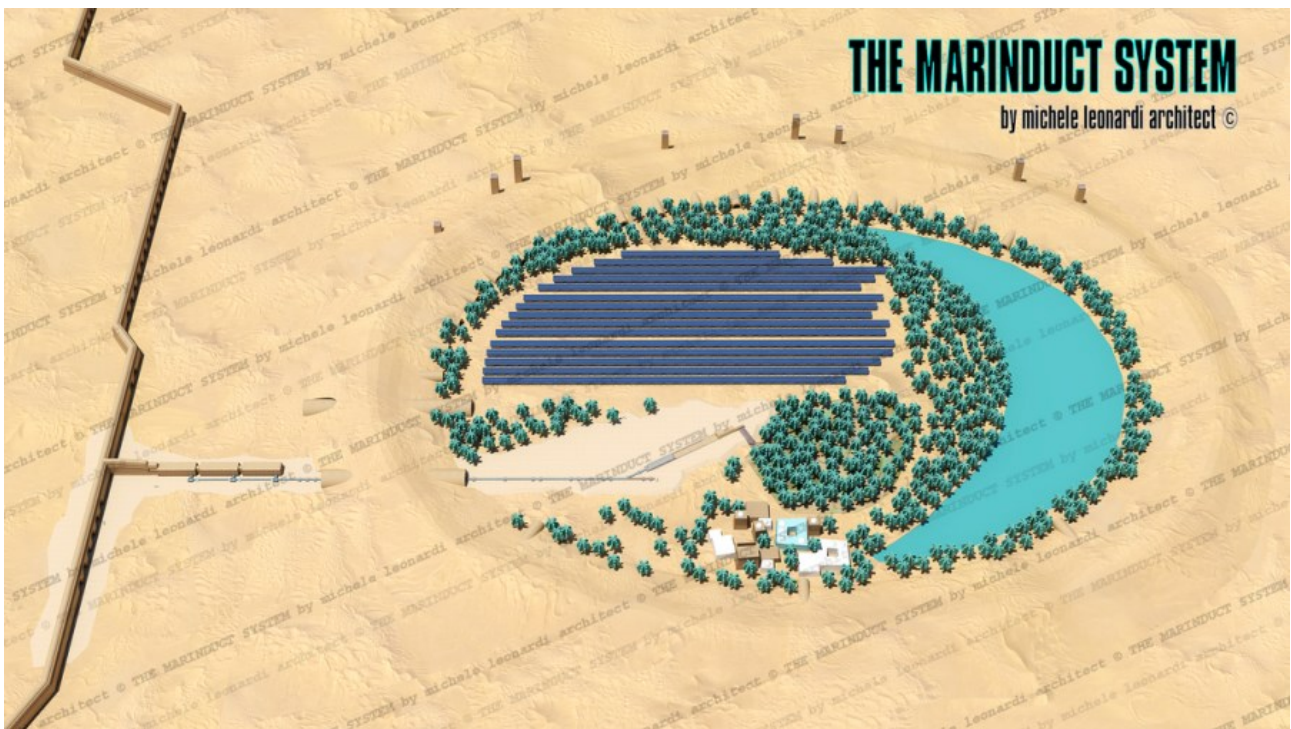


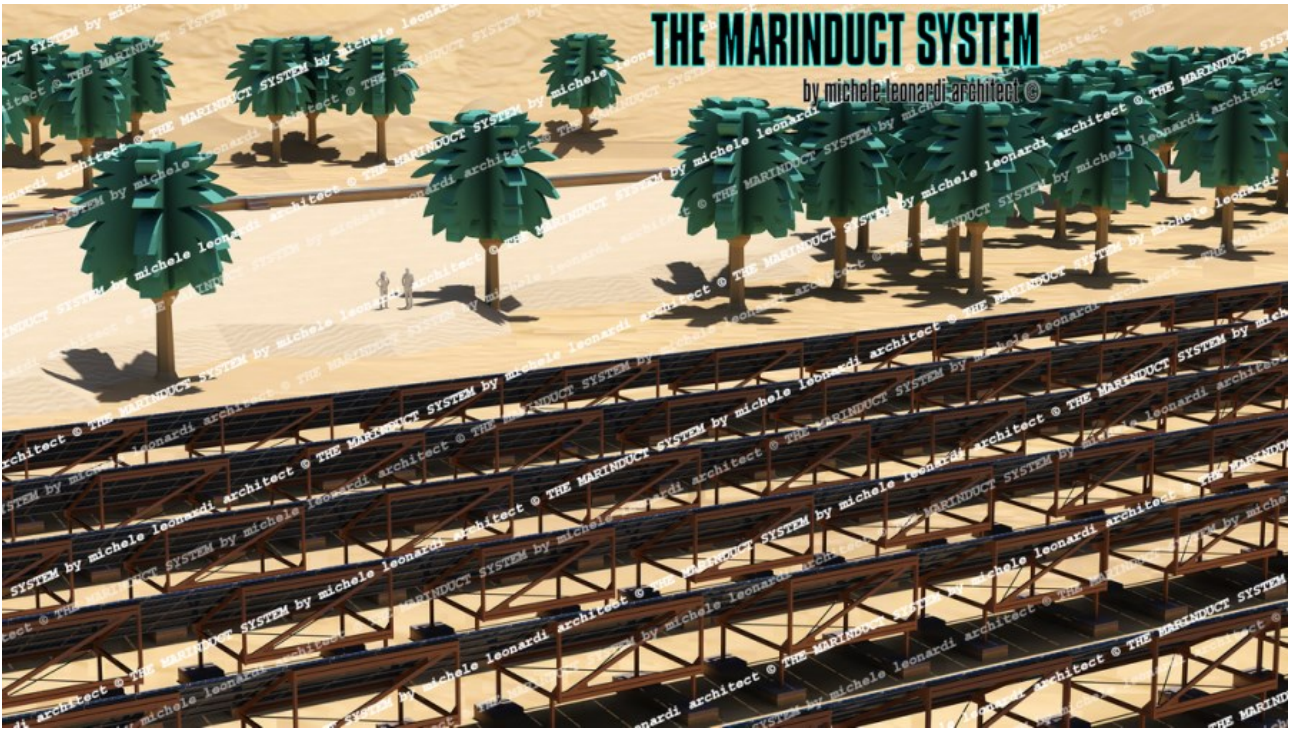


# THE MARINDUCT OASIS SYSTEM

THE PHOTOVOLTAIC OASES  
FOR DECENTRALIZED DESALINATION UNITS

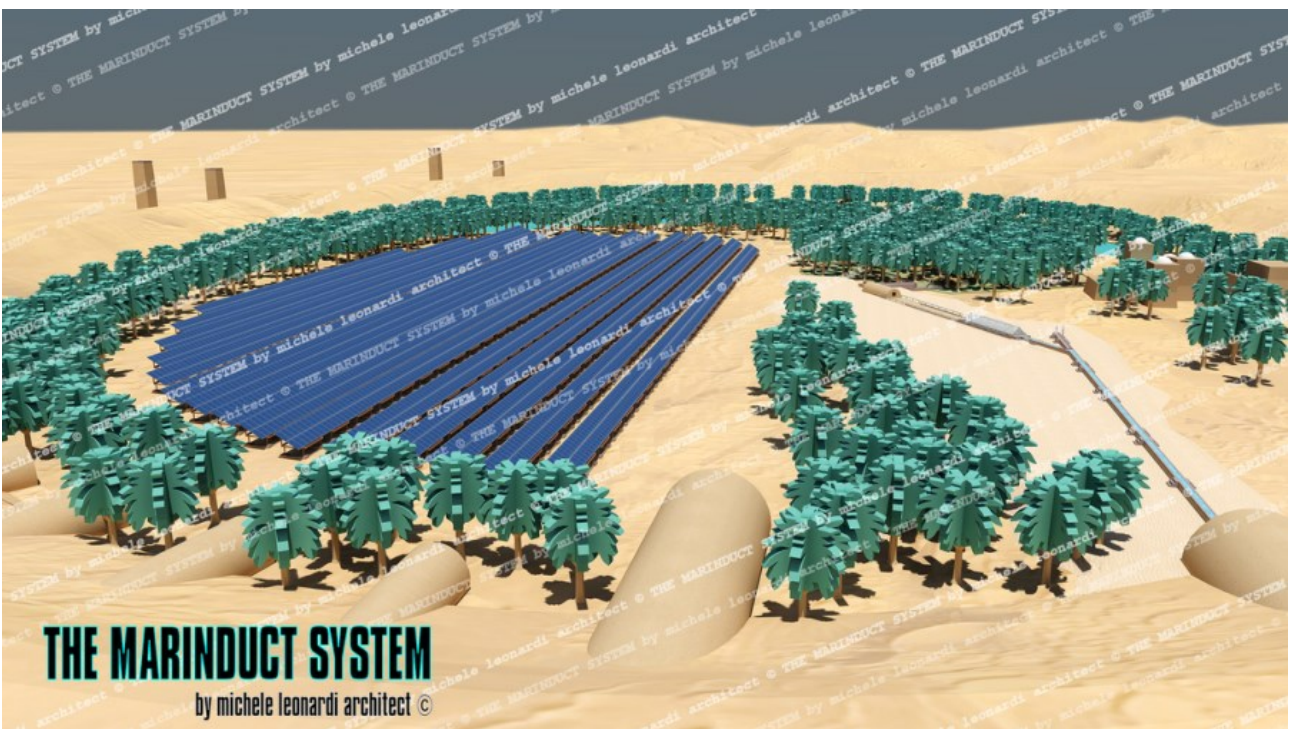
*by Michele Leonardi architect © July 2019*

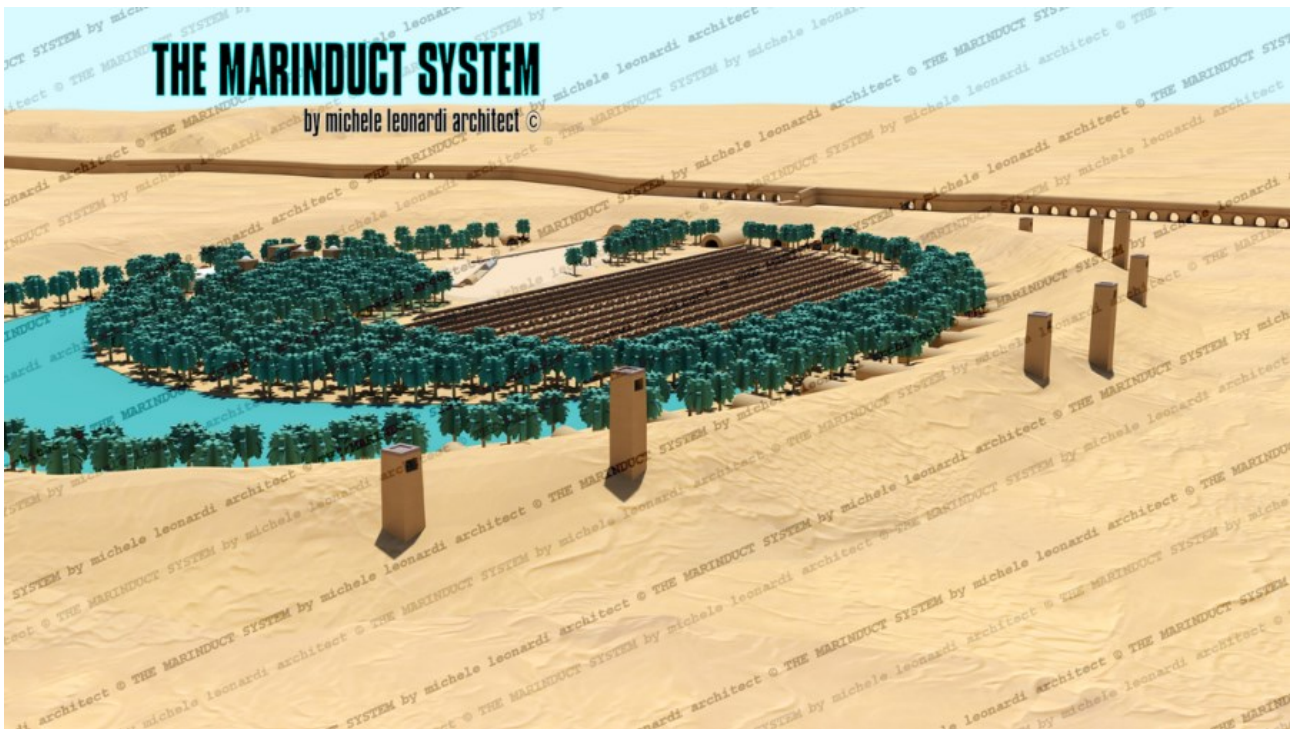
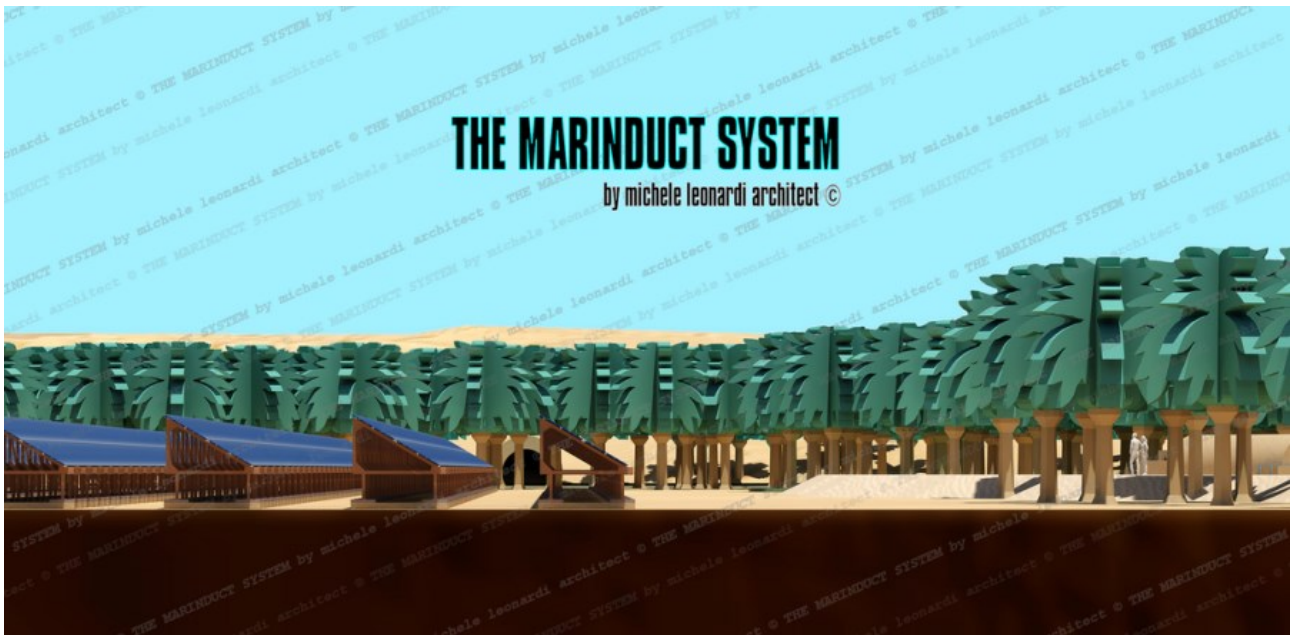




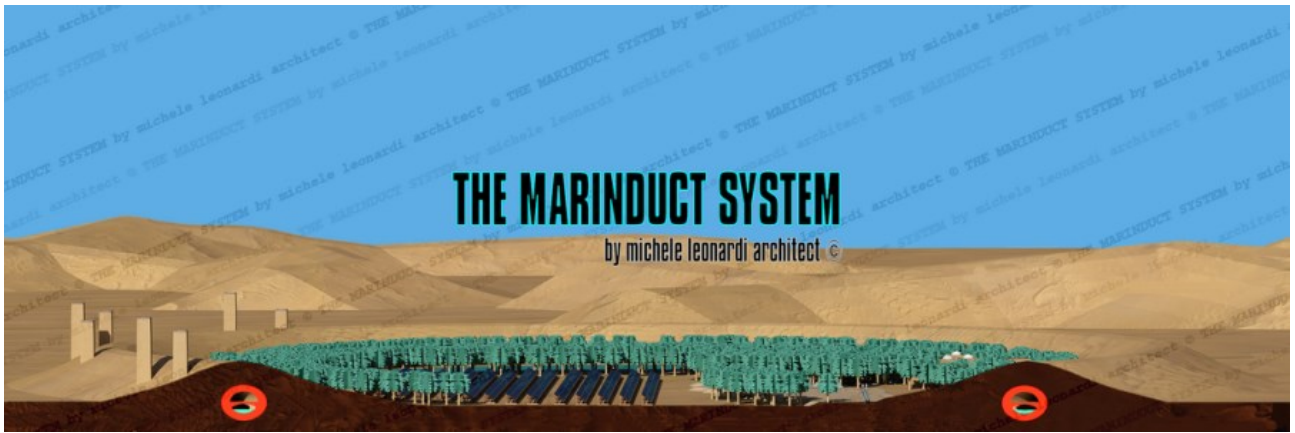
# THE

"Photovoltaic Oasis" supply electricity to the water lifting plants and the nearby oases that contain crops and desert people.





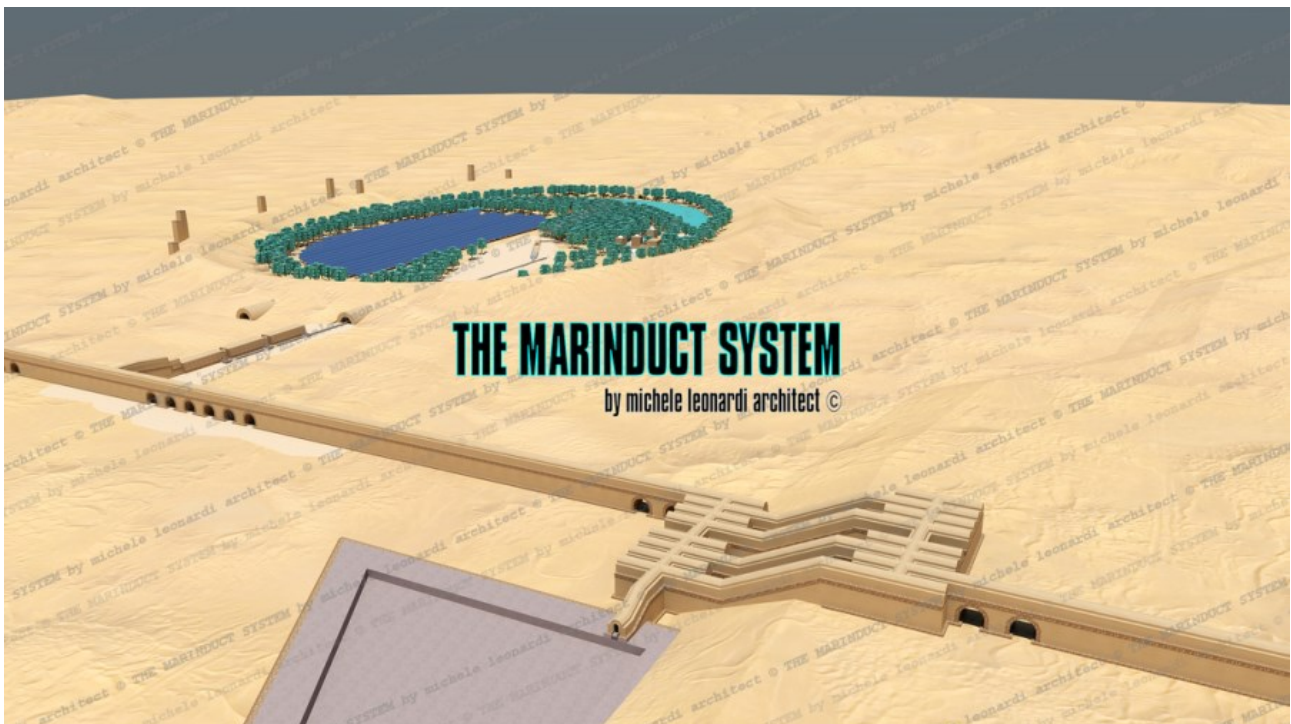


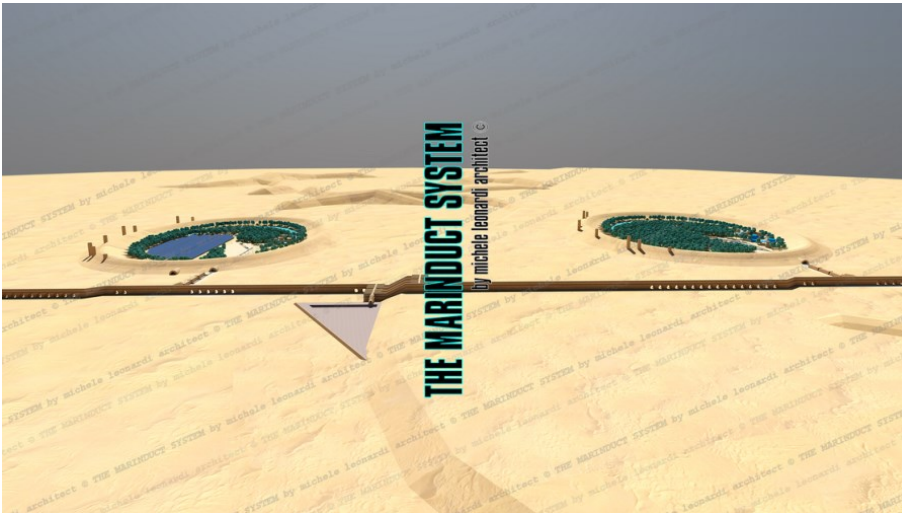


# THE MARINDUCT OASIS SYSTEM

THE WATER LIFTING PLANT

by Michele Leonardi architect © July 2019





## THE

Water Lifting Plan uses the Archimedean screws pumps to lift the water.

- 1) It's powered by a nearby oasis with an electricity production plant (photovoltaic, gas, or oil).
- 2) It's equipped with accumulation and compensation tanks connected in series; everything is covered, away from the sun, in order to keep the sea water temperature low, before the final use.
- 3) The water lifting plant has a large open-air emergency basin by means of a breather. This is to avoid contaminating the desert aquifer in case of problems, maintenance, etc.



# THE MARINDUCT OASIS SYSTEM

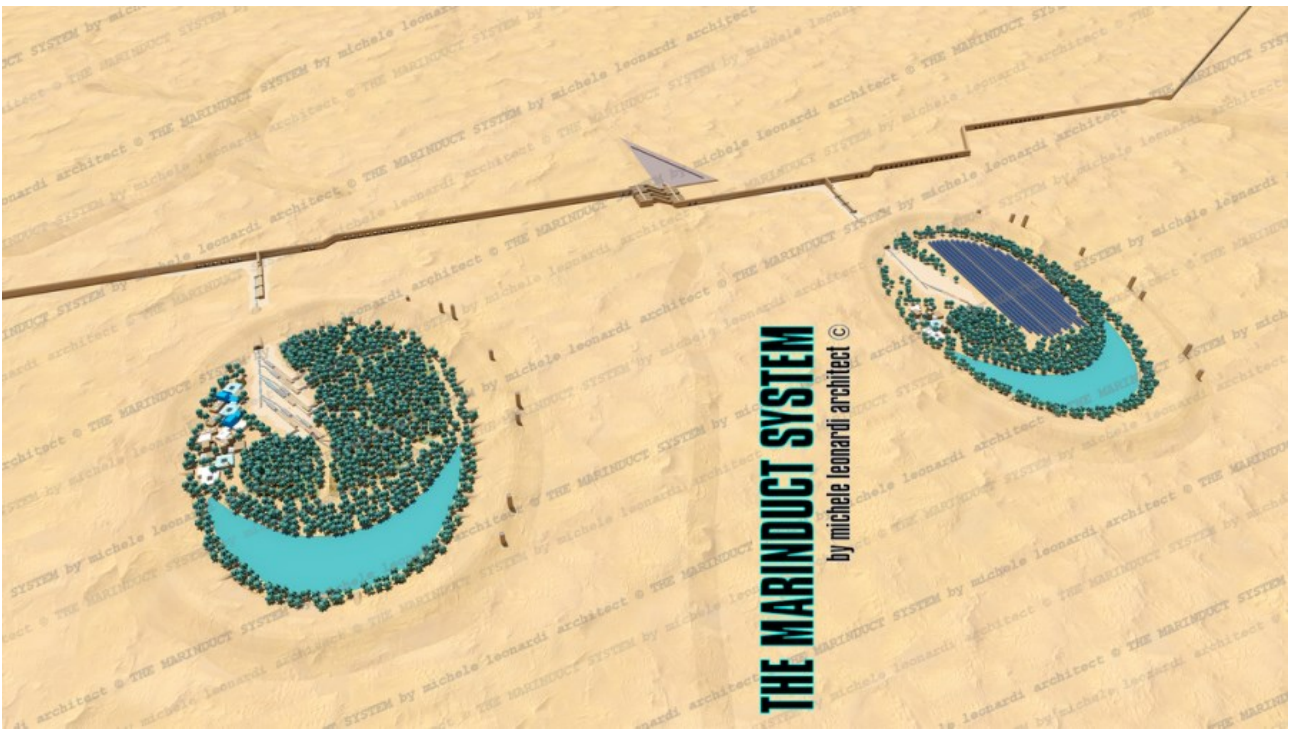
HD SELECTED PICTURES OF  
DECENTRALIZED DESALINATION UNITS

*by Michele Leonardi architect © July 2019*

**The Marinduct Oasis System  
at dawn**



## The Marinduct Oasis System by day



# THE MARINDUCT OASIS SYSTEM

SOME EXAMPLES OF  
ANCIENT OASES IN THE SAHARA

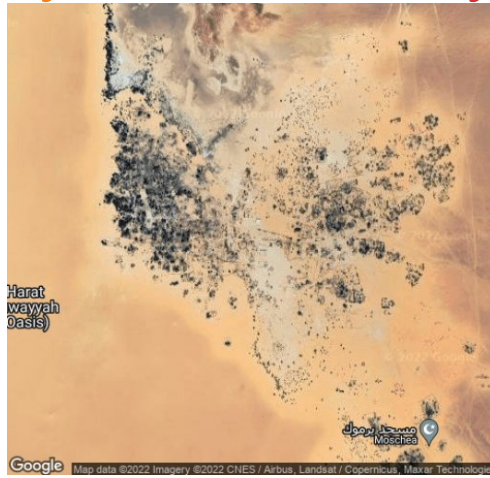
## Sebha Oasis, Lybia



## Tazirbu Oasis, Lybia



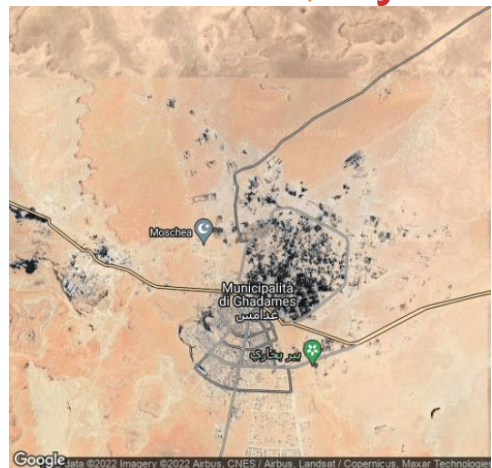
## Rabyanah Oasis, Lybia



## Bilma Oasis, Niger



## Ghadames Oasis, Lybia



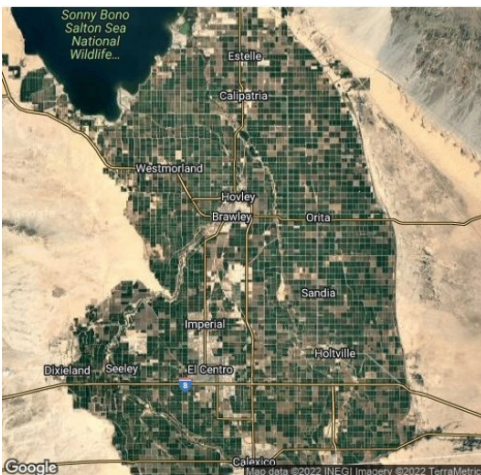
# THE MARINDUCT OASIS SYSTEM

SOME EXAMPLES OF  
CONTEMPORARY DESERT FARMING

*by Michele Leonardi architect © The M.O.S.*

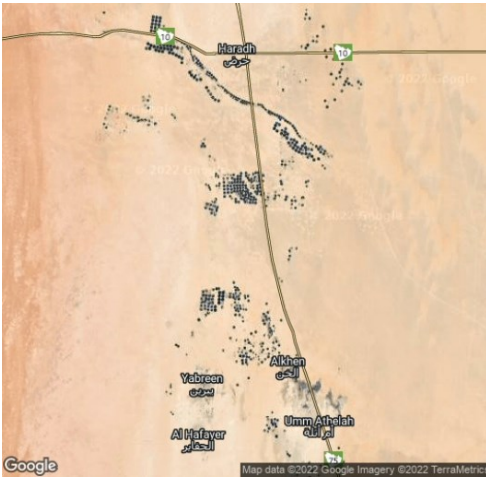
## The Salton Sea Valley, California, U.S.A.

Note that the Salton Sea Lake is artificial  
(images from Google Earth Pro).





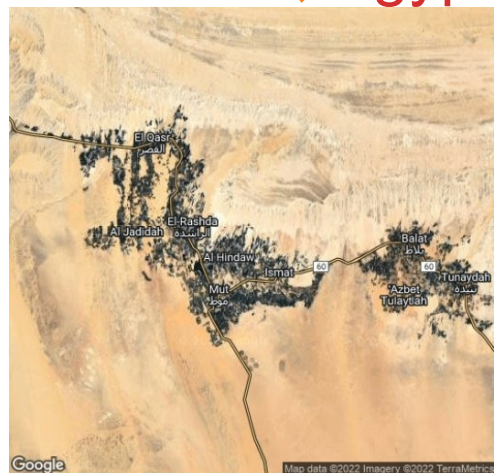
## Haradh, Saudi Arabia



## Al Kharj, near Riyadh, Saudi Arabia



## El Qasr, Egypt



## Liwa Oasis, United Arab Emirates



## Ein HaBesor, Israel

The advanced phase of desert terraforming process.

Perhaps it's not the right area, I tried to guess, but it's known that the Israelis work from decades in the field of desert farming, for example with drip irrigation.



## Augusta, Australia

Near the port of Augusta, in southern Australia, there is an agrovoltaic farm called Sundrop Farms Port Augusta Pdt Ltd, which "transforms" solar energy and salt water into fresh and decontaminated vegetables: 23,000 mirrors produce 17,000 tons of tomatoes in a big greenhouse.



# THE MARINDUCT OASIS SYSTEM

**THE CHINA'S GREAT GREEN WALL:  
HOW CHINA IS TERRAFORMING THE DESERT.  
The Three-North Shelter Forest Program.**

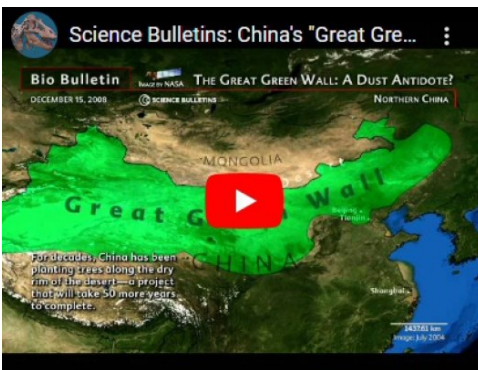
## The Gobi Desert China



## Zoom of the New Green Belt in the Gobi Desert, China



### Science Bulletins: China's Great Green Wall: a dust antidote?



### Can the Great Green Wall stop desertification in China?



## Green miracle: Forest workers turn desert into oasis in North China

(all frame from YouTube.com)



## Desert turns into oasis: China's new technology



## This ingenious system brings water to the Chinese Desert



## 5 useful methods China uses to convert desert into productive lands rich with crops



## Watch how China combats desertification with these simple methods



## Drought and water solutions in Israel: Environmentalism and water management



## The Great Green Wall of the Sahara and the Sahel



## Why is Africa building a Great Green Wall? BBC News



## They make the desert bloom, South Africa







# THE MARINDUCT OASIS SYSTEM

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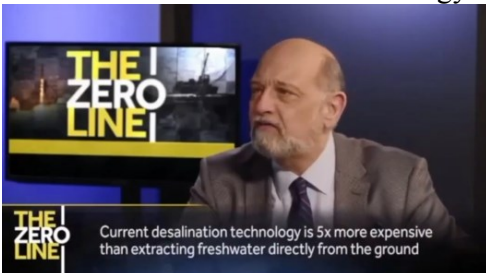
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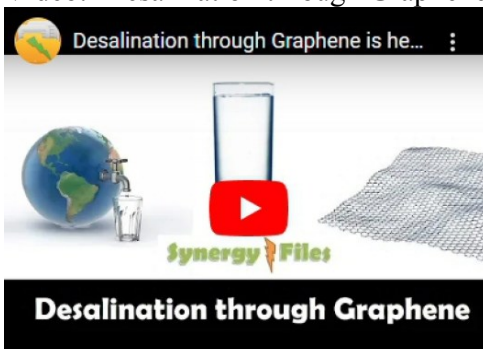
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Video: Graphene: Pure Drinking water Invention of Special Filter for India Bucket Filter.Mr.Nitin Gadkari:



Video: Desalination through Graphene is here:



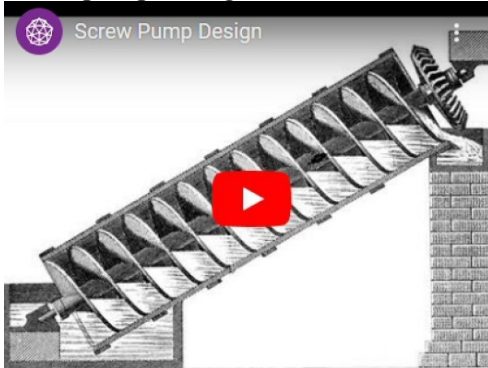
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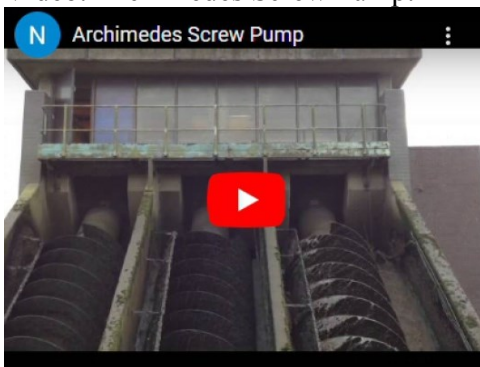
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Video: Archimedes Screw Pump:



Video: Archimedean screw water pump in action:



Video: Holand Micro Archimedes Screw:



Video: Archimedes screw pump:



# CENTRALI TERMOELETTRICHE A SPECCHI SOLARI

in Marocco, Spagna, Israele, in Cina:







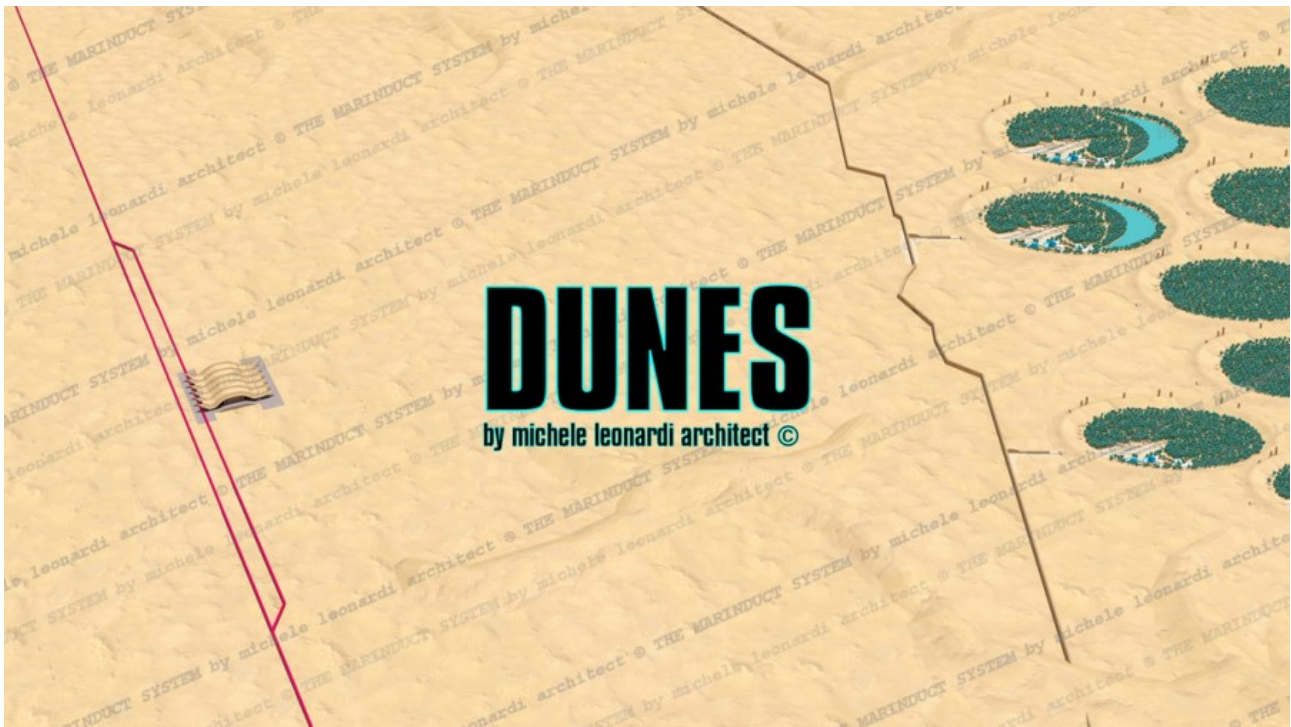


# الدunes

# DUNES

**THE MONUMENTAL RAILWAY STATION AND MARKET:  
THE ARRIVAL IN THE ENDLESS DESERTIC SPACES**

*by Michele Leonardi architect © August 2019*





# THE MARINDUCT AND DUNES: WHY?

Why are we involved in new habitats, in new settlements in the desert?  
For all the reasons given in the Marinduct introduction.

## AT FIRST

**monumental stations like this one illustrated here, will be a rarity and an exception that confirms the rule in the "Marinduct System".**

The rule will be given by "open air" railway stations, consisting only of a parallel parking track with respective exchanges, manuals. The driver stops the train (passengers and / or freight), then another man gets out and moves the exchange. The same railway stations will be a rarity and will not be electrified. This at least in principle and according to the progressive development of the whole system.

So a market-station and "portal in the desert", like the one proposed here, would make sense only for special places, for example as the entrance to an area of the desert declared from scratch a natural reserve, and the large aggregates of new artificial oases placed outside its borders.

In fact it will also be necessary to envisage new protected natural areas simultaneously with the progressive development of the Marinduct System with its new artificial Oasis.

Monumental architecture also has its function: **to reveal the nature of a place, his "genius loci", and to create new worlds.**

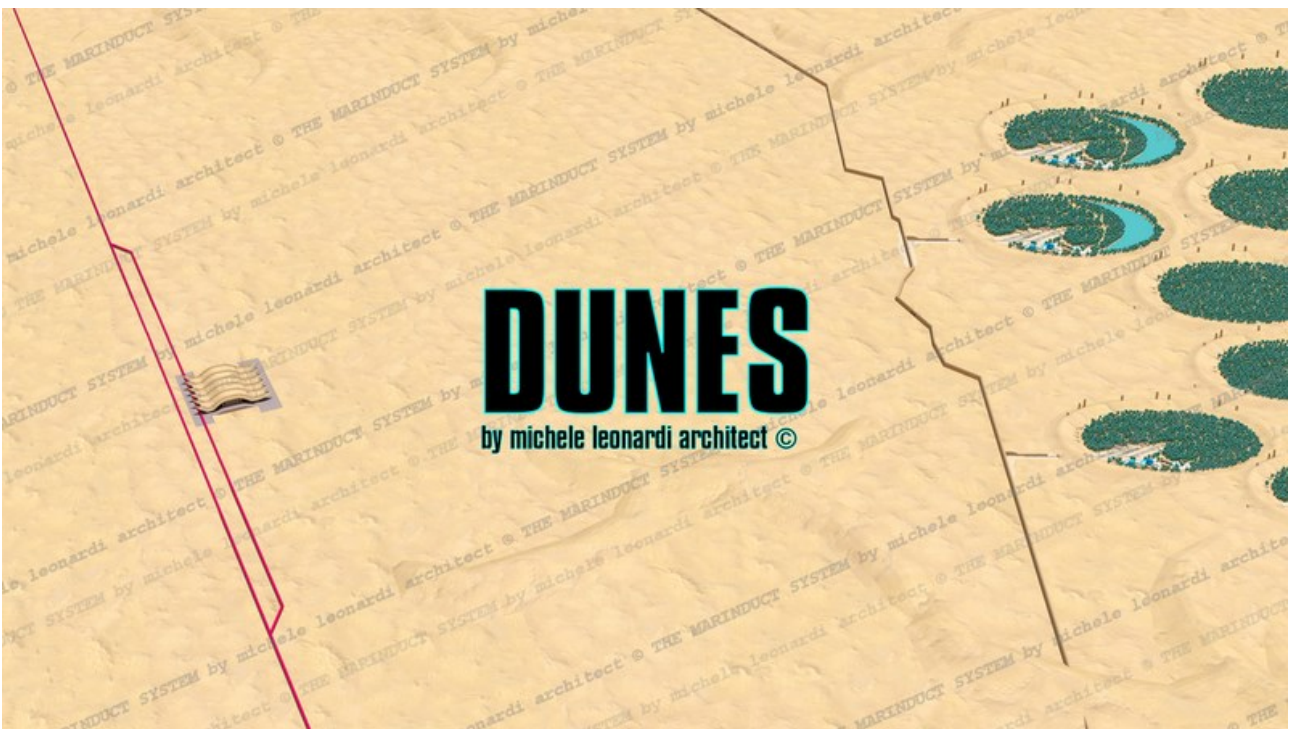
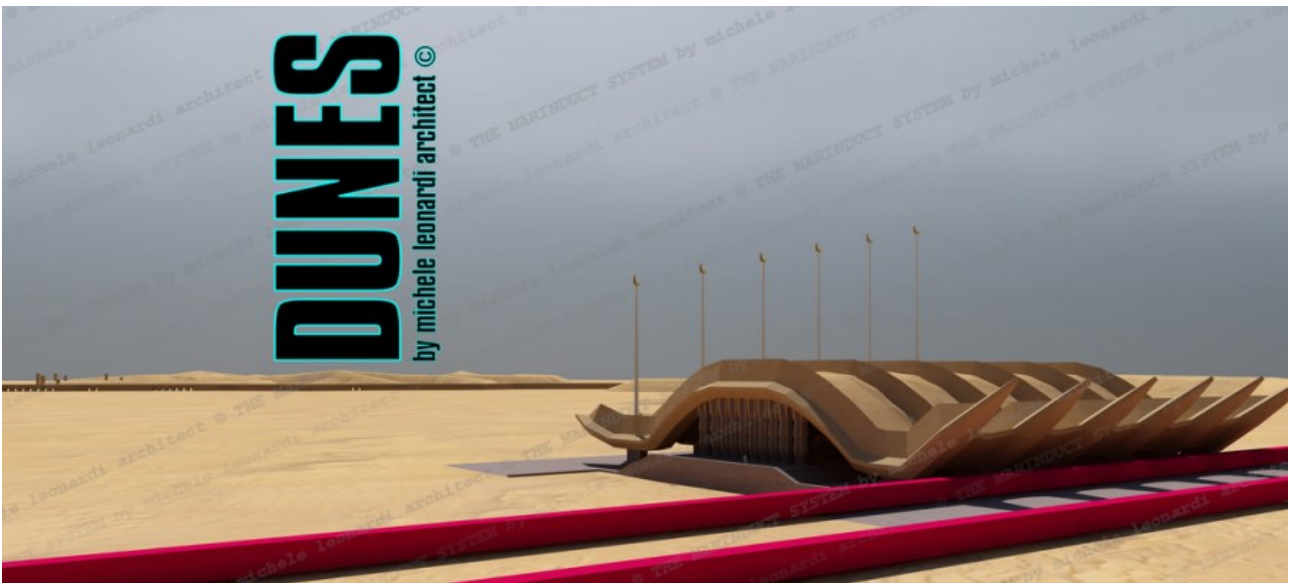
# WE MUST

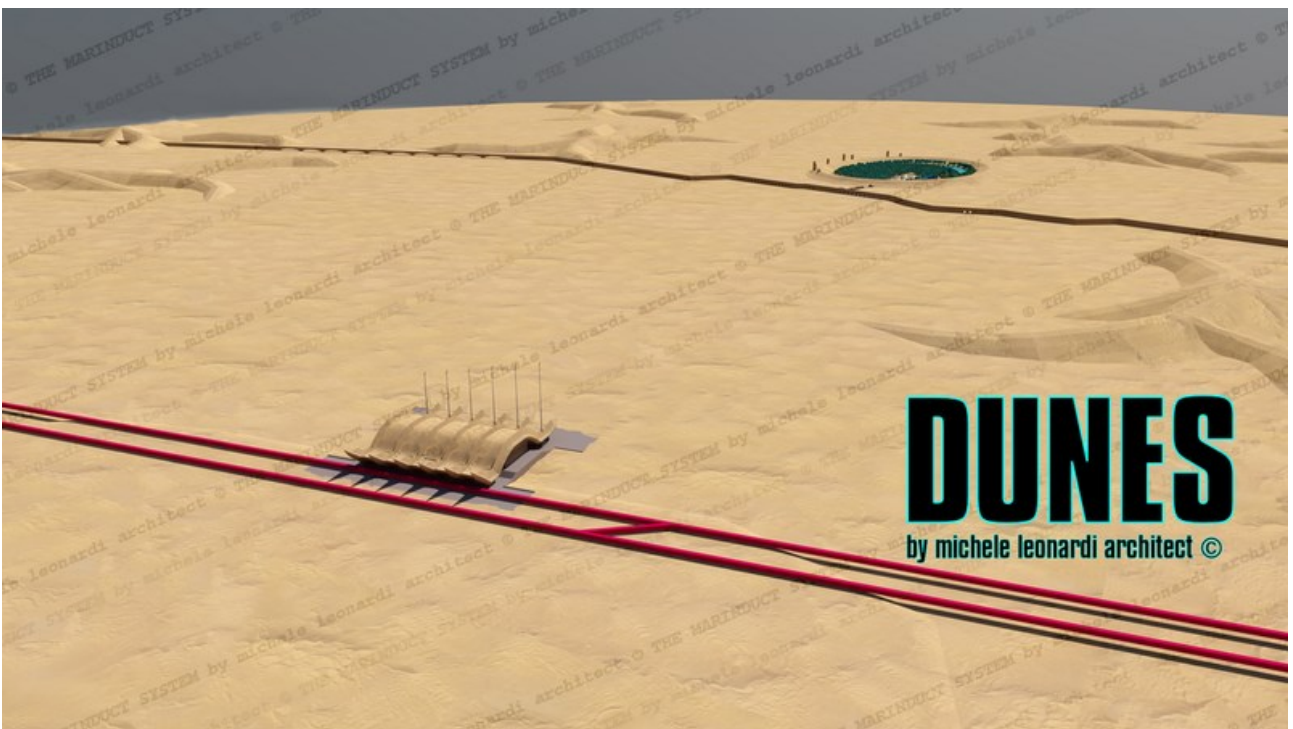
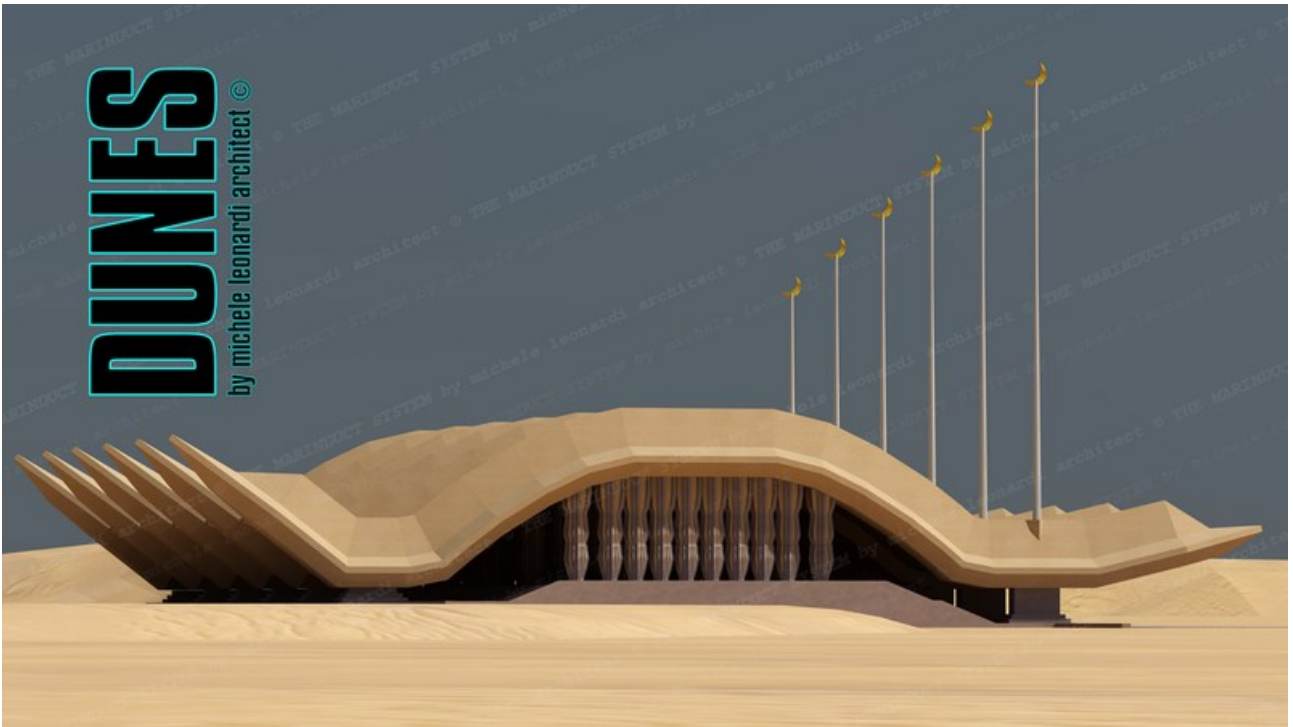
respect the desert.

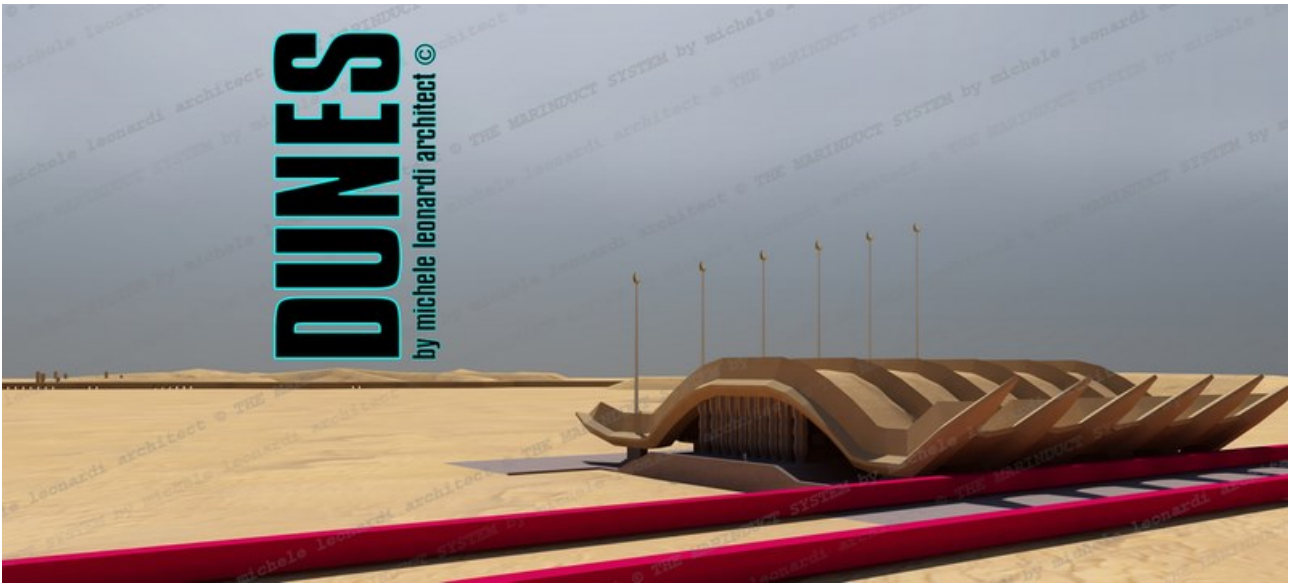
The desert is nature, it is alive, it is a sacred place. As shown in the drawings of "The Marinduct Oasis System": **no cars always in the way.**

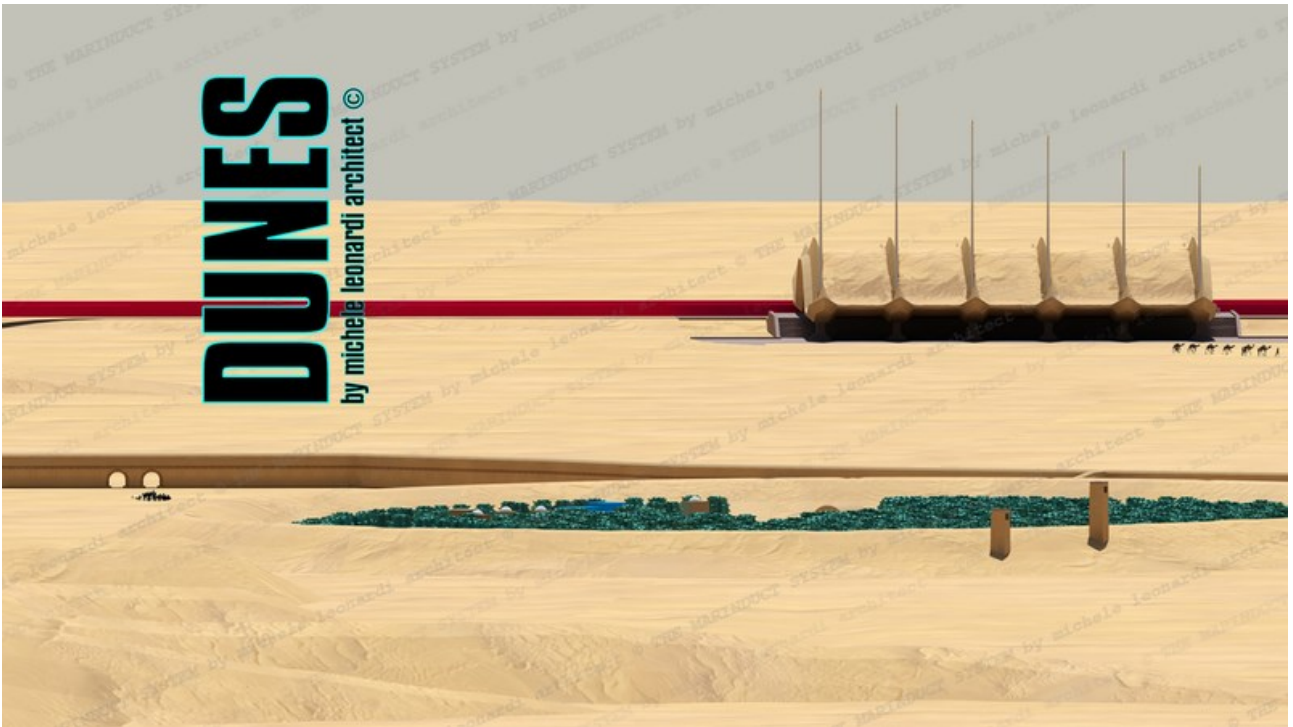
Then no asphalt and roads, because the stench of civilization (or rather, incivility) must never reach the desert. Artificial lighting only inside the new artificial oases. **The only means of transport allowed in the new habitat of artificial oases will be: feet, camels and trains**, the latter for the great essential movements of goods and people.

In other words, the new oases will not be a new colonization system followed by the construction of the usual dystopian new cities.





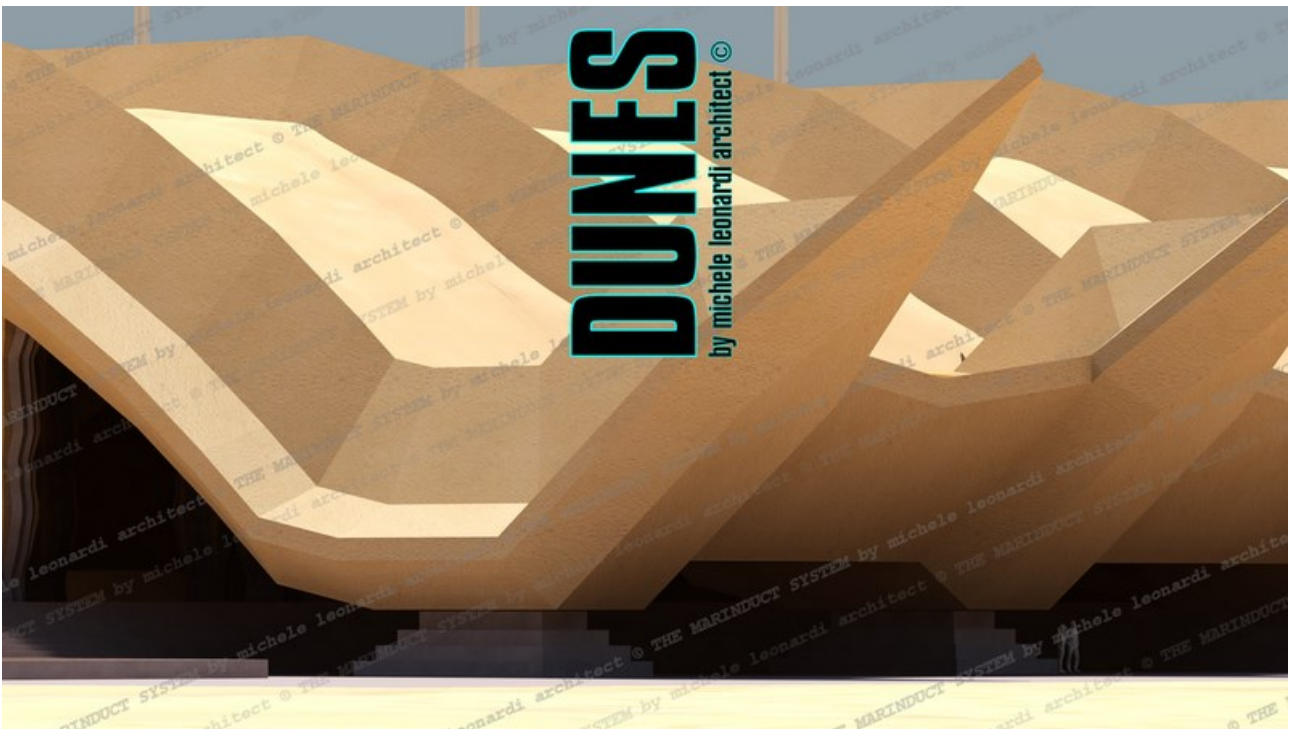


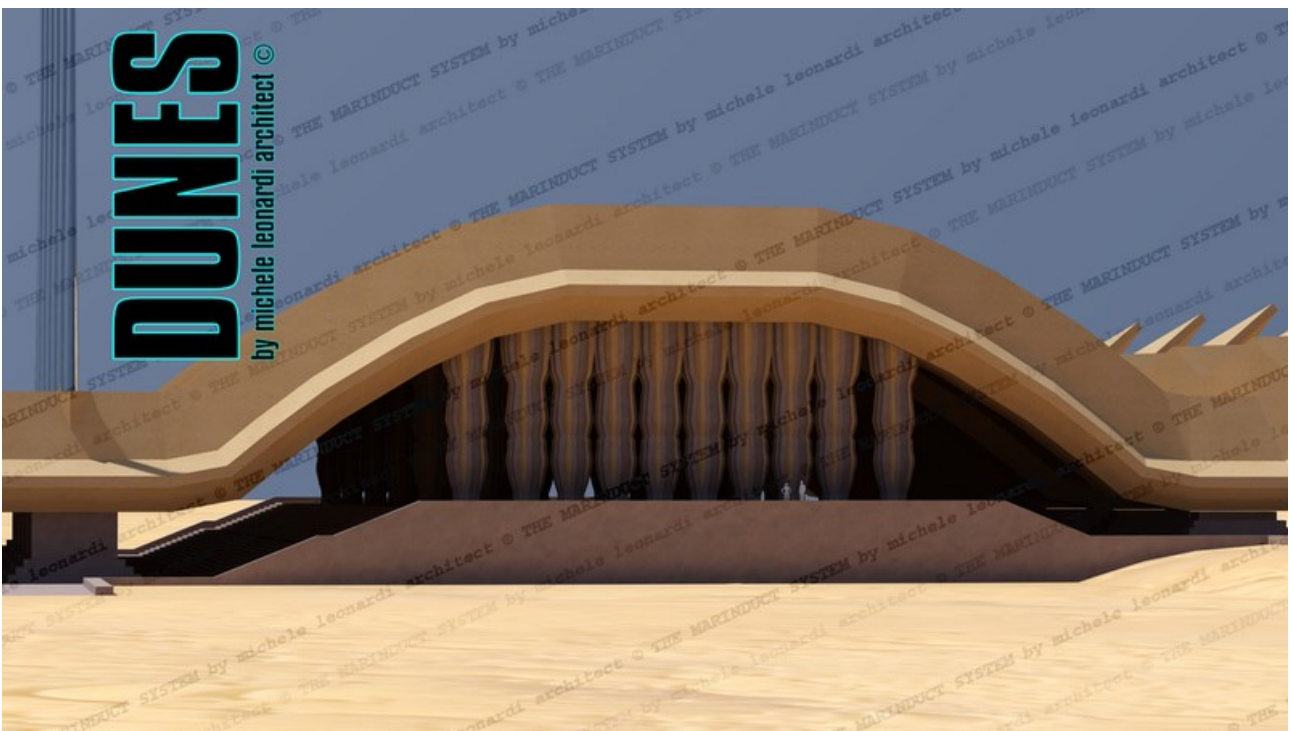
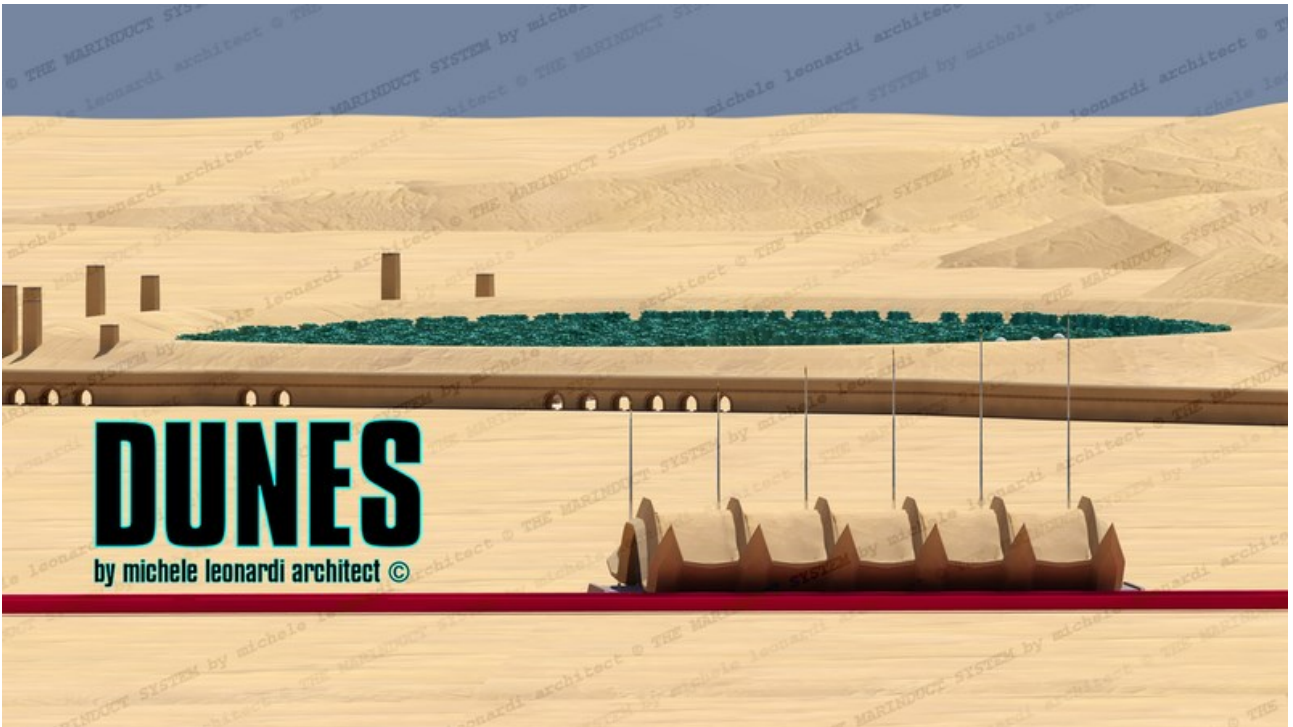




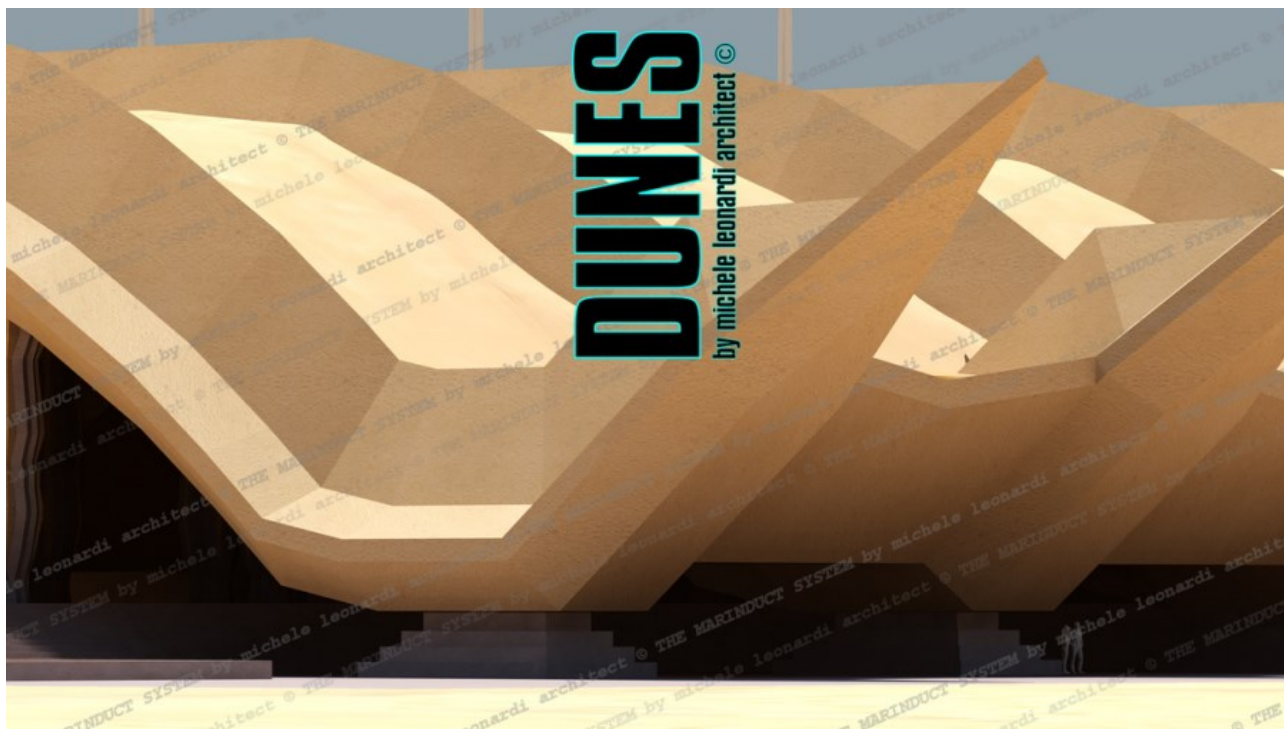












# POURQUOI LE MARINDUCT ET DUNES?

Pourquoi on nous occupe de nouveaux habitats, c'est-à-dire de nouveaux établissements, on espère innovatifs, dans le désert?

Pour toutes les raisons indiquées dans l'introduction au Marinduct.

## AU DEBUT

**les stations monumentales comme celle illustrée ici, seront une rareté et une exception confirmant la règle dans le contexte du "Système Marinduct".**

La règle sera donnée par des gares "à ciel ouvert", composées uniquement que d'une piste de stationnement parallèle à la ligne principale, avec ses respectifs aiguillages, mais manuels. Le conducteur arrête le convoi (train de voyageurs et/ou de marchandises), un autre homme sort et déplace l'aiguillage. Les mêmes gares ferroviaires seront une rareté et ne seront pas électrifiées. Ceci au moins au principe et en fonction du développement progressif de l'ensemble du système.

Ainsi, une station de marché et un "portail dans le désert", comme celui proposé ici, n'auront de sens que pour des lieux particuliers, par exemple comme l'entrée d'une zone du désert déclarée ex novo réserve naturelle, avec de grands ensembles de nouvelles oasis artificielles placées en dehors de ses frontières. En fait il faudra aussi envisager de nouvelles zones naturelles protégées simultanément au développement progressif du système de Marinduc avec ses nouvelles Oasis artificielles. Il faut souvenir que aussi l'architecture monumentale a sa fonction: **révéler la nature d'un lieu, son "genius loci", et créer de nouveaux mondes.**

## IL FAUT

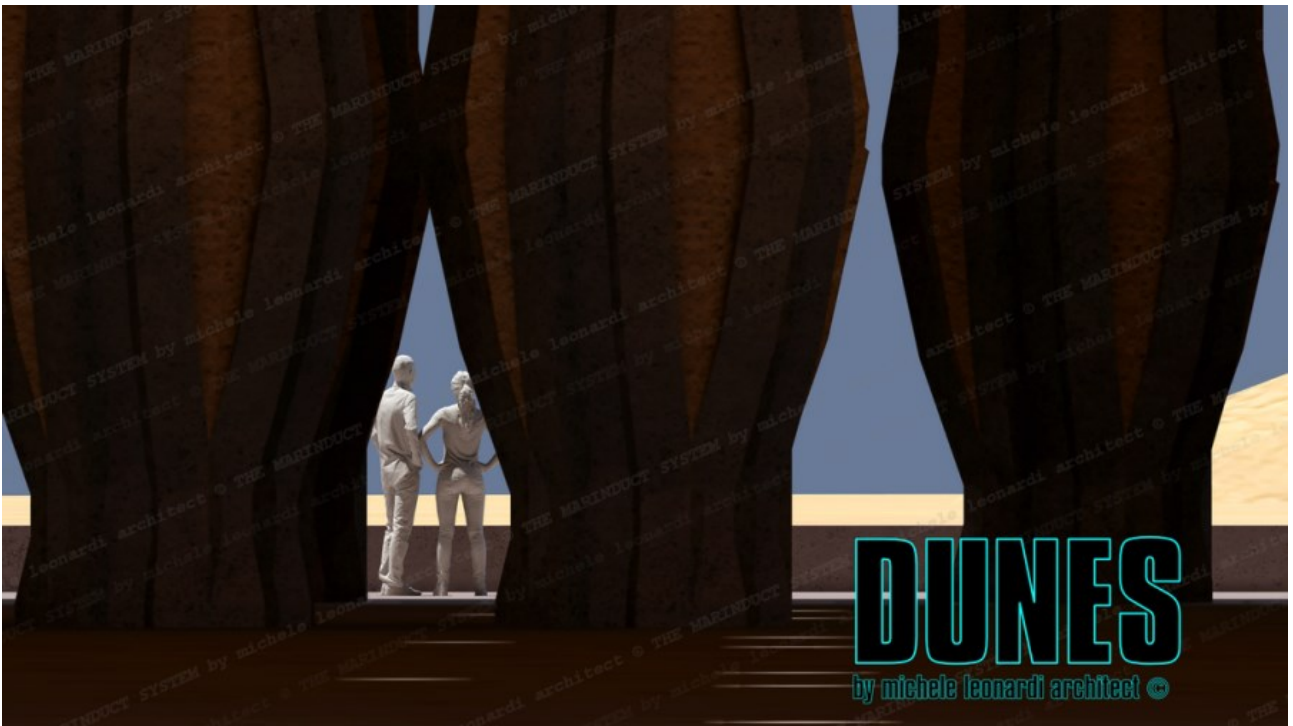
respecter le désert.

Le désert c'est de la nature, c'est du vivant, c'est un lieu sacré. Comme indiqué dans les dessins du projet "The Marinduc Oasis System", **pas de voitures toujours sur les parages.**

Donc pas d'asphalte et pas de routes, parce que la puanteur de la civilisation (ou plutôt, de l'incivilité) ne devra jamais atteindre le désert. Éclairage artificiel uniquement à l'intérieur des nouvelles oasis artificielles. **Les seuls moyens de transport autorisés dans le nouvel habitat des oasis artificielles seront: les pieds à soi, les chameaux et les trains**, ces derniers utilisés pour les grands mouvements essentiels de marchandises et de personnes.

C'est-à-dire que les nouvelles oasis ne seront pas un nouveau système de colonisation suivi par la réalisation des habituelles villes nouvelles, tartinées sur la surface terrestre.







The Dragon Station in the desert by Michele Leonardi Architect.







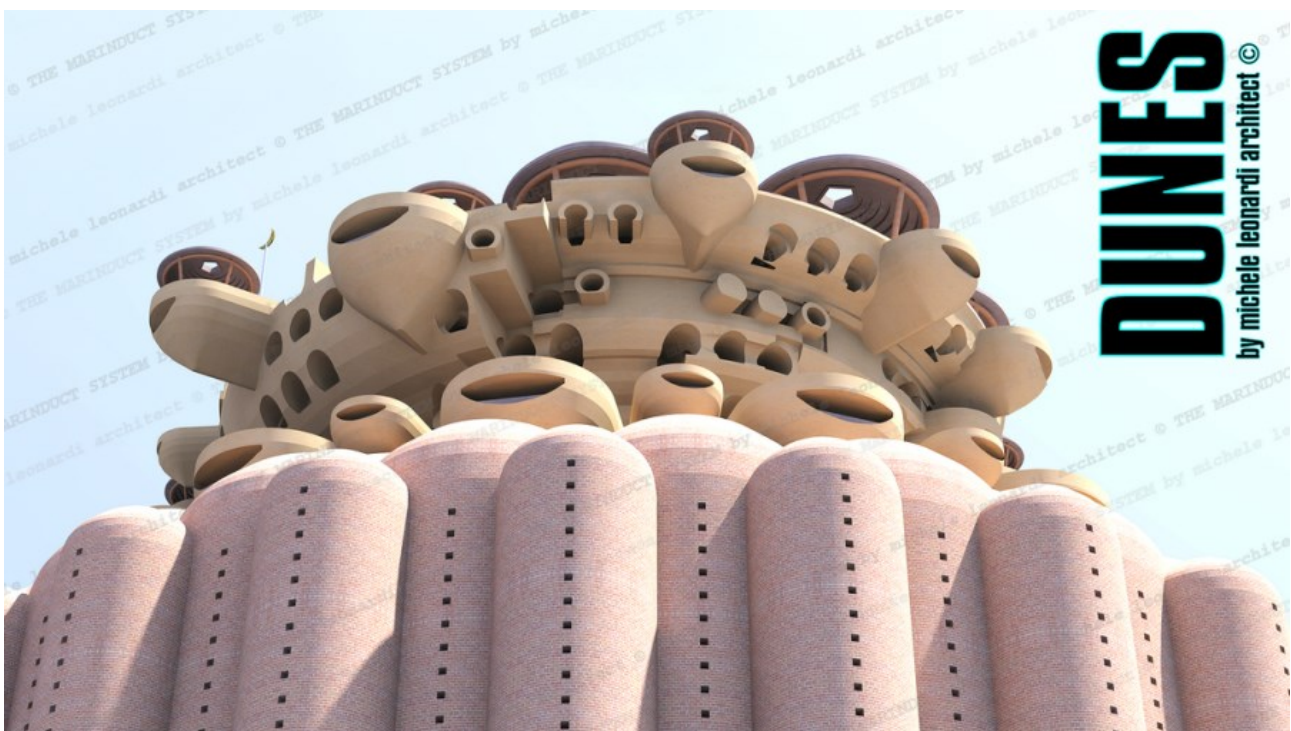
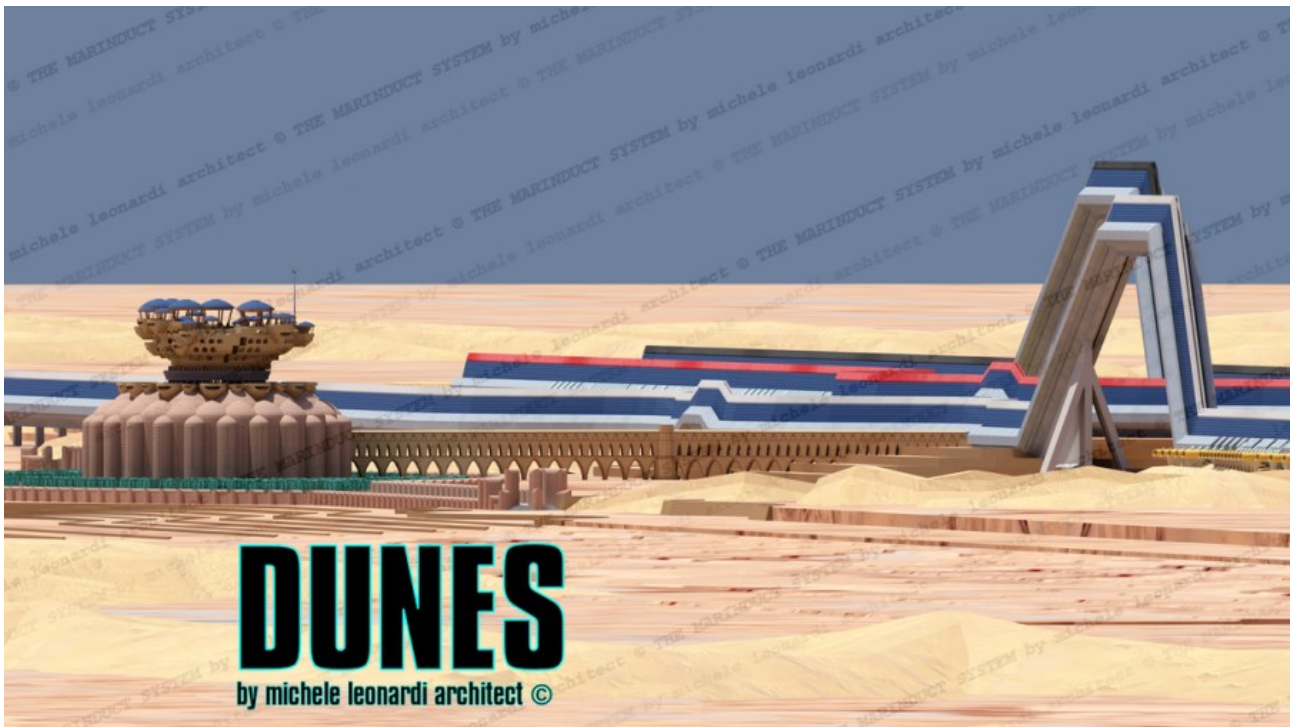
# الذكوبان

# DUNES

CITY OF KNOWLEDGE, THE UNIVERSITY - Part 1

by Michele Leonardi architect © August 2019

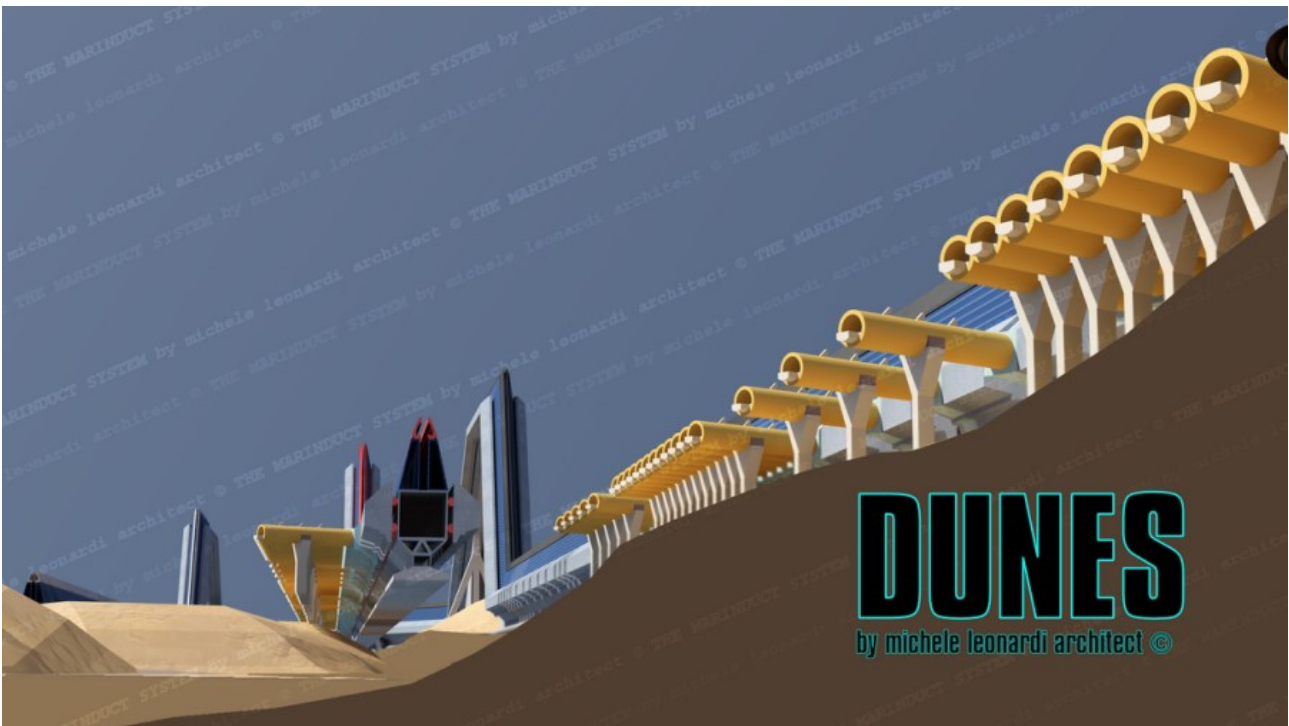
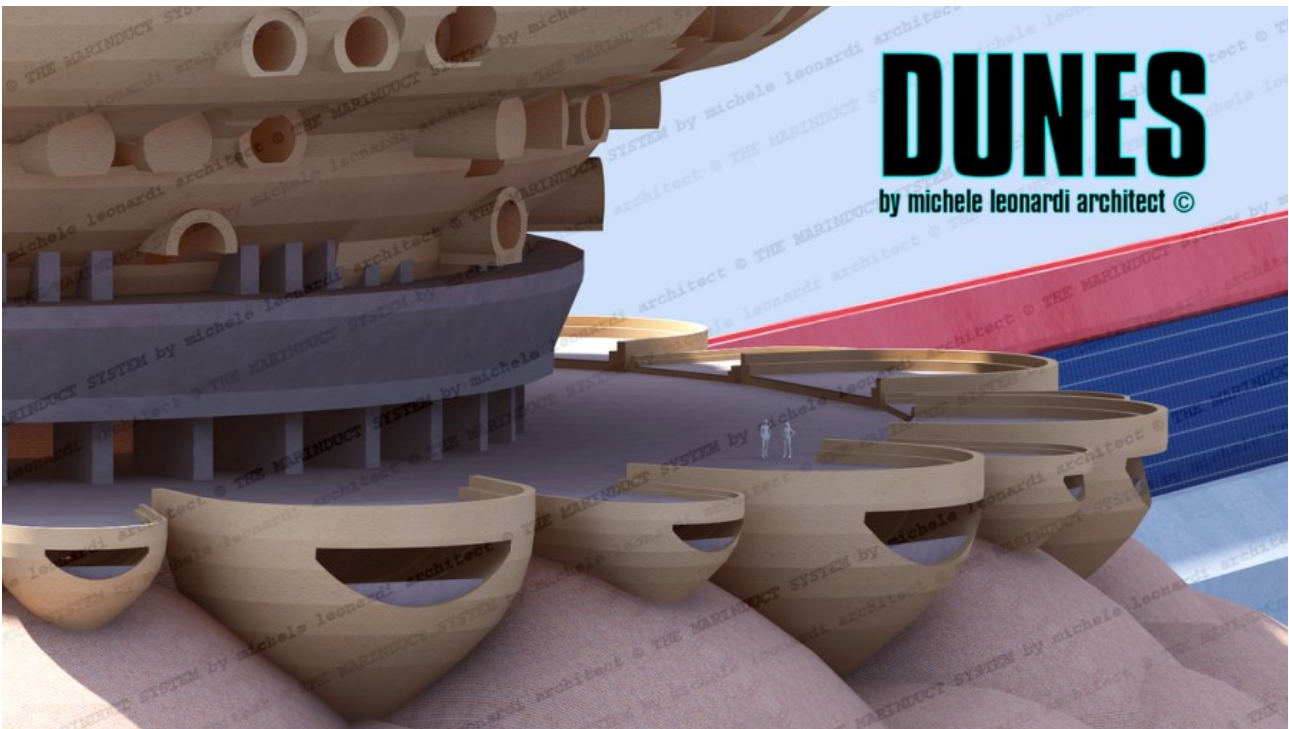


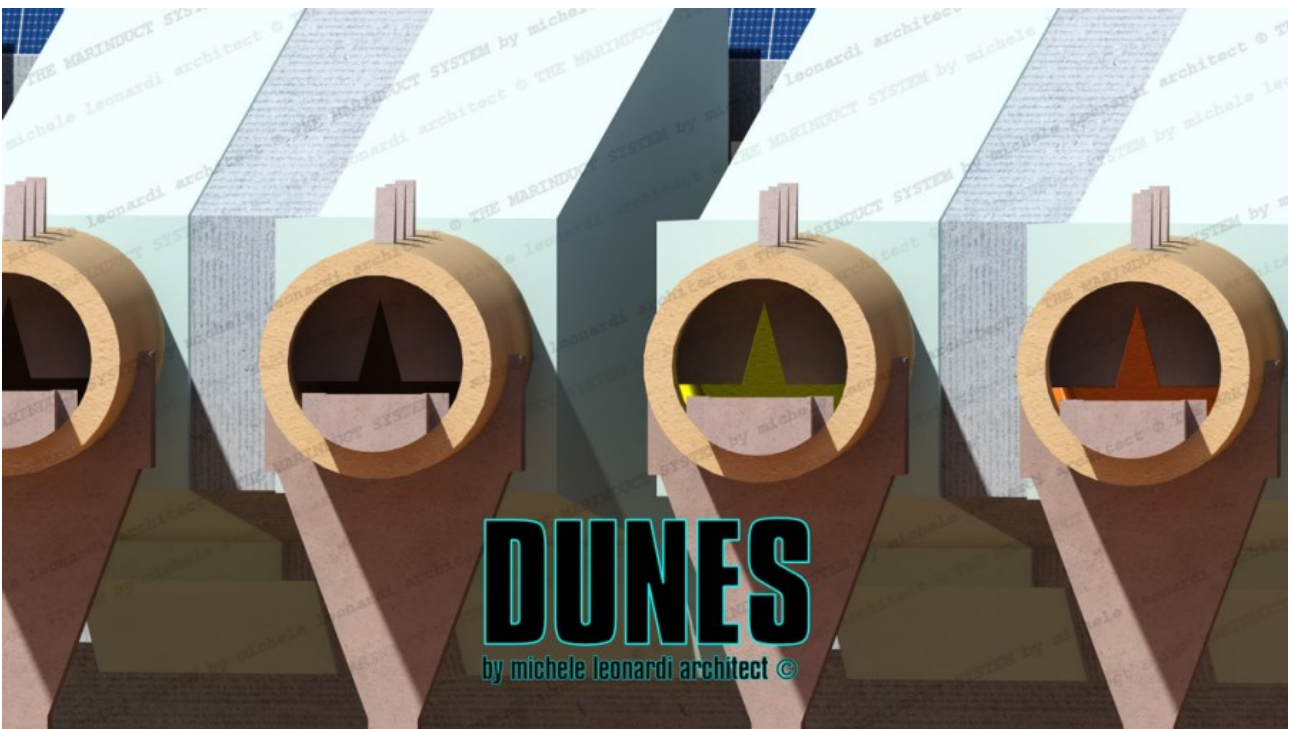
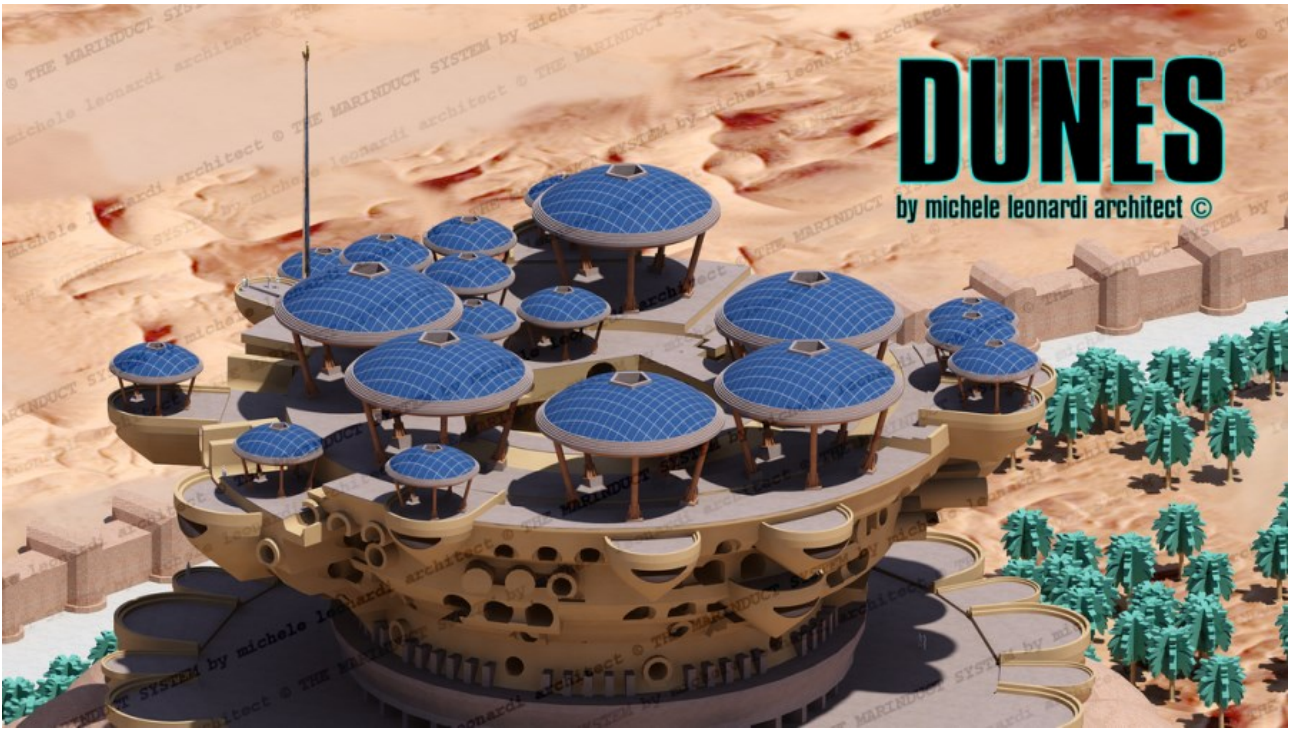


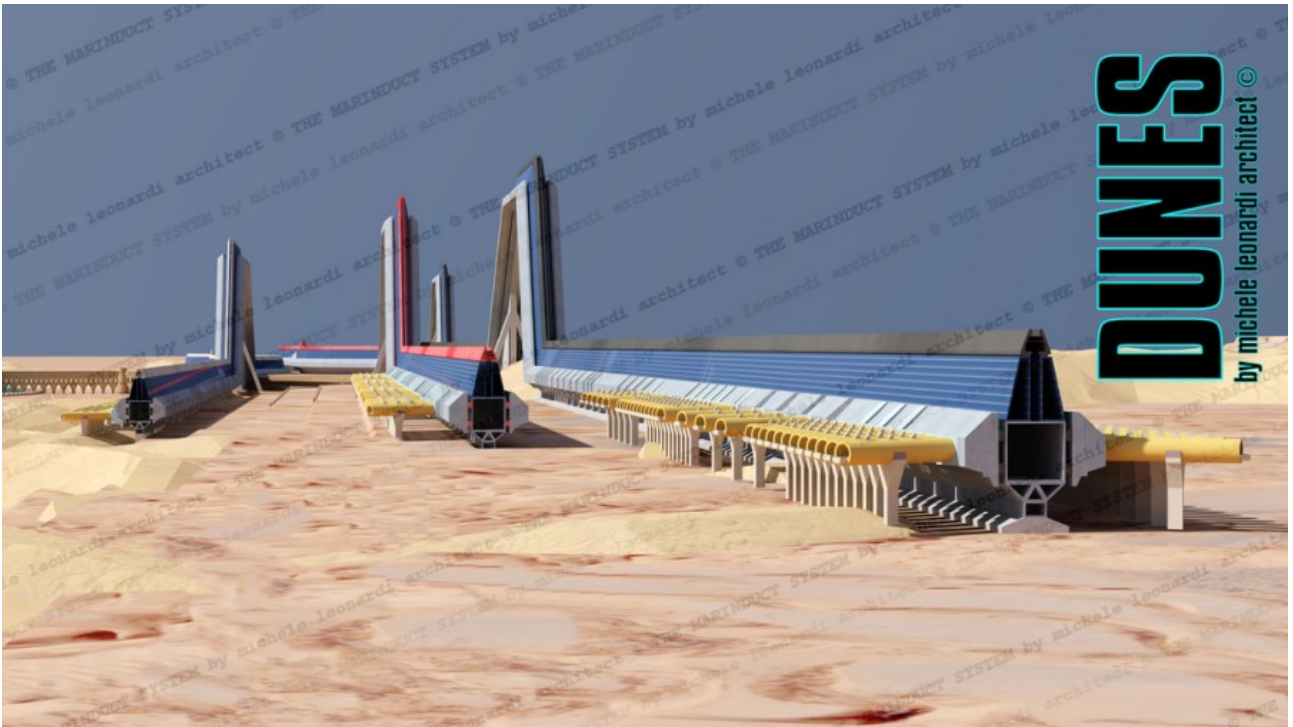
## City of Knowledge

is an eye that investigates the universe. He wants to know the physical, biological and spiritual worlds. It moves away from any flow of transport, objects, people, information, but it remains deeply bound to them. The "City of Knowledge" moves away to a certain extent from the flow of things, because it needs

maximum concentration to pursue its objectives. Its vital axis is vertical, it points from one side to the center of the Earth, from the other to the celestial vault, or rather, to the whole thing, to infinity.



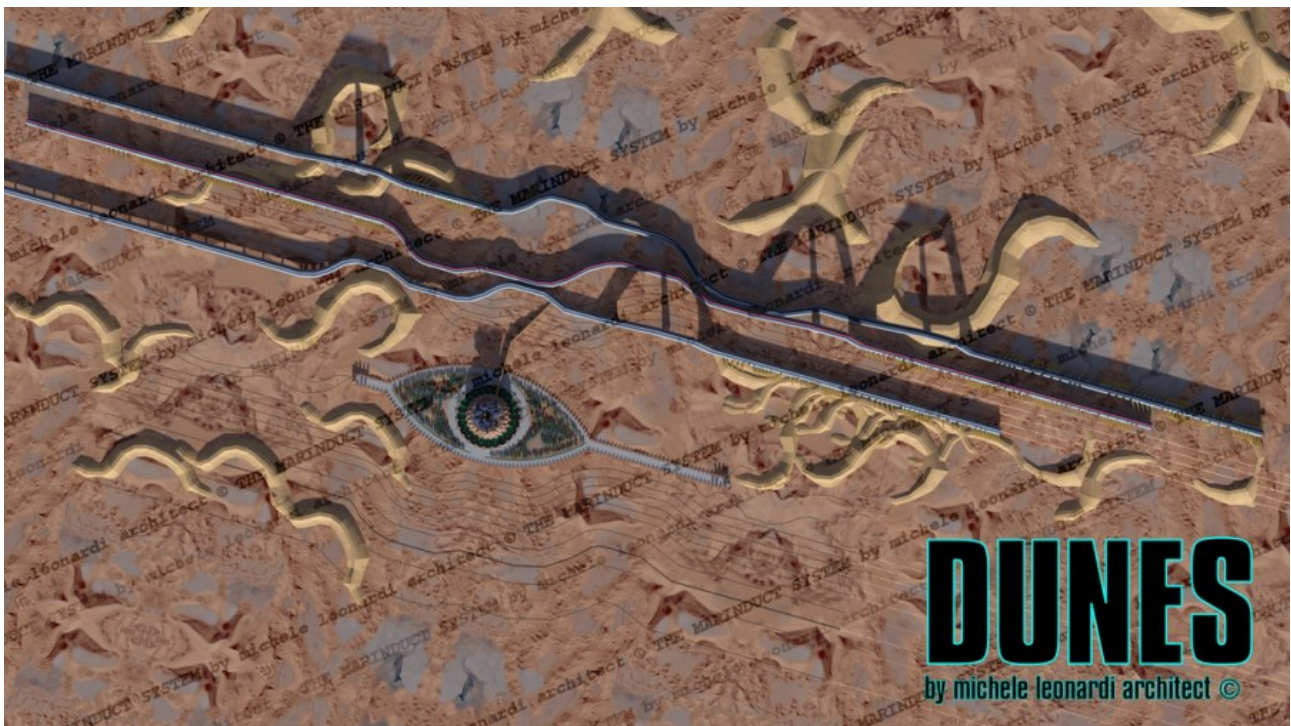






# La Cité de la connaissance,

"The City of Knowledge", il est un oeil qui observe l'univers. Il veut connaître l'ensemble des mondes physique, biologique et spirituel. Il s'éloigne de quelconque flux de transport d'objets, de personnes, d'informations, mais il reste profondément lié à ceux-là. La "Cité du savoir" s'éloigne dans une certaine mesure du flux des choses car elle a besoin d'une concentration maximale pour poursuivre ses objectifs. Son axe vital est le vertical, il pointe d'un côté au centre de la Terre, de l'autre à la voûte céleste, ou plutôt à l'ensemble, à l'infini.



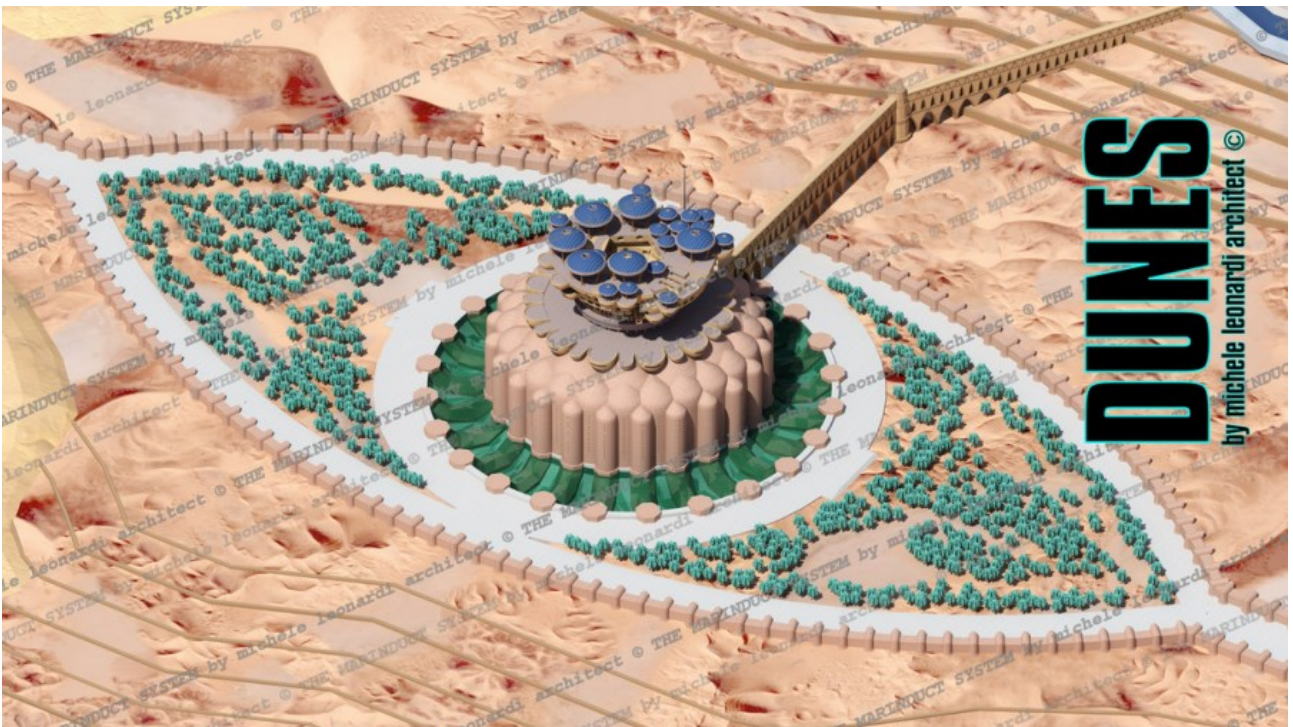


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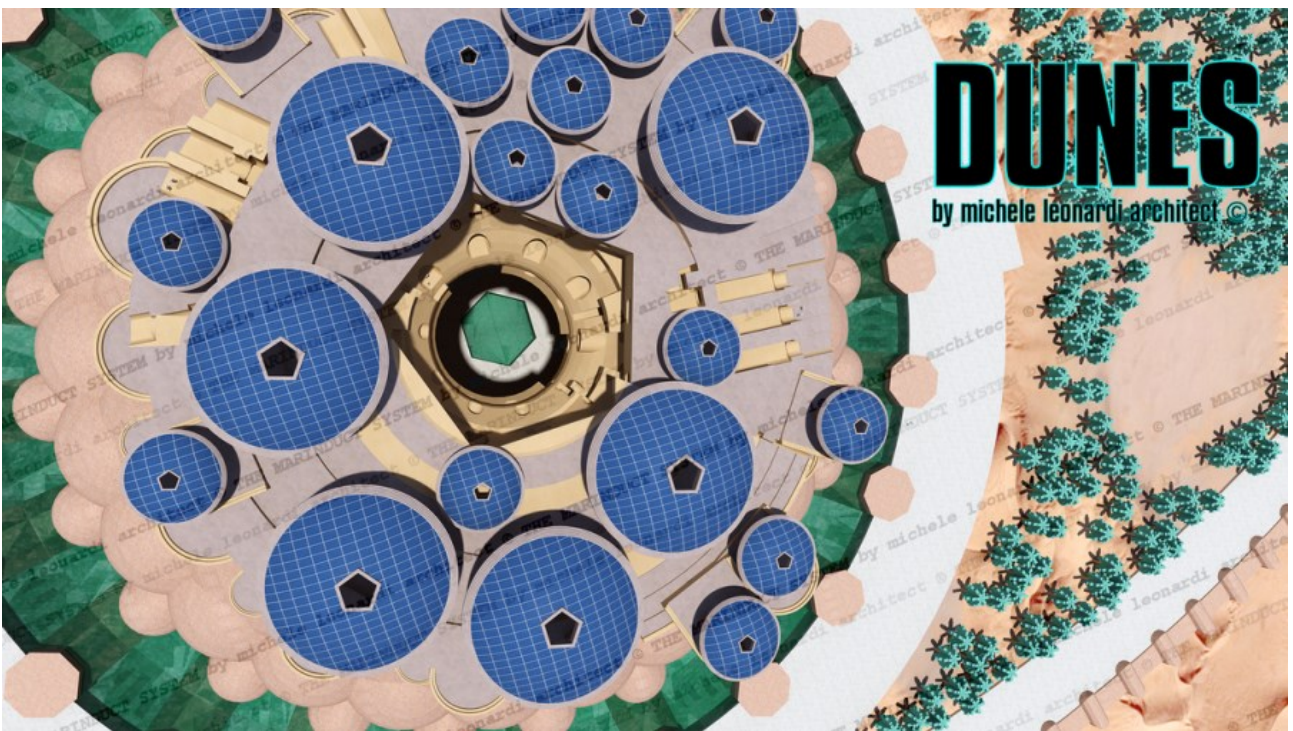
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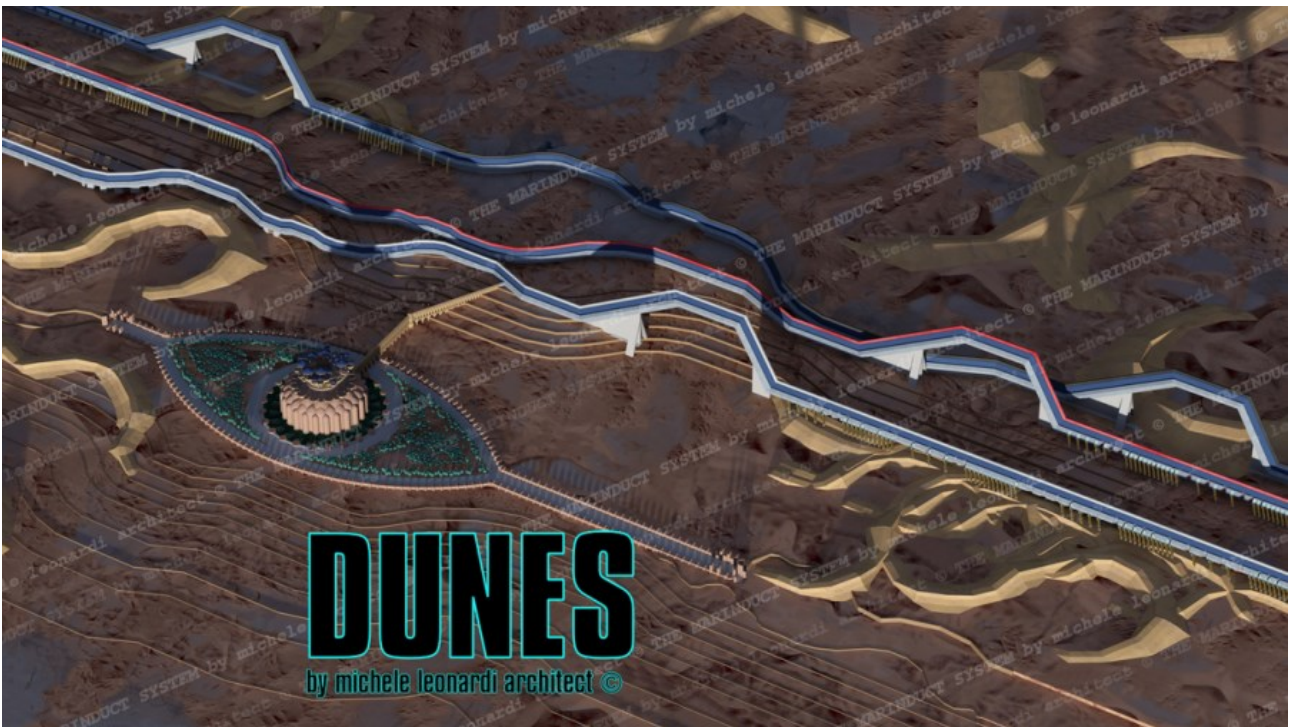
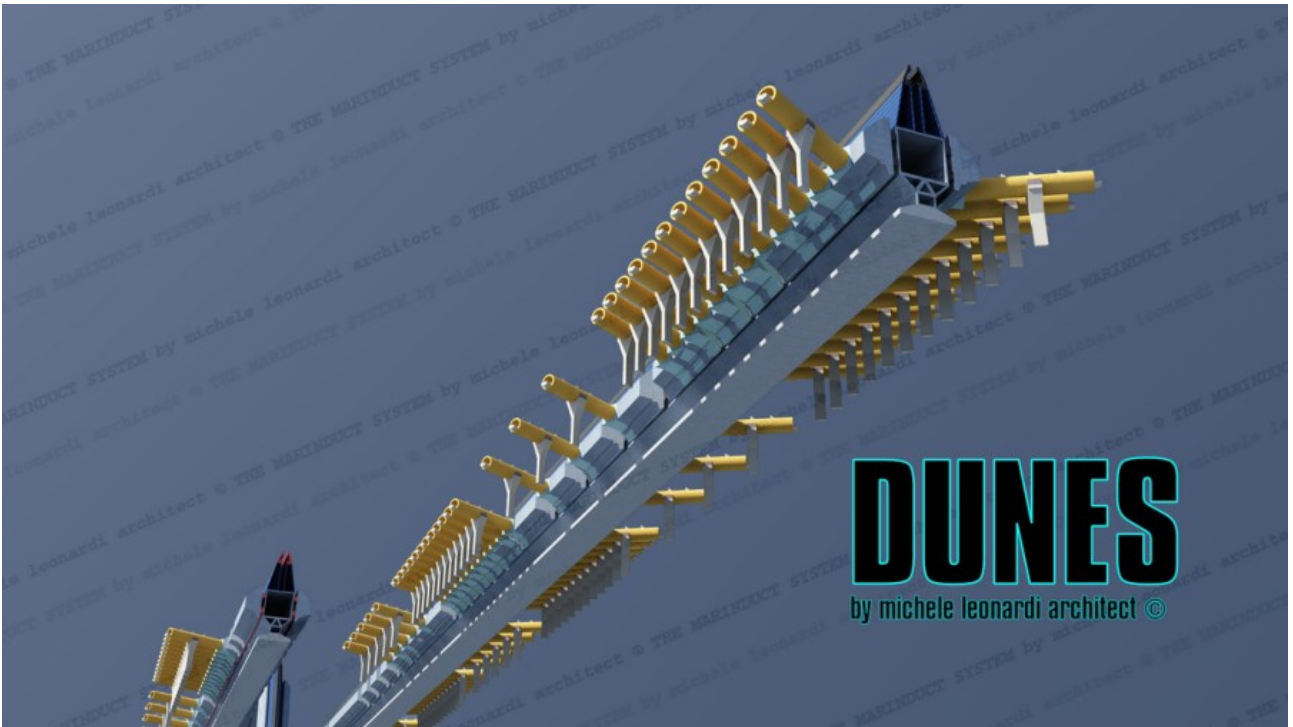
CITY OF KNOWLEDGE, THE UNIVERSITY - Part 2

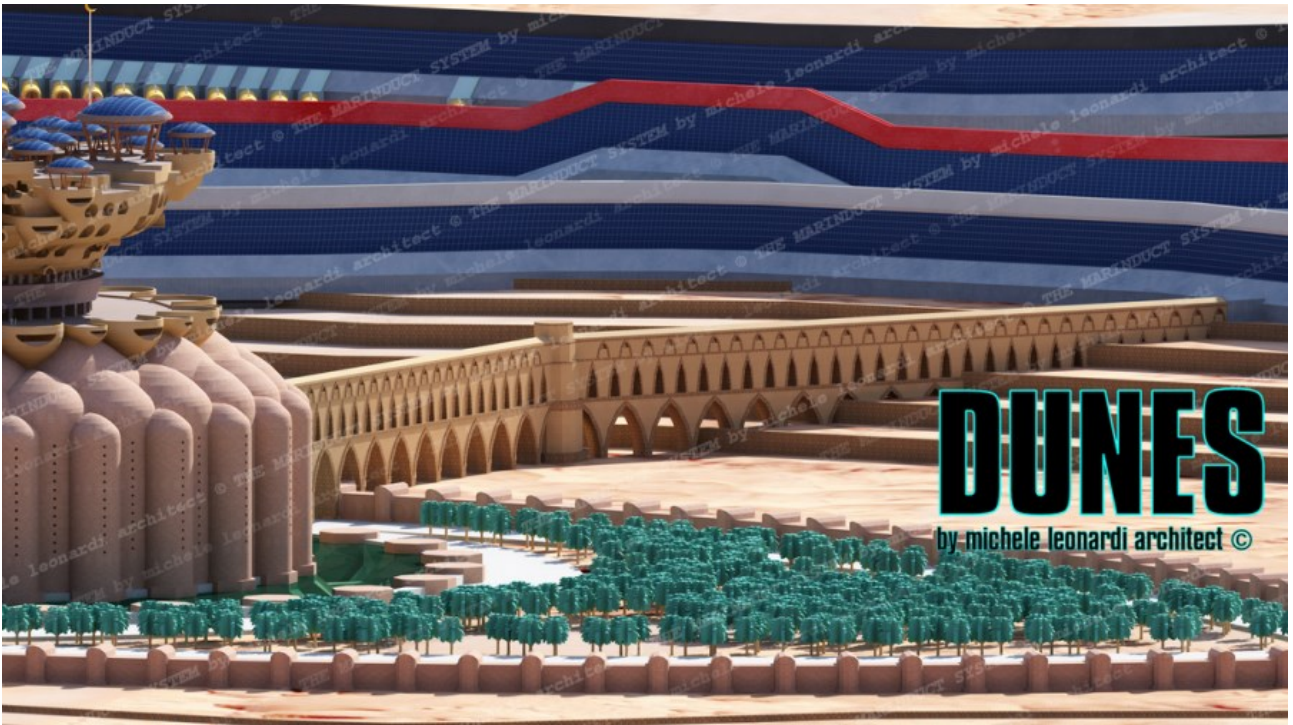
by Michele Leonardi architect © August 2019

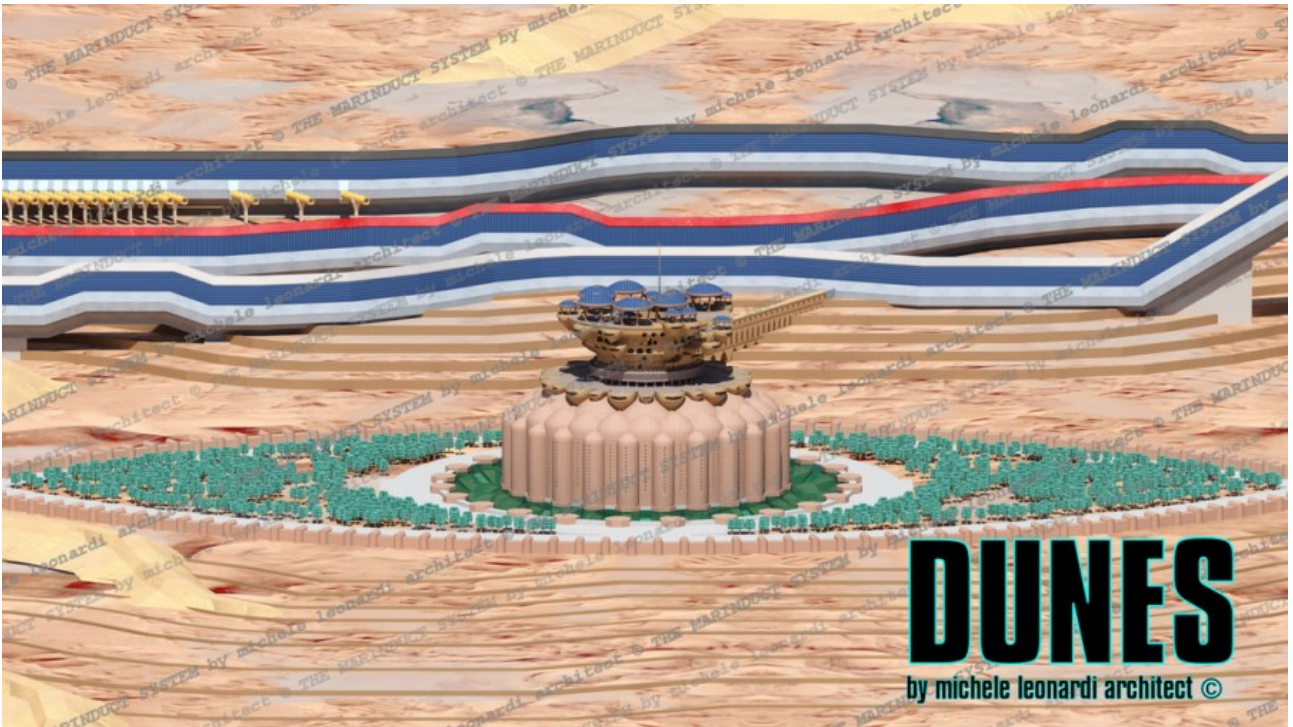


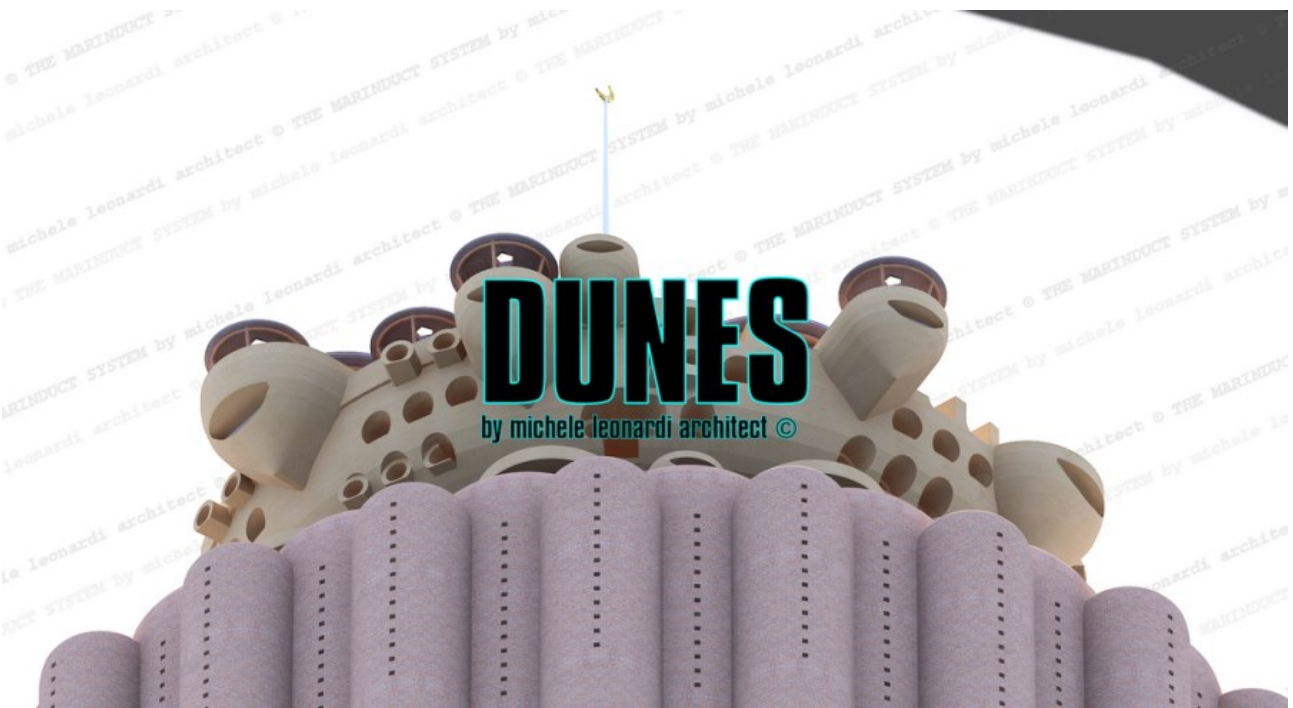
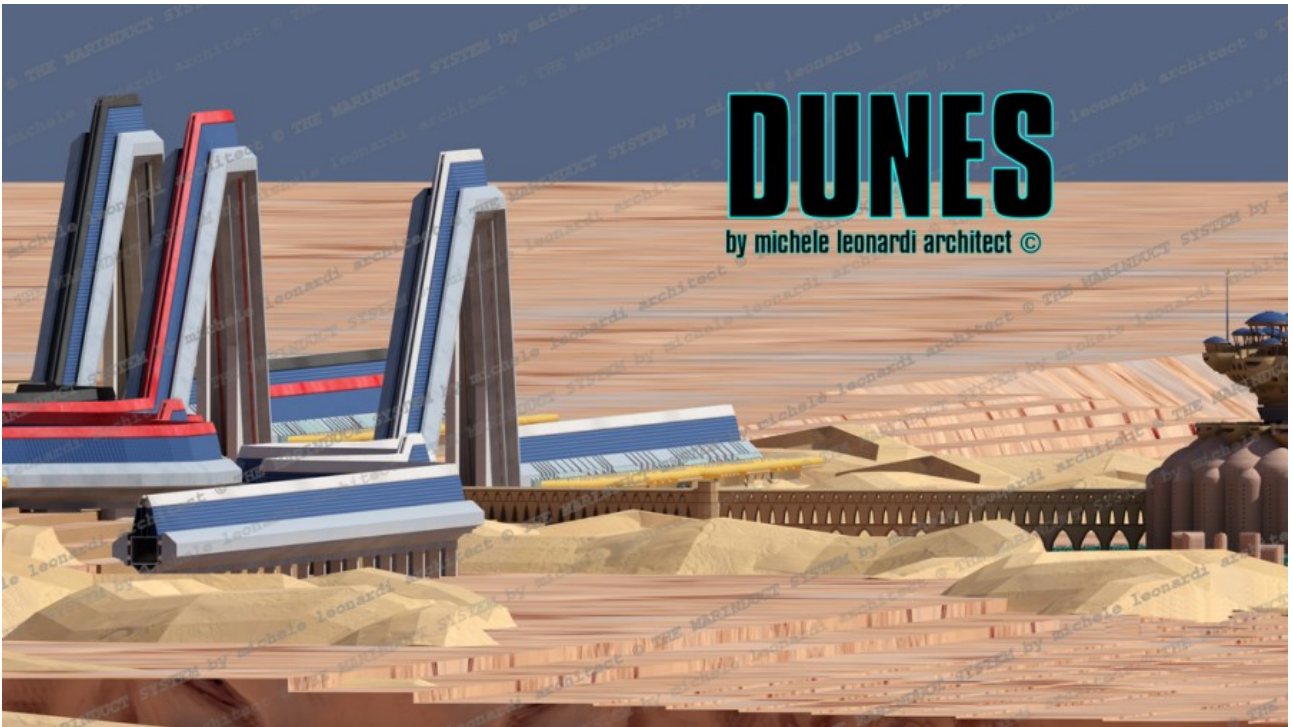


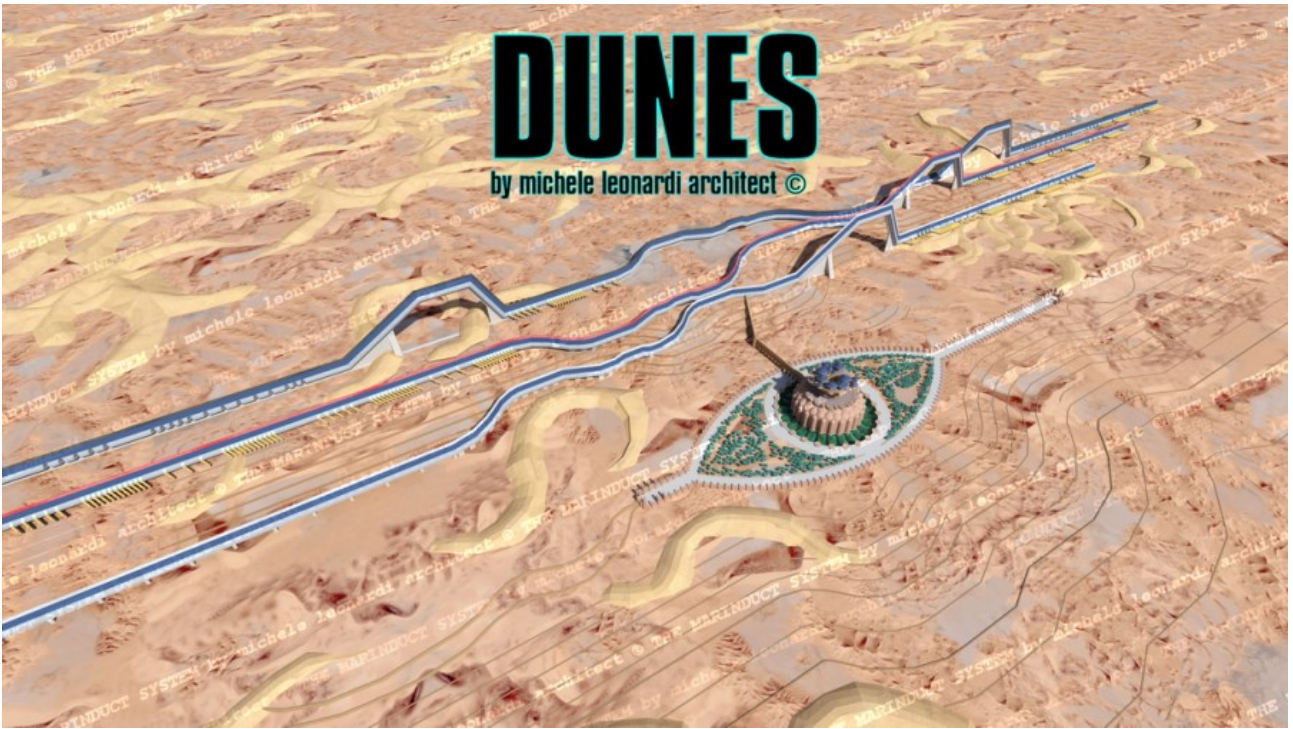










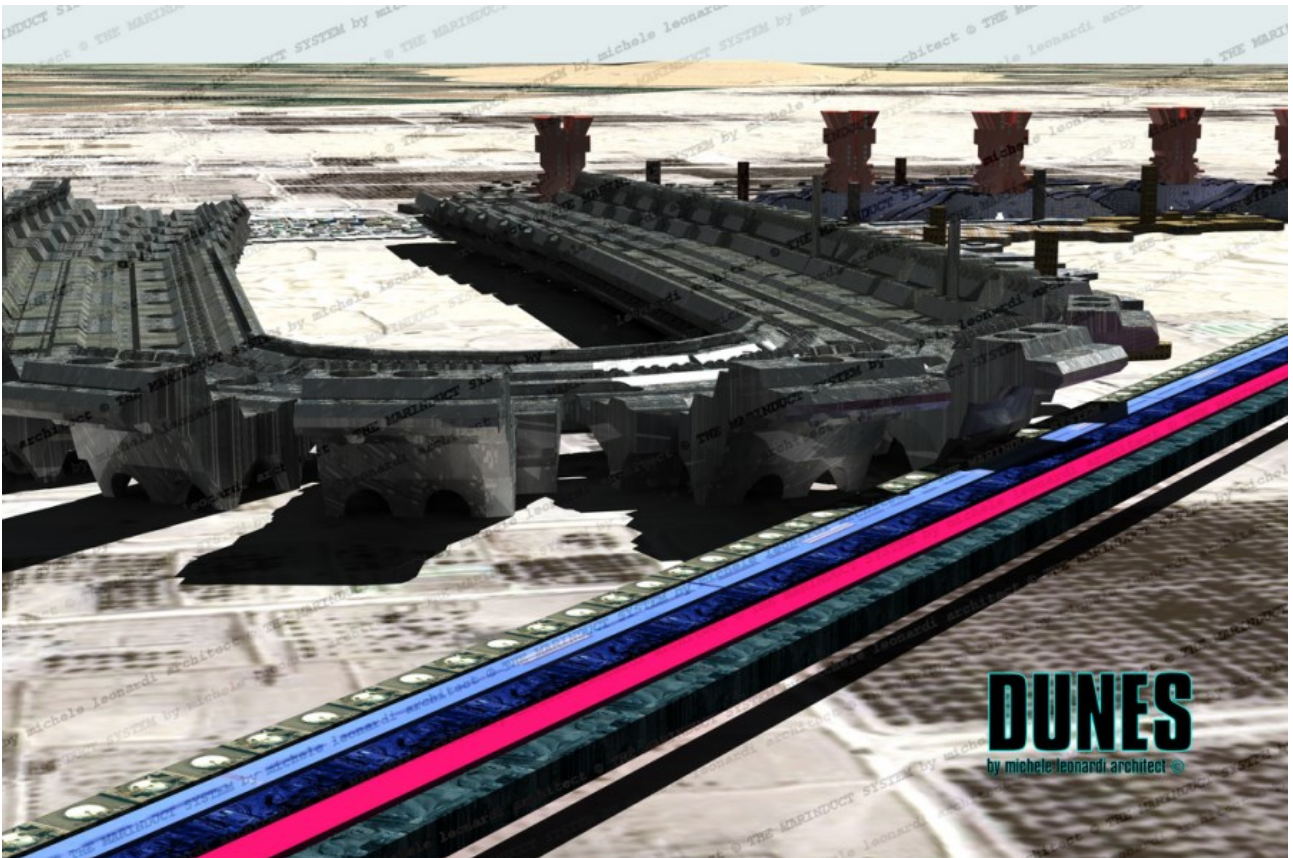


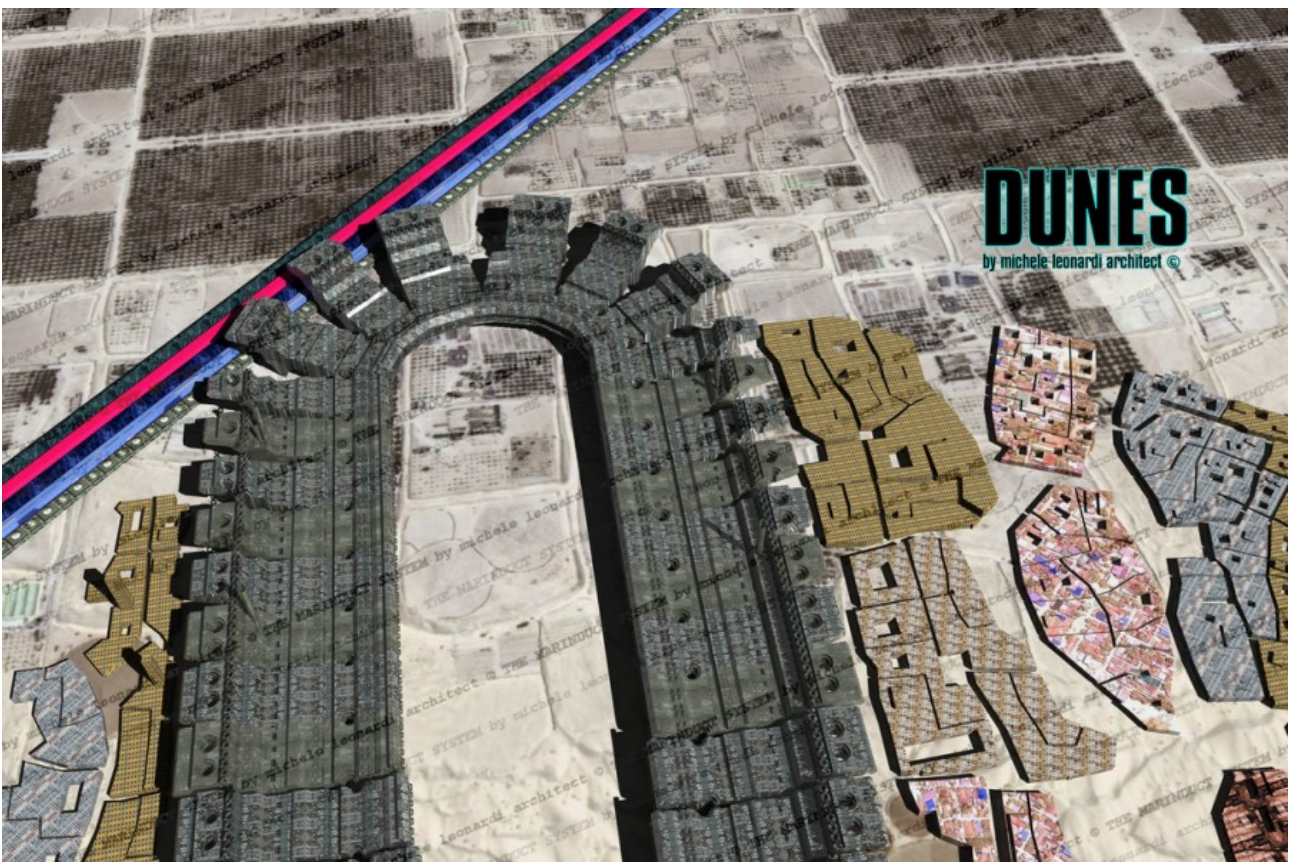
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## DUNES

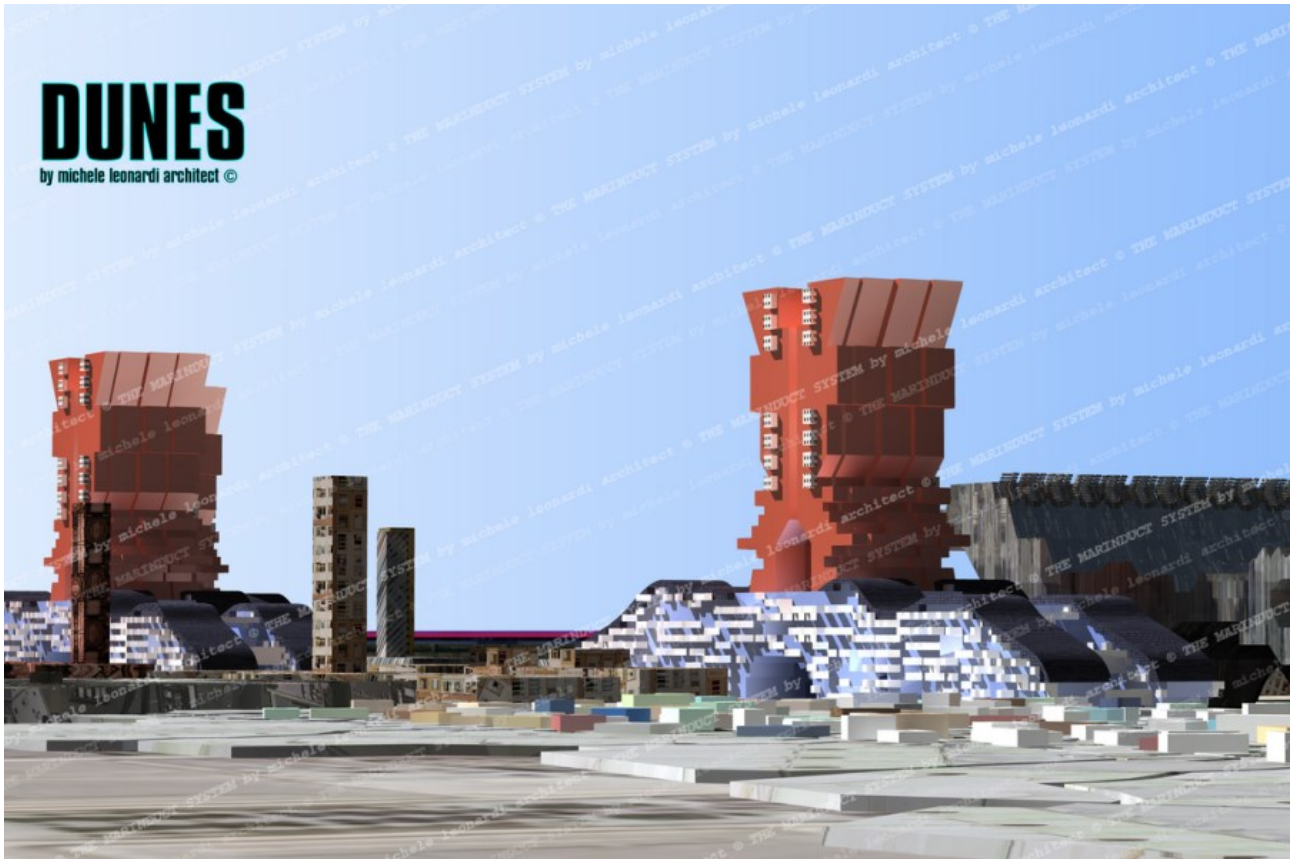
THE "MAMMOUTH" HABITAT: THE SOUQ,  
MARKETPLACE AND COMMERCIAL SPACES

by Michele Leonardi architect © 2002; 2005; November 2011

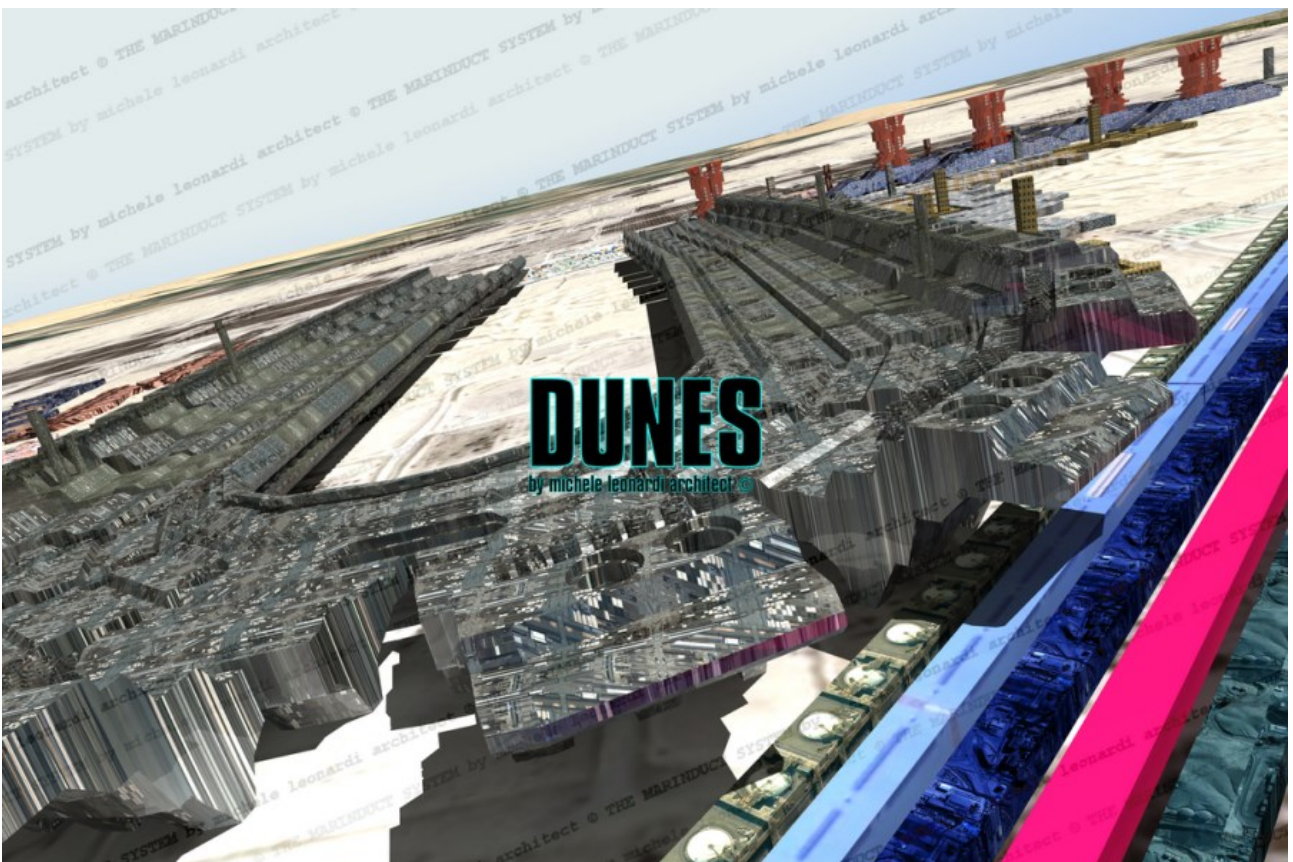


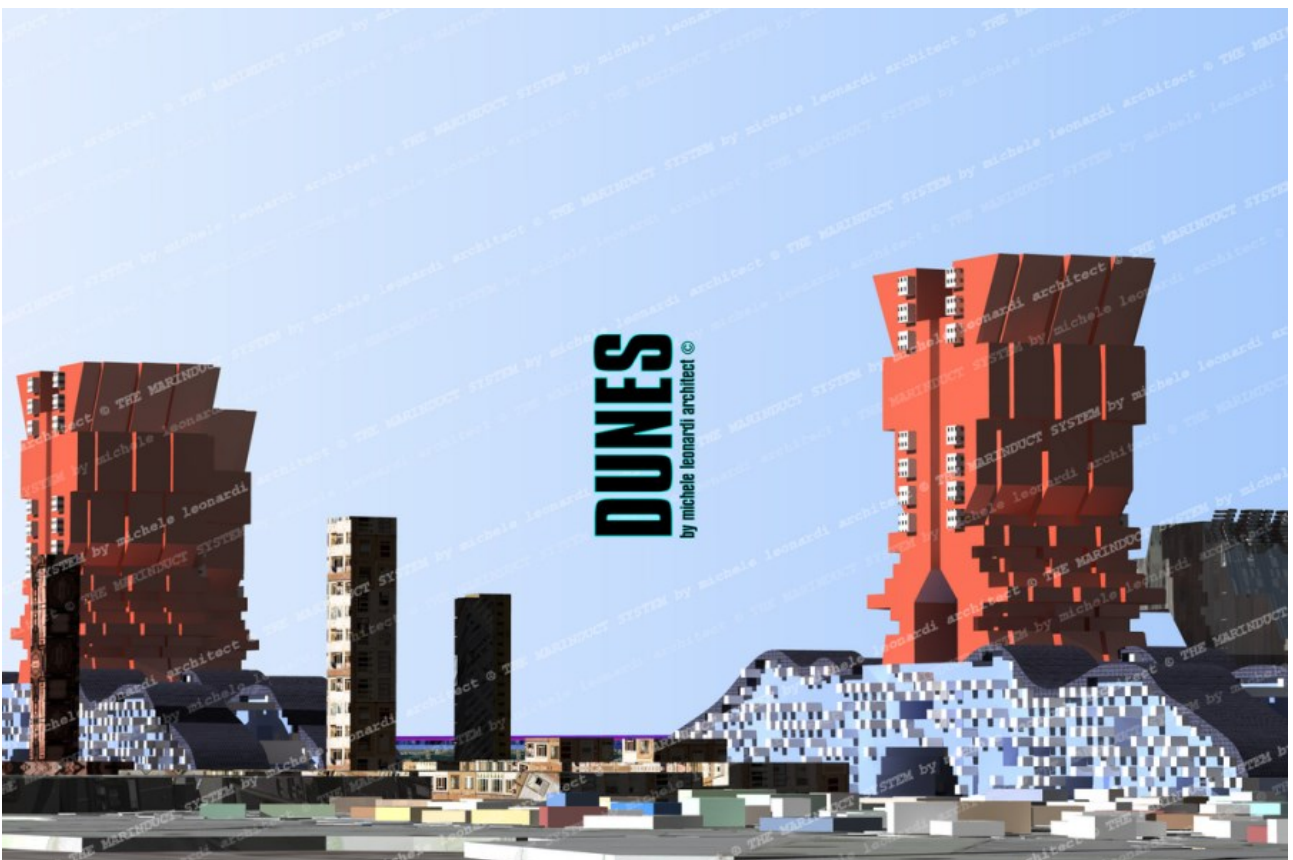
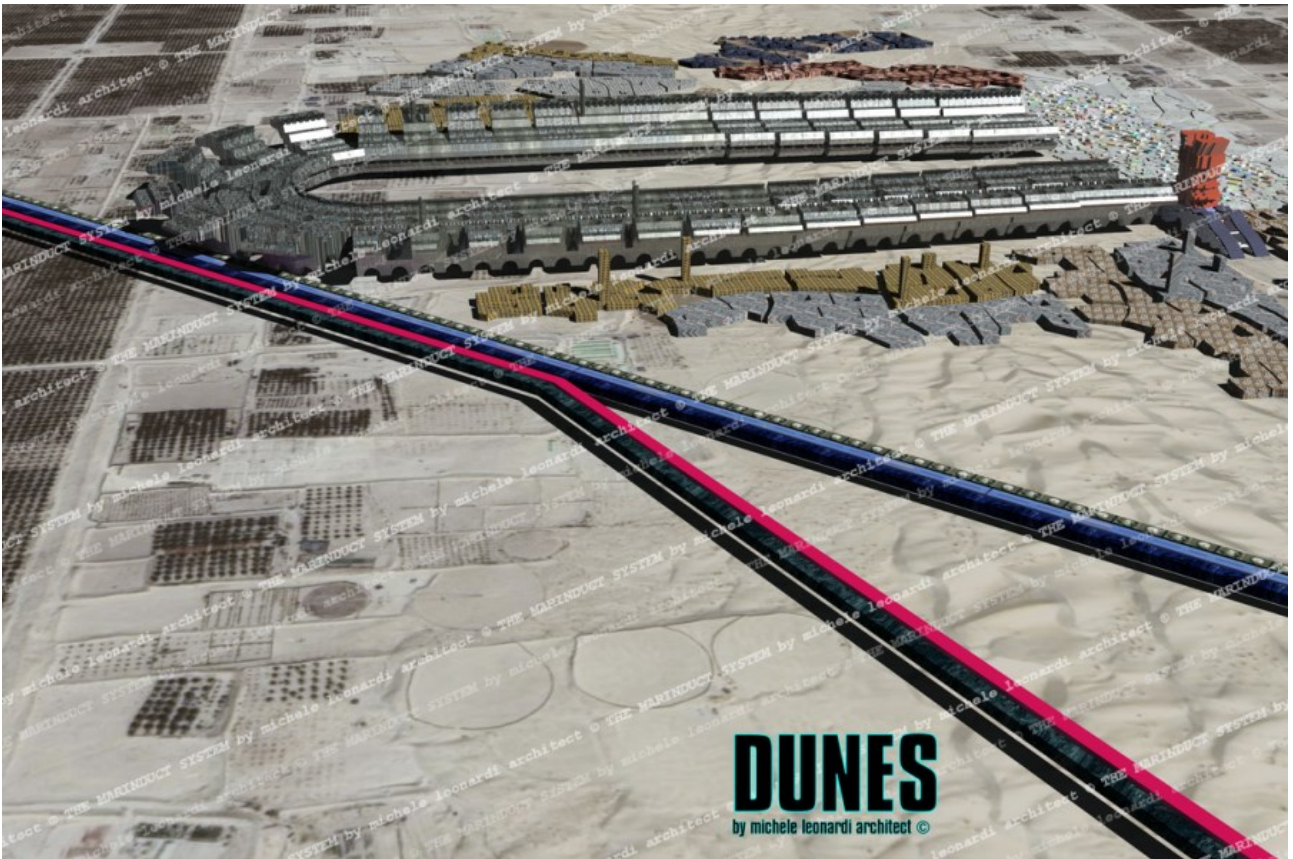


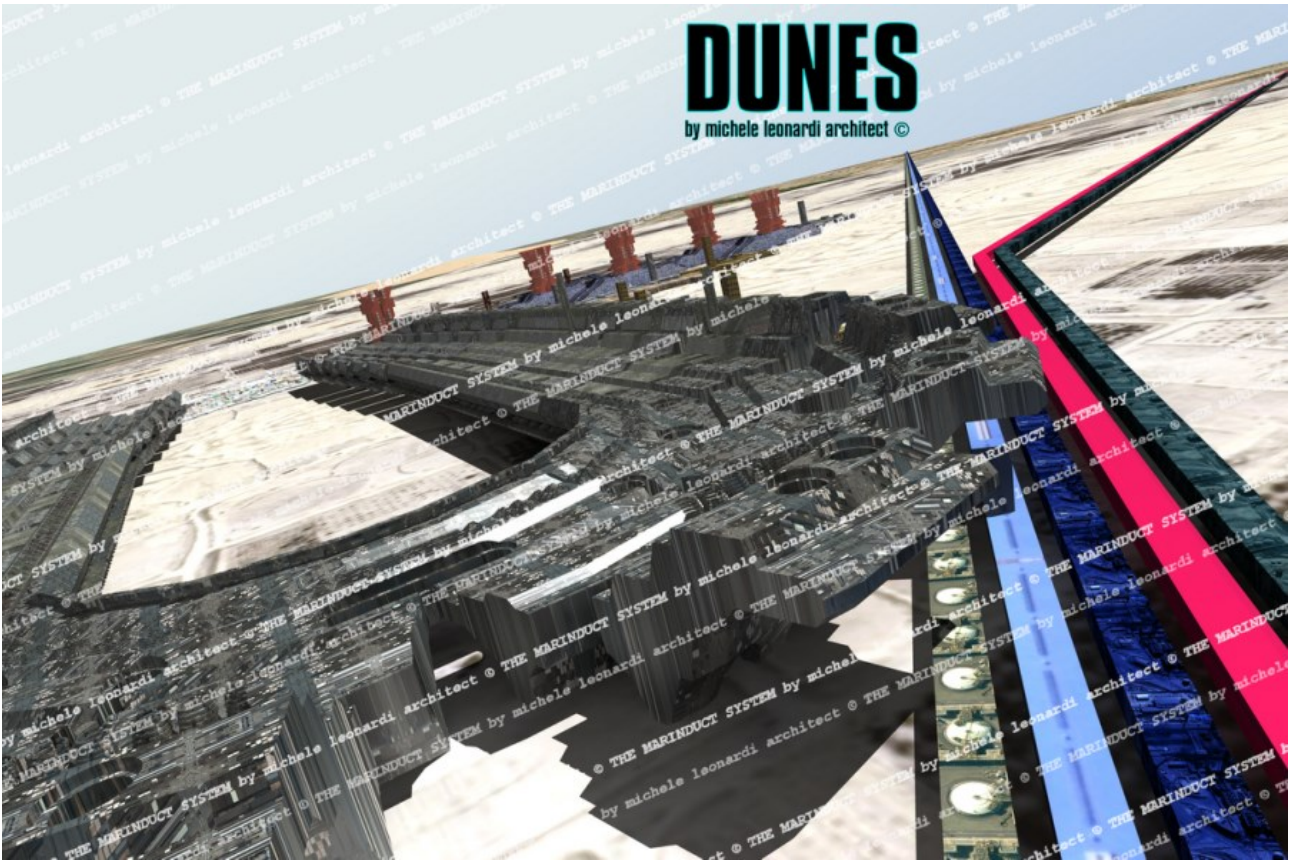












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الذكثبان

# D U N E S

**BUNDLE OF VECTORS: THE LINEAR CONNECTION  
BETWEEN DIFFERENT VECTORS**

*by Michele Leonardi architect © August 2019 - concept*



under construction page



الذكّة بان

D U N E S

THE HOUSES UNDER THE SAND

by Michele Leonardi architect © August 2019 - concept

Example of cover-up  
from the natural world :



# MOVING

from the natural to the artificial world - the natural world created by man -, **what is the advantage for a building?**

A first conceptual benefit is the invisibility one, but this does not interest us.

# THE OTHER

**very important practical advantage is the daytime cooling and night heating** (in the desert, by night the air temperature drops considerably). That is the thermal insulation and the damping of daily and seasonal temperature changes, thanks to the mass of sand placed over the structure of the house. We are talking about bioclimatic architecture.

In other words, in the desert: **we can use the sand as a shield**, compared to solar radiation and atmospheric air temperature. Is what many little animals of desert do when they hide in the sand to escape the heat.

So, if we think of the Kalahari Desert in South Africa, we do not consider antelopes and elephants ...



under construction page







الذكوبان

# DUNES

**THE HOUSES IN THE SAND: THE BLUE SHELL, Part 1**

*by Michele Leonardi architect © August 2019*





## Basic premise:

In all the new artificial Oases, **most of the villages' houses would be built using traditional techniques:** clay houses and / or with **the Geopolymers** by Prof. Dr. Joseph Davidovits, that is to say: economic, bioclimatic and 100% recyclable. ([See the bibliography.](#))

In fact "the houses in the sand" would be only an exception: spaces for guests, for tourists, representative spaces and special community spaces.

After all it has already been said why the "houses in the sand": **because sand mass can be used as a "heat shield" and as a bioclimatic "thermal damper"**. While it is obvious that for ordinary houses the clay mass acts as a heat shield and damper.

Finally, it is clear that even stone can be used to build houses in village houses, depending on the materials available instead. In the new oases, special open spaces will also be left to the nomads and caravaneers of the desert.

## The Blue Shell

is a construction that ideally descends from above and mobile like animals.

The other two main "healthy" possibilities of land-construction relationship are, first, the architecture rooted on the surface of the Earth and outgrowth of the Earth, such as trees, fungi, forests, a coral reef, a crystal.

The third is the architecture that rises from the ground, of which the most striking example are **the 8 Horizontal Skyscrapers** by the russian El Lissitzky, a project of 1923, which remains almost avant-garde and prophetic project after almost a century. By conceptually imitating it, humanity is only now coming to make the El Lissitzky Horizontal Skyscraper, a small step at a time, when it was technically and economically feasible already a century ago. So let's get rid of prejudices.





## Prémisse fondamentale:

Dans toutes les nouvelles Oasis artificielles, **la plupart des maisons des villages seraient construites selon des techniques traditionnelles**: des maisons en argile et / ou avec **les Géopolymères** du Professeur

Joseph Davidovits, c'est-à-dire: économiques, bioclimatiques et recyclables à 100%. ([Voir la bibliographie.](#))

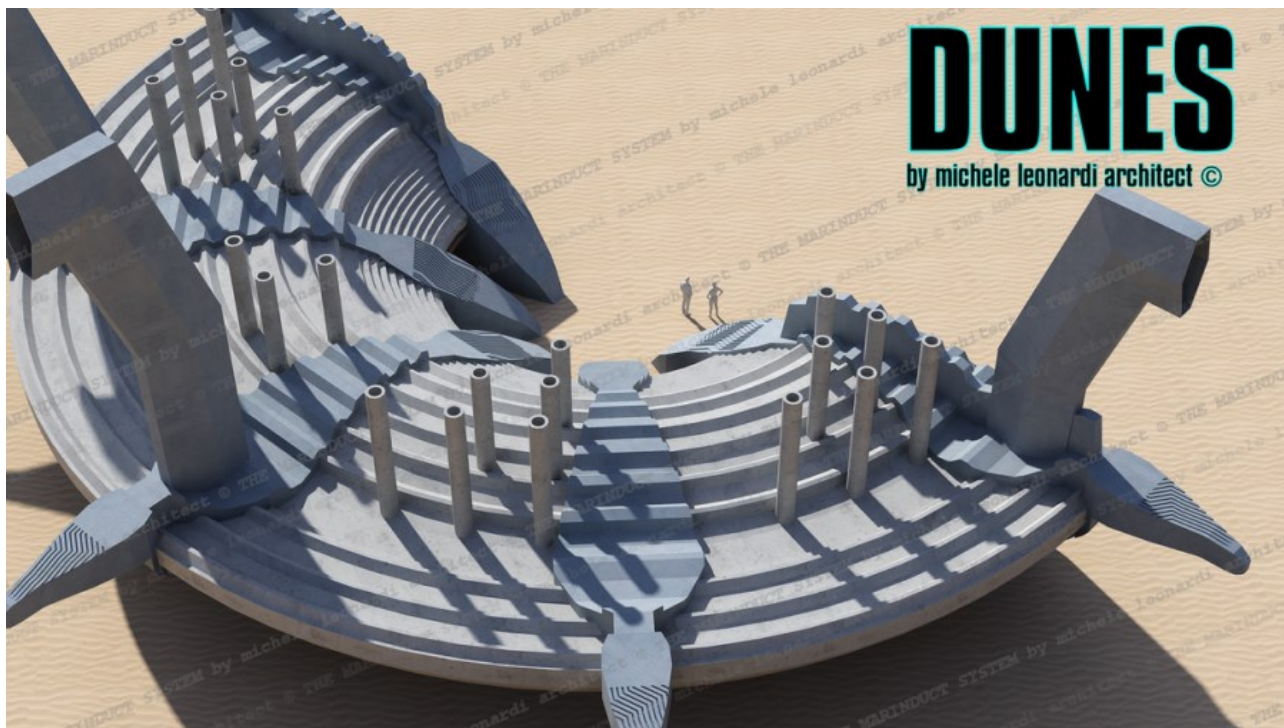
En fait, les "maisons dans le sable" ne seraient qu'une exception: des espaces pour les visiteurs, pour les touristes, des espaces représentatifs ou des espaces communautaires spéciaux.

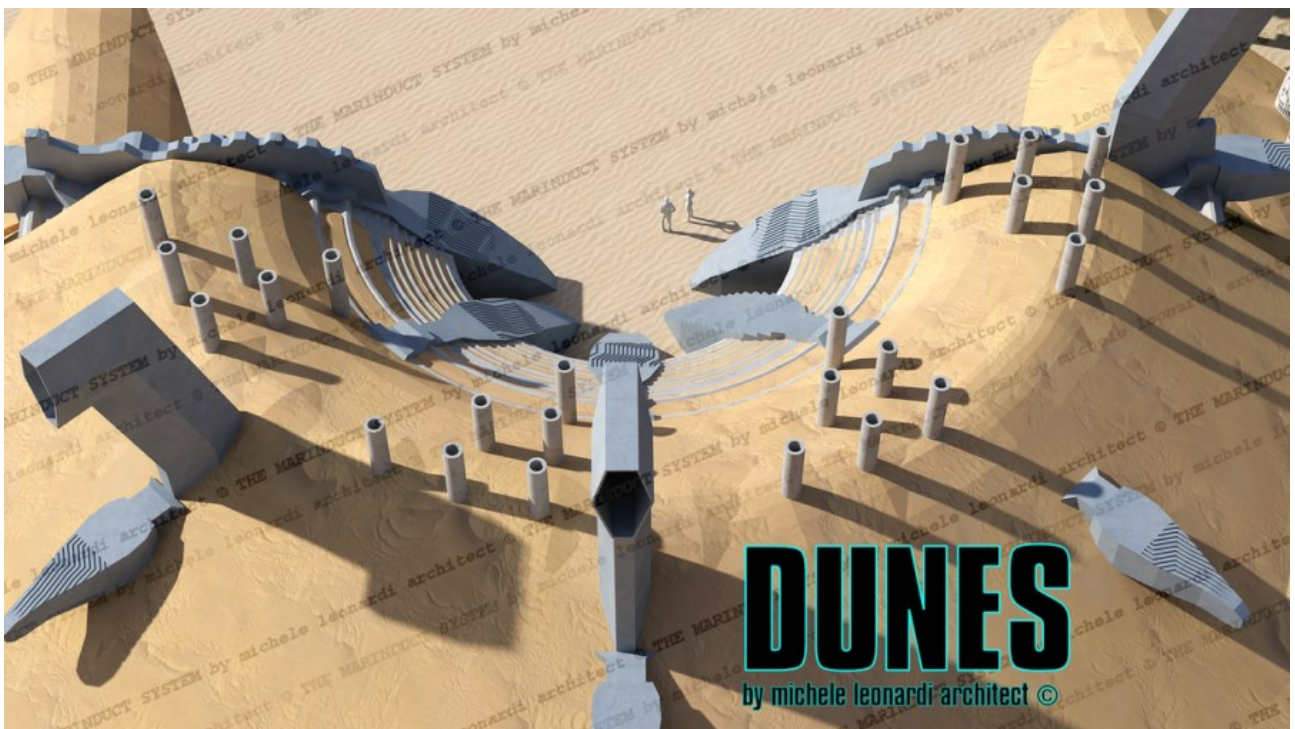
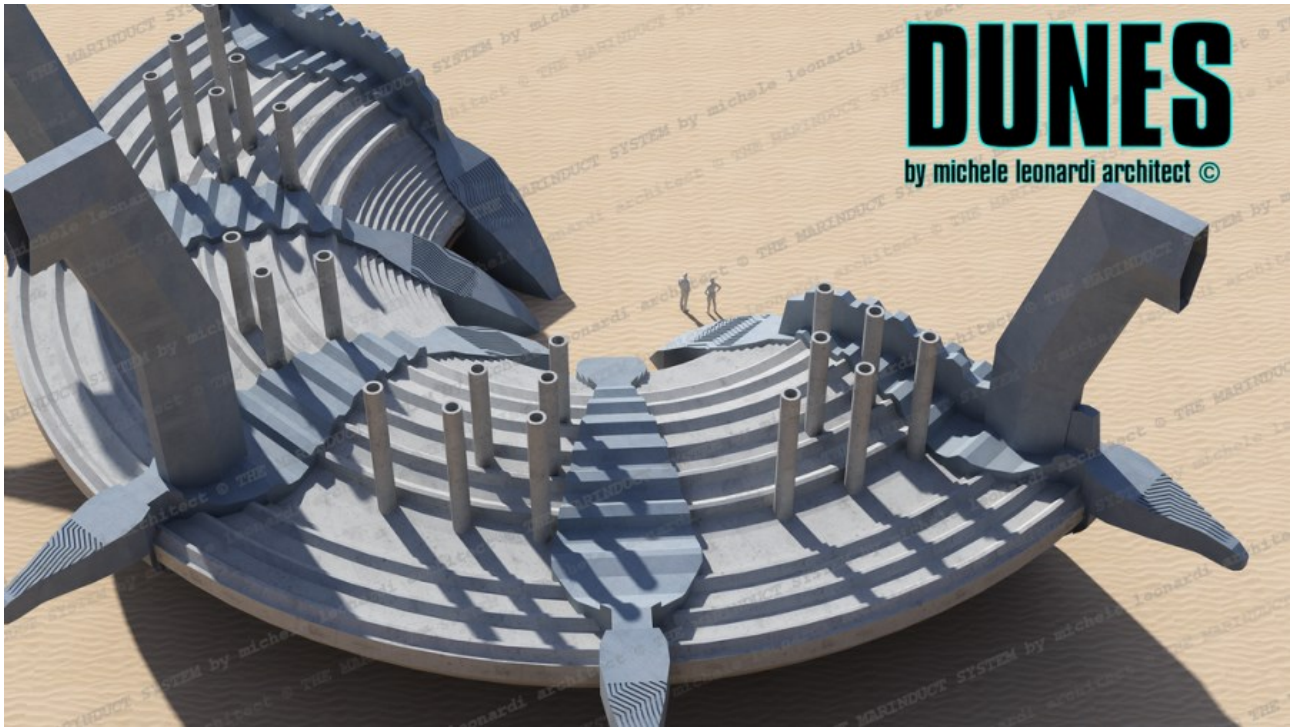
D'ailleurs on a déjà dit "pourquoi des maisons dans le sable": **parce que la masse de la sable peut être utilisée comme "écusson thermique" et comme "amortisseur thermique"**, bioclimatique. Bien qu'il est évident que pour les maisons ordinaires la masse d'argile agit comme isolant et amortisseur thermique. Enfin, il est clair que même la pierre peut être utilisée pour construire les maisons des maisons de village, en fonction des matériaux disponibles à la place. Dans les nouvelles oasis, des espaces libres spéciaux seront également laissés aux nomades et aux caravaniers du désert.

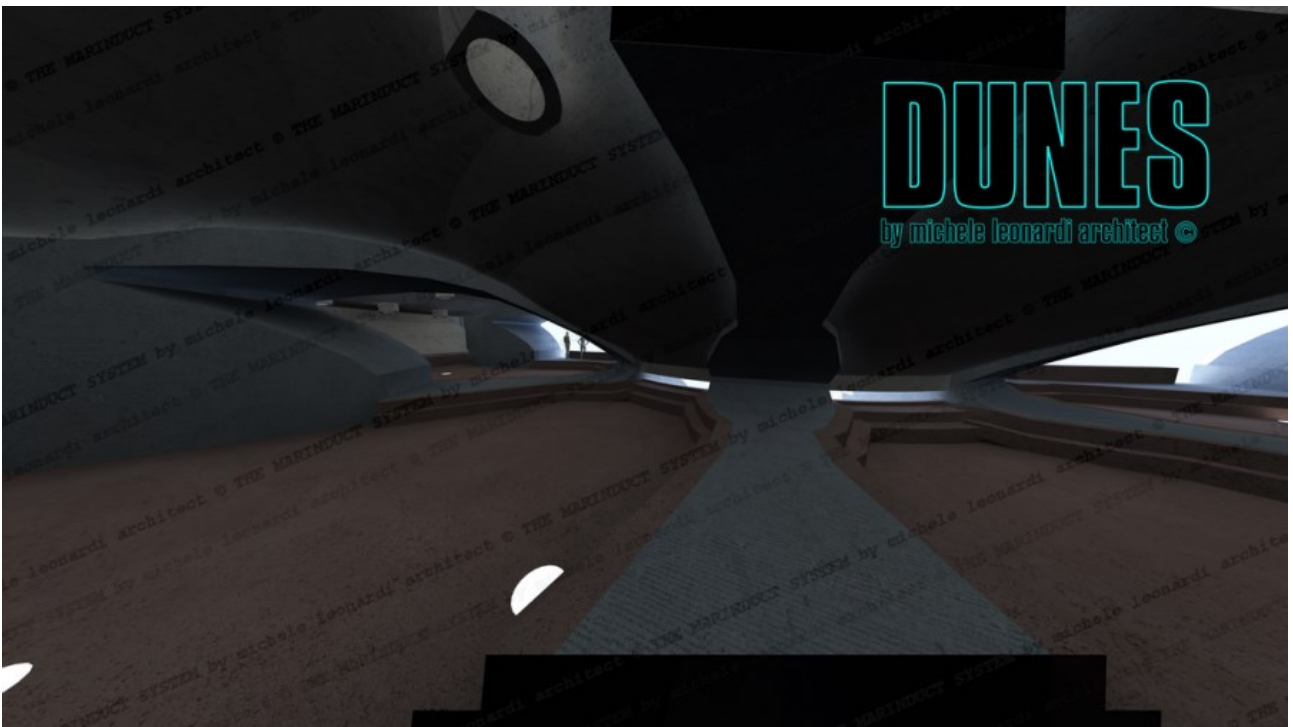
## "The Blue Shell",

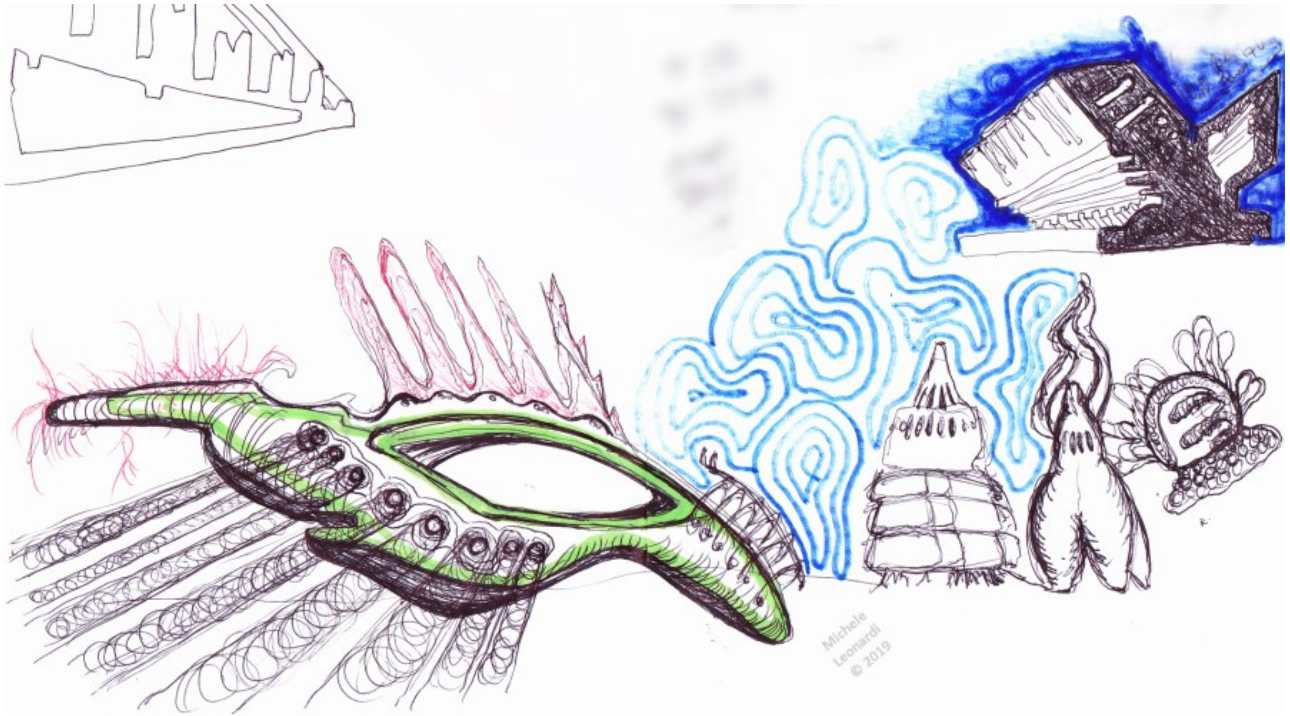
la "Coquille d'azur", elle est une construction qui descend idéalement par le haut, mobile comme les animaux. Les autres deux principales possibilités de relation "saine" terre-construction sont: l'architecture enracinée à la surface de la Terre et excroissance de la Terre, comme les arbres, les champignons, les forêts, un récif corallien, un cristal.

La troisième possibilité est l'architecture qui se lève du sol, dont l'exemple le plus frappant est celui **des 8 Gratte-ciels Horizontaux** du russe El Lissitzky, un projet de l'an 1923, lequel depuis presque un siècle il reste toujours avant-gardiste et prophétique. En l'imitant conceptuellement, l'humanité est en train d'arriver seulement aujourd'hui à réaliser la Gratte-ciel Horizontal du El Lissitzky, un petit pas à la fois, alors qu'il était techniquement et économiquement faisable déjà il y a un siècle avant. Alors, enfin débarrassons-nous des préjugés.









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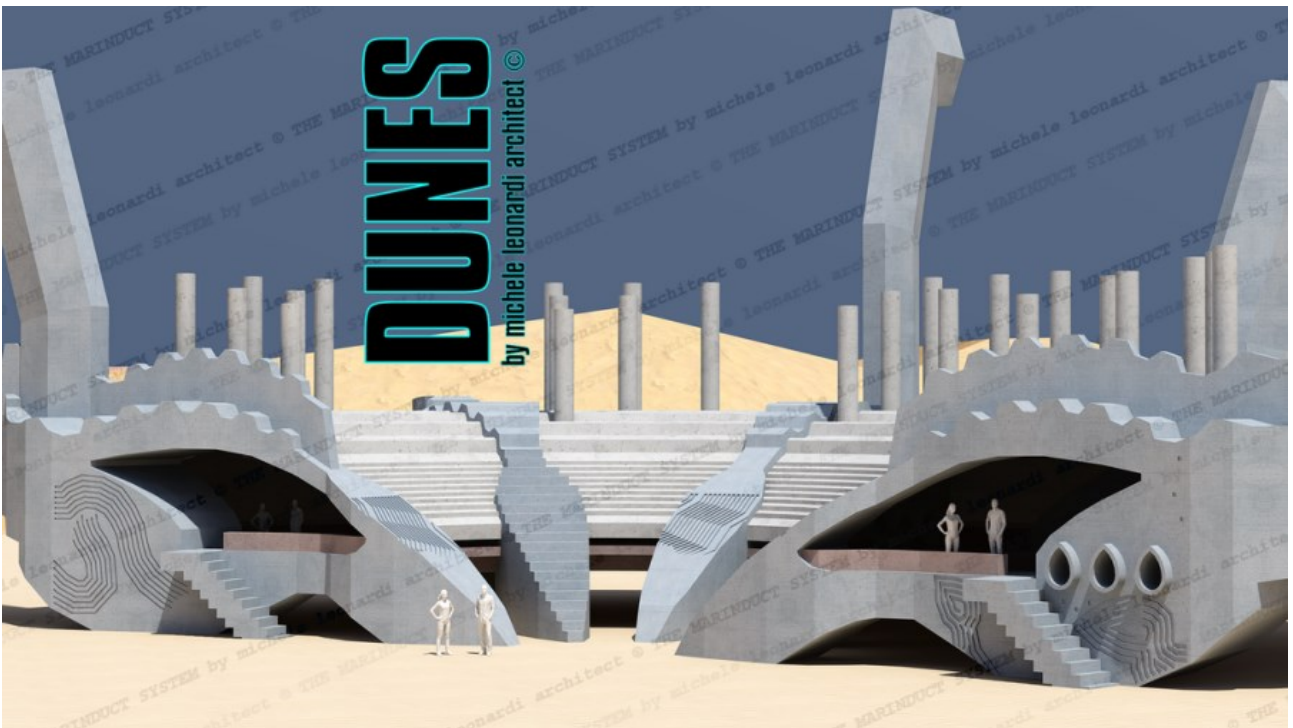


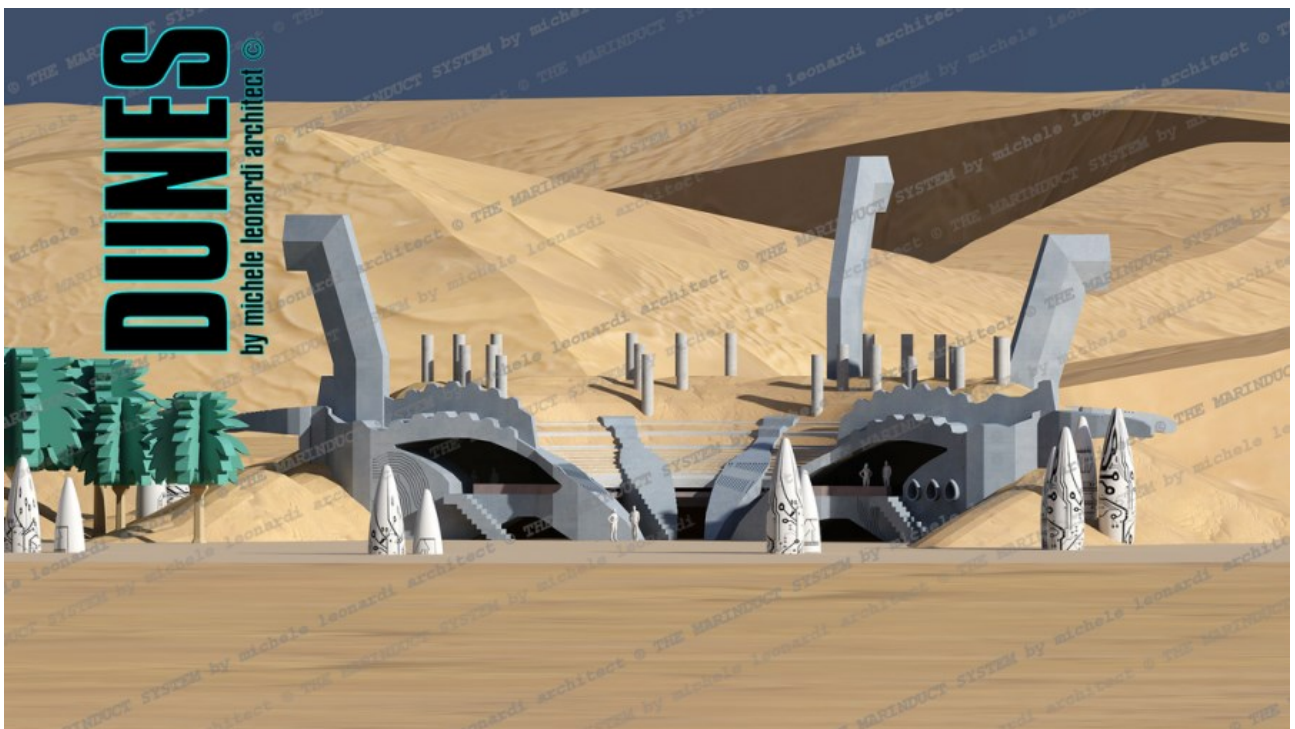
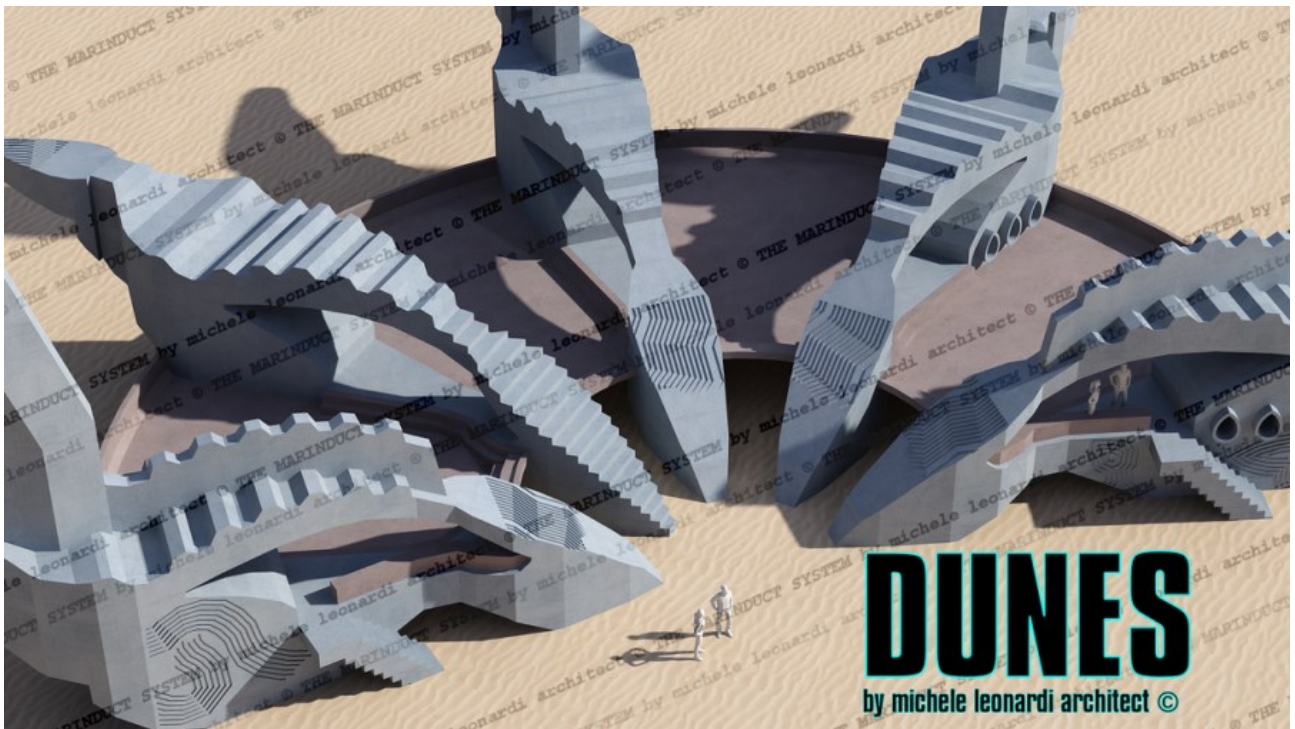
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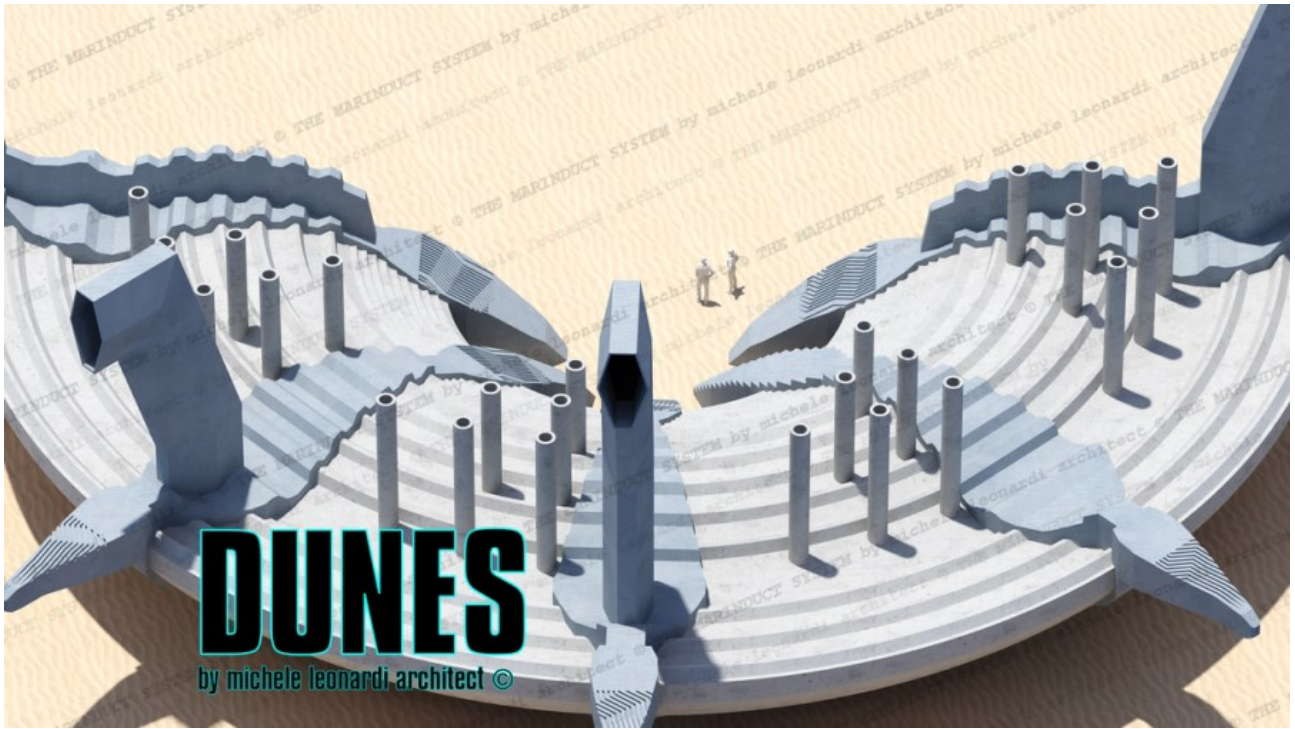
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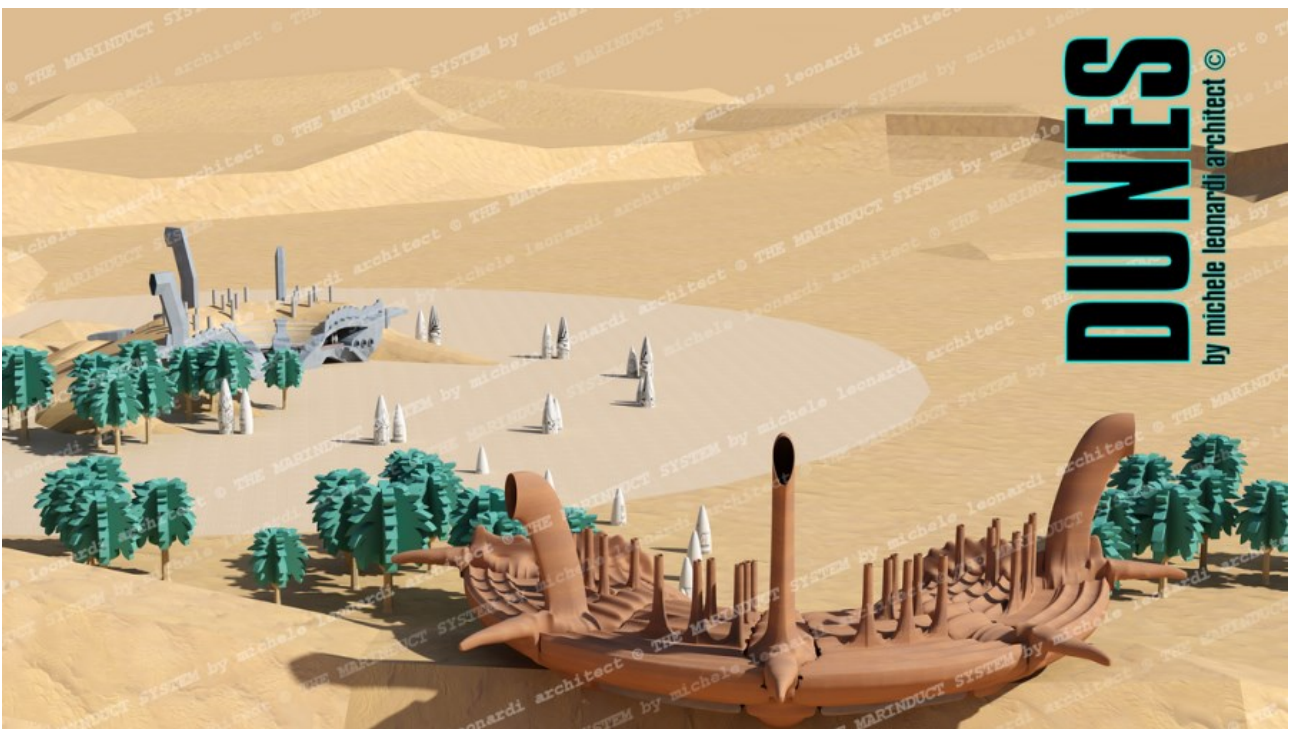
## THE HOUSES IN THE SAND: THE BLUE SHELL, Part 2

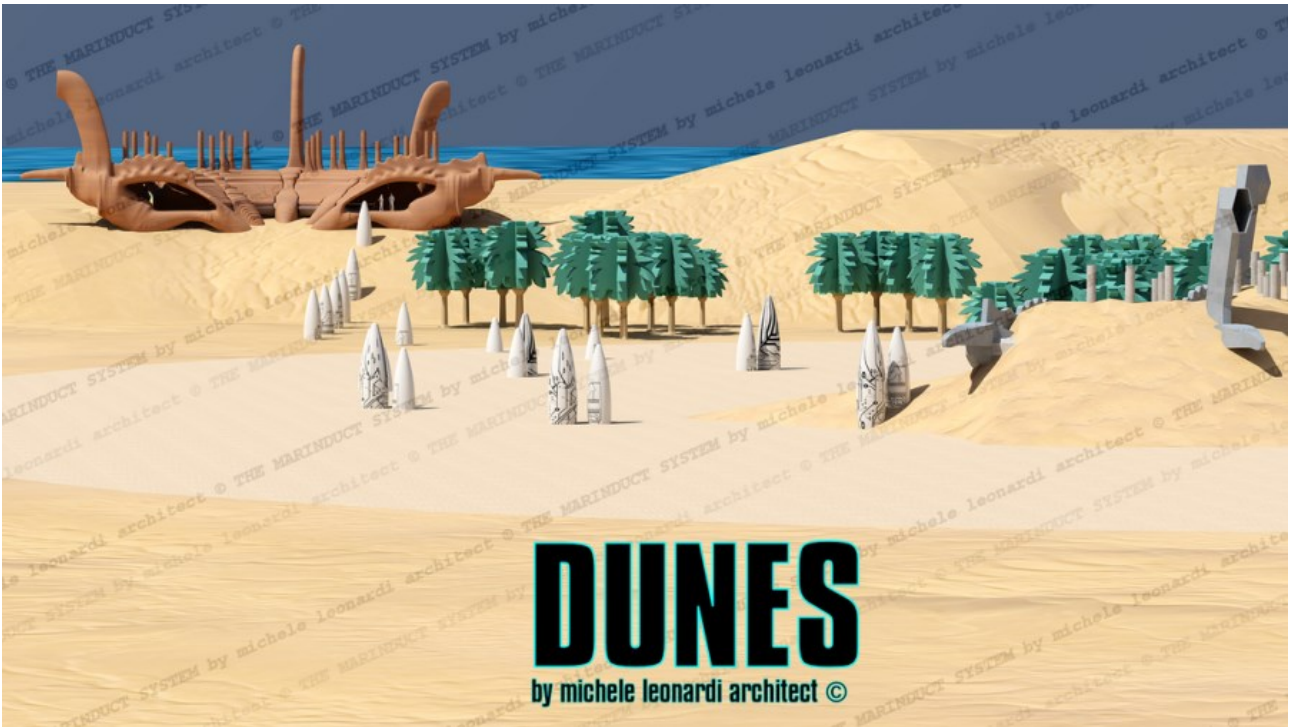
by Michele Leonardi architect © August 2019

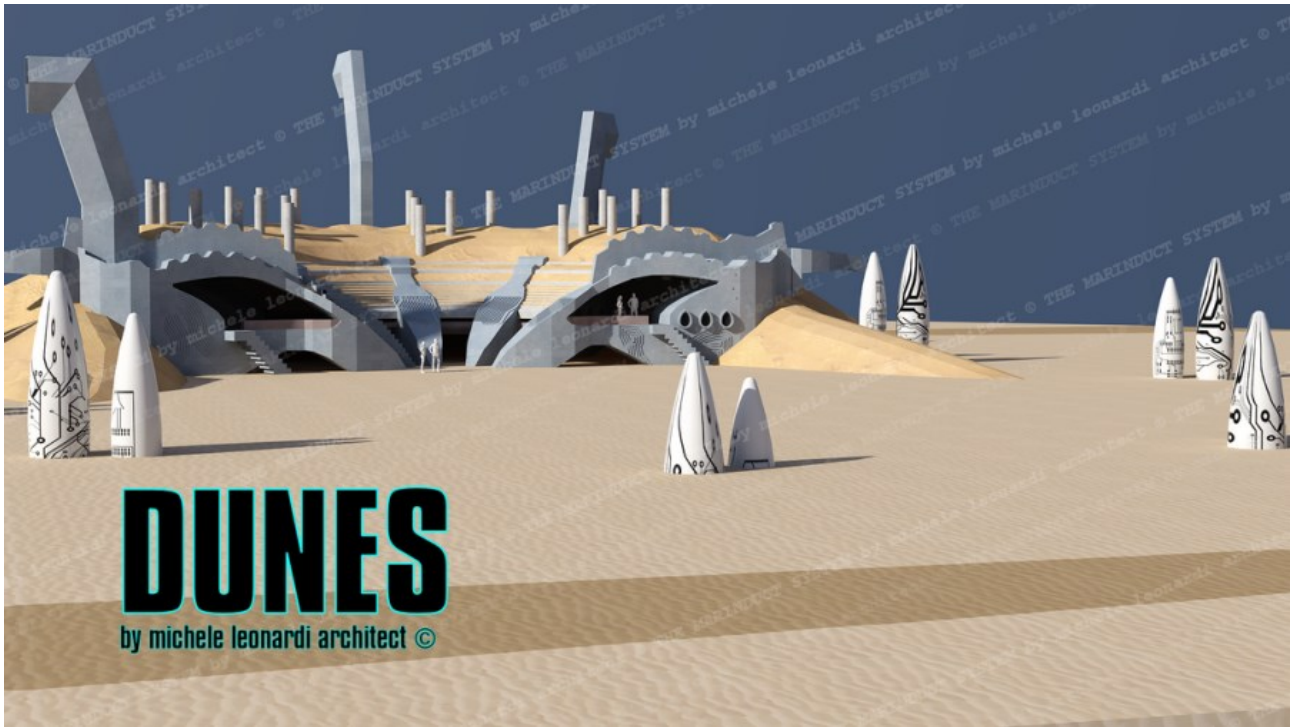




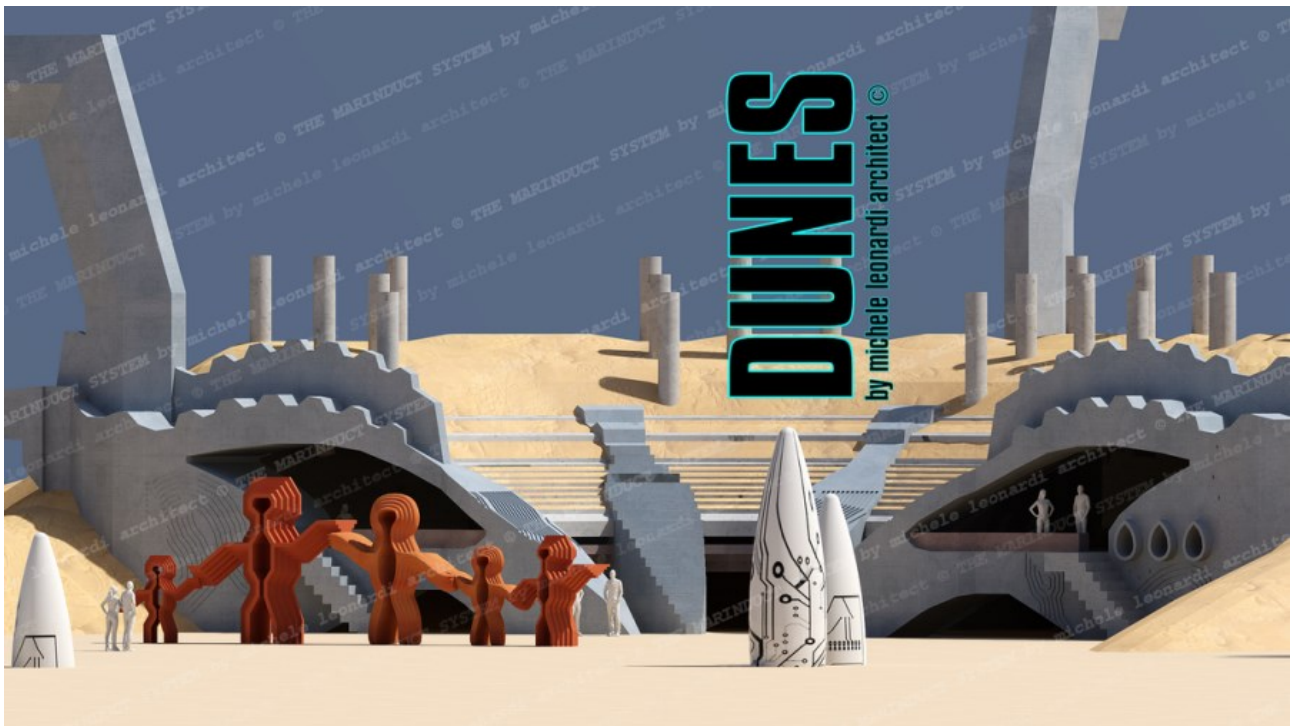


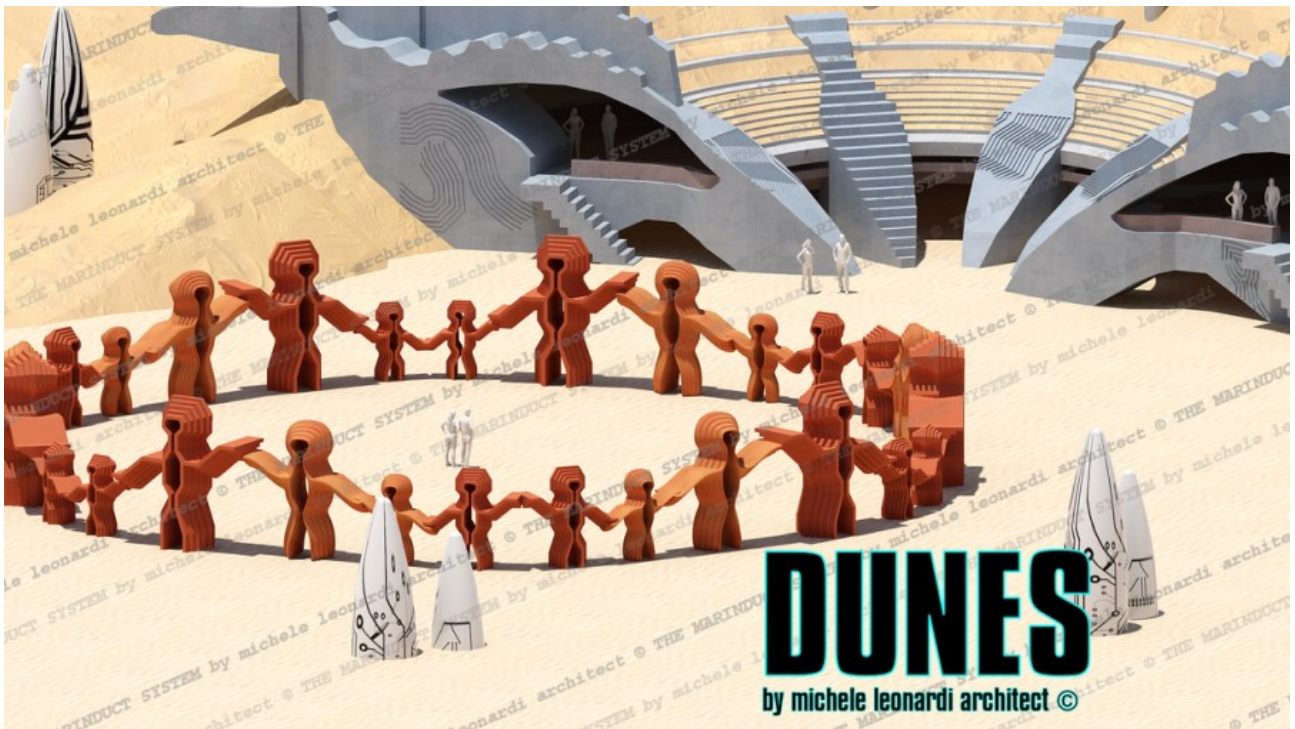






The Rhythm Family,  
the iron sculptures in the sand garden of Blue Shell House:



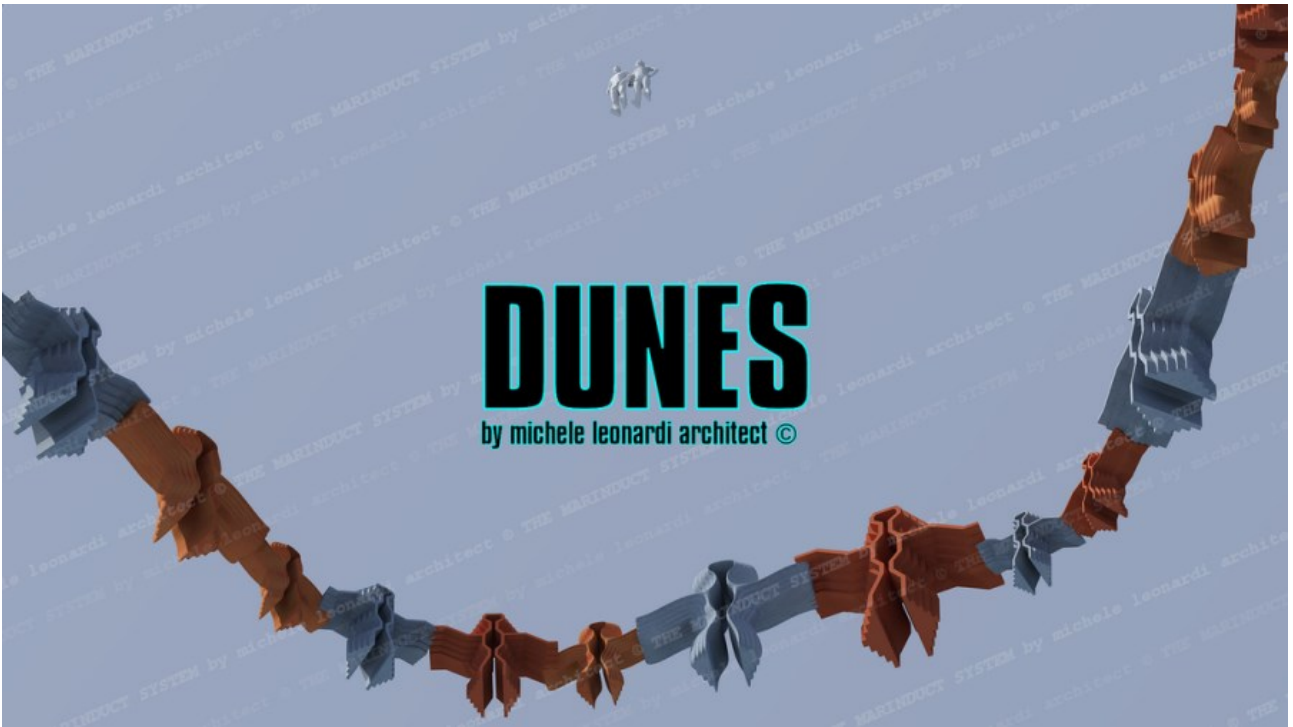


The Rhythm Families,  
the sculptures in the sand garden of Blue Shell House:









Angels and Demons

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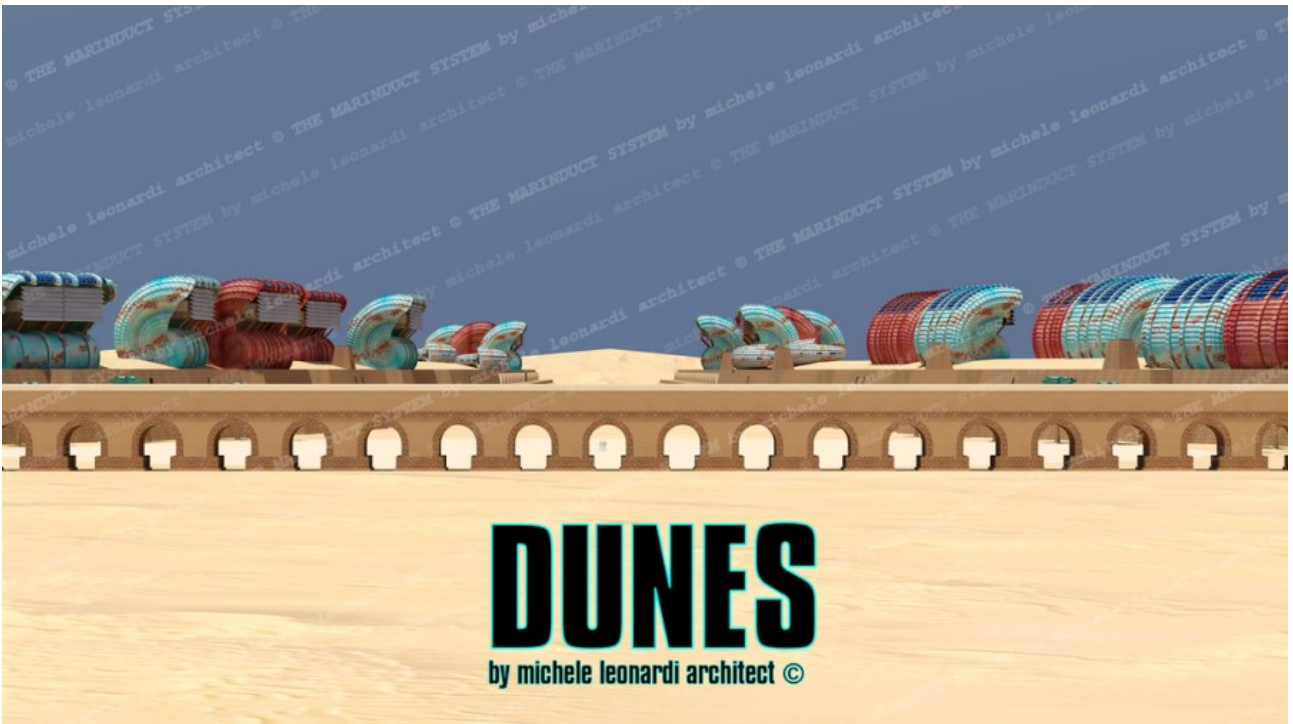


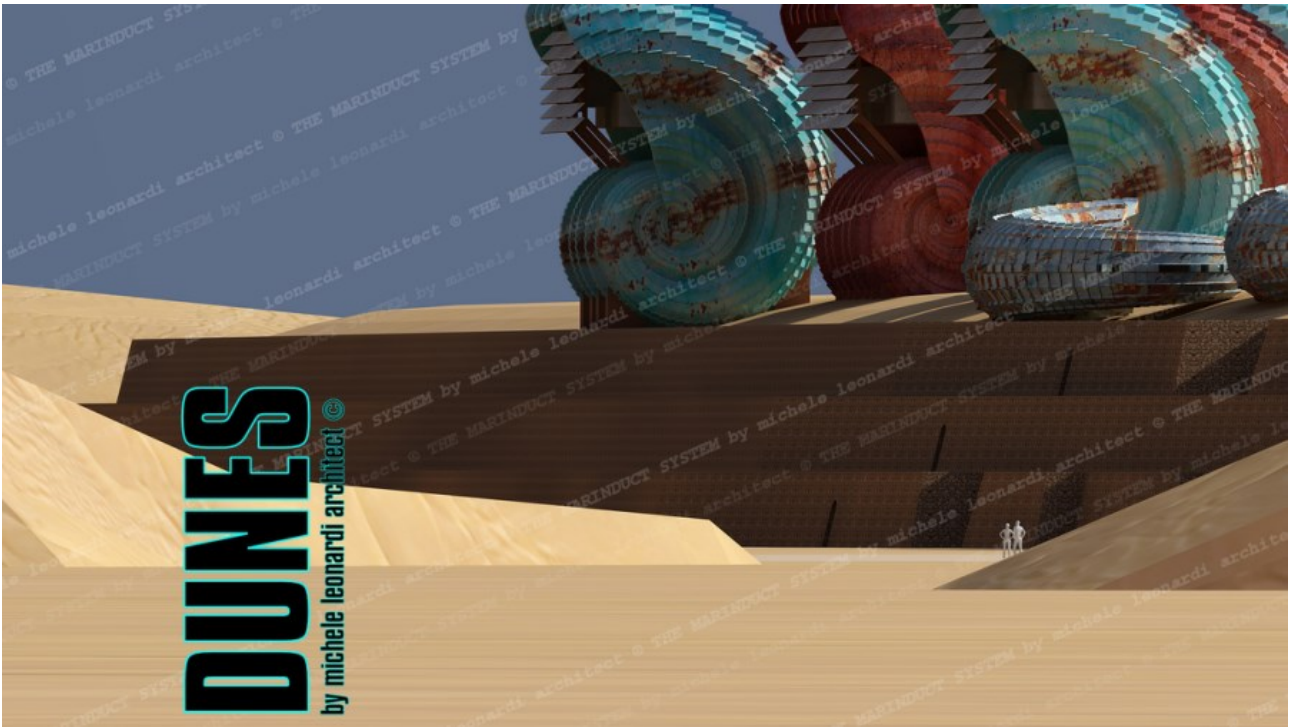
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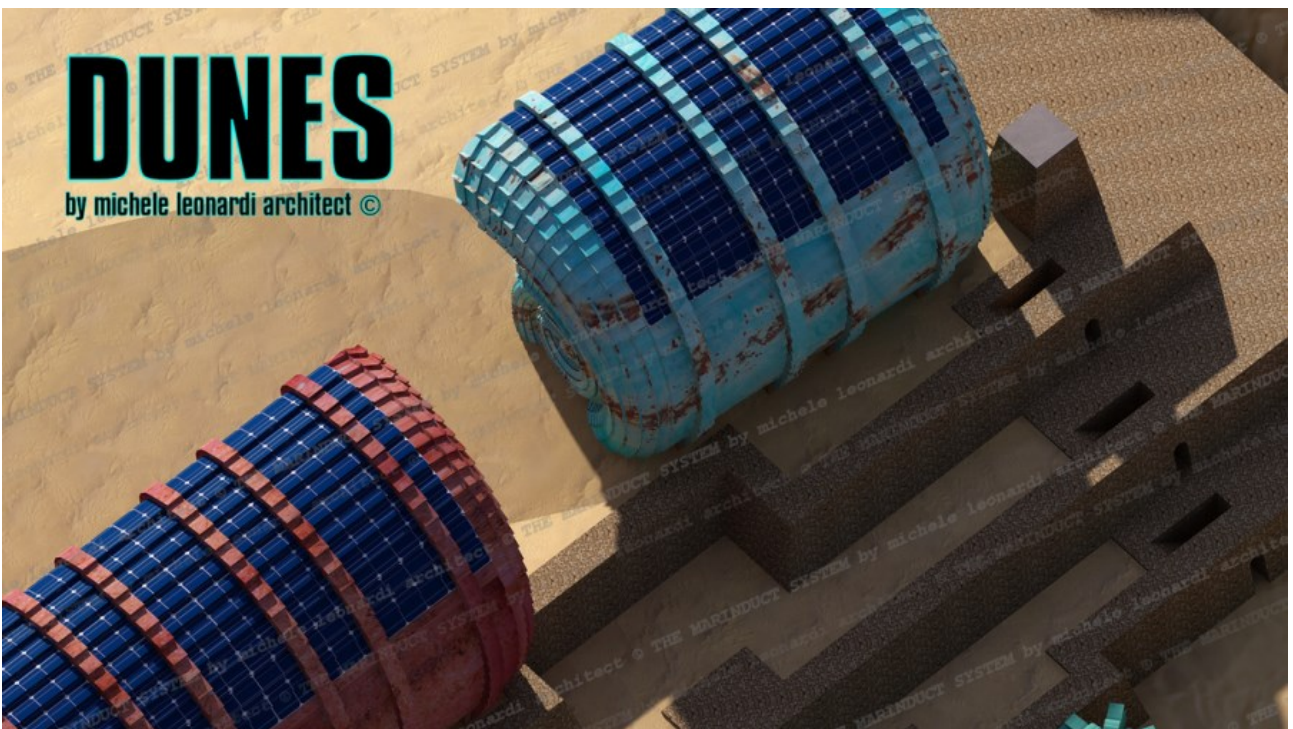
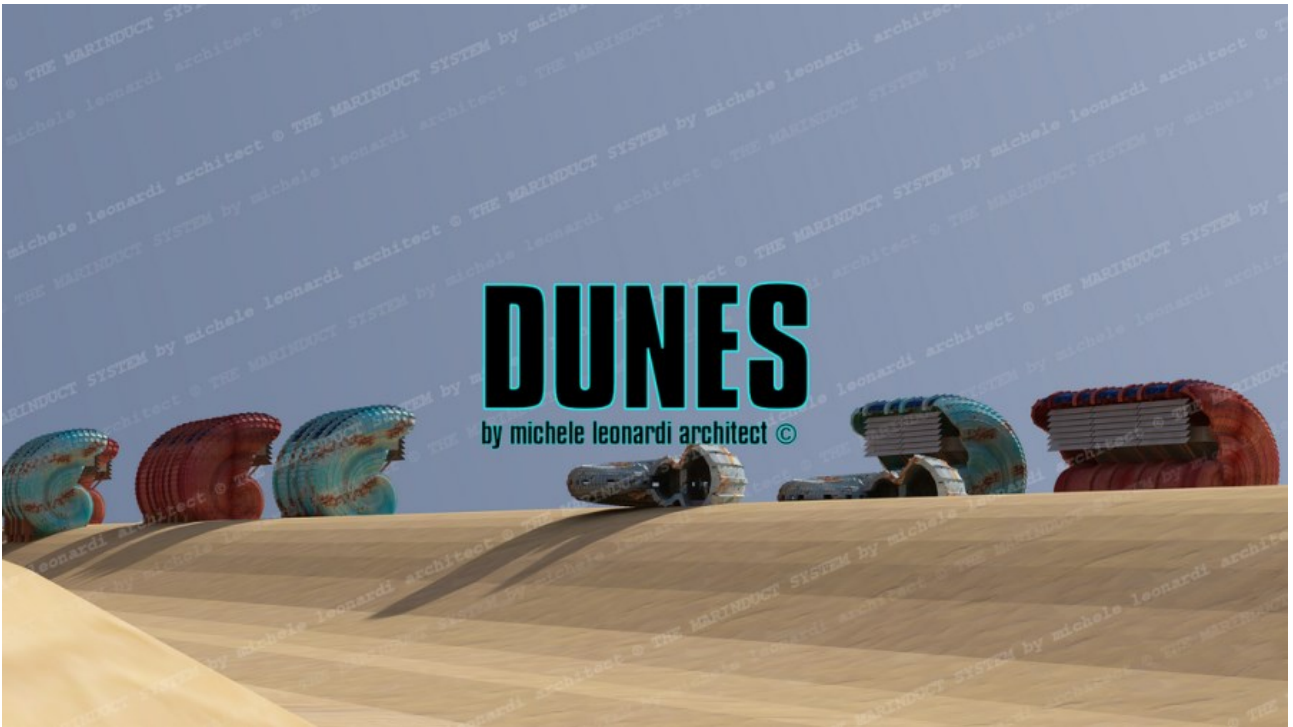
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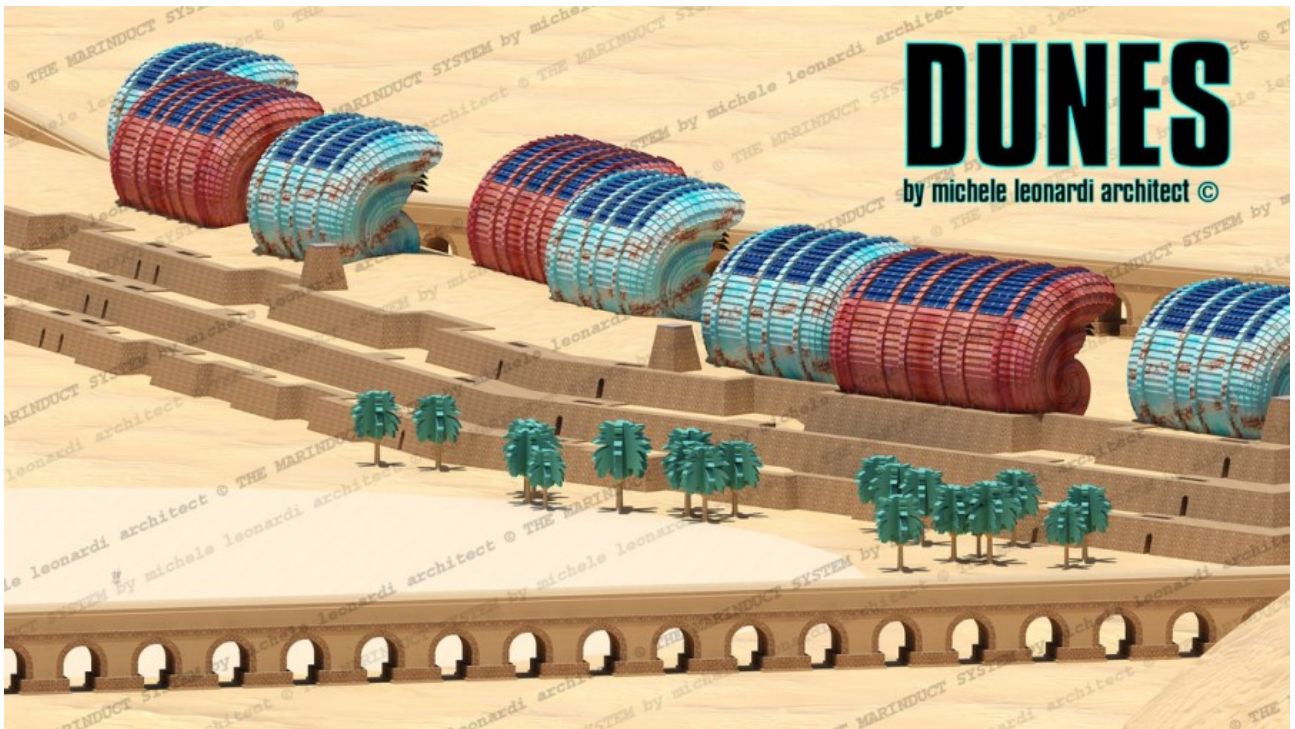
THE HOUSES IN THE SAND: THE NAUTILUS

by Michele Leonardi architect © August 2019









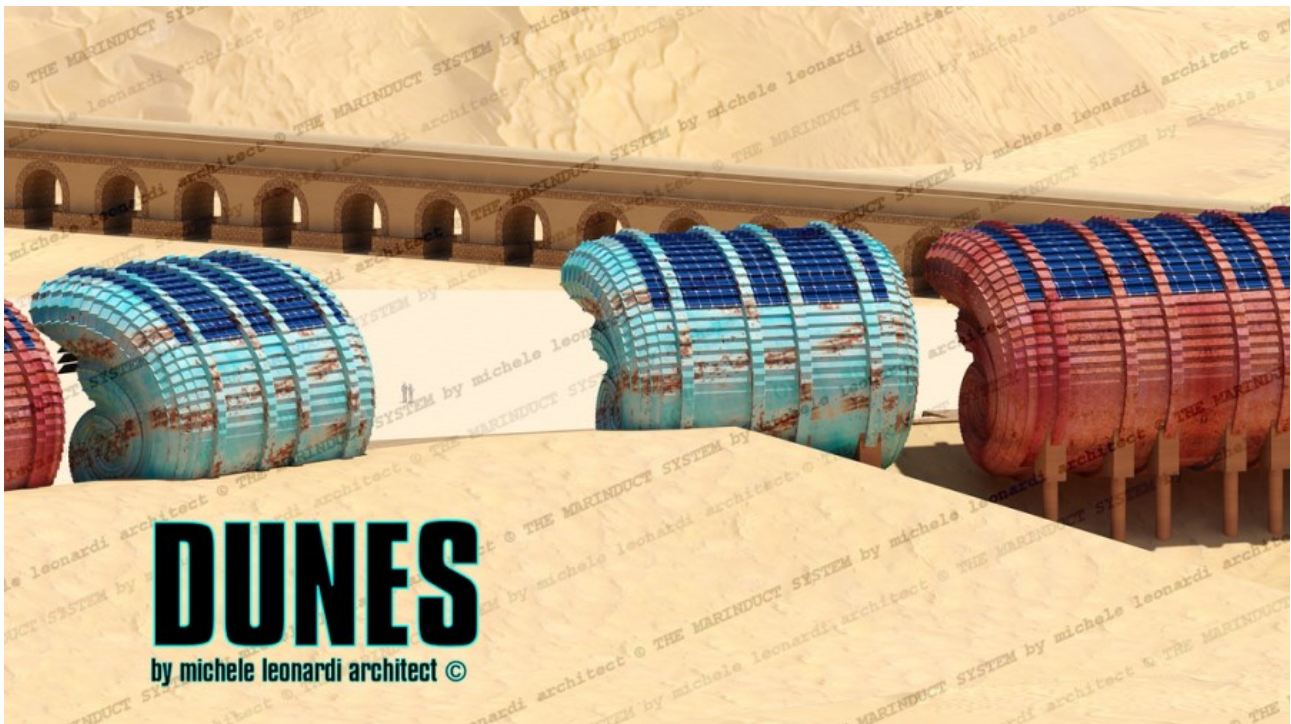
## The Nautilus:

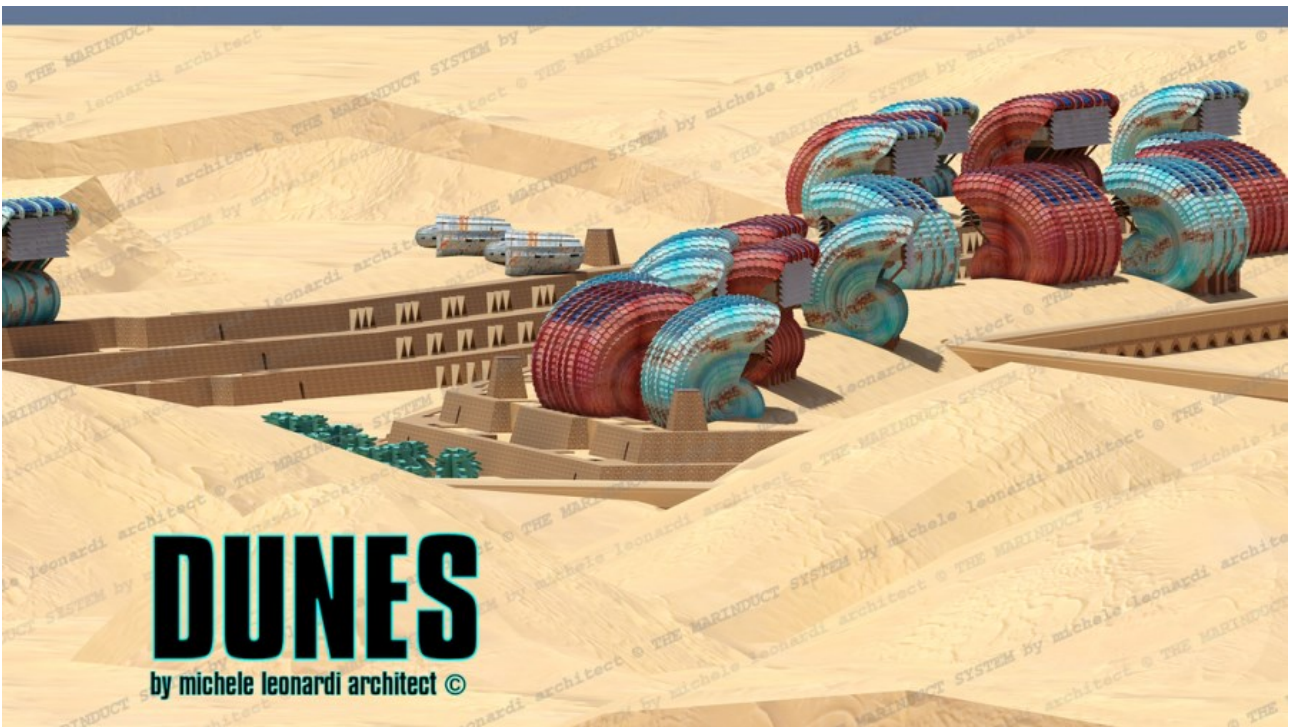
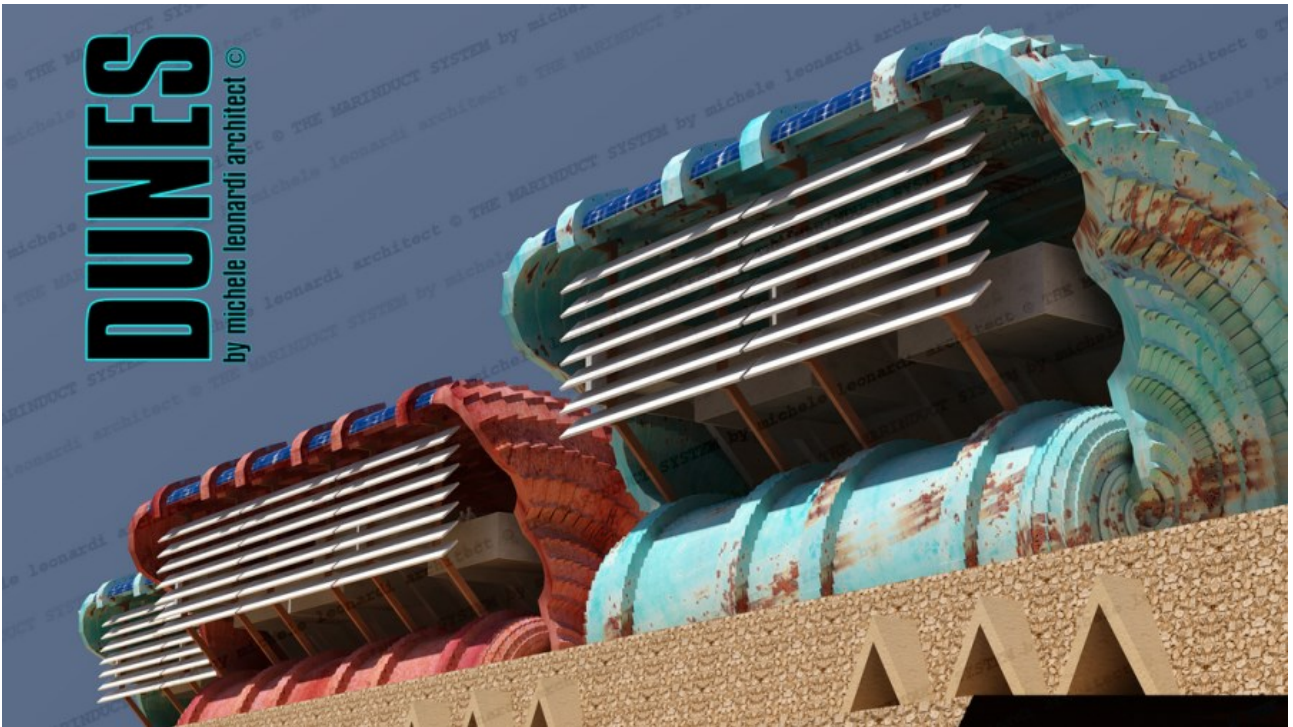
Spaces and functions "X" in the basement floors; "Y" spaces above ground, on the upper level, protected by a shell-shield. It's an almost classic scheme, always valid, but in this case it is not. Because **transposing a certain form from nature to architecture in a literal way, rather than conceptual, never gives a good result. So: discarded hypothesis.**

On the other hand it's also true that the nautilus shell was sectioned into two parts, and then the two parts were shifted. Therefore there is the change. And it is also true that the external form of the shell-shield corresponds to the his internal form, ie it's not a fake. So, yes, it's not sculpture, **but this is more scenography than real architecture.**

Other: sunscreens have a double surface: an external one is white, in order to reflect the solar radiation, while the internal one is black, so as not to transmit, reflect, visible light and infrared rays. In fact, note that the tents of the Berber nomads are dark, black, tinged with dark brown. So, in my opinion, it would be even better to have a double surface, white outside and black inside.

It's almost superfluous to add that the photovoltaic panels are placed on the roof, since the images should speak for themselves.





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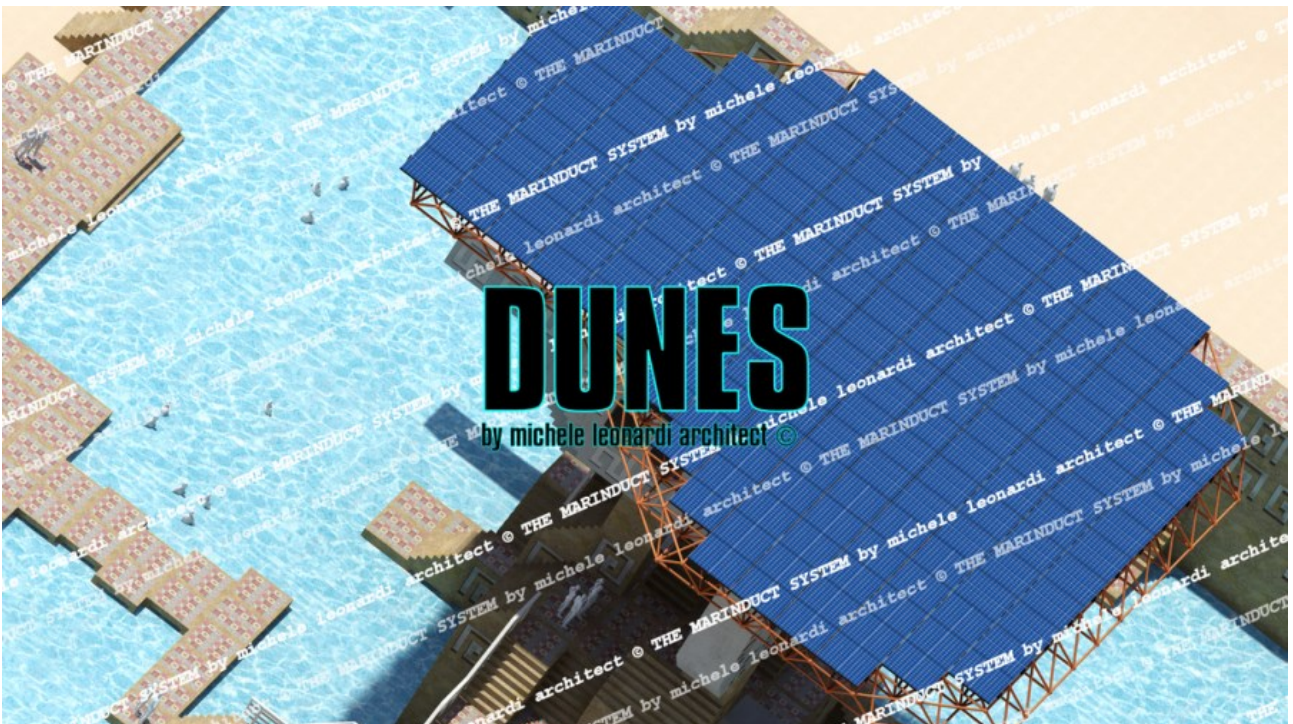


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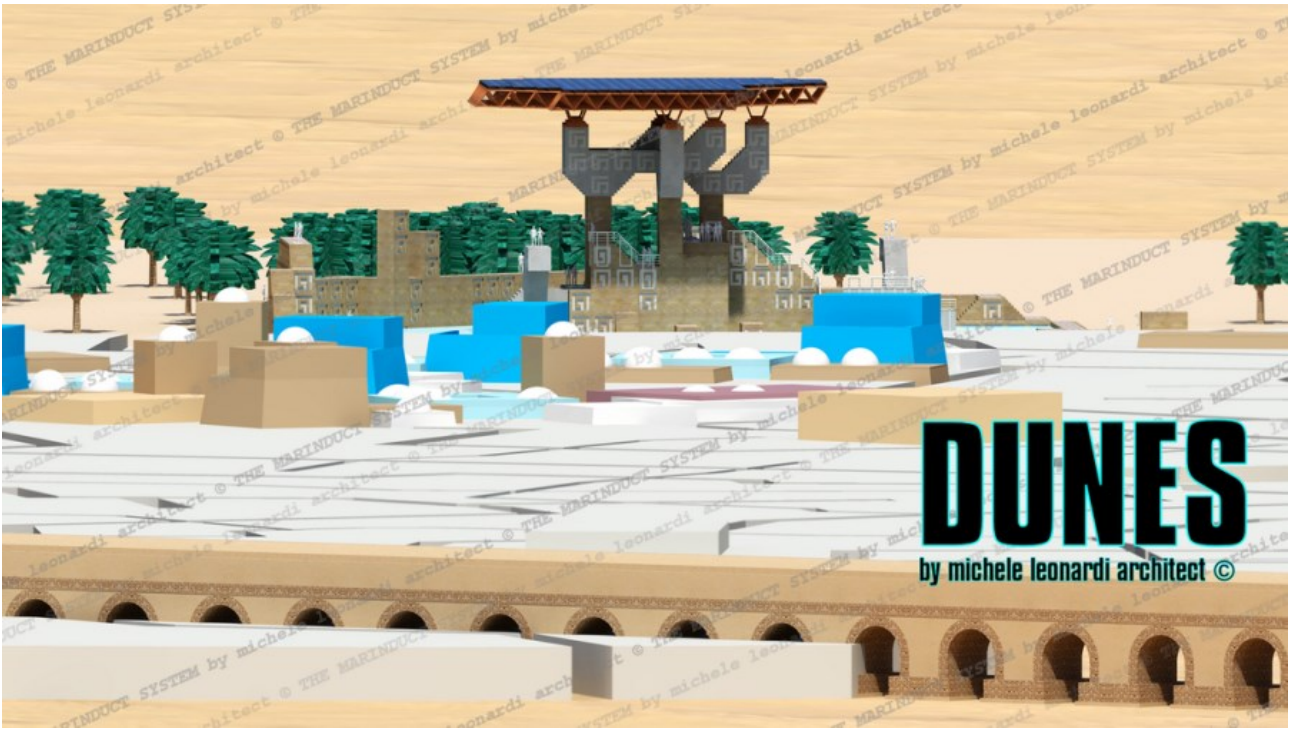
## DUNES

**THE BIG THERMAL BATHS:  
STAIRS IN THE WATER, a labyrinth of stairs**

*by Michele Leonardi architect © September 2019*

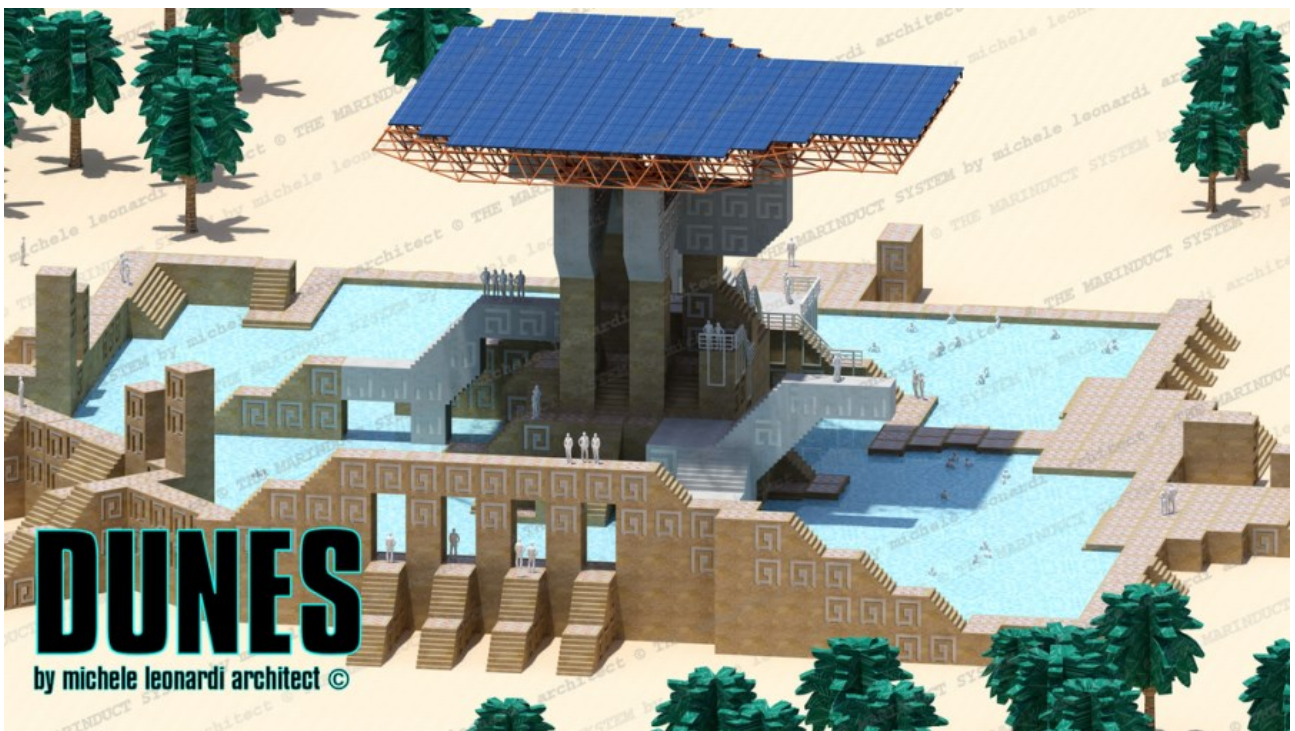
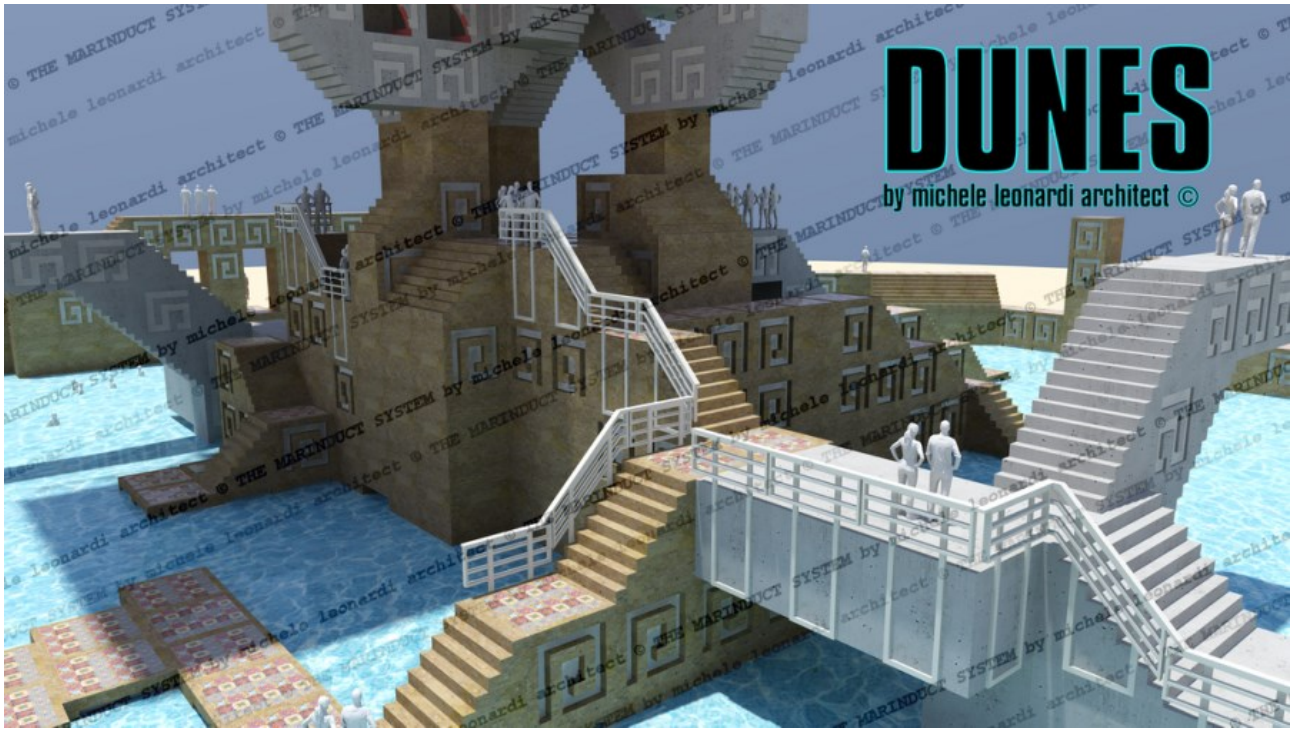


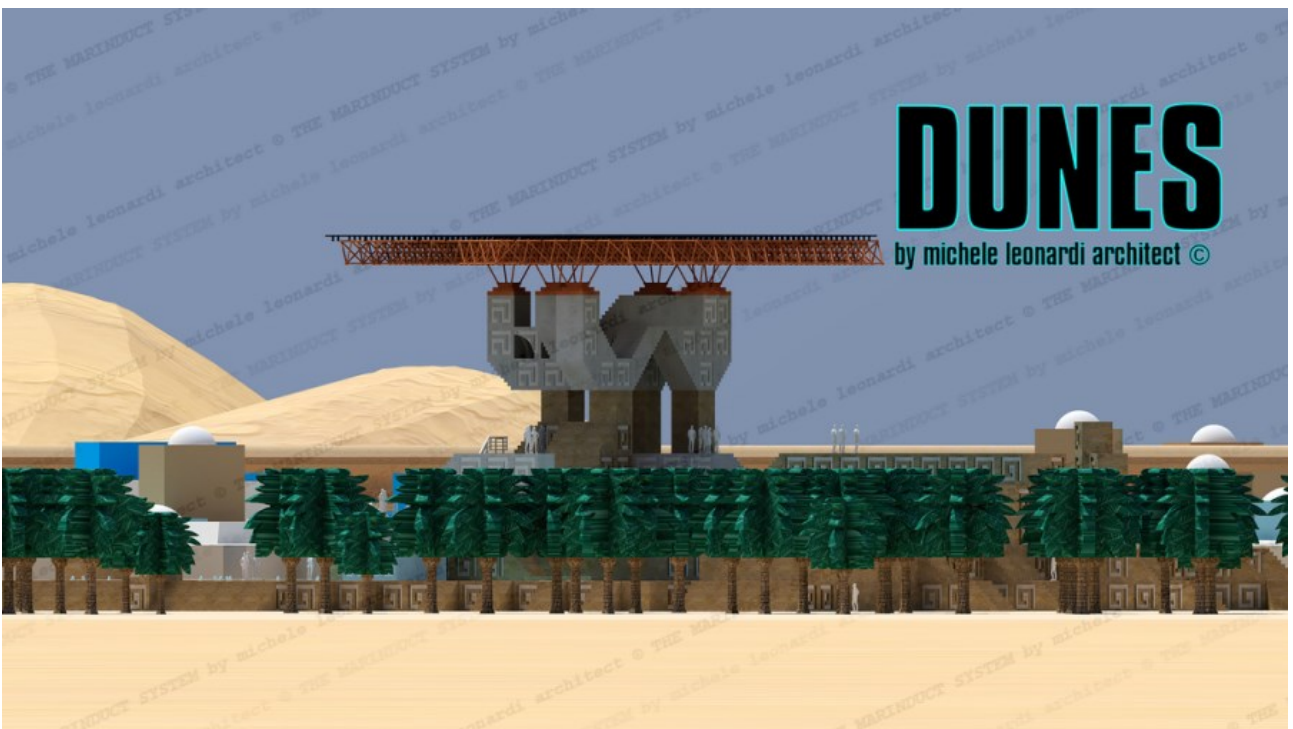
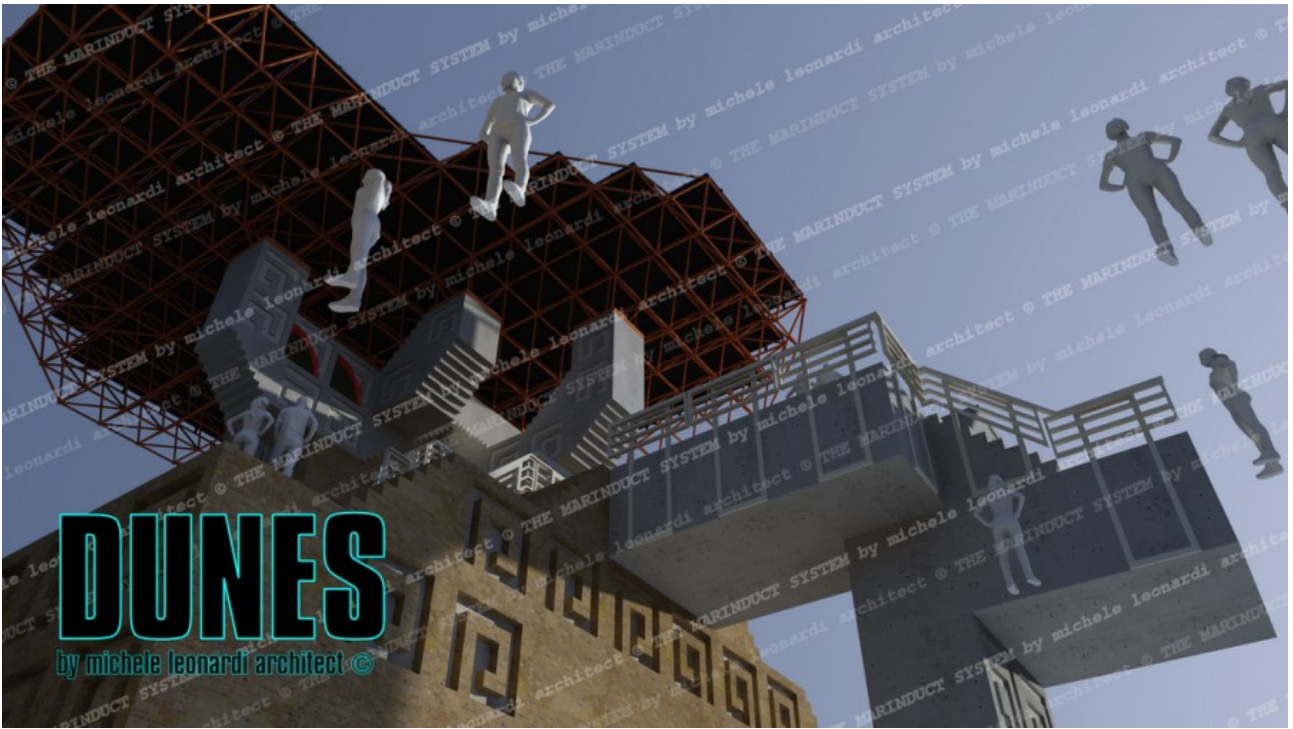


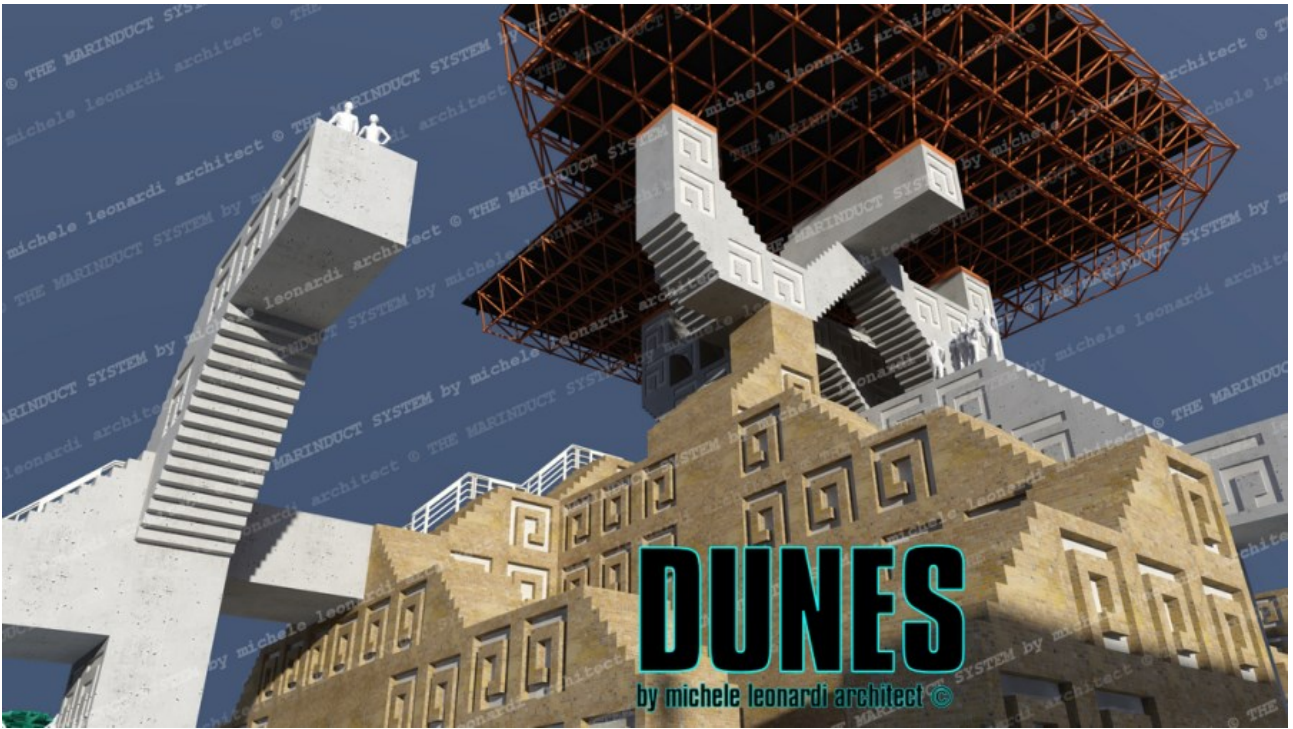


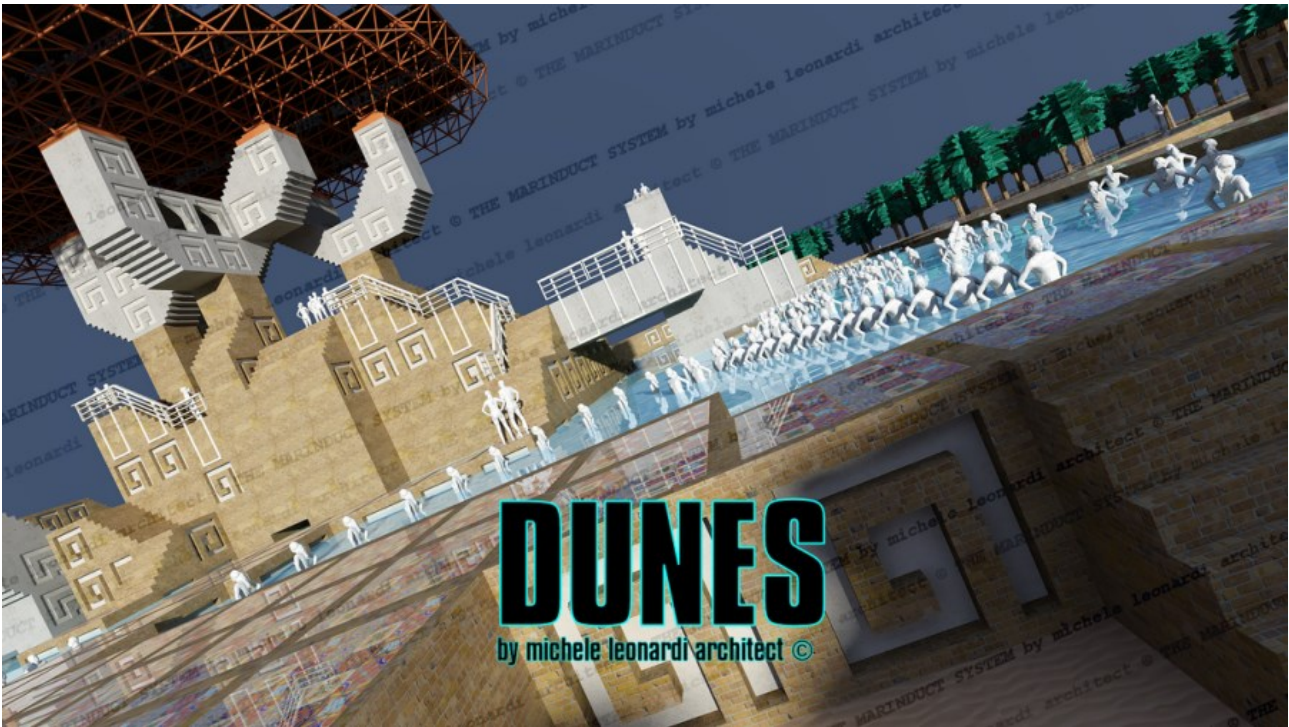












Project submitted in October 2019 to the attention of many businessmen in the water parks and amusement sector, both with plants in Italy and abroad.

Given that all entrepreneurs in general always respond to designers when they propose new ideas to them, I have not received any response from those I questioned.

It's too bad that this project has not been taken into consideration: **the children would have had a lot of fun in these unusual spaces, and the adults would have had one more chance to have more fun in their spare time.**

An architecture of this type could also be built and managed by an efficient public body.

*Rome, 31 October 2019,  
M.L.*



Projet soumis dans le mois d'octobre 2019 à l'attention de nombreux entrepreneurs du secteur des parcs aquatiques et des loisirs, dotés d'installations en Italie et à l'étranger hors d'Italie.

Étant donné que en général tous les entrepreneurs répondent toujours aux projeteurs quand lui proposent des nouvelles idées, je n'ai pas reçue aucune réponse par aucun d'entre eux.

Domage que personne n'ait pas pris en compte ce projet: **les enfants se seraient bien amusés dans ces espaces insolites, autant que les plus agés auraient eu une chance en plus de loisir pendant leur temps libre.**

Une telle structure pourrait également être bâtie et gérée par un organisme public.

*Rome, le 31 octobre 2019  
M.L.*



# الدunes

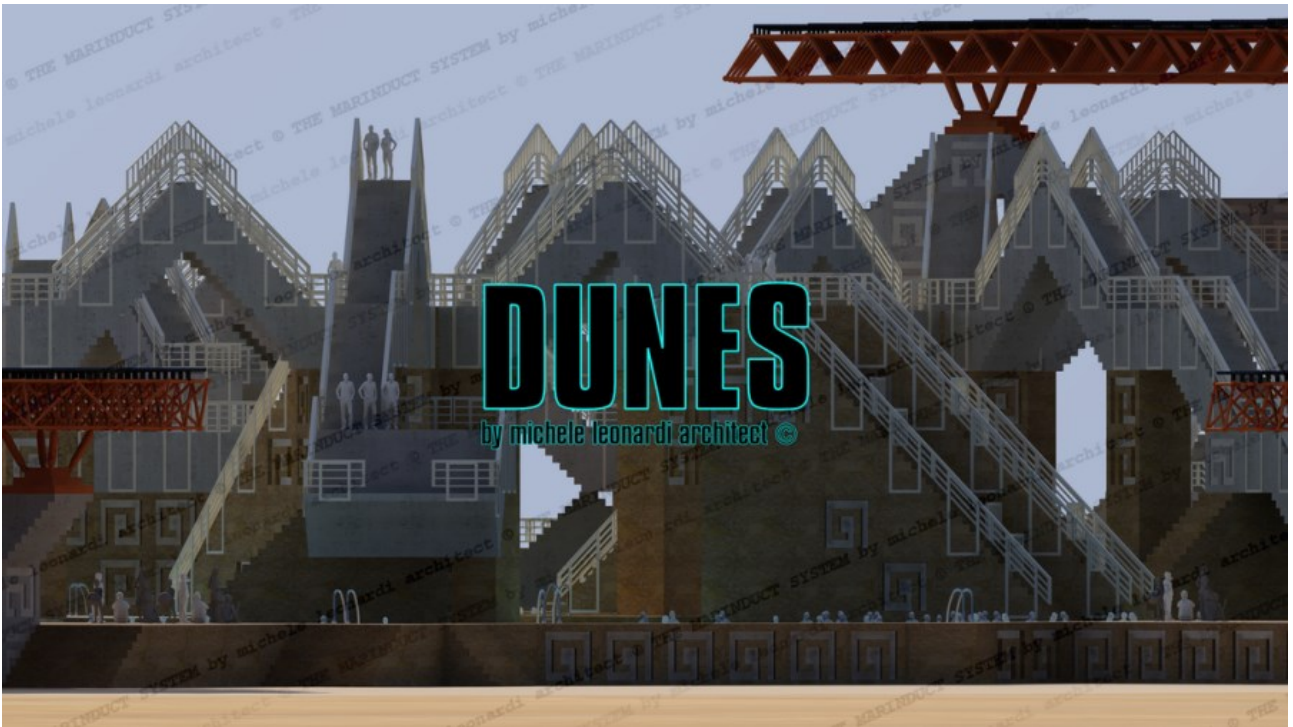
# DUNES

THE ROLLER COASTER OF STAIRS,  
a water fun, Part 1

by Michele Leonardi architect © September 2019







THE WELL OF 157 STEPS.

# The Roller Coaster of Stairs

can be a fun water park in its own right, or a component of a large amusement park. In the preliminary project that can be seen in the images, the Roller Coaster of Stairs would extend over a total of 1,3 hectares (equal to 13,000 square meters, equal to ca. 4 acres), while the only pools would extend over less than 5,000 square meters (ca. 2 acres) excluding the storage and compensation basin.

## The functional program of the "Roller Coaster of Stairs":

- 1) A compensation basin for sea water, and / or tanks, water supplied by the **Marinduct**, with the function of accumulation, compensation and final supply of water, substantially thermal.
- 2) A connection channel between the basin and the swimming pools of the water park.
- 3) A first service unit, with entrance, reception, ticketing, changing rooms, cloakroom, etc.
- 4) 3 labyrinthine paths at ground level, connected to each other and connected with the various pools and with the elevated path of the "Roller Coaster of Stairs".
- 5) 3 pool areas all connected together.
- 6) Other 2 service units, at ground level, with various functions: changing rooms, cloakroom, toilets, showers, bars, etc.
- 7) "**The Roller Coaster of Stairs**", that is an elevated labyrinthine path (in reality it would not be a real labyrinth, since one cannot get lost, apart from a few short routes without a way out).
- 8) "**The Well of 157 Steps**", and at the bottom, underground, a circular fountain with a respective water basin in which to throw the coins, as is done at the Trevi Fountain in Rome.  
"The Well of 157 Steps" would be about 23 meters deep in all (like a 7-storey residential apartment building of approx.), with a 15 centimeters rise approx. (variable depending on the size of the tread) and average tread variable between 55 centimeters at ground level, up to 30 centimeters approx. at the bottom of the well. There would also be 3 or more resting niches, with benches for seating, arranged along the entire staircase. As an indication, we recall that the steps of the Grotta del Turco in Gaeta, in Italy, are many more, that is about 300 steps, with a drop of about 50 meters, while those of the double helicoidal staircase of the magnificent Well of St. Patrick in Orvieto, still in Italy, there are 248, with a depth of 157 meters. Another example, in Greece, to reach the sea level from Santorini, that is the Port of Fira, it is necessary to go down even a stairway of 600 steps. Obviously with all this gymnastics the inhabitants of these places are necessarily "all healthy".

**Depth of the basin swimming pool:** the pools and canals of the Roller Coaster of Stairs will have an average depth of about 1.40 meters, with deeper exception areas (diving area, bounded by special floats) and other areas with a depth of less than one meter, for childrens accompanied by their caregivers, as well as clearly marked and delimited.

**Electricity:** the photovoltaic roofs would ensure all the electricity needed for the operation of the plants (hydraulic pumps, any water features, fountains, bars, services, etc.).

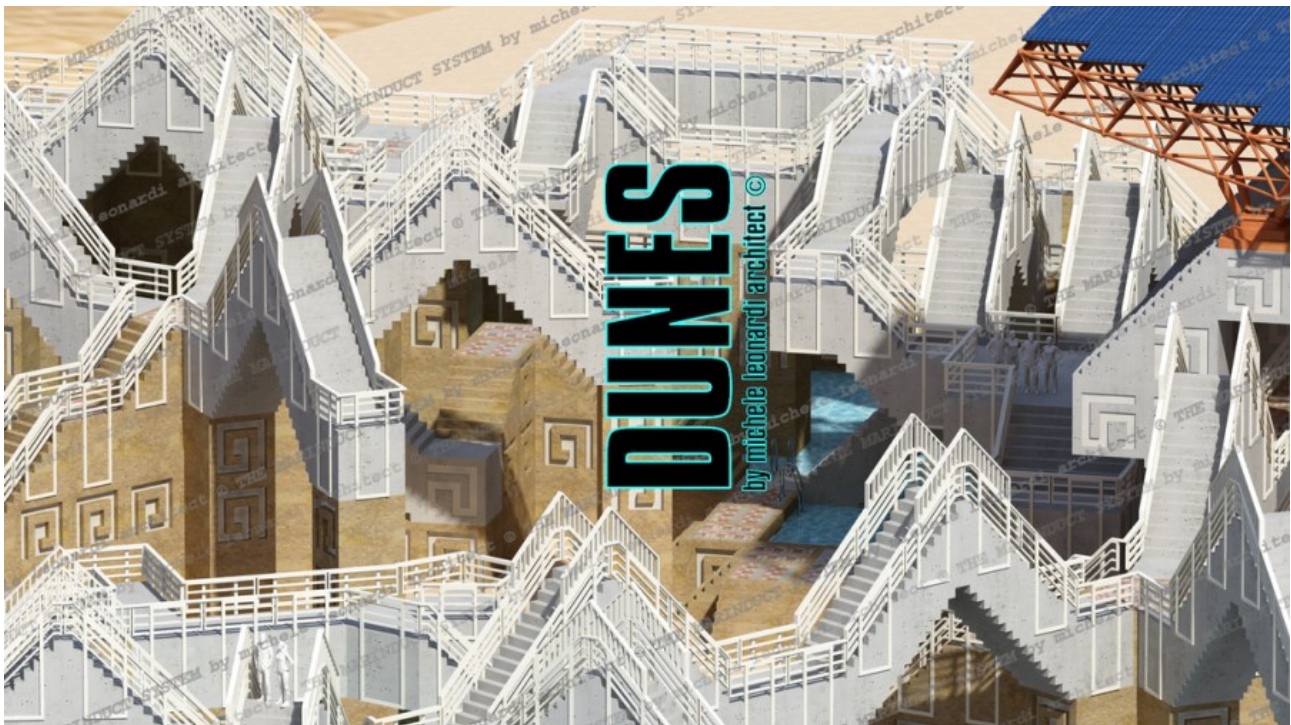
**Construction system:** the architectural structure of the complex would be constructed using reinforced concrete hollow caissons, prefabricated and essentially of 4 types combined: one covered with brick, another simply with exposed concrete, a third type of caisson with a geometric decorative motif, as seen in the images, which would exalt the systemic modularity of the building; and finally a fourth type of caisson with steps, finished in cement or brick.

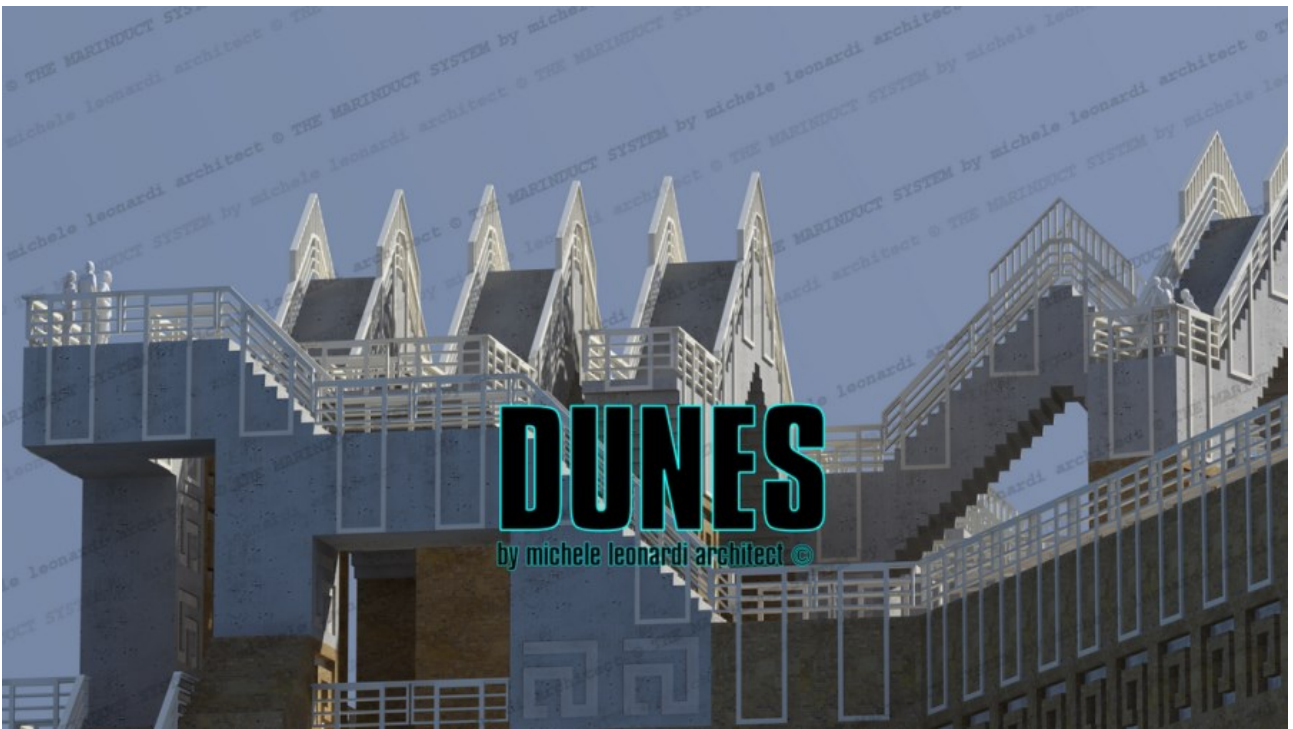
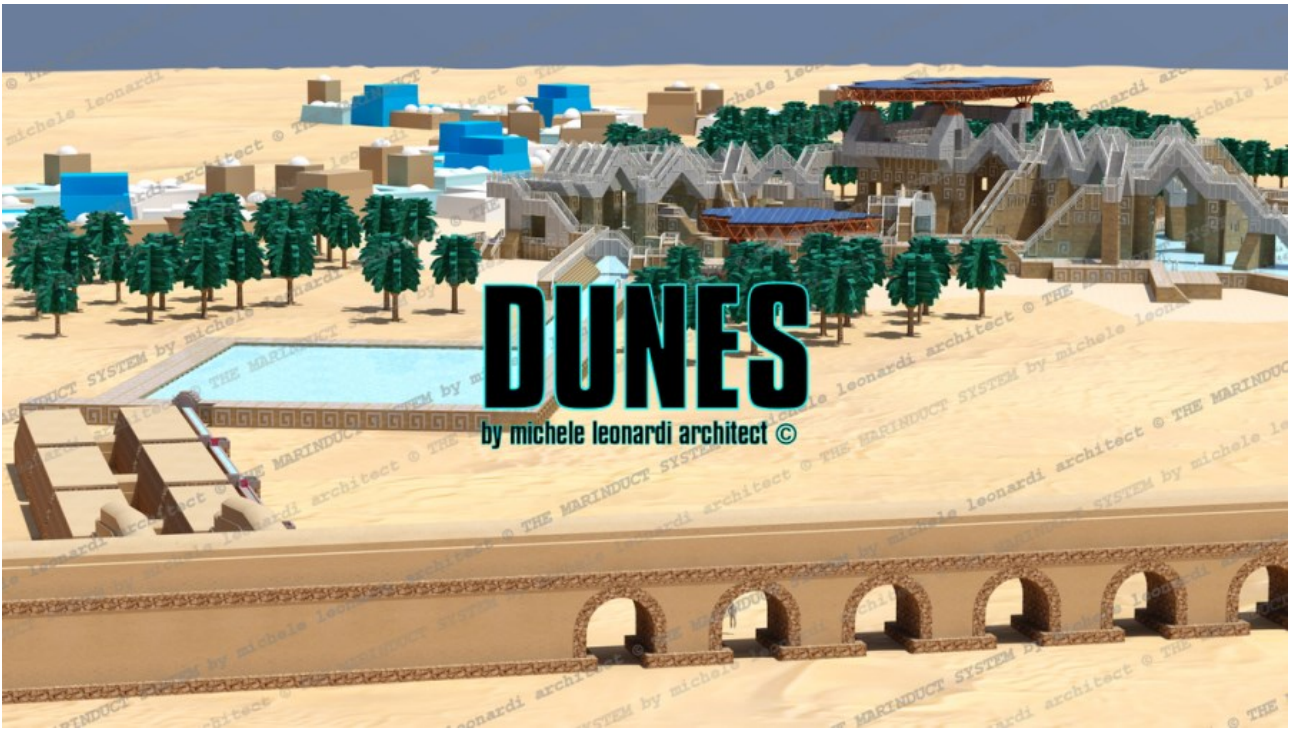
Secondly, the prefabricated hollow caissons in reinforced concrete can be prefabricated and installed in many ways: with stacking grooves and metal bolts to be fastened to one another, with internal metal reticular beams to form large beams, with solidifying concrete jets, they could also fill with sand to further stabilize the caissons placed at the lower levels, if there was a need, for example to contain the water pressure along the edges of the pools, etc.

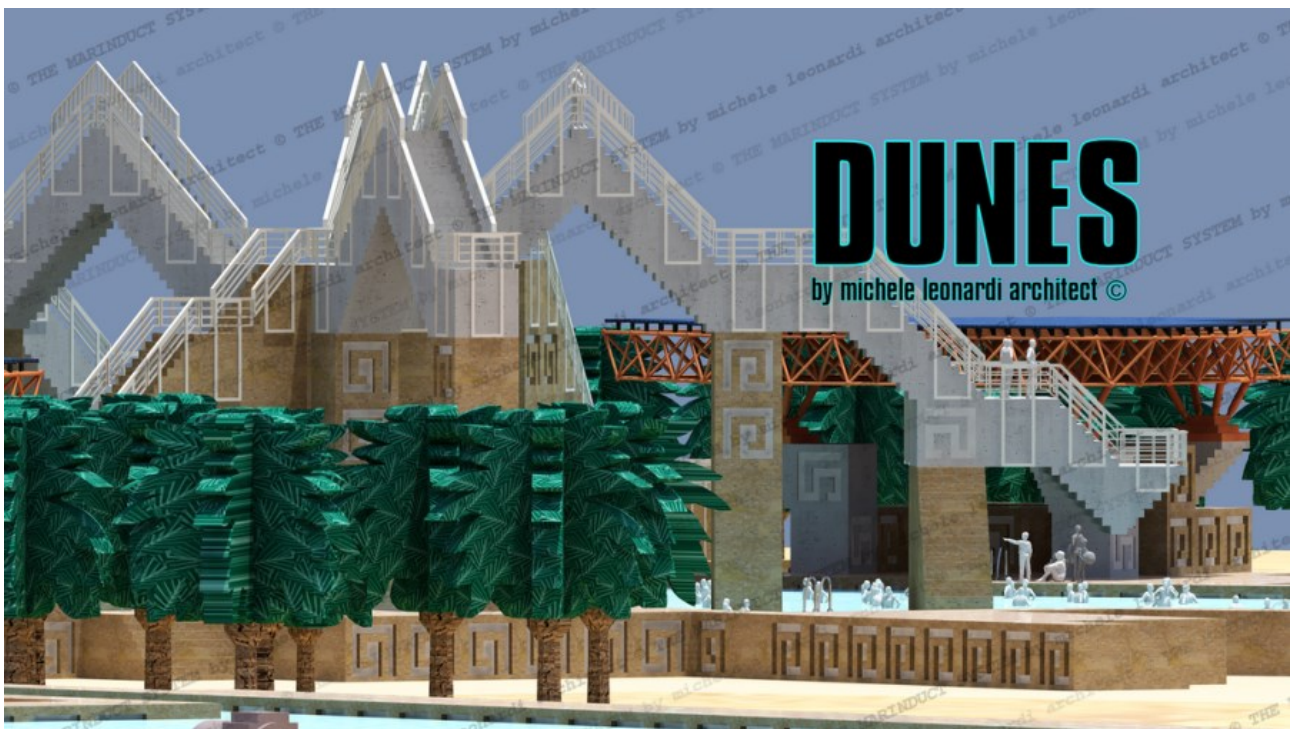
**Safety:** the parapets will be 110 - 120 centimeters high from the floor, with fissures not exceeding 13 centimeters (a child's head must not pass). At the most extreme points of the Roller Coaster of Stairs, the parapets will also be taller, up to about 160-180 cm, as seen in some images. As for the longer and steeper stairs, there will be transversal safety guardrails, in case of accidental fall and rolling of people along the stairs, or more simply an intermediate landing every 15 steps max, as some regulations require and the good sense. However this is obviously not an executive project, but only preliminary and illustrative of the "Rollercoaster of Stairs" idea.

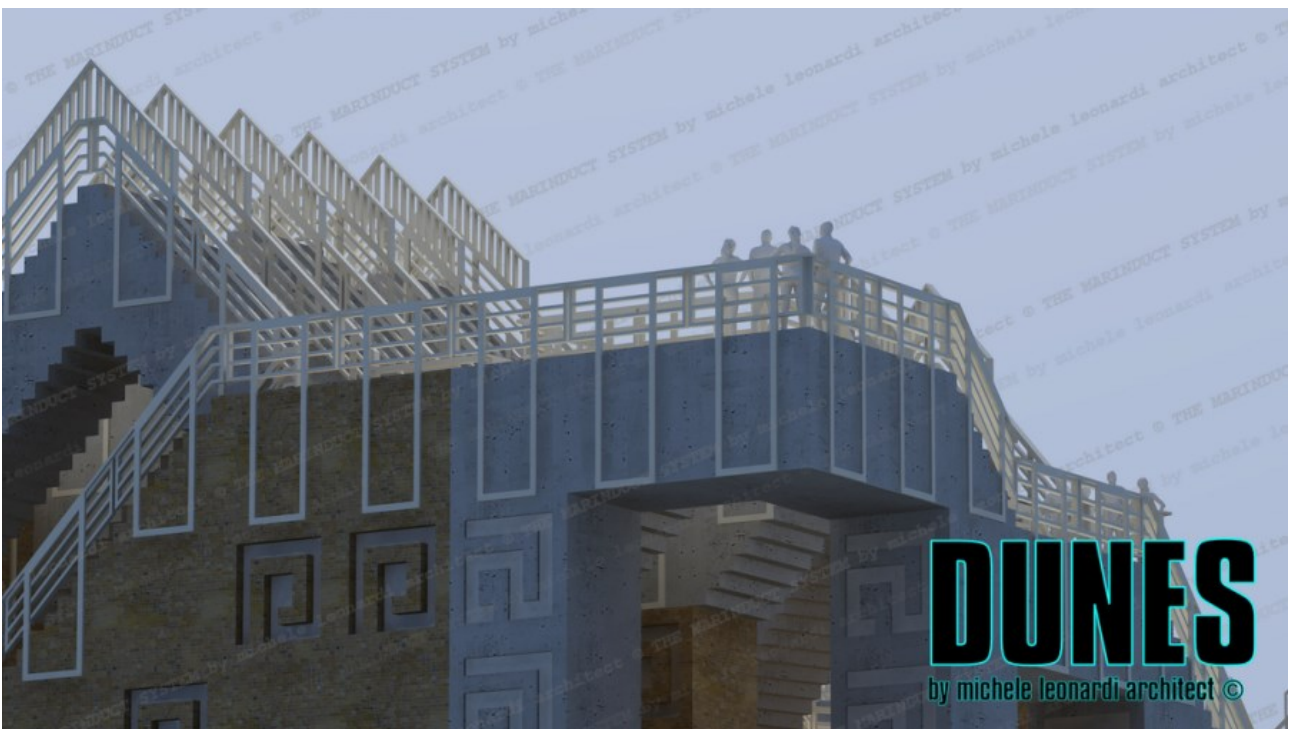
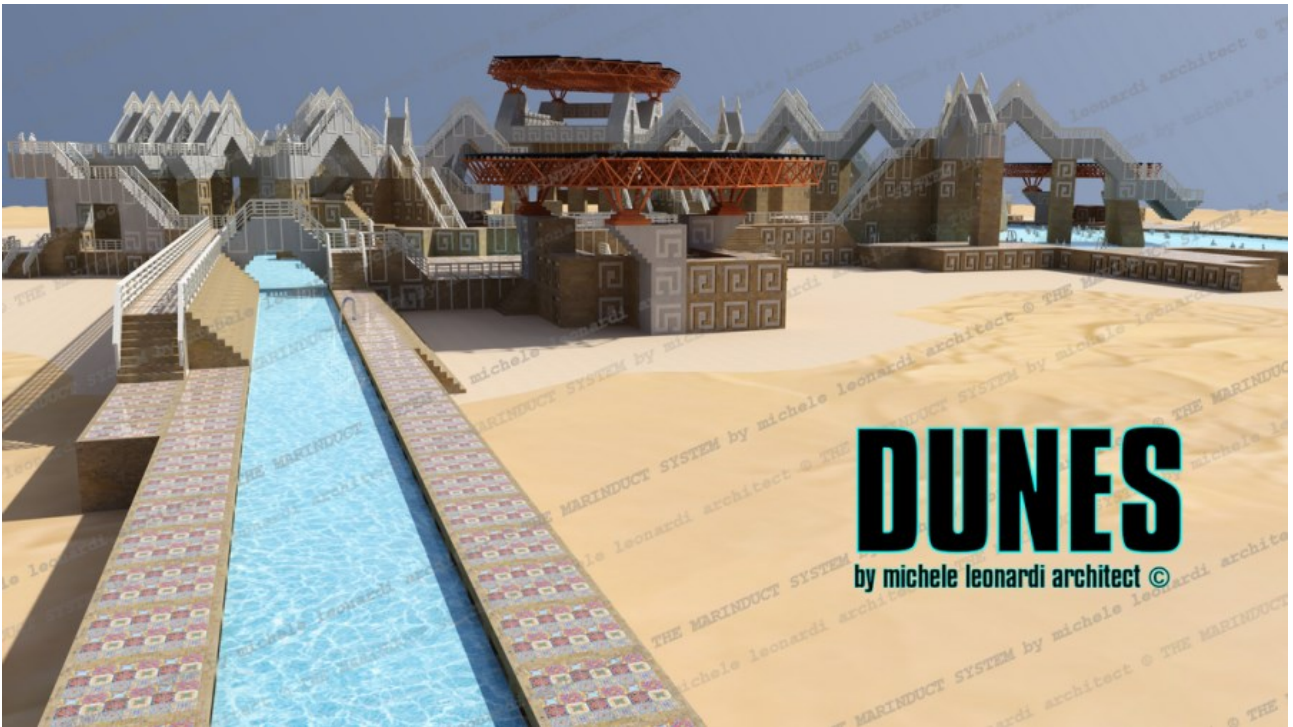
An installation of this kind would obviously require staff to supervise, with lifeguards, video cameras, loudspeakers for emergencies, warnings, private guards, etc., and even a small first aid with medical safeguards.

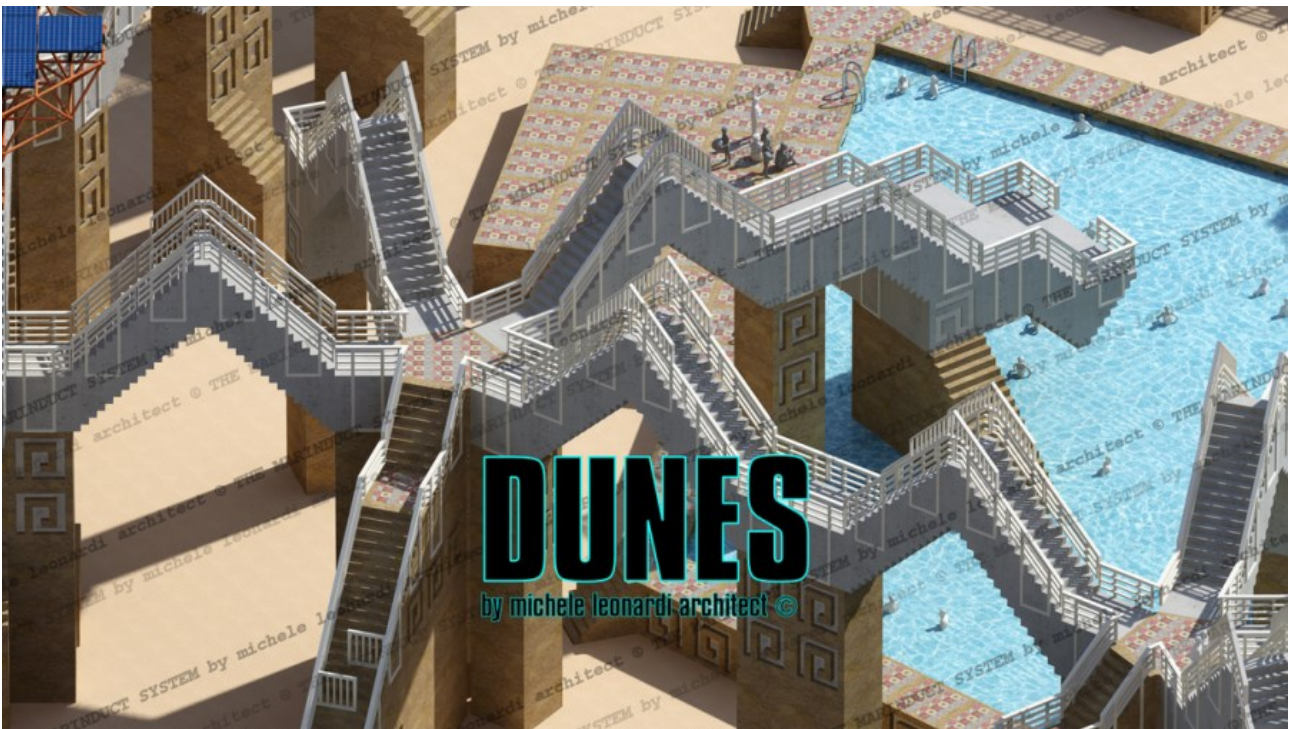
**Like all my other projects, even this "is looking for a client",** even if for a professional the chances of receiving such a job are probably more or less equal to those of winning the lottery, especially in Italy and these days, but not only in Italy.

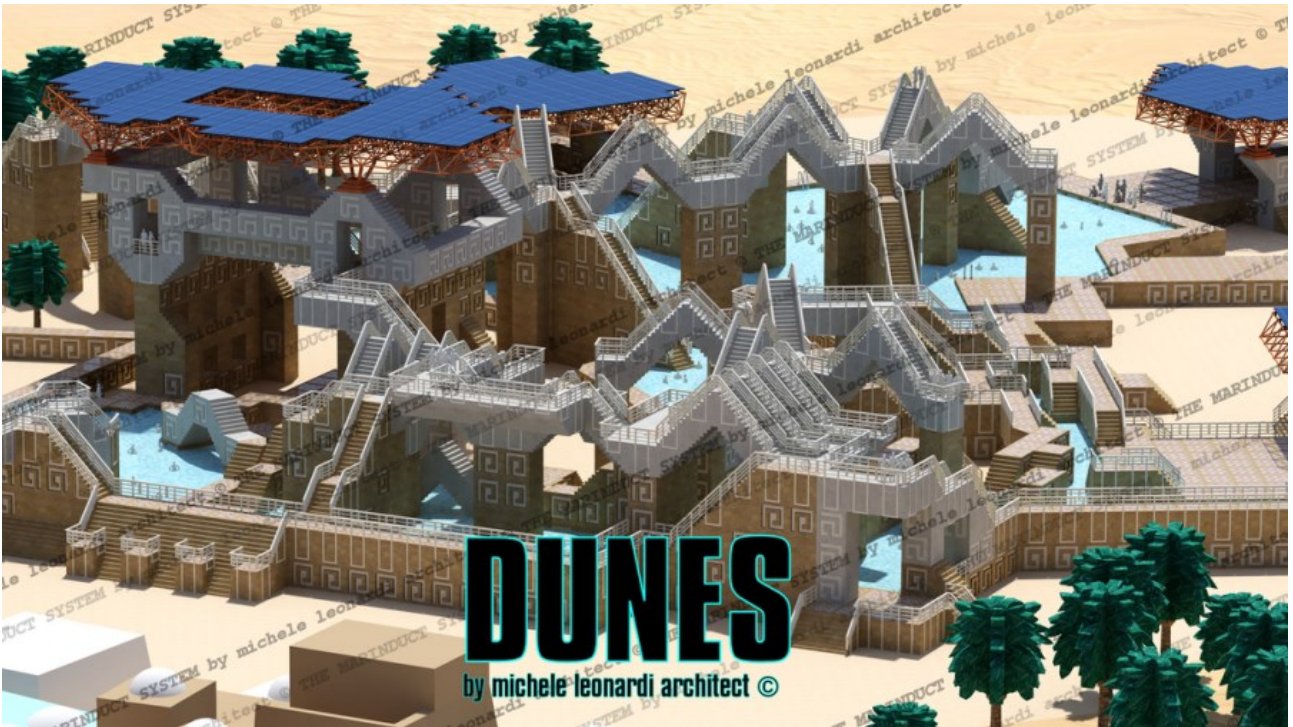




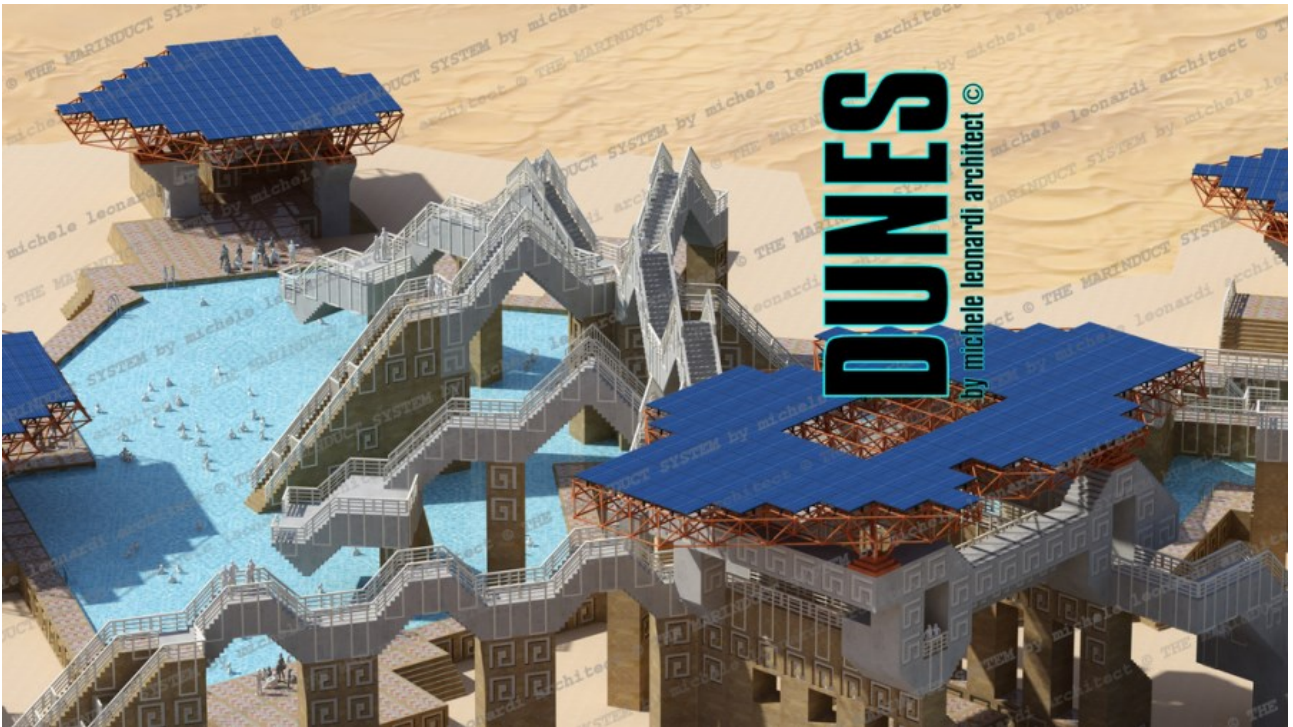














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Project submitted in October 2019 to the attention of many businessmen in the water parks and amusement sector, both with plants in Italy and abroad.

Given that all entrepreneurs in general always respond to designers when they propose new ideas to them, I have not received any response from those I questioned.

It's too bad that this project has not been taken into consideration: **the children would have had a lot of fun in these unusual spaces, and the adults would have had one more chance to have more fun in their spare time.**

An architecture of this type could also be built and managed by an efficient public body.

*Rome, 31 October 2019*

*M.L.*



Projet soumis dans le mois d'octobre 2019 à l'attention de nombreux entrepreneurs du secteur des parcs aquatiques et des loisirs, dotés d'installations en Italie et à l'étranger hors d'Italie.

Étant donné que en général tous les entrepreneurs répondent toujours aux projeteurs quand lui proposent des nouvelles idées, je n'ai pas reçue aucune réponse par aucun d'entre eux.

Quel dommage que personne n'ait pas pris en compte ce projet: **les enfants se seraient bien amusés dans ces espaces insolites, autant que les plus agés auraient eu une chance en plus de loisir pendant leur temps libre.**

Une telle structure pourrait également être bâtie et gérée par un organisme public.

*Rome, le 31 octobre 2019*

*M.L.*



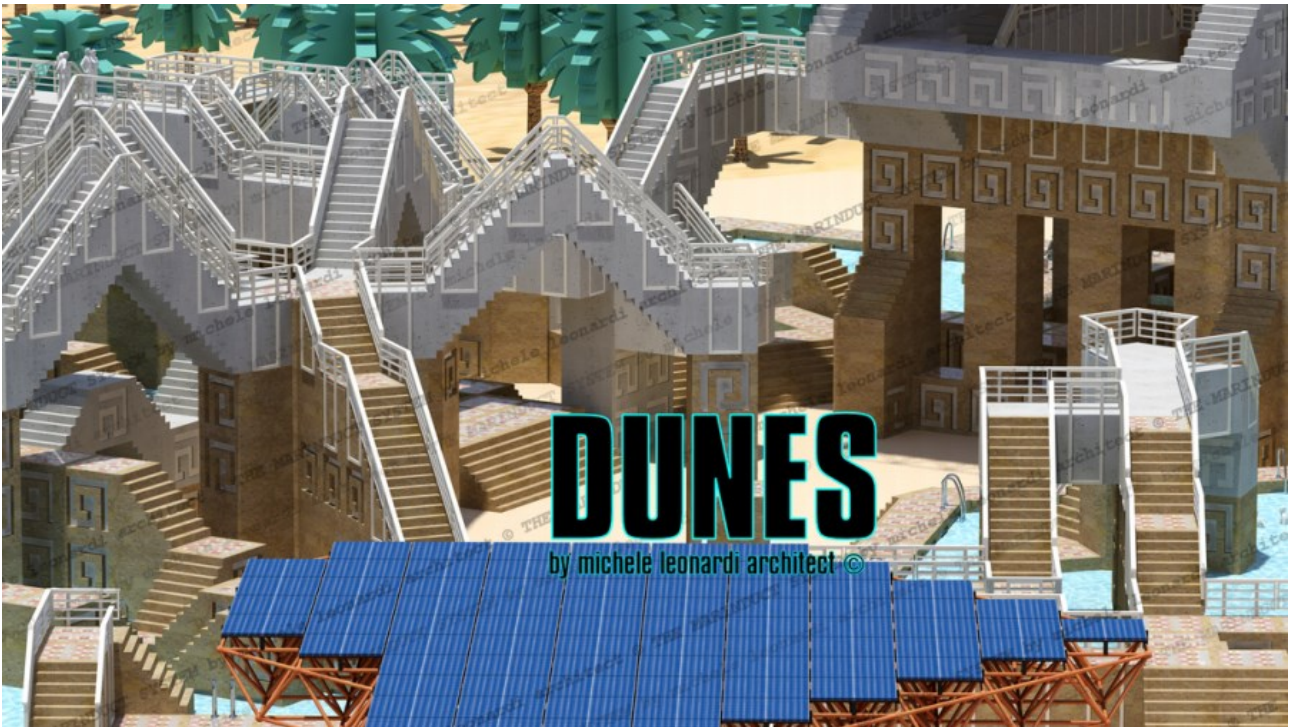
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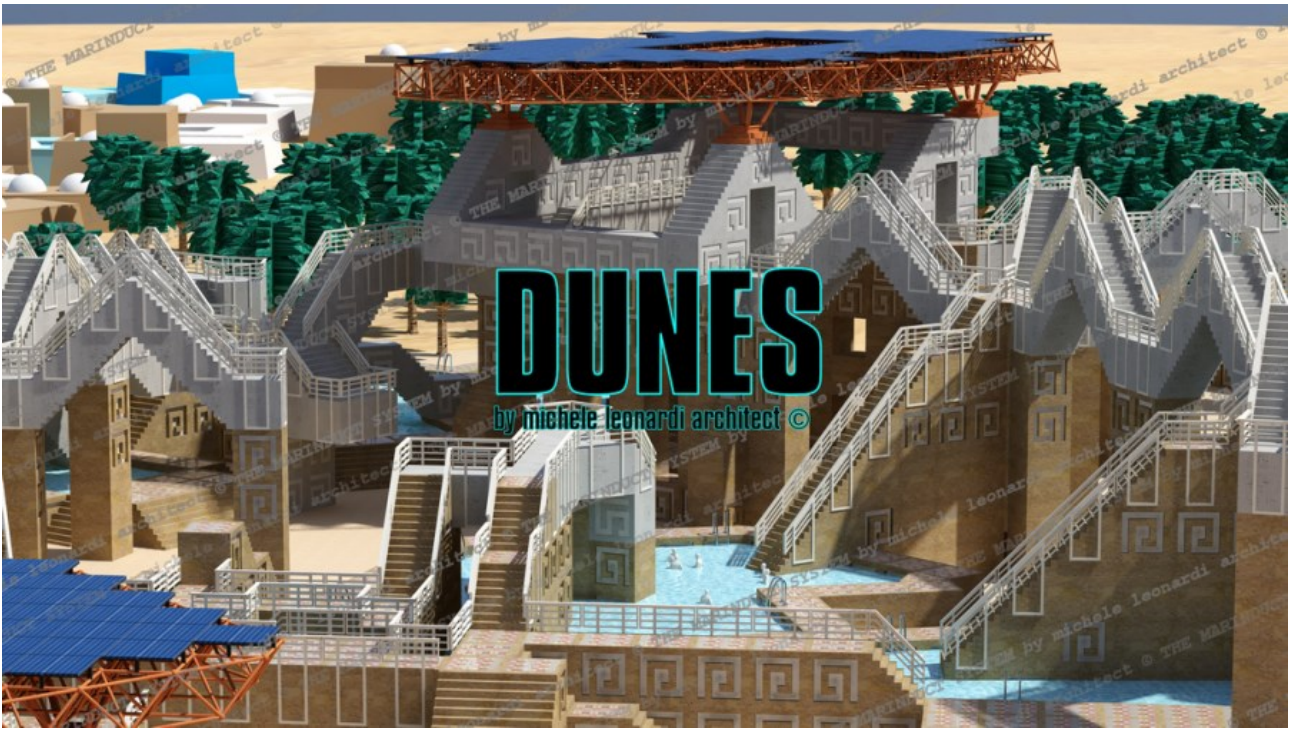
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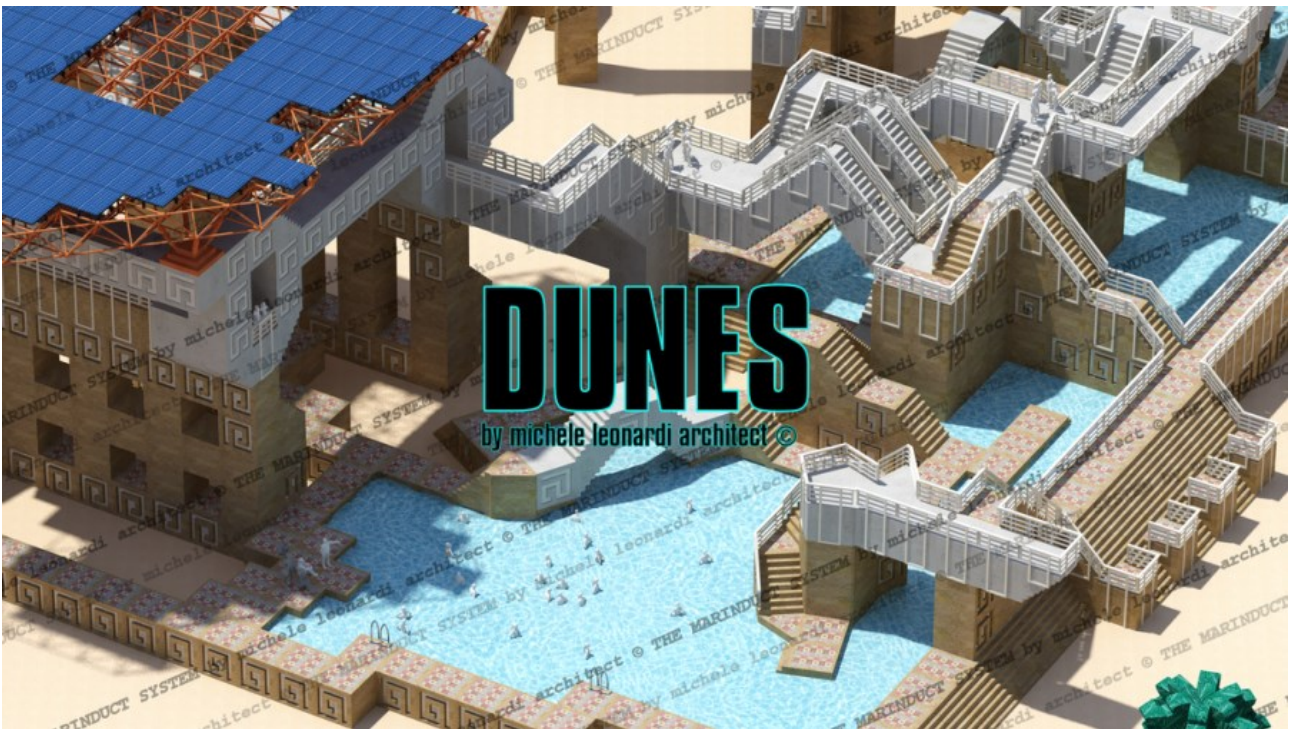
**THE ROLLER COASTER OF STAIRS,  
a water fun, Part 2**

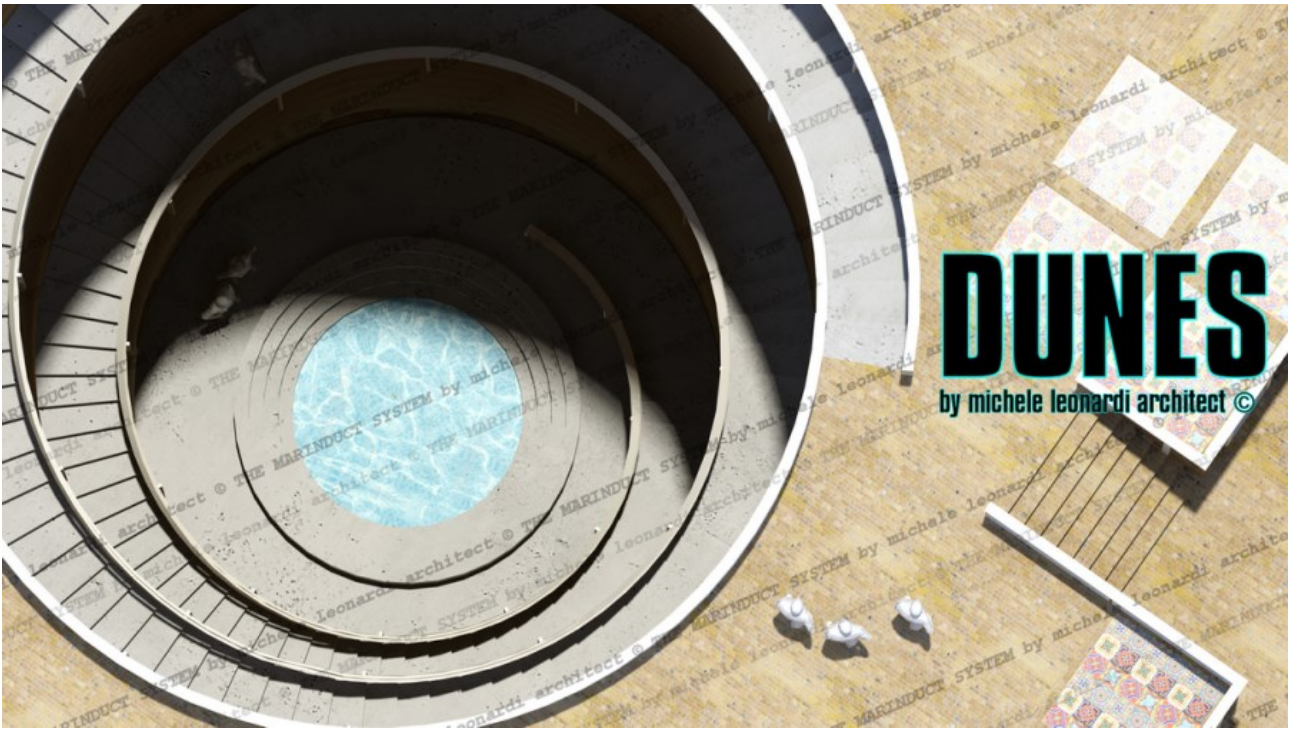
*by Michele Leonardi architect © September 2019*











The Well of 157 Steps.



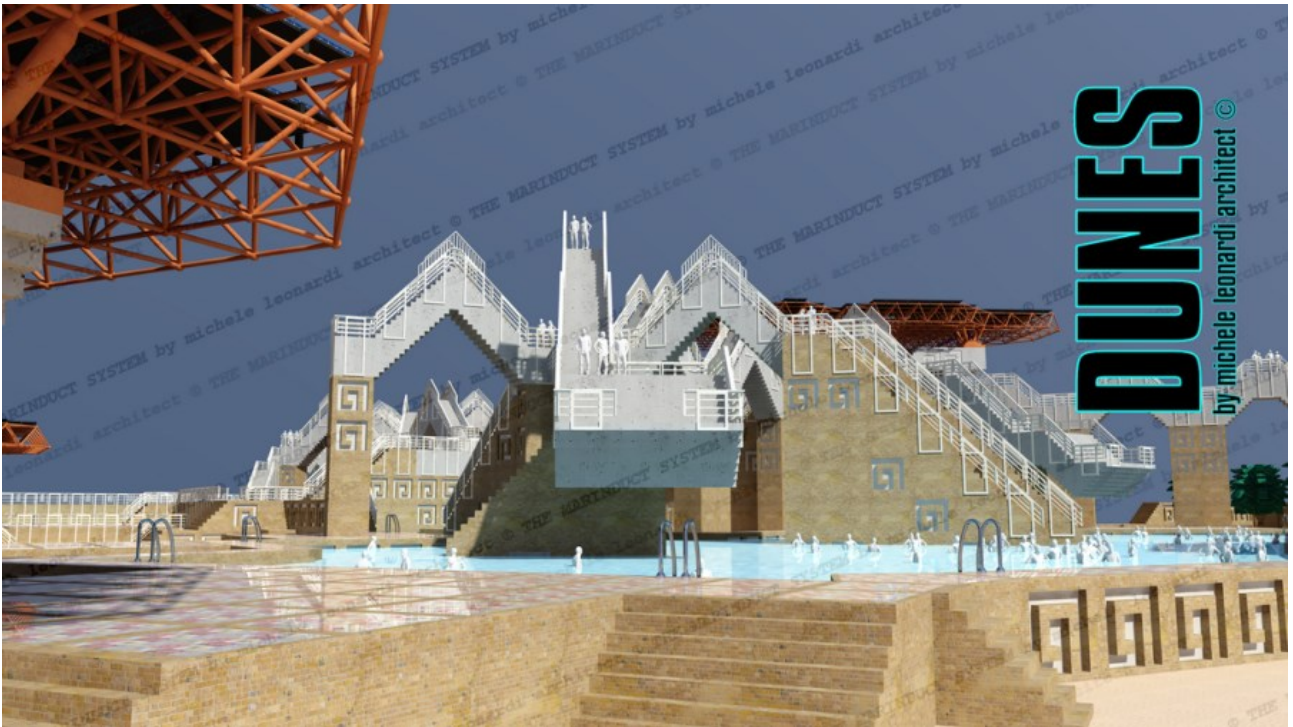












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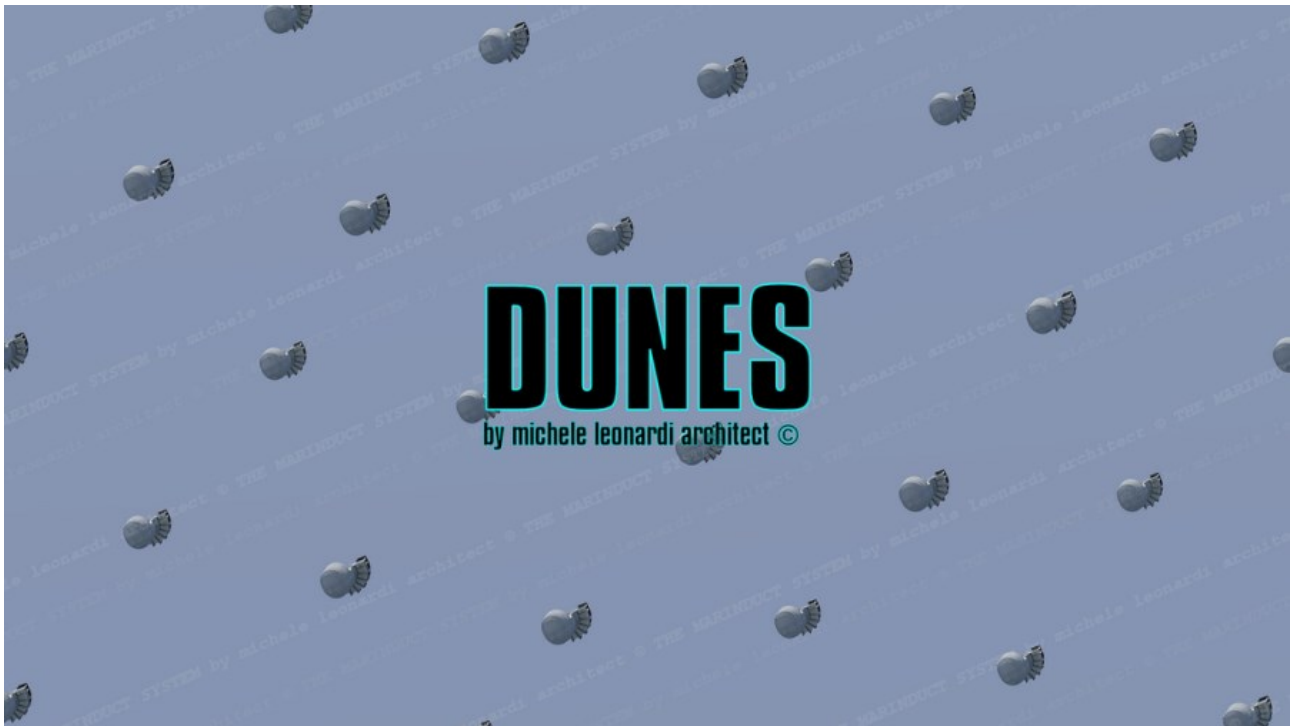


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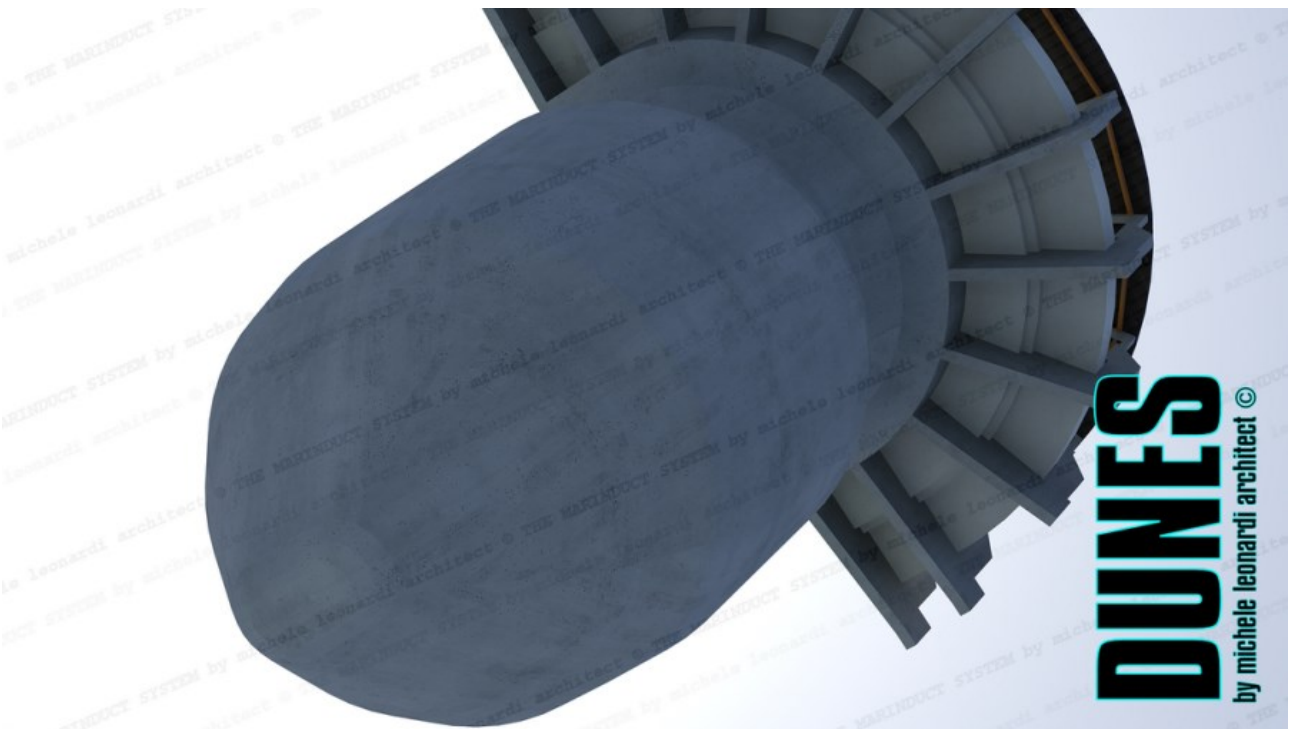
# DUNES

**THE LARGE BATHS, Part 1**  
FOR THE NEW HABITATS IN THE DESERT,  
POWERED BY THE MARINDUCTS,  
the marine water aqueducts

*by Michele Leonardi architect © September 2019*







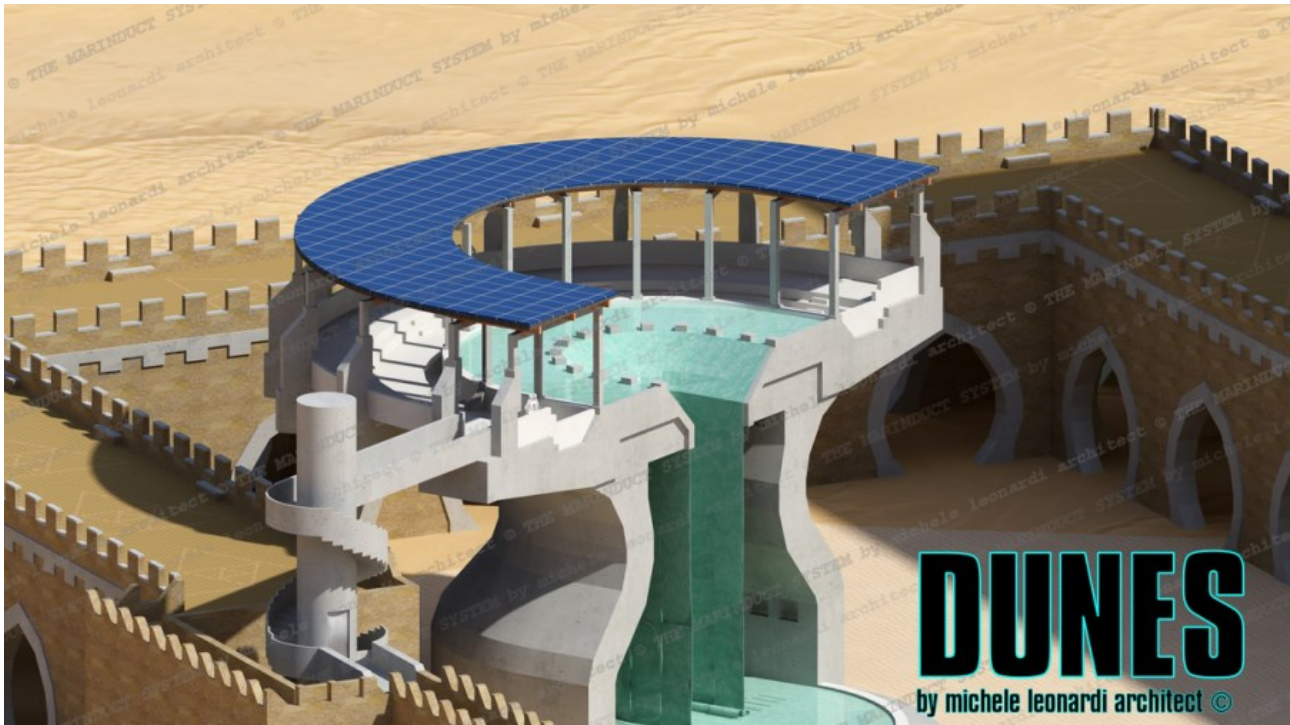




... Don't worry, it's not a bomb.



...It is only a water lifting plant,  
equipped with a large waterfall and a large tank.

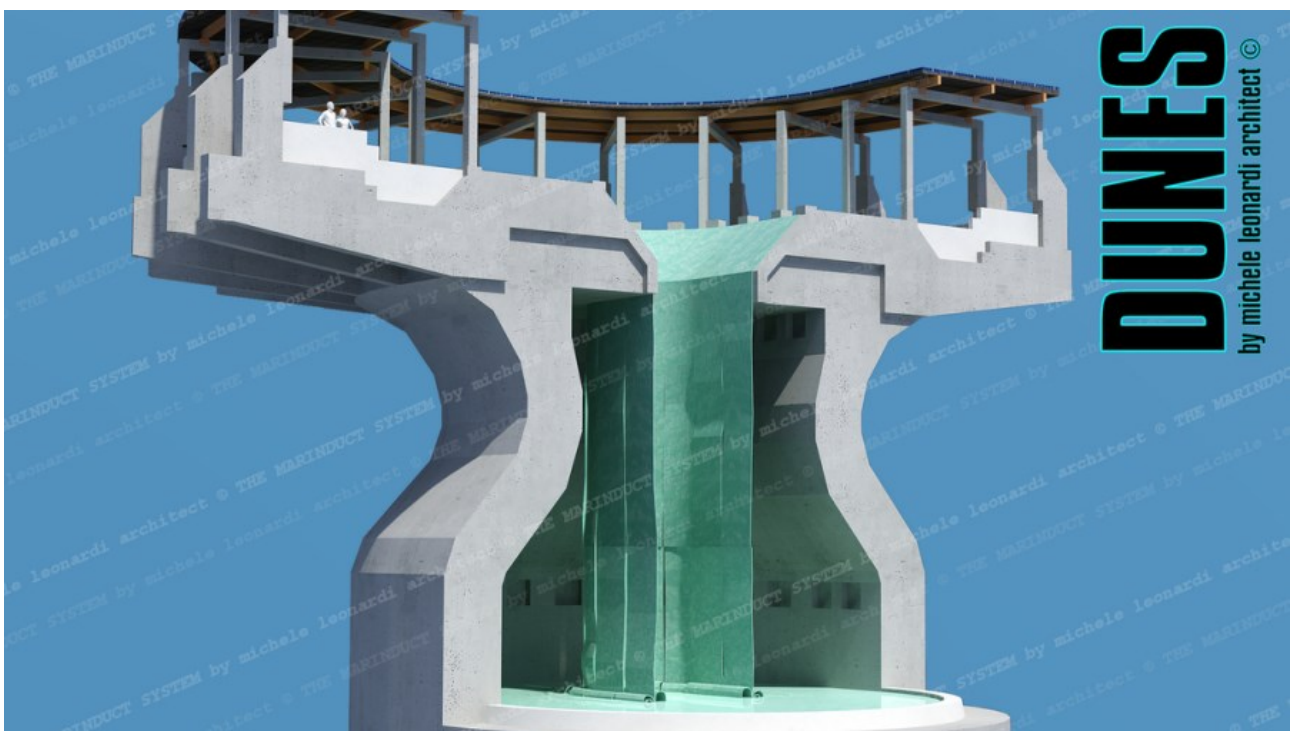
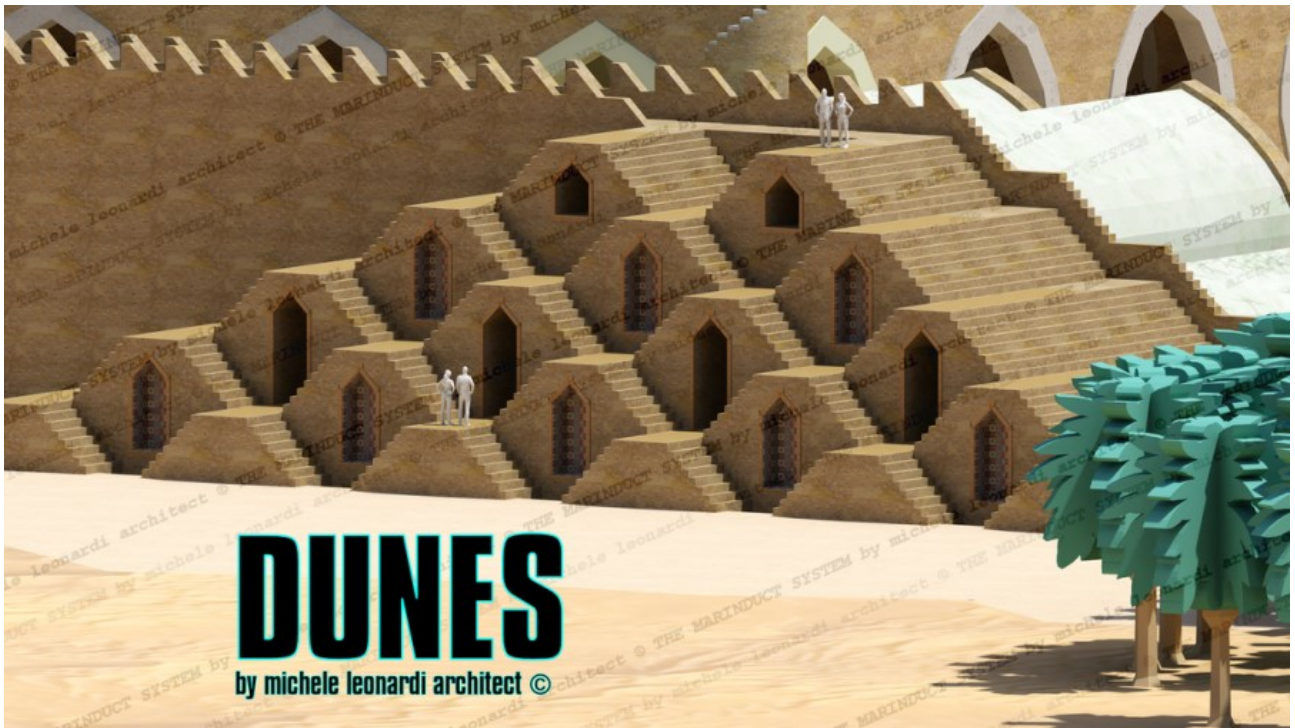


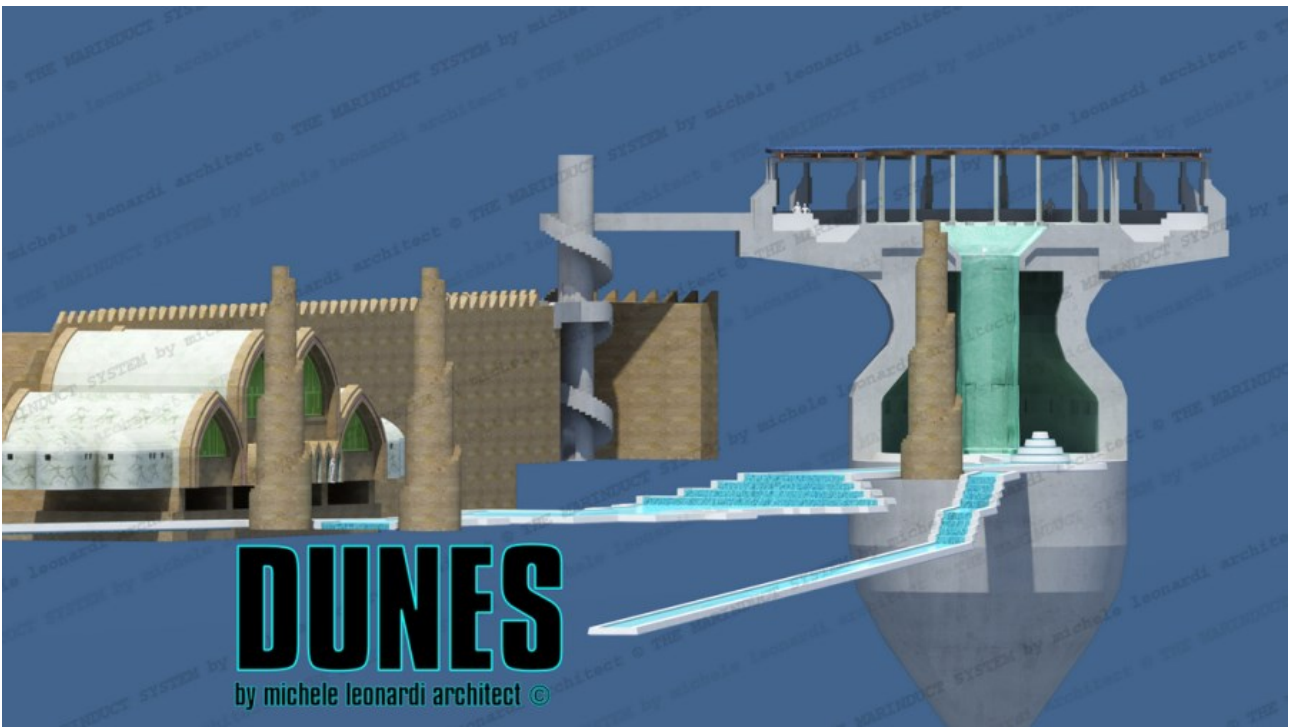
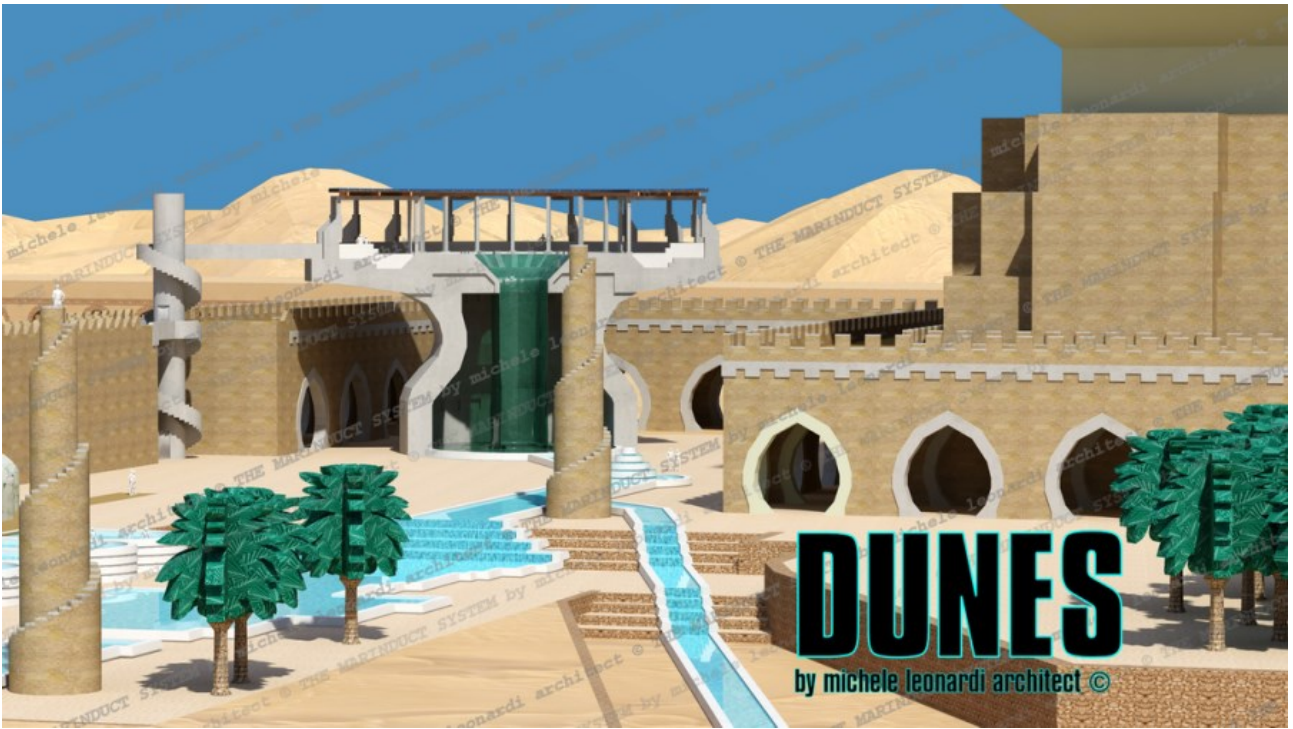
## The functional program

In this architectural research project the functions of the Great Baths of sea water are composed as follows:

- 1) **The arcades.**
- 2) **A water lifting system, equipped with a big waterfall and a large tank, cistern.** The seawater cascade will only work at certain hours.
- 3) **The thermal baths with Calidarium and Tepidarium, that is pools and sauna of hot water and lukewarm water,** always fed by **the Marinduct**, the seawater aqueduct. All the seawater baths are subdivided and distinguished on one side for men and on the other for women and children. This subdivision will be more or less strict depending on the country in which they are carried out.
- 4) **A building with hanging pools, that is the Frigidarium, that is with cold water.** The frigidarium is composed of a large swimming pool and some suspended pools.
- 5) **The outdoor swimming pools and water games,** as well as the channels for moving spare water to the salt evaporation pond.
- 6) **The salt evaporation pond,** addressed to the chemical industry (production of chlorine compounds, etc.), not for food use, due to obvious hygienic reasons.

In the various plants and buildings of the spa the water will be recycled several times, while the water exchange will be guaranteed by the vents, which will convey a certain percentage of water towards the salt canals for the salt pond supply.





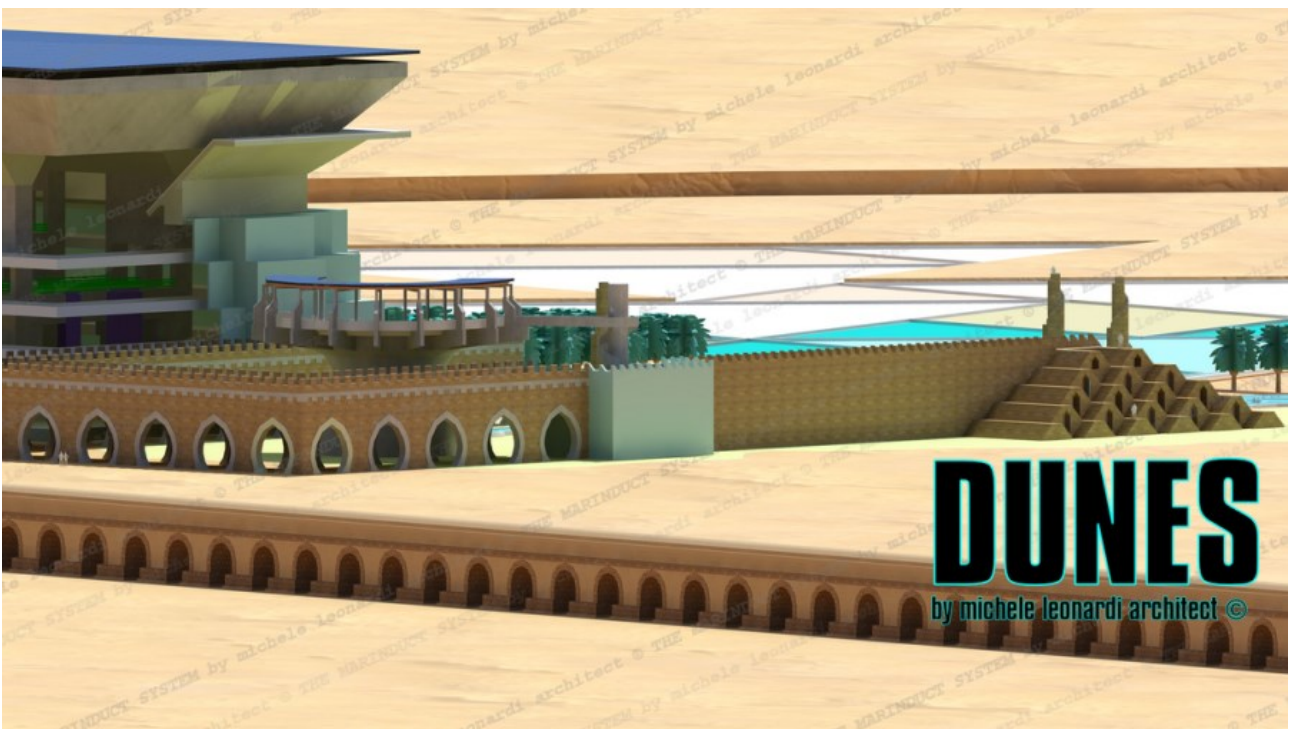


# Le programme fonctionnel

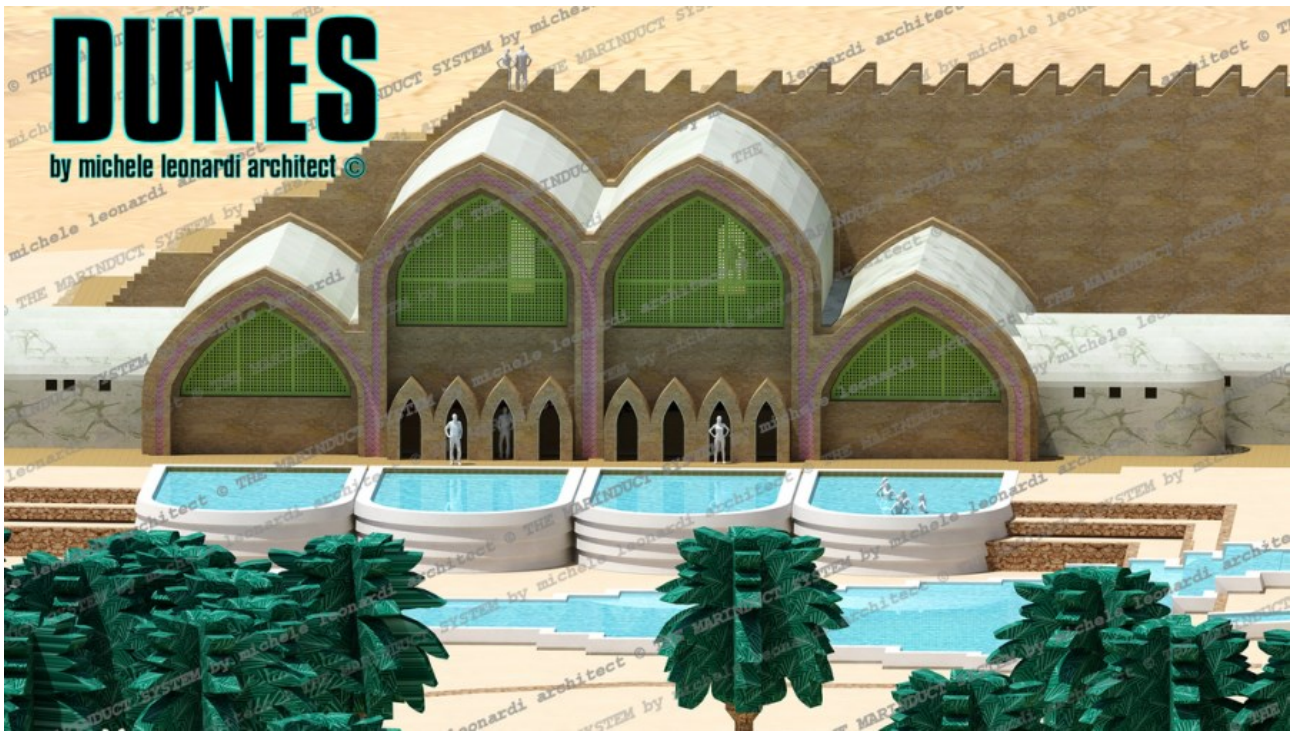
Dans ce projet de recherche architecturale les fonctions des Grands Bains d'eau de mer sont composées comme de suite:

- 1) **Les arcades.**
- 2) **Une installation de levage de l'eau, équipé d'une grande cascade et d'un grand réservoir.** La cascade d'eau de mer ne fonctionnera qu'à certaines heures.
- 3) **Les thermes avec Caldarium et Tepidarium, c'est-à-dire des bassins et des sauna d'eau chaude et d'eau tiède,** toujours alimentés par le Marinduct, l'aqueduc d'eau de mer. Toutes les thermes seront divisées et distinguées d'un côté pour les hommes et de l'autre pour les femmes et les enfants. Cette subdivision sera plus ou moins stricte en fonction du pays dans lequel la station thermale sera construite.
- 4) **Un bâtiment avec des piscines suspendues, c'est-à-dire les thermes du Frigidarium,** c'est-à-dire à l'eau froide, comme dans toute piscine. Le frigidarium est composé d'une grande piscine et par des piscines suspendues.
- 5) **Les piscines et les jeux d'eau en plein air,** ainsi que des canaux permettant d'évacuer l'eau de recharge en direction des marais.
- 6) **Les marais pour la production du sel adressé à l'industrie chimique** (production de composés de chlore, etc.), non pour l'usage alimentaire, à cause d'évidentes raisons d'hygiène.

Dans les différentes installations et bâtiments de la station thermale l'eau sera recyclée plusieurs fois, tandis que le renouvellement de l'eau sera garanti par des soupirails, qui éloigneront un certain pourcentage d'eau vers les canaux salés et après en direction des marais.



The Thermal Baths with **Calidarium** and **Tepidarium**,  
that is pools and sauna of hot and lukewarm seawater.



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# الذكبان

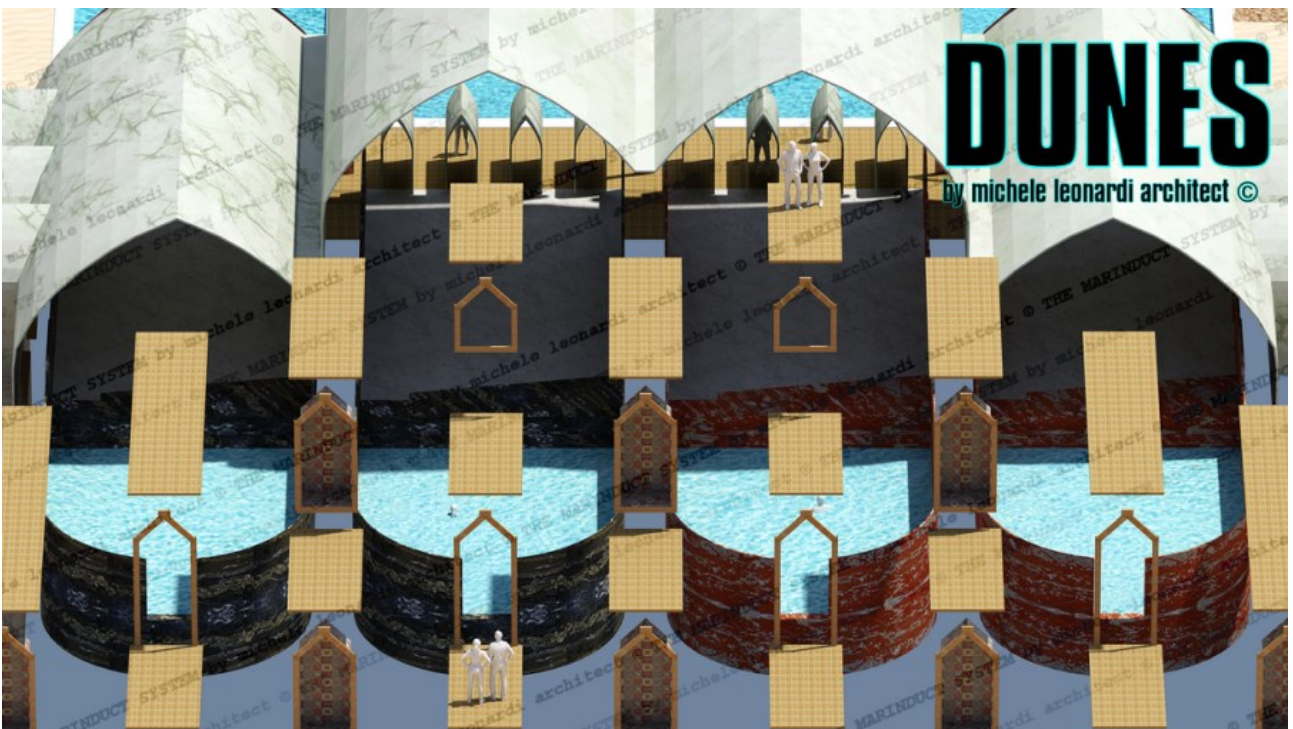
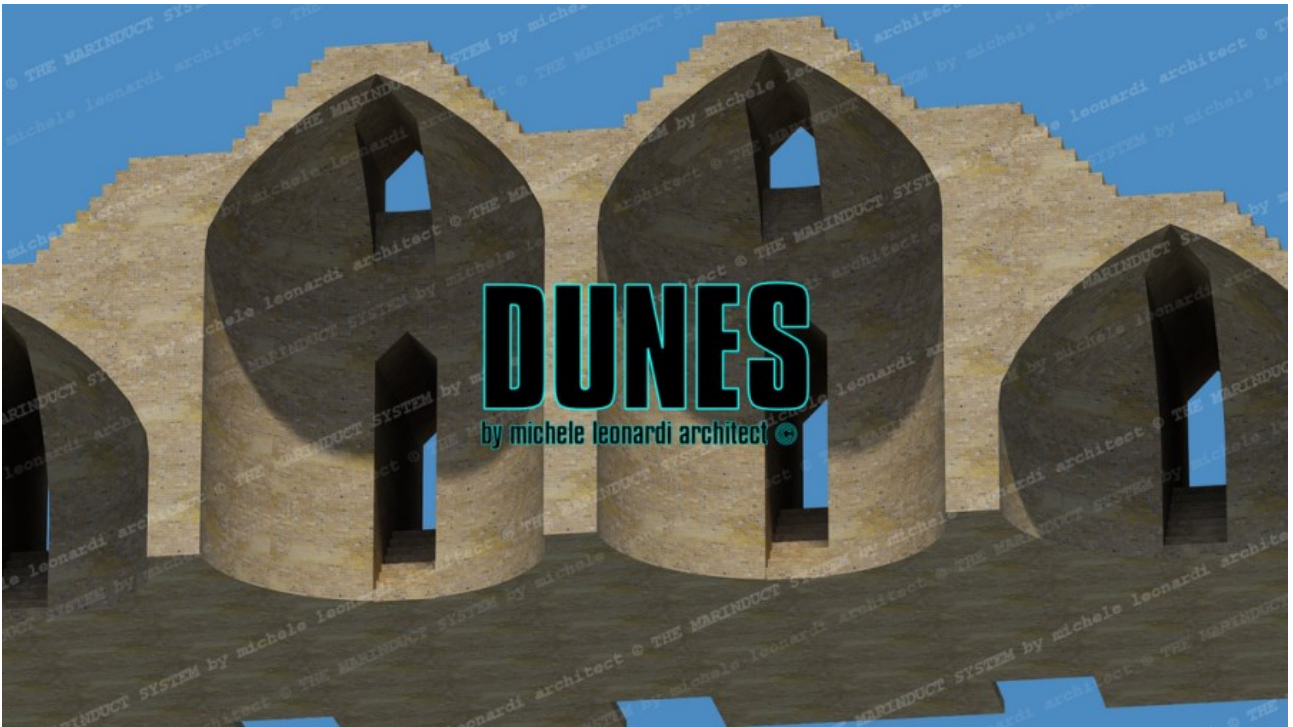
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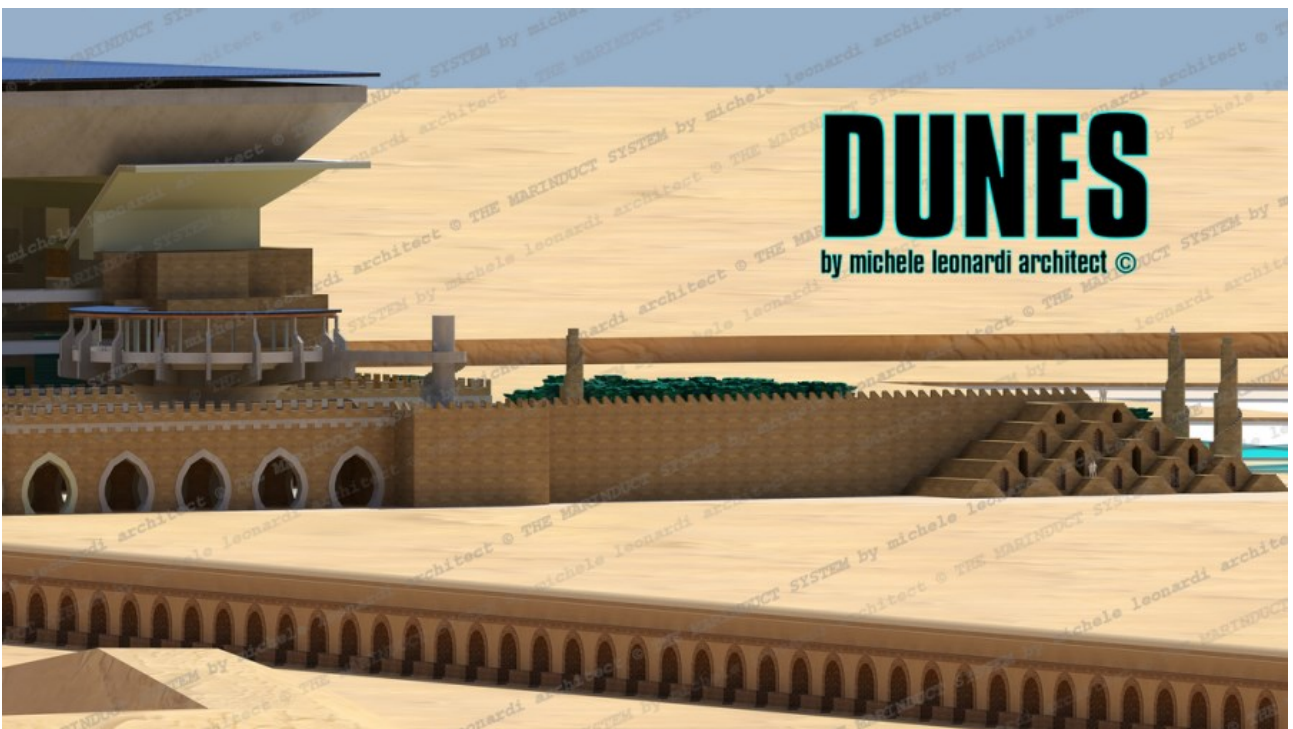
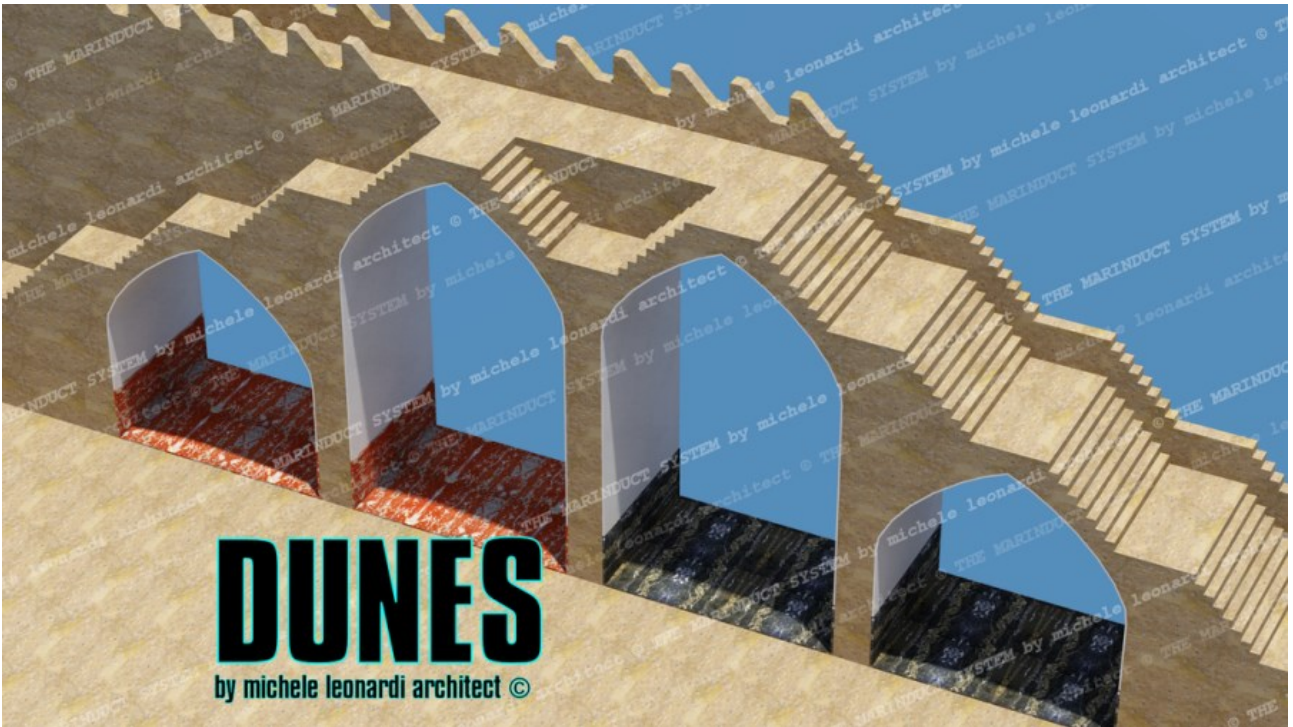
**THE LARGE BATHS, Part 2**  
FOR THE NEW HABITATS IN THE DESERT,  
POWERED BY THE MARINDUCTS,  
the marine water aqueducts

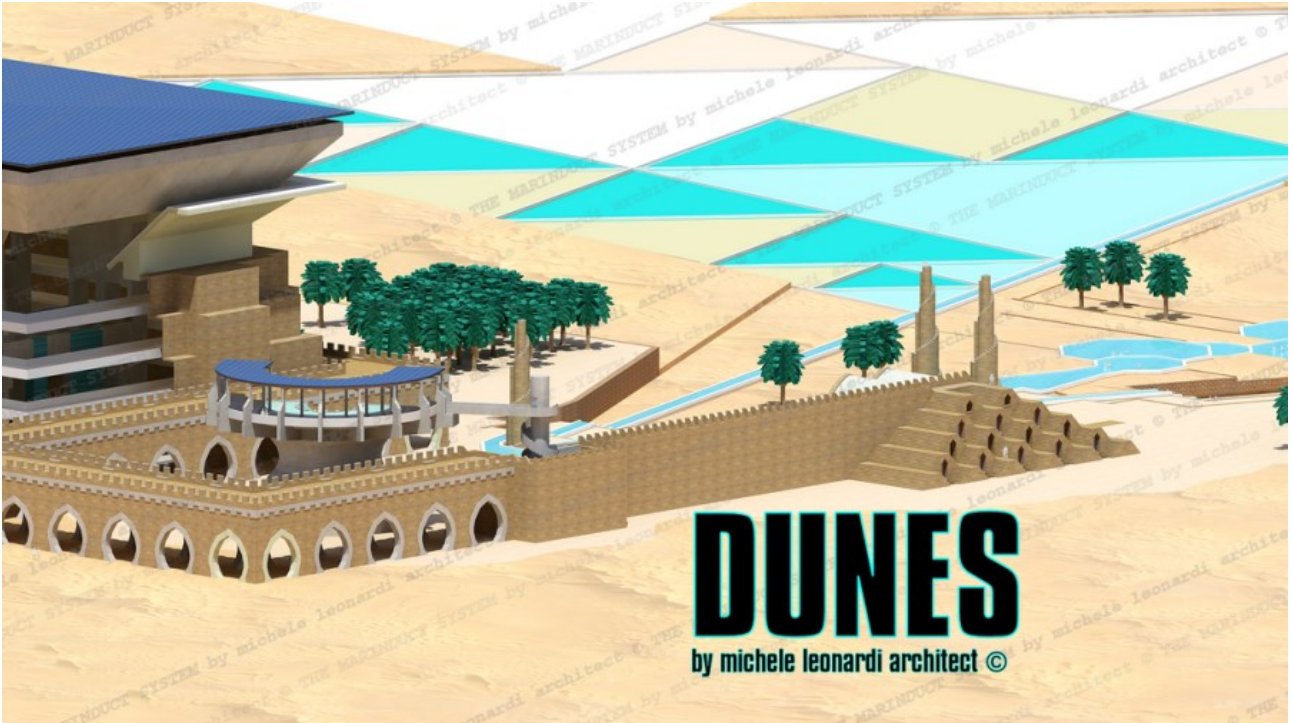
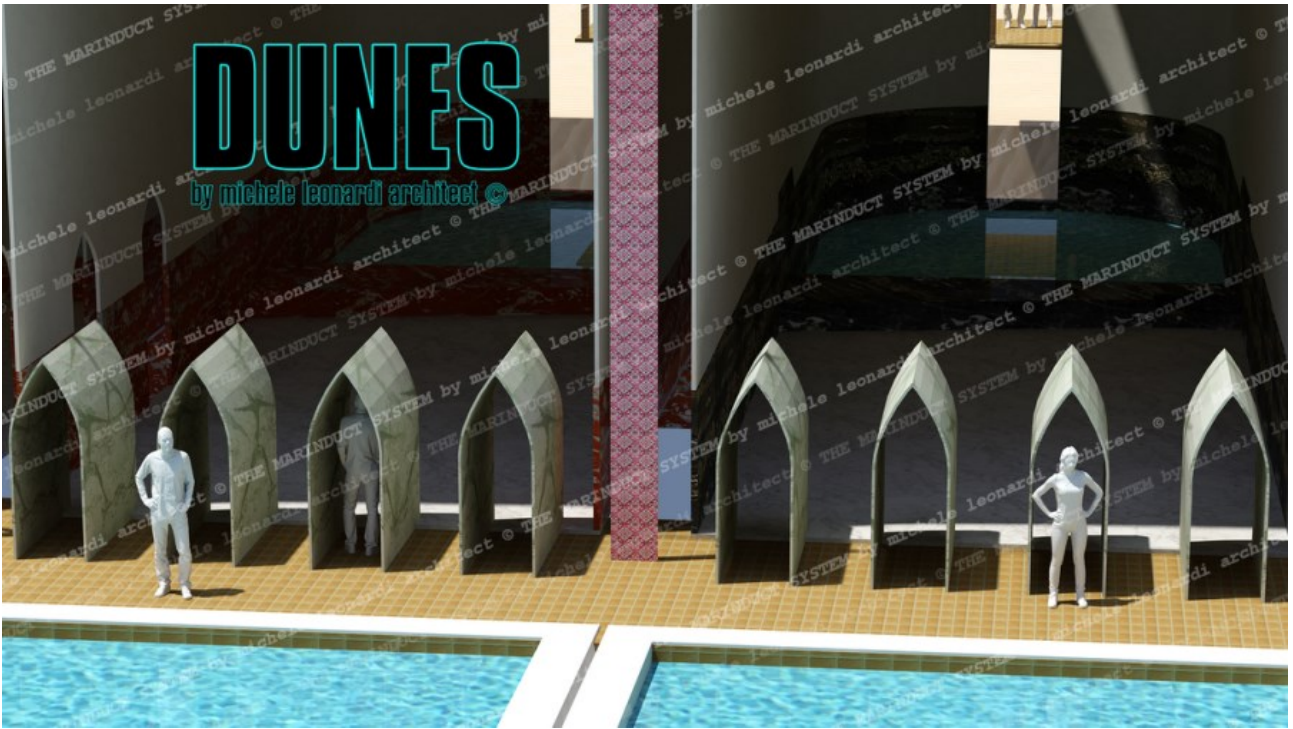
by Michele Leonardi architect © September 2019



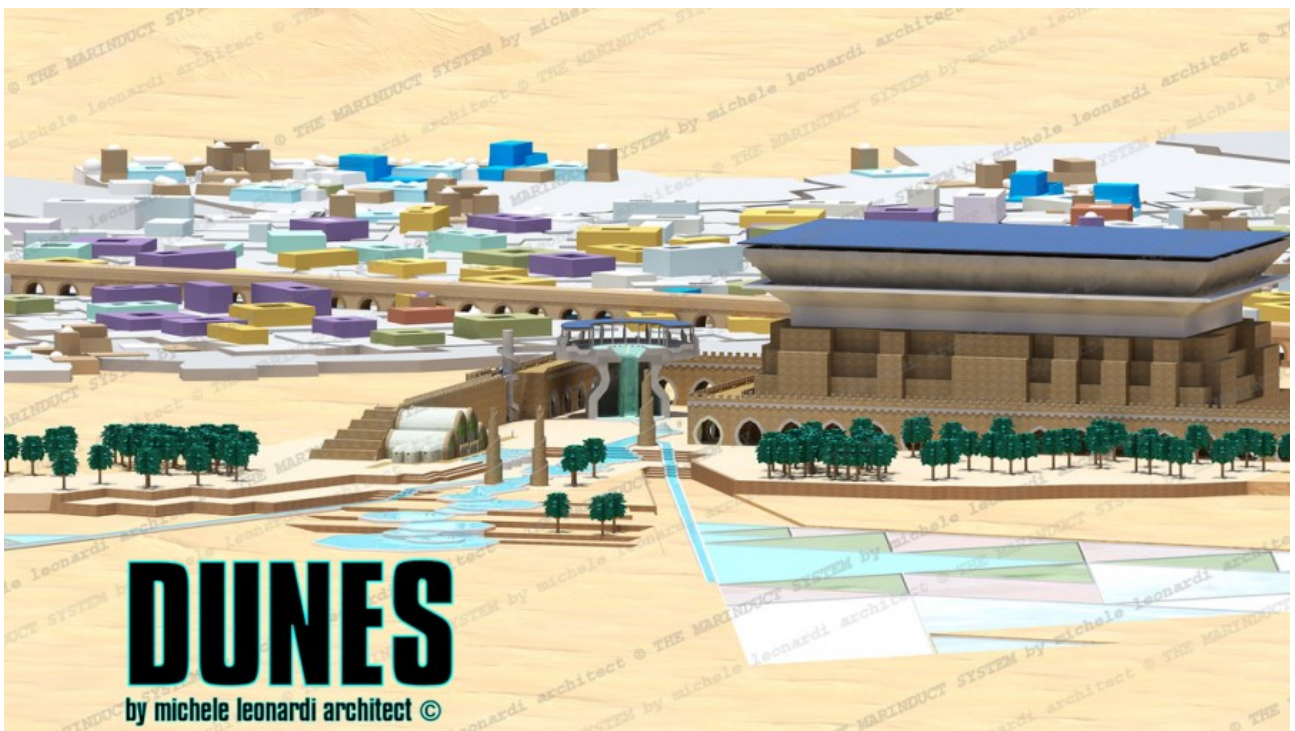


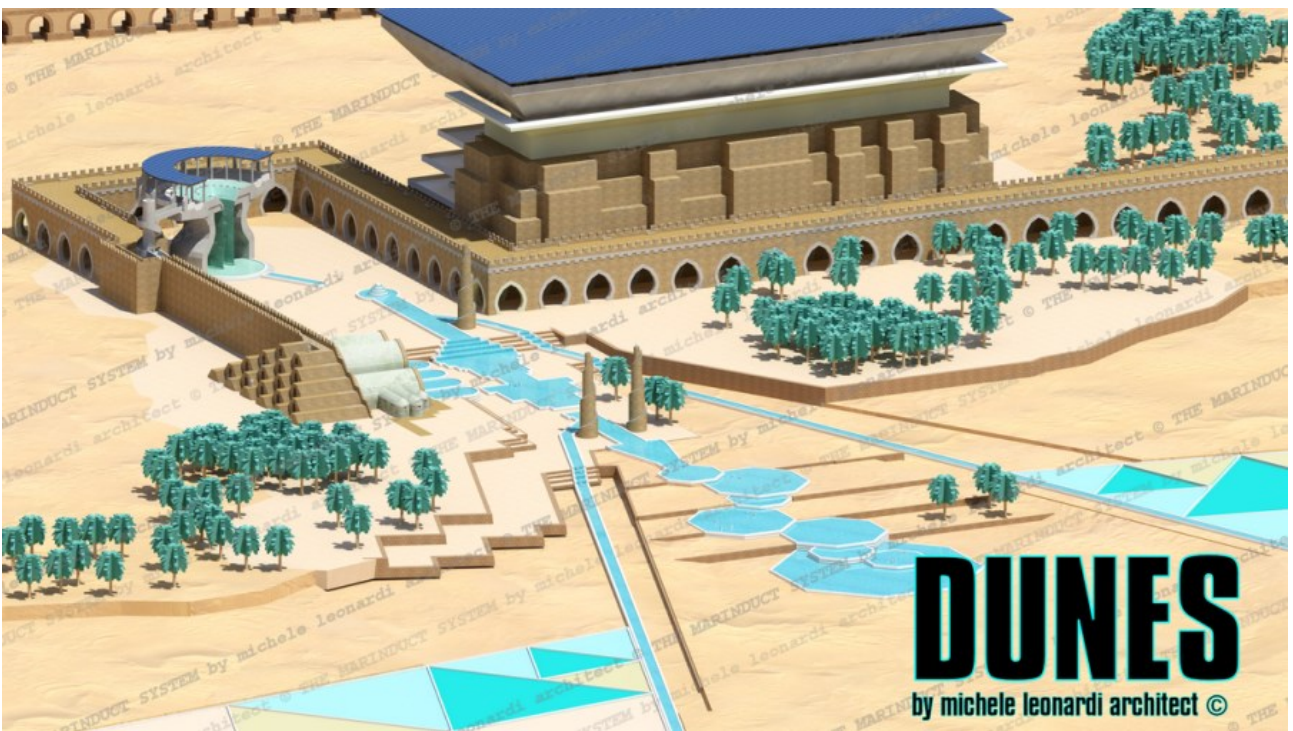


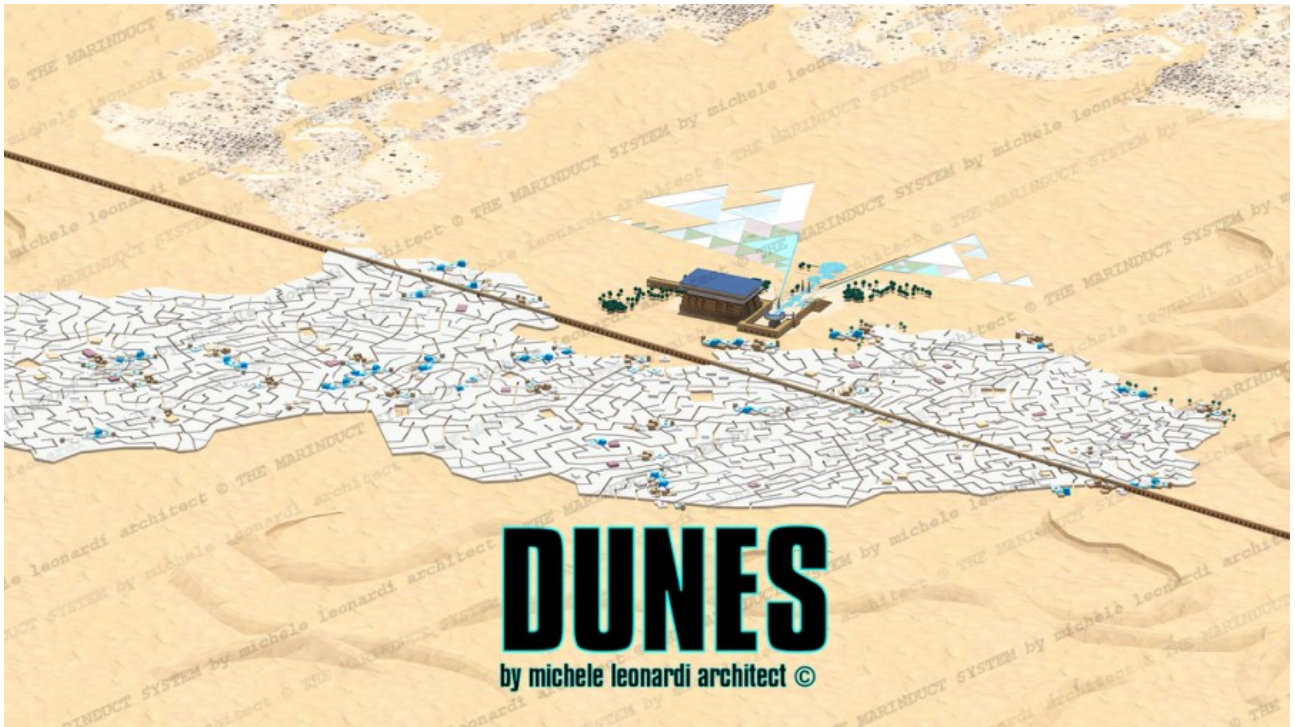












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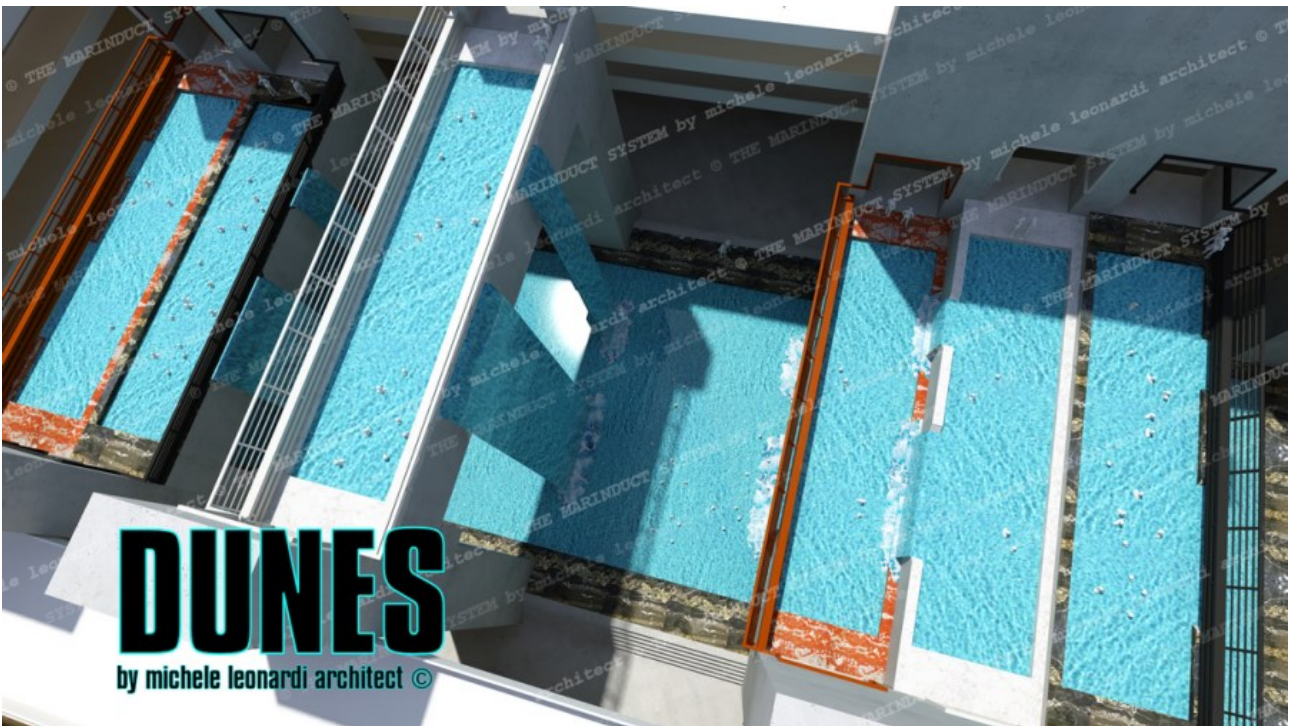


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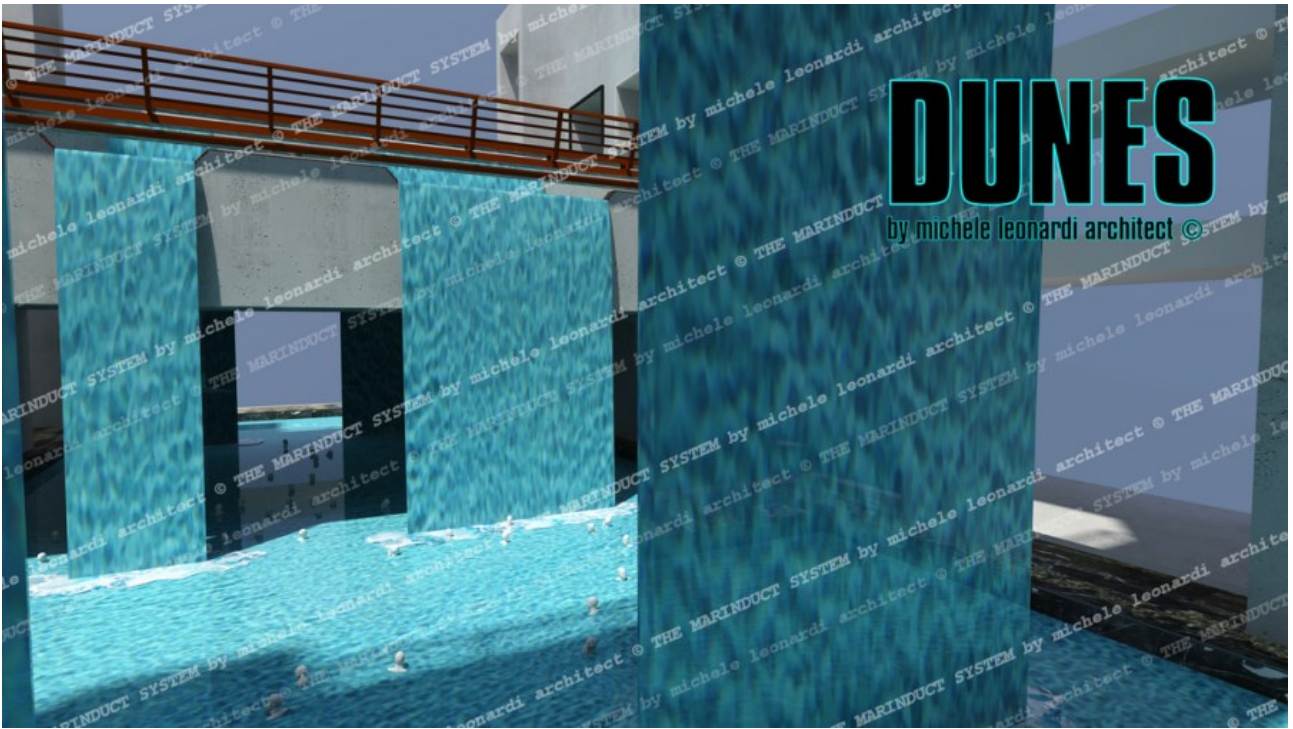
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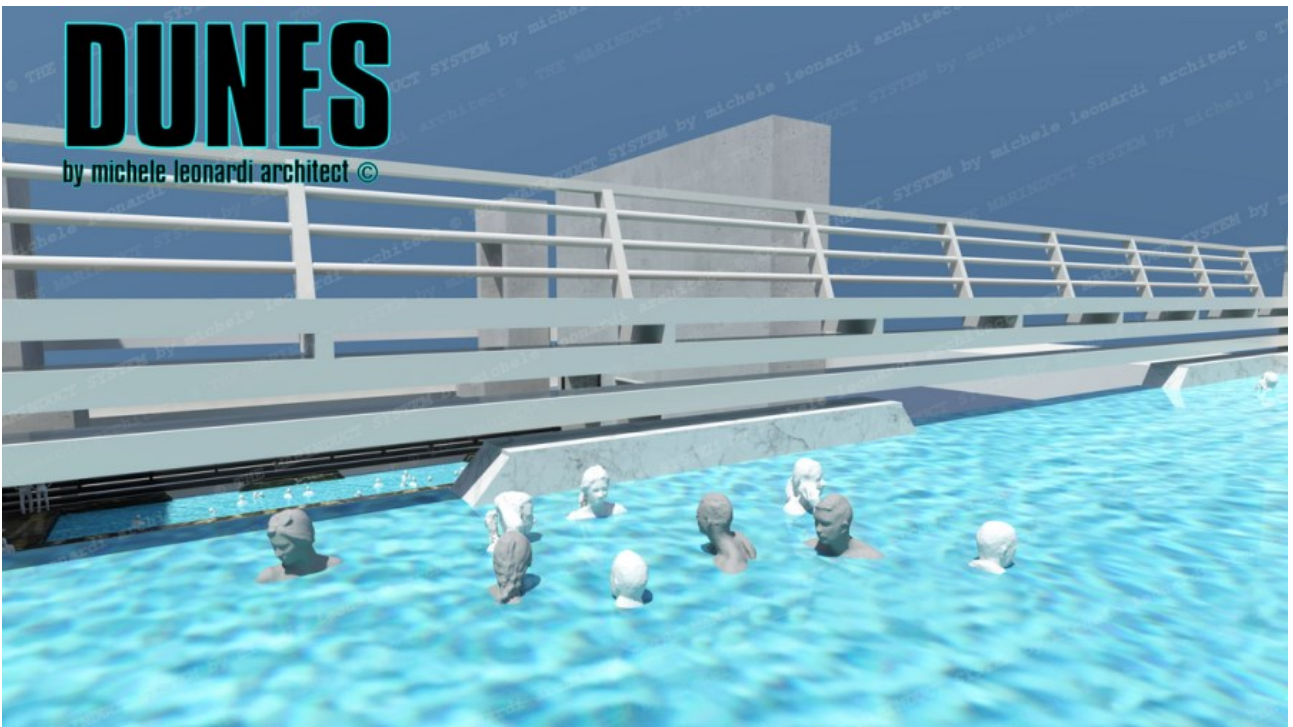
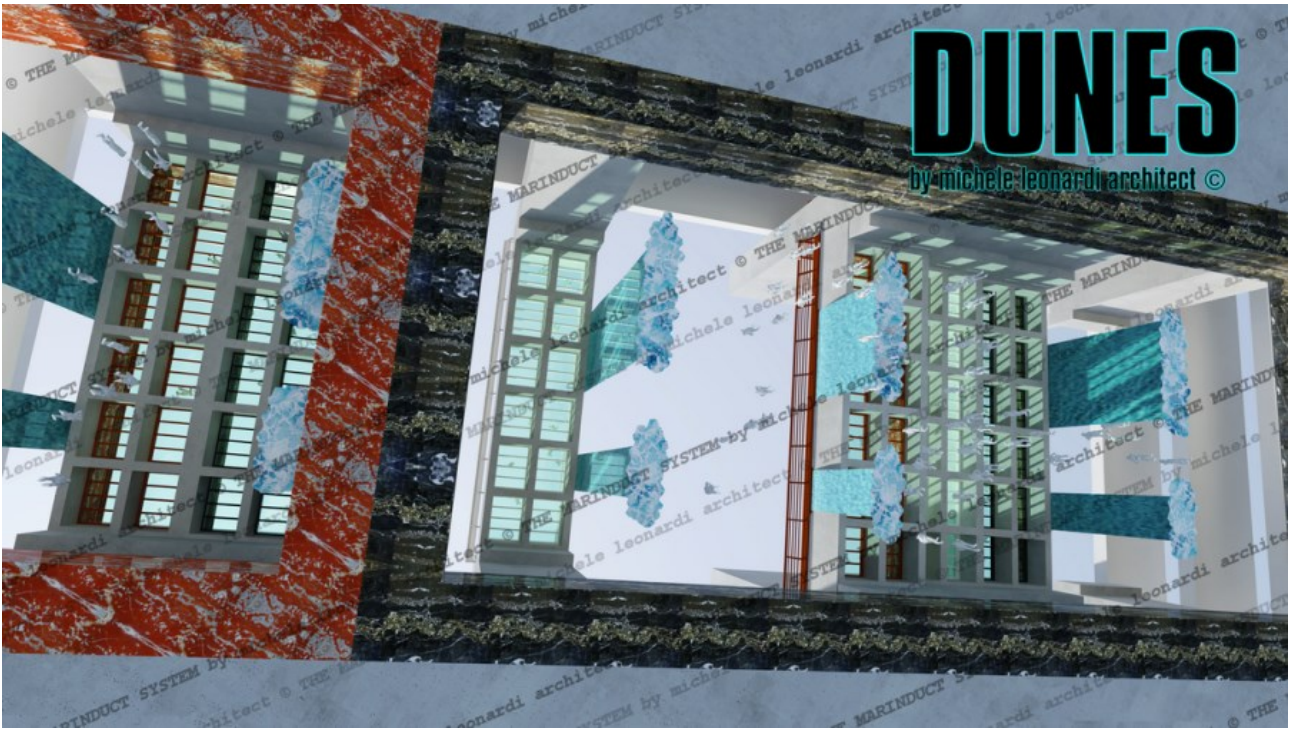
**THE GREAT THERMAL BATHS:  
THE PENSILE POOLS - Part 1**

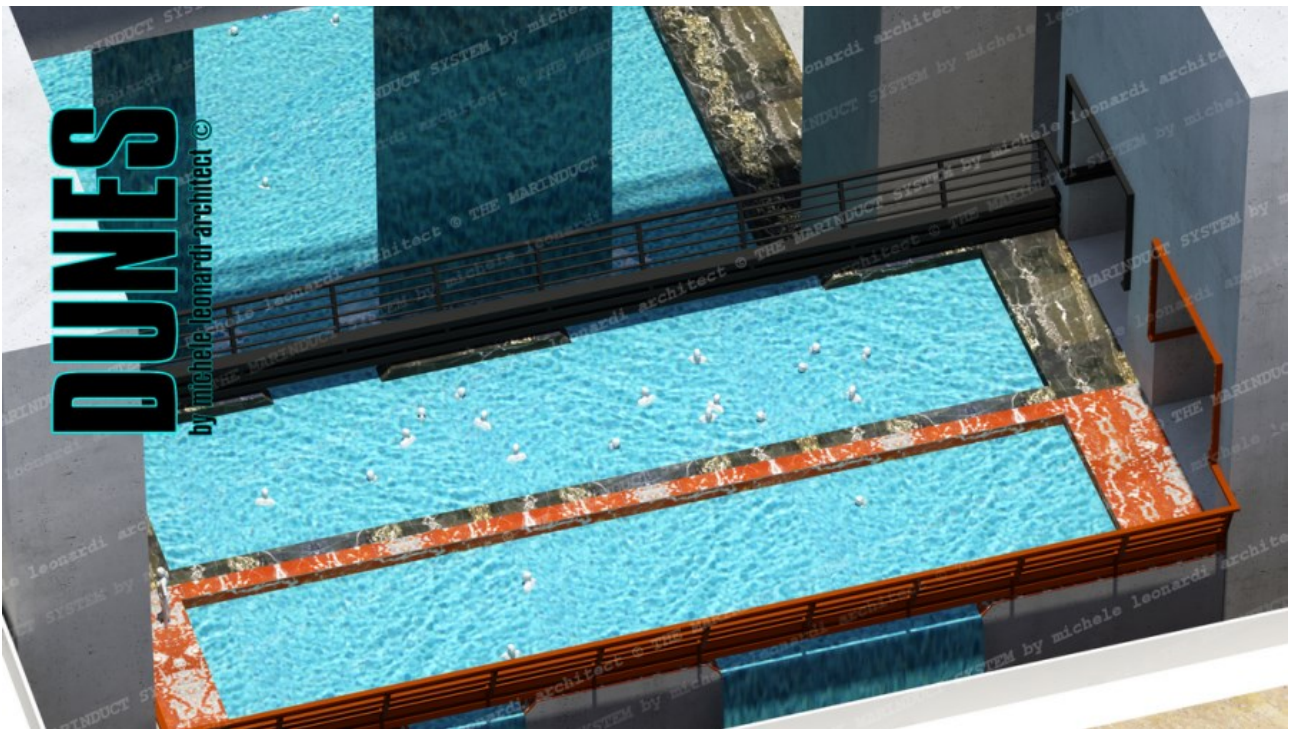
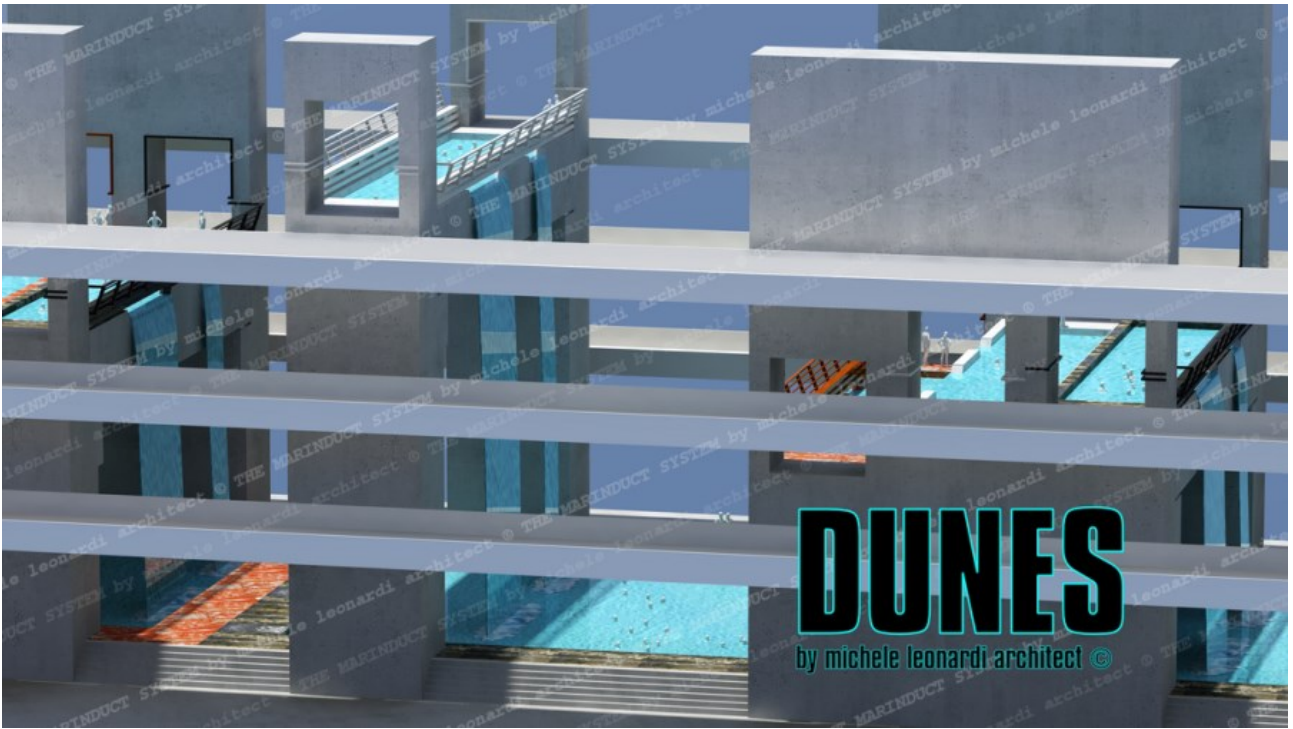
*by Michele Leonardi architect © September 2019*

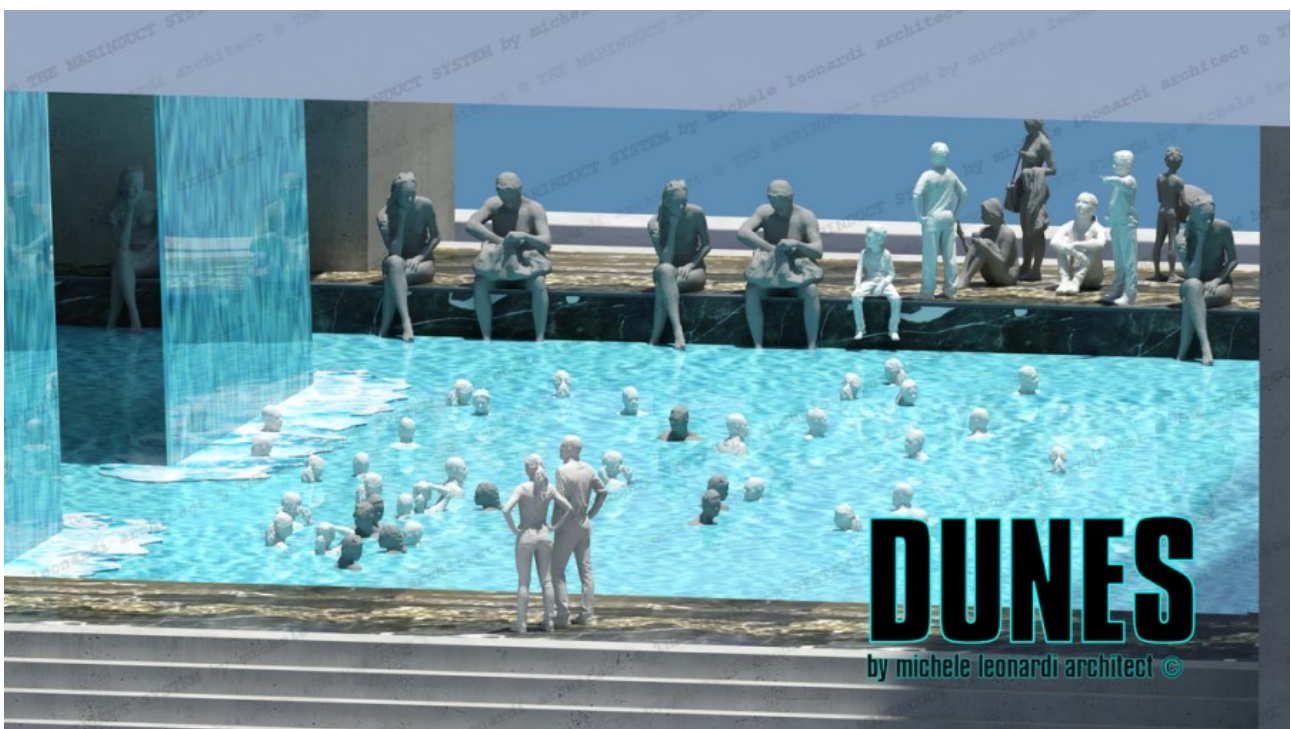
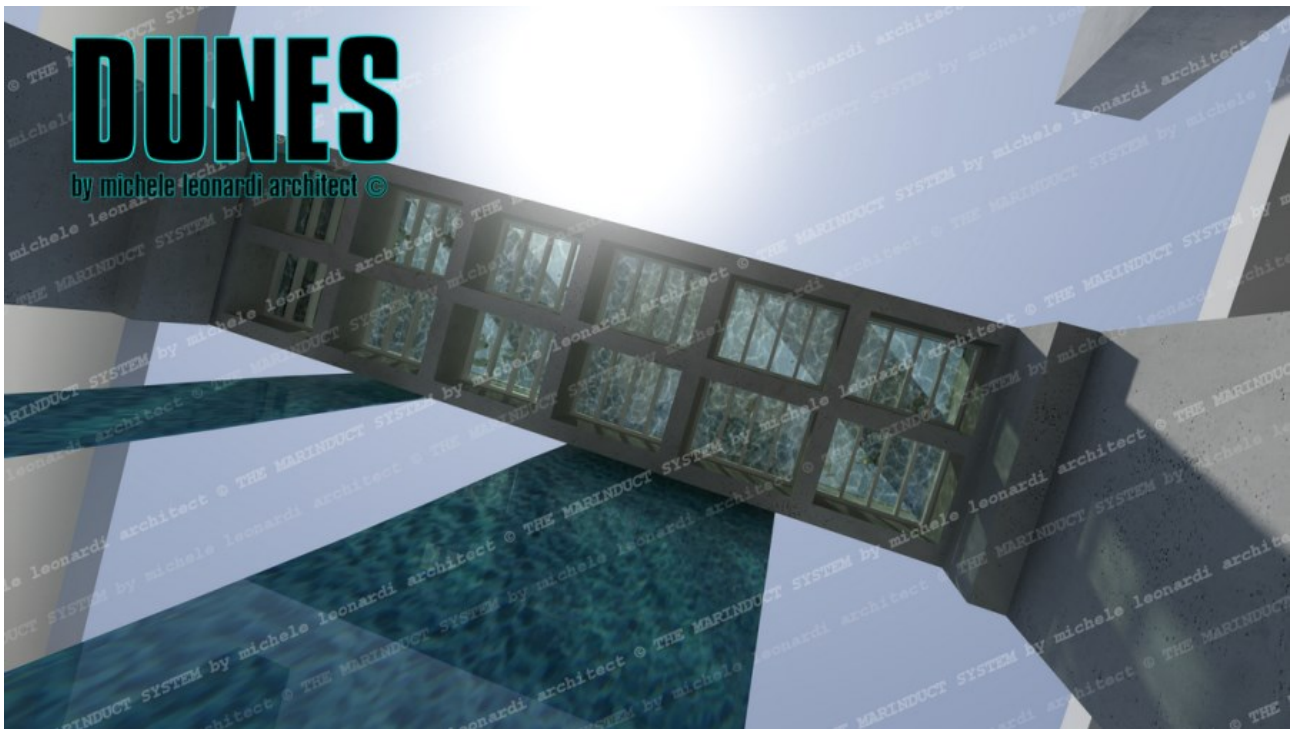












## The Pensile Pools

are powered by the Marinduct, the Marin Water Aqueduct, and they constitute the Frigidarium (the cold water baths) of the Great Baths Complex designed for a desert city.

The functions foreseen are the following:

- **a large swimming pool** (also for sports competitions) **and a small swimming pool** (children and non-swimmers) **on the ground floor level**, with cold or relatively cold water, depending on the season and latitude, etc .;
- **vertical connection by stairs and lift;**
- **three floor levels with an annular ambulatory** around the pools of each level;
- **changing rooms, showers, toilets arranged along the walkers;**
- **spectator stands** on one side only, on 2 levels (they must not interfere with the pedestrian circuit circulation), for the sports competitions.
- **6 Hanging Pools**, with static bridge structure (in reinforced concrete or in iron or mixed), connected to the 3 levels of walkers.

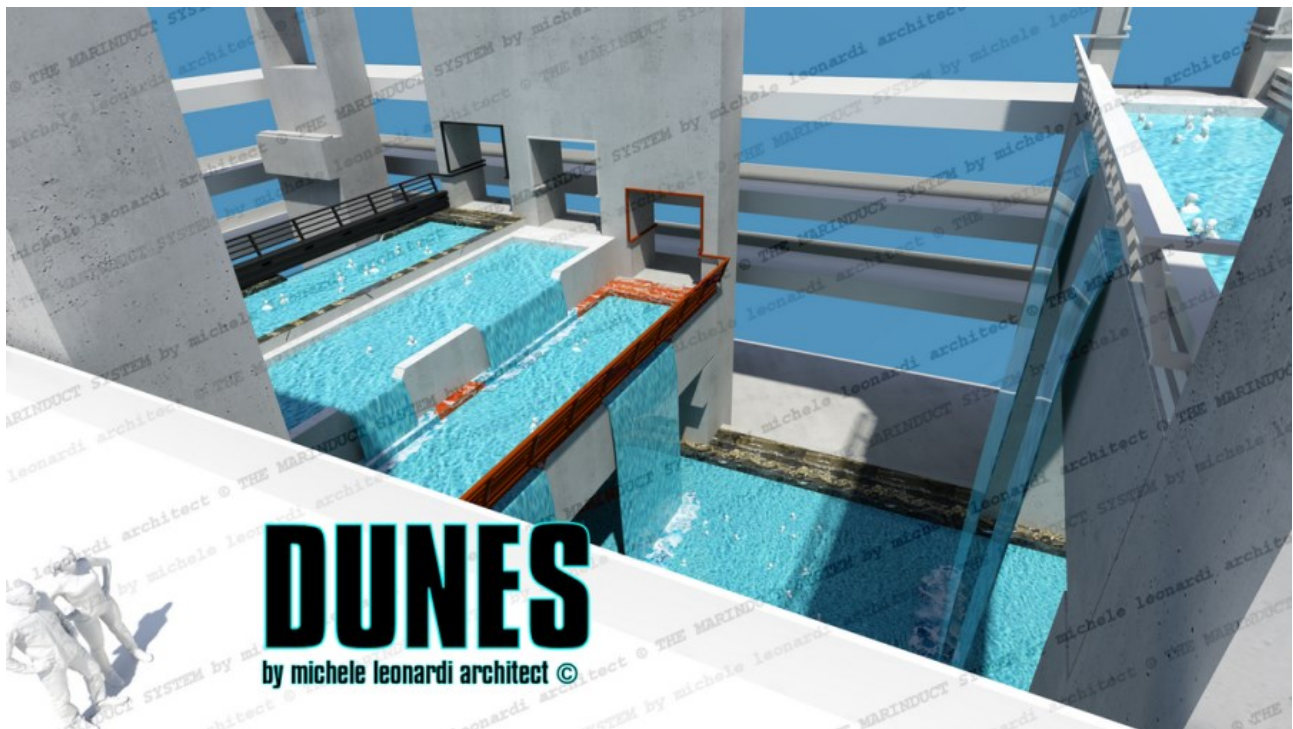
A minimum of water will flow from the hanging pools to give rise to refreshing and above all thunderous waterfalls. As regards safety with respect to accidental falls from suspended pools (example: young adolescents who exaggerate with their feats, drunk people, children who have escaped parental control, exalted, etc.), the two levels of parapets provided should suffice. However, for additional safety and where necessary, an elastic anti-fall emergency net can be provided, just below the large parapets.

On the large roof there is a photovoltaic roofing system. It can also be "pierced", to allow an extra contribution of natural light.

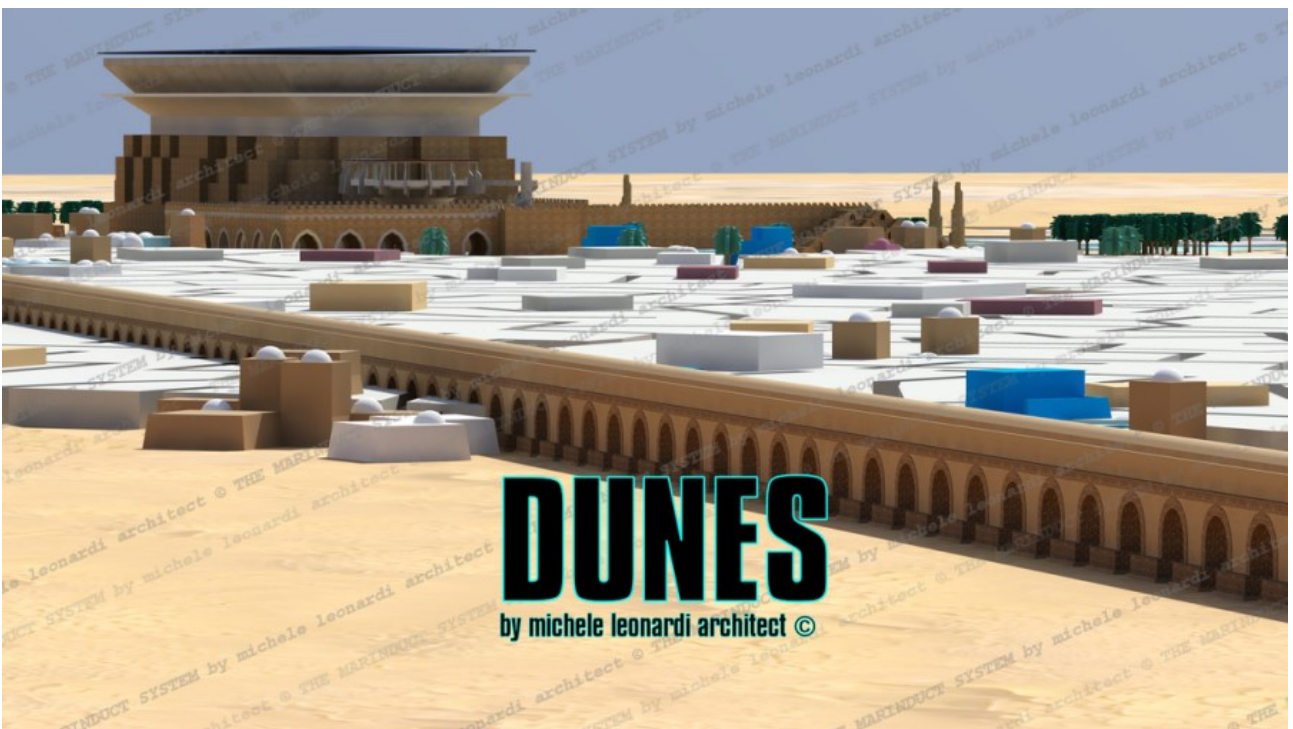
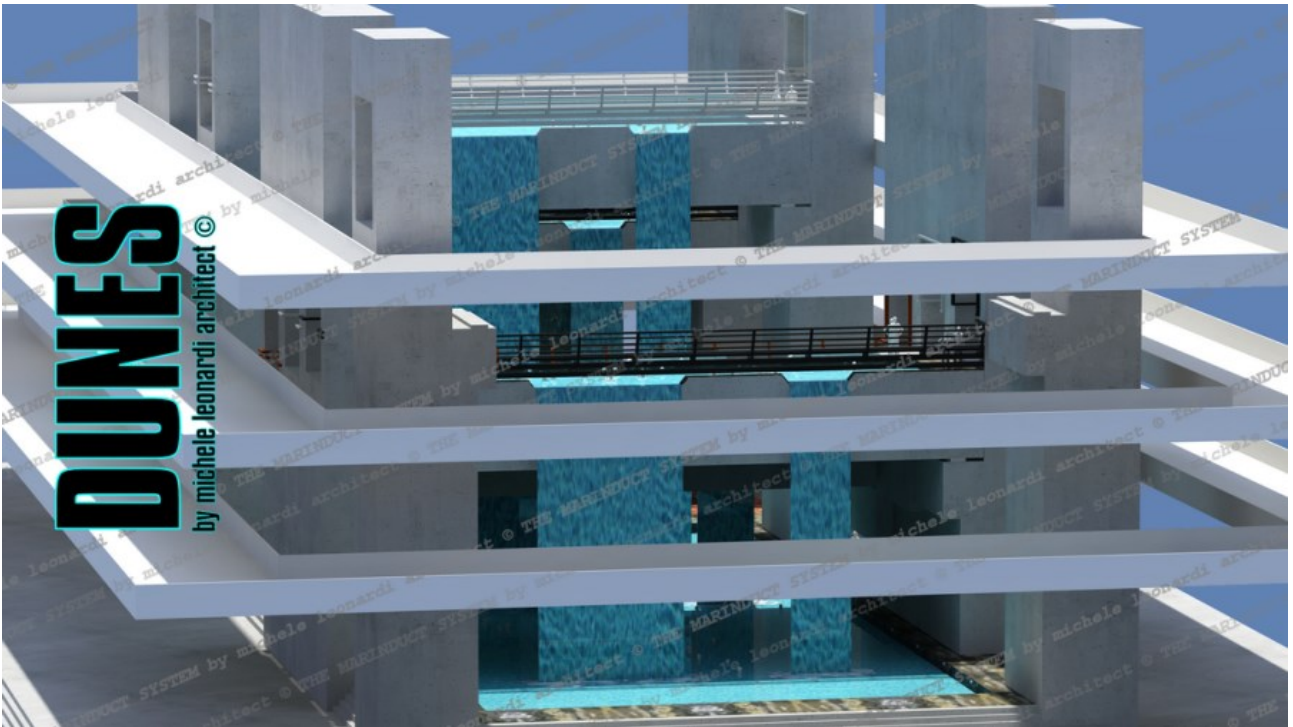
In final, as regards the bottom of the tanks suspended vertically, this could be both opaque and transparent, ie with both a coffered closure and a structural glass closure. In the images below the glass you can see a structure (metal and painted) would serve only as an additional static safety device, as well as to reassure the bathers, since in reality there is no need to reinforce the structural glass.

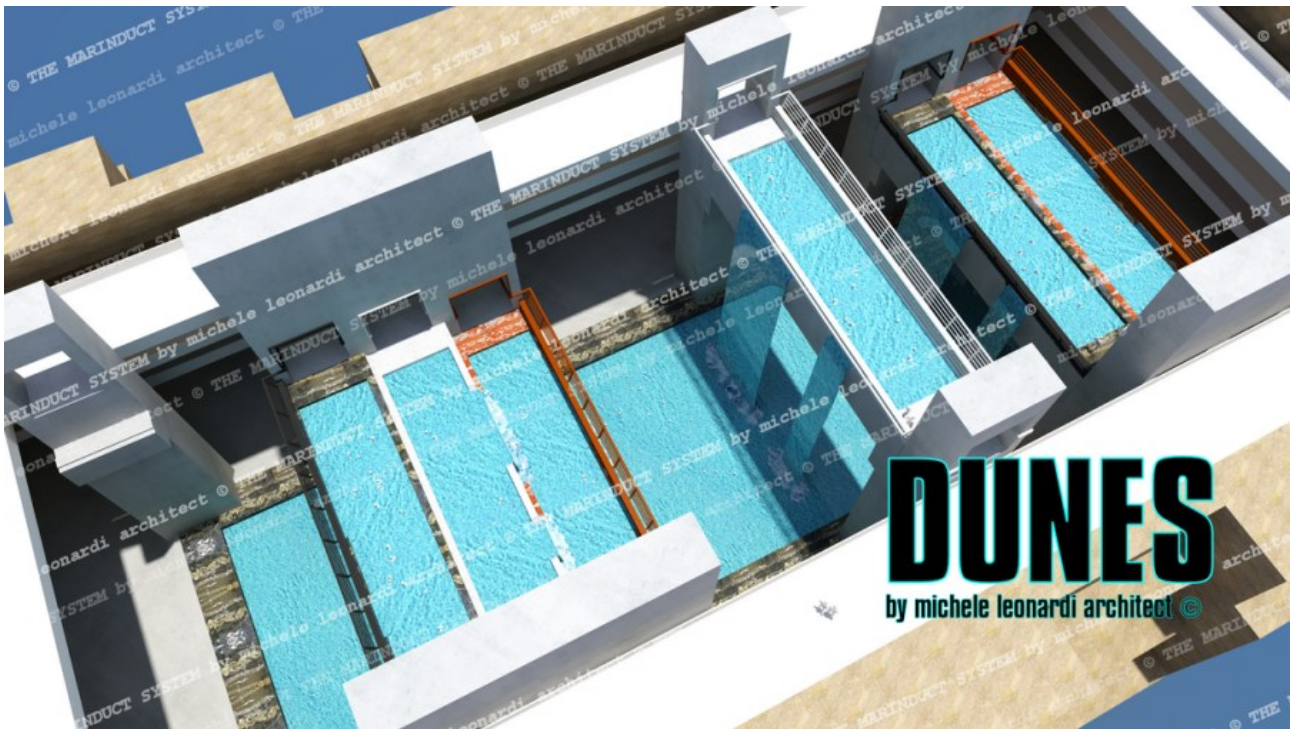
### **This project is looking for a client.**

Of course this is just a schematic, conceptual design, yet to be developed. Depending on the latitude of the location in which it will be built, the following will vary: the modulation of natural light, the architectural aspect, the functional program, etc. Do not even pay attention to the shape at right angles: it is only an initial scheme, while instead the installations would all be visible, to facilitate inspection, maintenance and replacement. But the idea of the Hanging Pools is clearly shown here. It's simple.









## Les piscines suspendues

sont alimentées par le **Marinduct**, l'aqueduc d'eau de mer, et elles constituent le Frigidarium (les bains d'eau froide) des Grands Thermes conçues pour une ville du désert.

Les fonctions prévues sont les suivantes:

- **une grande piscine** (également utilisable pour les compétitions sportives) et **une petite piscine** (enfants et non-nageurs) **au rez-de-chaussée**, à l'eau froide ou relativement froide, selon la saison et la latitude, etc.
- **des escaliers et un ascenseur** de liaison vertical;
- **trois niveaux d'étages chacun avec une déambulatoire annulaire** autour des piscines de chaque niveau;
- **vestiaires, douches, toilettes** aménagées le long des déambulatoires;
- **forums de spectateurs d'une seule coté** (ils ne doivent pas gêner la circulation du circuit piétonnier) **au rez-de-chaussée, pour quand il y a une** compétition sportive;
- **6 piscines suspendues**, avec structure statique à pont (en béton armé ou en fer ou mixte), reliées aux 3 niveaux de déambulatoires.

Un minimum d'eau écoulera des piscines suspendues pour créer des cascades rafraîchissantes et surtout orageuses.

En ce qui concerne la sécurité en cas de chute accidentelle de les piscines suspendues (exemple: jeunes adolescents qui exagèrent avec leurs conneries, personnes ivres, enfants échappés au contrôle parental, exaltés, etc.), les deux niveaux de parapets fournis devraient suffire.



Cependant, pour un surplus de sécurité, s'il sera nécessaire, un réseau anti-chute élastique peut être fourni davantage, juste au-dessous des gros parapets.

Sur le grand toit il y aura un système de toiture photovoltaïque. Il peut être également "percé", au but de permettre un apport supplémentaire de lumière naturelle.

Enfin, en ce qui concerne le fond des piscines suspendues verticalement, celui-ci pourrait être à la fois opaque et transparent, c'est-à-dire avec une fermeture à caissons et une fermeture en verre structural. Dans les images on voit une structure (métallique et peinte) sous le verre: elle ne servirait donc que pour la sécurité statique supplémentaire, au fin de rassurer les baigneurs, car en réalité il n'est absolument nécessaire de renforcer le verre structural au dessous de l'eau des piscines suspendues vis-à-vis des dimensions limitées des pièces en verre.

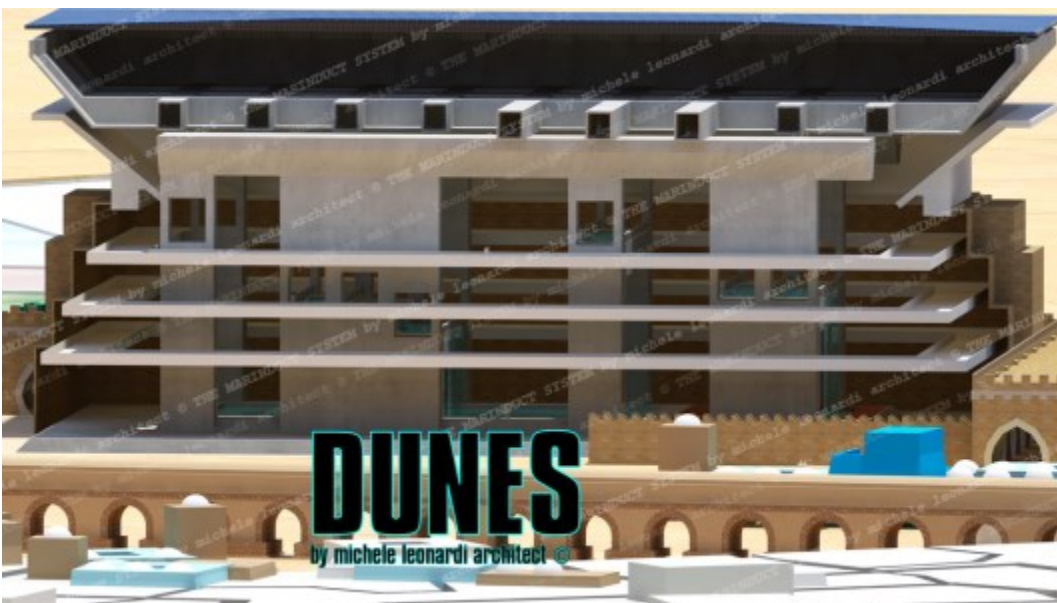
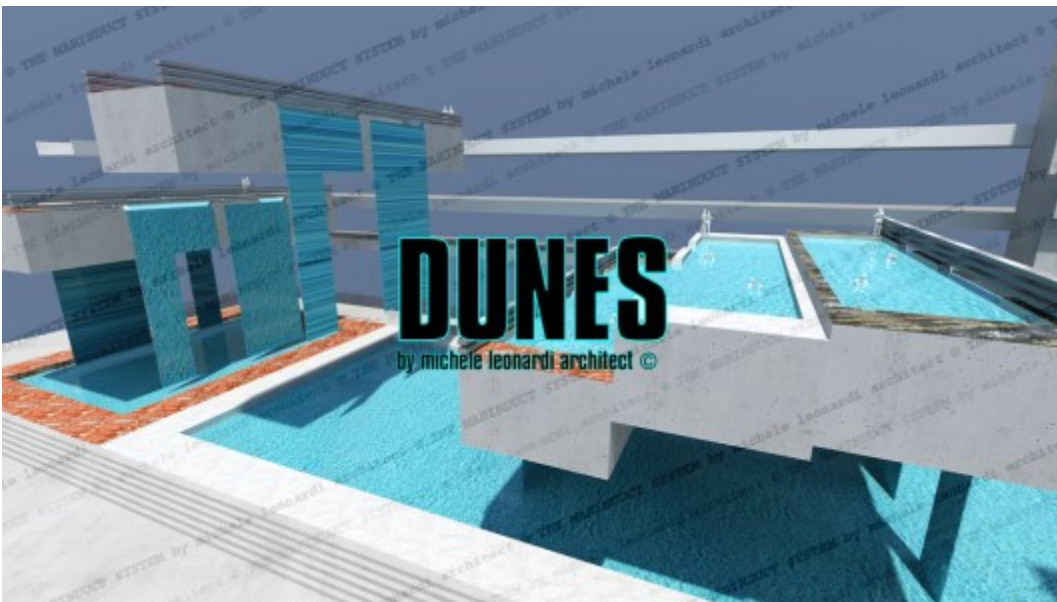
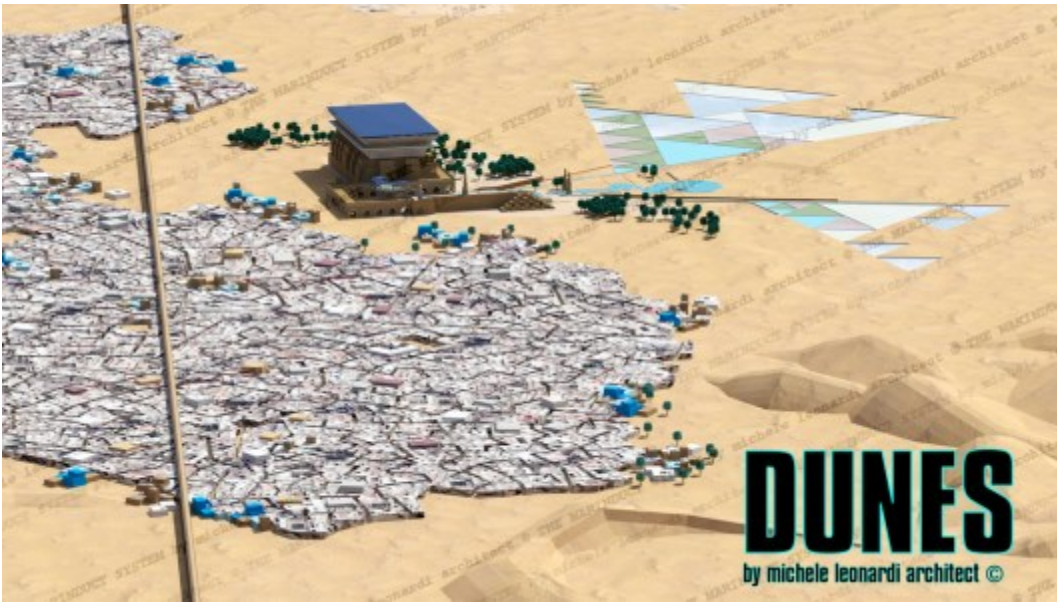
### **Ce projet est à la recherche d'un client.**

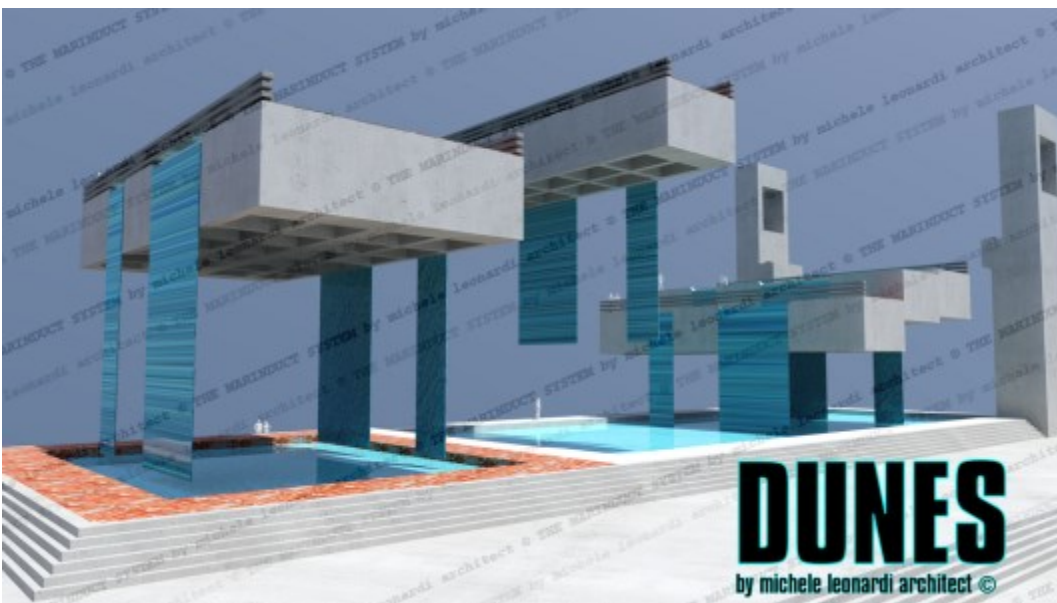
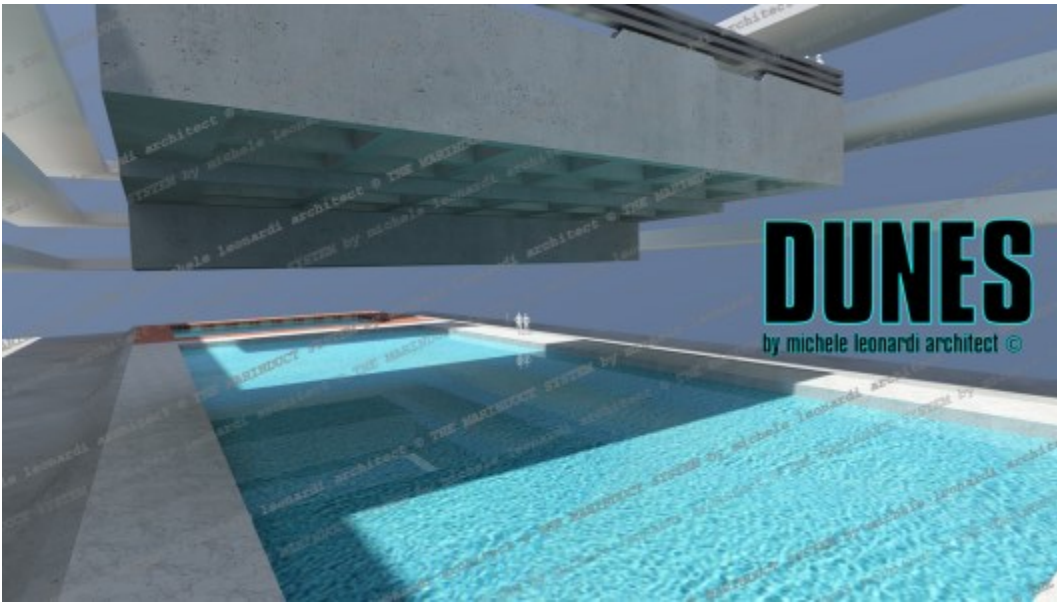
Bien entendu, il ne s'agit que d'une conception schématique, toute à développer. En fonction de la latitude du lieu dans lequel on construira le bâtiment, les éléments suivants ils varieront: la modulation de la lumière naturelle, l'aspect architectural, le programme fonctionnel, etc. Ne faites même pas attention à la forme aux angles droits de les desseins: ce n'est qu'un schéma initial, alors que les installations seraient toutes visibles, pour faciliter l'inspection, la maintenance et le remplacement. Mais l'idée des piscines suspendues est clairement montrée ici. C'est simple.

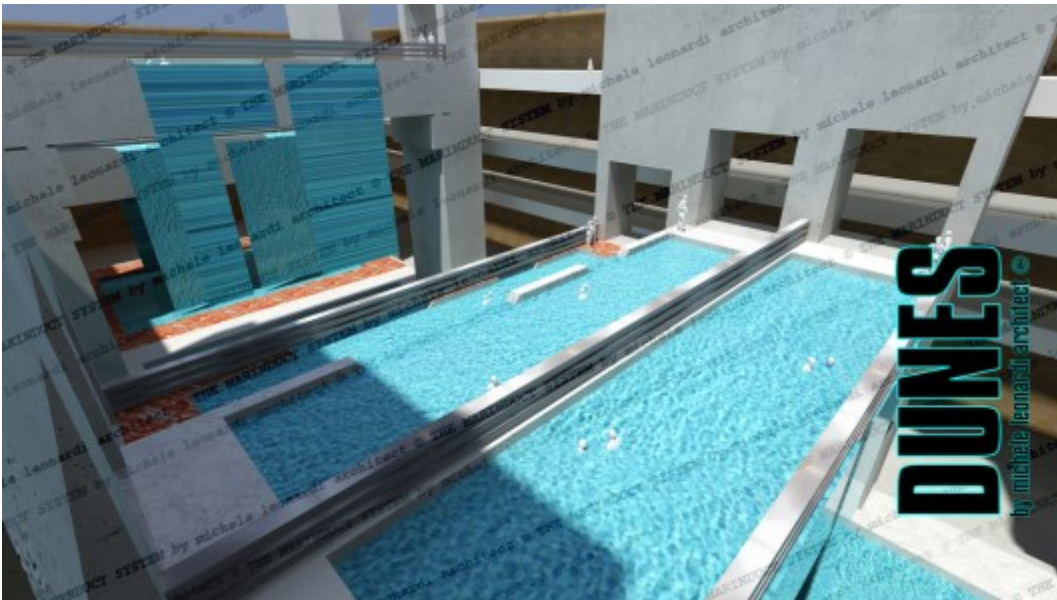
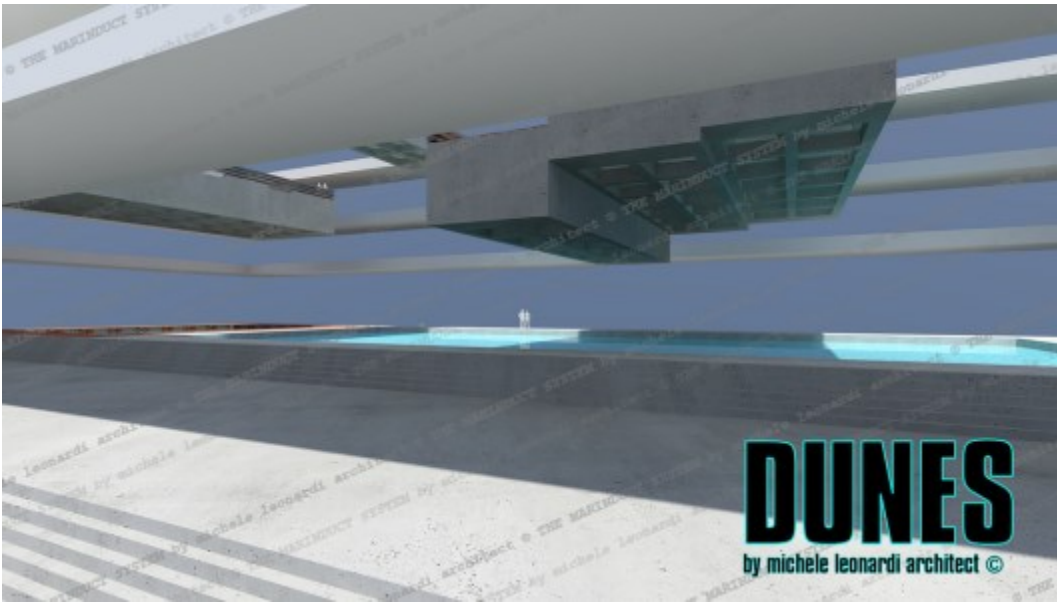


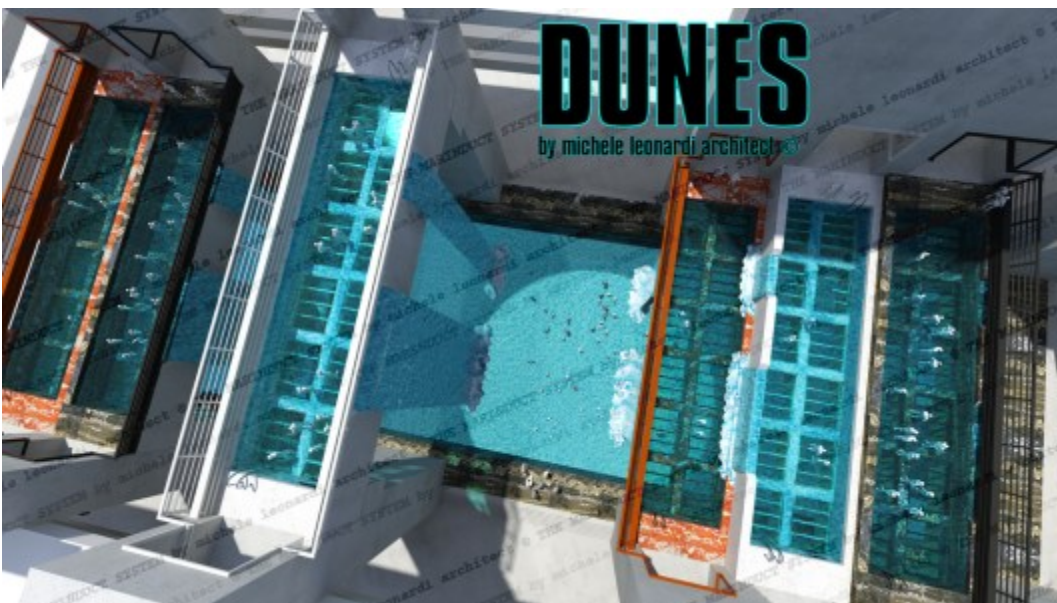
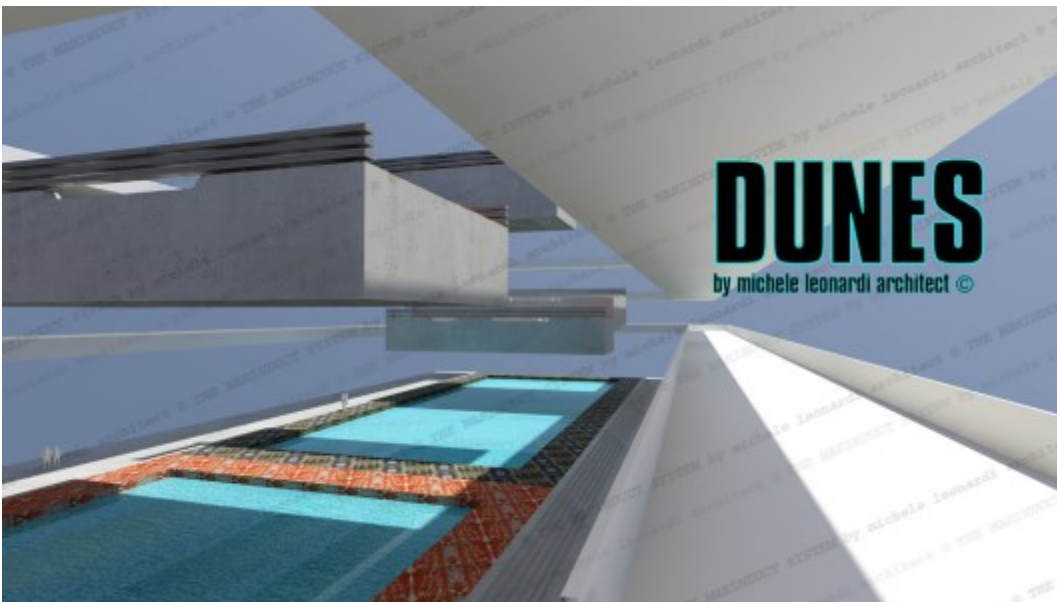
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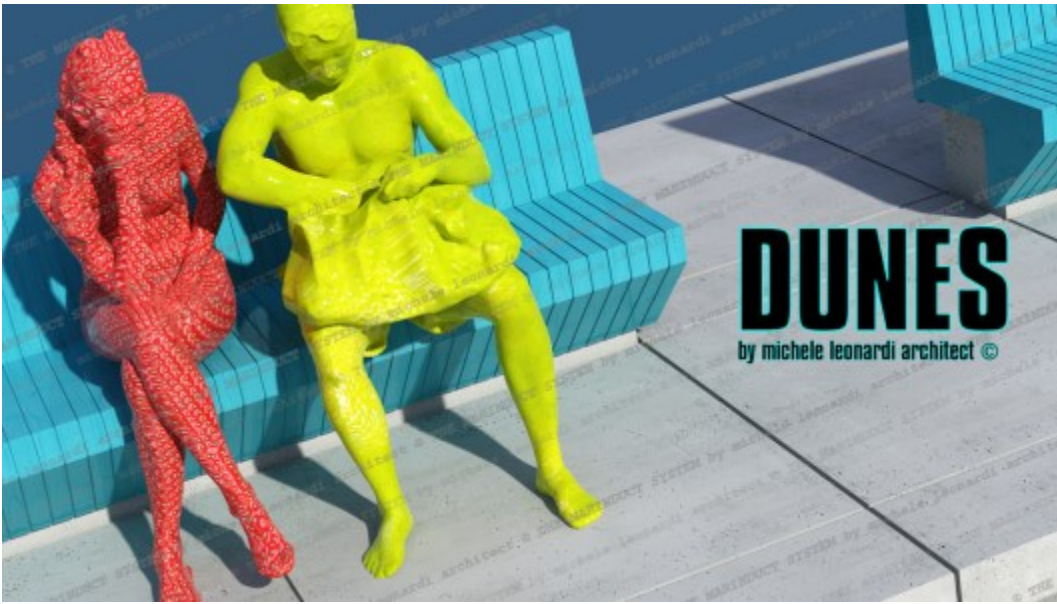


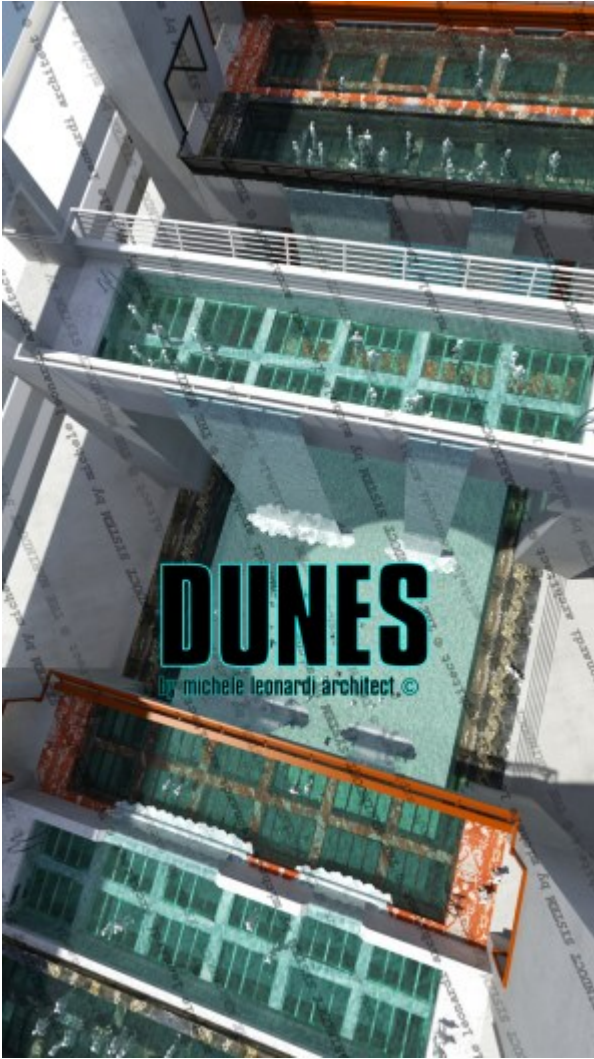












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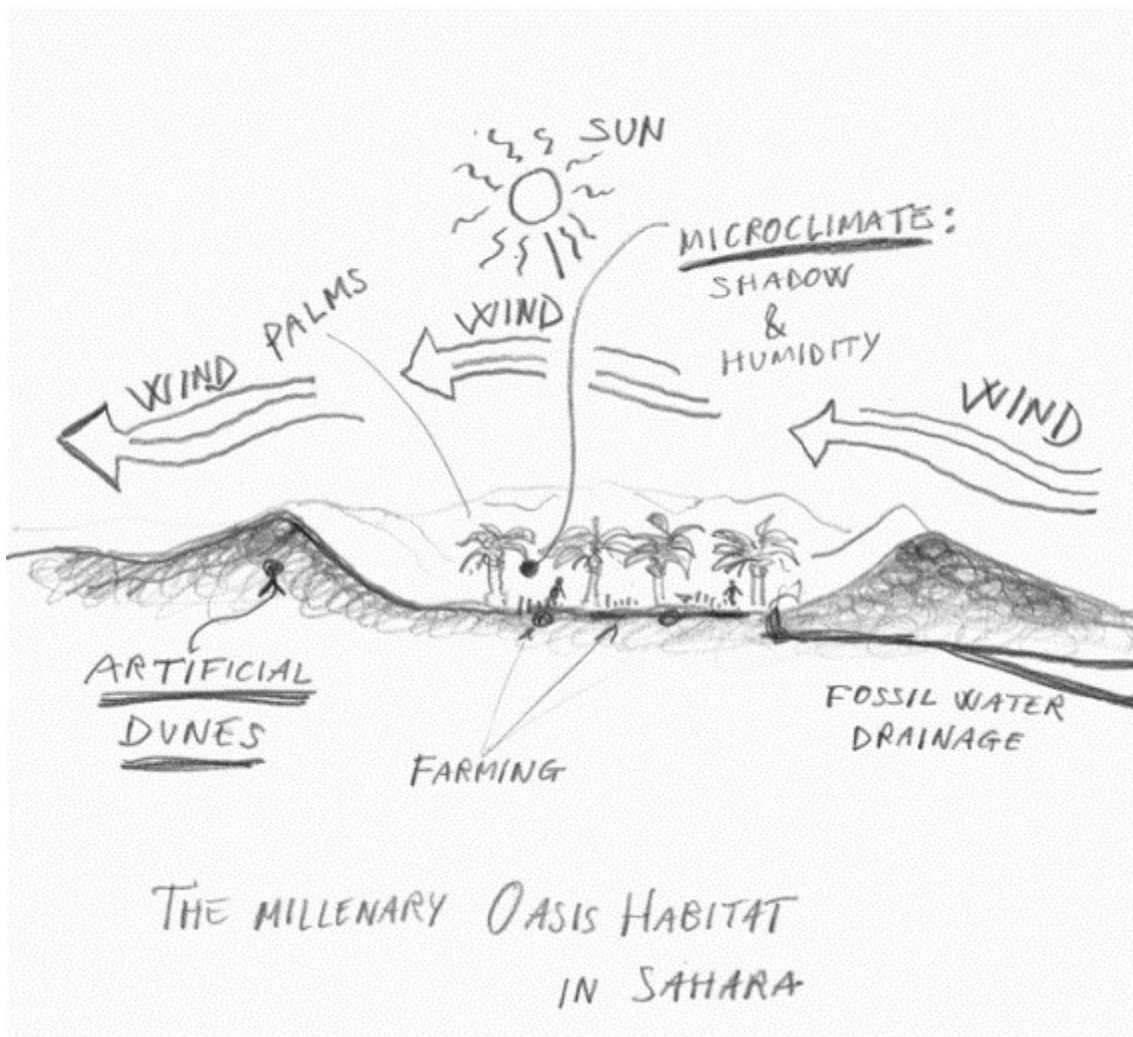


الدunes

D U N E S

**THE OASIS HABITAT,  
FOR TERRAFORMED DESERTS**

*by Michele Leonardi architect © 2002; 2007; November 2011*



## THE OASES

are not a natural phenomenon, as most people think it, because they are the product of a millenary culture, the result of a long adaptation of some people to extreme living conditions.

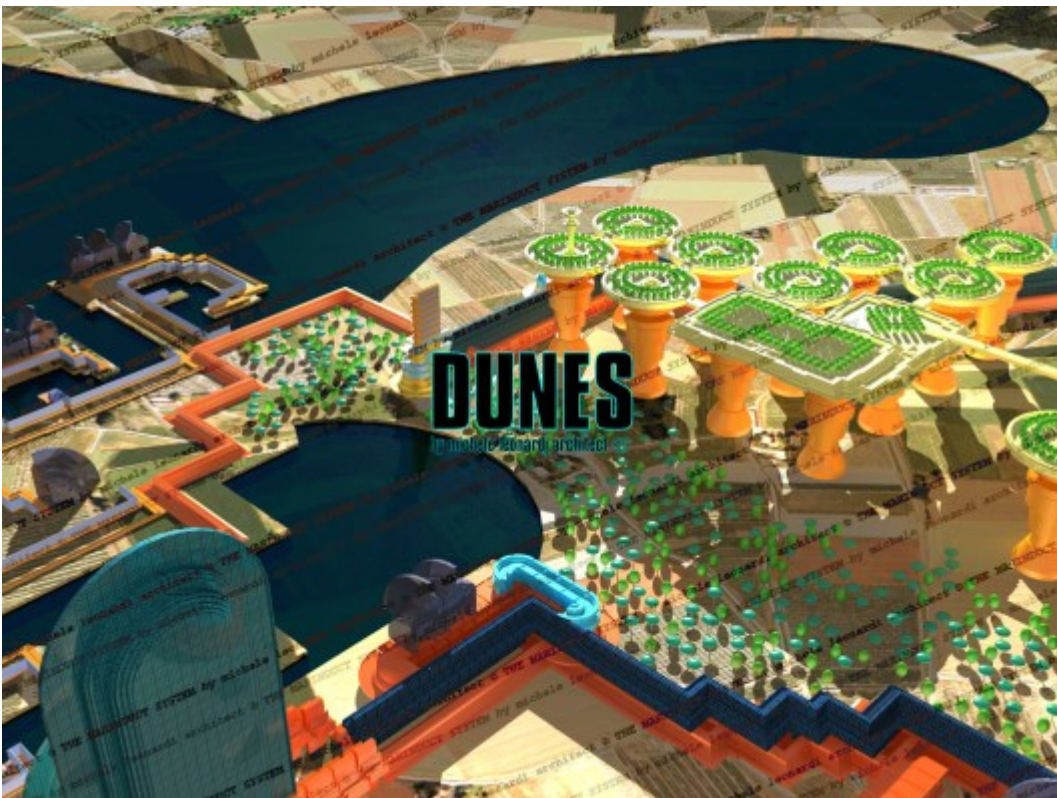
In the oasis everything is artificial, like the drainage and administration of water-resource, like the palm wood that create a microclimate. Even the dunes are artificials, always to create a microclimate.

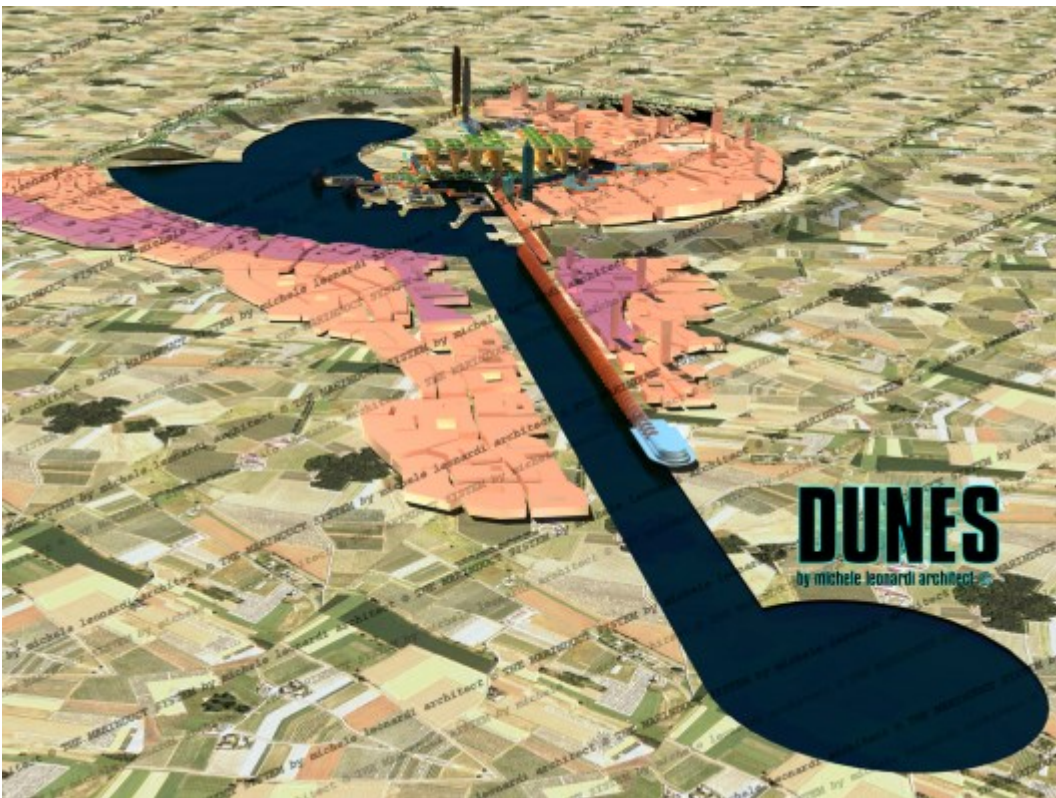
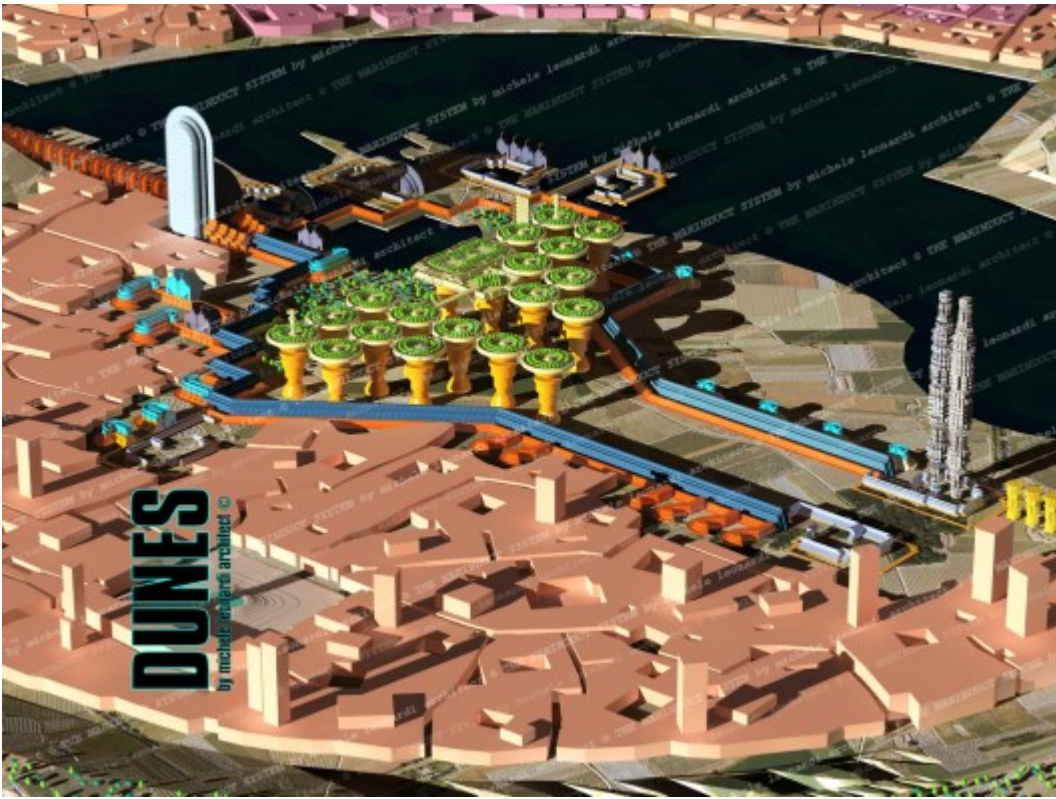
The oasis: a perfect example of long-term strategy, real sustainable architecture.

**In the following project, The Oasis Habitat consists of 4 parts:**

- 1 - An artificial dune that protects against the dominant winds, with inside craft and industrial activities.
- 2 - An artificial lake which creates a microclimate, and a fish farming.
- 3 - The houses in clay, or adobe, or pisé, or in géopolymer-bricks, low cost and ecofriendly.
- 4 - The civic center with tall buildings geopolymer cement, in low environmental impact.







all rights reserved © Michele Leonardi architect



# L'HABITAT OASIS

Les oasis ne sont pas un phénomène naturel, comme la plupart de gens pense, car au contraire elles sont le produit d'une culture millenaire, le résultat d'une longue adaptation par certaines peuples à des conditions de vie extrêmes.

Dans l'oasis tout est artificiel: le drainage souterrain et l'administration de la précieuse ressource "eau", les palmiers qui créent un microclimat, même les dunes sont artificielles, toujours au but de créer un microclimat.

L'oasis: un parfait exemple de stratégie à long terme, réelle architecture durable.

## **Dans ce projet, l'Habitat Oasis est composé par 4 parts:**

1 - Une dune artificielle qui protège contre les vents dominants, au sein du quel il y a les activités artisanales et industrielles.

2 - Un lac artificiel qui crée un microclimat, et avec de la pisciculture.

3 - Les maisons en argile, ou en adobe, en pisé, ou en briques géopolymère, pas chers et ecosoutenables.

4 - Le centre civique avec de grands bâtiments en ciment géopolymère, à faible impact environnemental.



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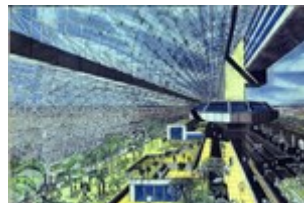
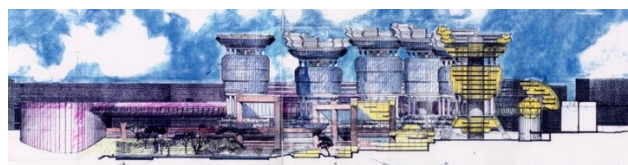
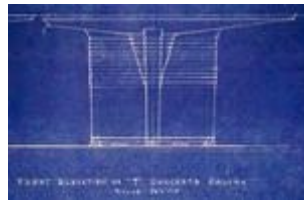
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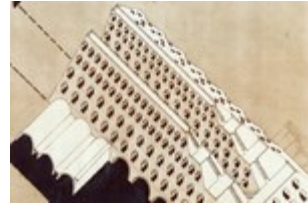
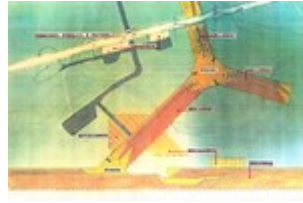
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**the evolution of an idea:**  
provided it is not the usual boring  
mannerism of bad copying,  
**a project is a good project**  
**if it can generate a new project:**







# The MOS

## in slideshow

**THE M.O.S. - THE MARINDUCT OASIS SYSTEM**  
"THE MARINE WATER AQUEDUCT AND OASIS SYSTEM  
FOR NEW HABITATS IN THE DESERT"  
BY MEANS OF DECENTRALIZED DESALINATION UNITS

*by Michele Leonardi architect © 1996, concept - 2019, designs*

### THE MOS - THE MARINDUCT OASIS SYSTEM



*Preview linked to the video on YouTube.*

### THE MOS - THE MARINDUCT OASIS SYSTEM : THE MONUMENTAL RAILWAY STATION AND MARKET



*All previews are linked to the video on YouTube.*

**THE MOS - THE MARINDUCT OASIS SYSTEM :  
CITY OF KNOWLEDGE**



**THE MOS - THE MARINDUCT OASIS SYSTEM :  
THE "MAMMOUTH" HABITAT**



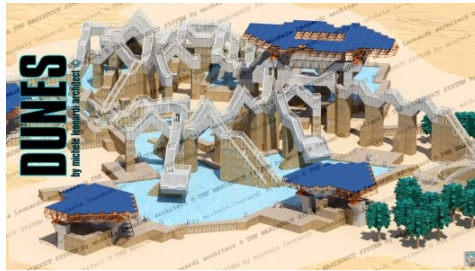
**THE MOS - THE MARINDUCT OASIS SYSTEM :  
THE HOUSES IN THE SAND :  
THE BLUE SHELL**



**THE MOS - THE MARINDUCT OASIS SYSTEM :  
THE HOUSES IN THE SAND :  
THE NAUTILUS**

**THE MOS - THE MARINDUCT OASIS SYSTEM :  
STAIRS IN THE WATER**

**THE MOS - THE MARINDUCT OASIS SYSTEM :  
THE ROLLER COASTER OF STAIRS**



**THE MOS - THE MARINDUCT OASIS SYSTEM :  
THE GREAT THERMAL BATHS**

**THE MOS - THE MARINDUCT OASIS SYSTEM :  
THE PENSILE POOLS**



**THE MOS - THE MARINDUCT OASIS SYSTEM :  
THE PROTO-CROCODILE**

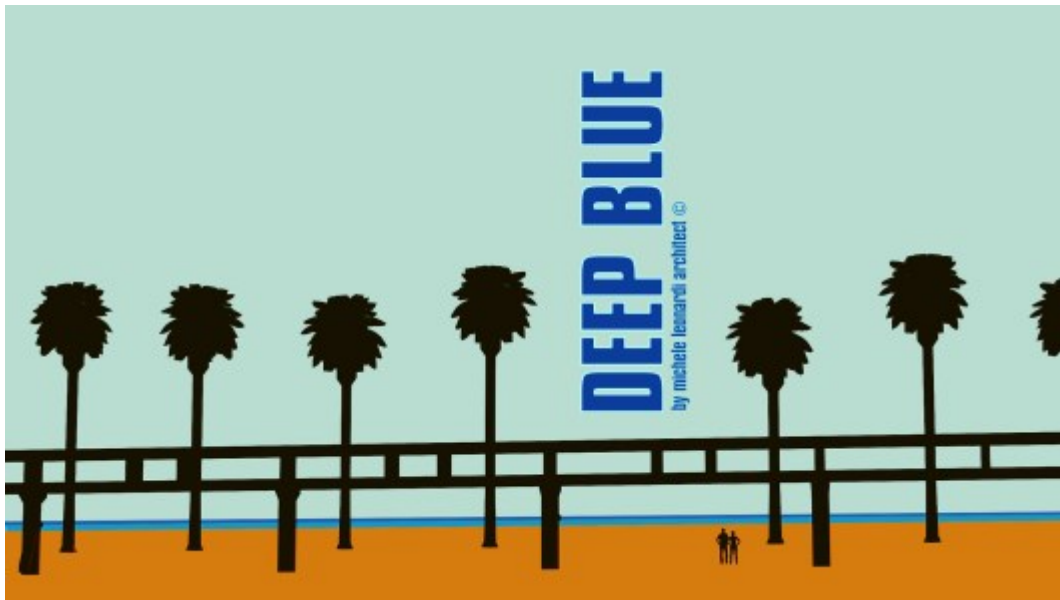
**THE MOS - THE MARINDUCT OASIS SYSTEM :  
THE OASIS HABITAT**



# Deep Blue

SEAWATER FOR OVER 200,000 SWIMMING POOLS OF  
LOS ANGELES  
BY MEANS OF DECENTRALIZED AND MECHANIZED SYSTEM

*by Michele Leonardi architect © September 2022*



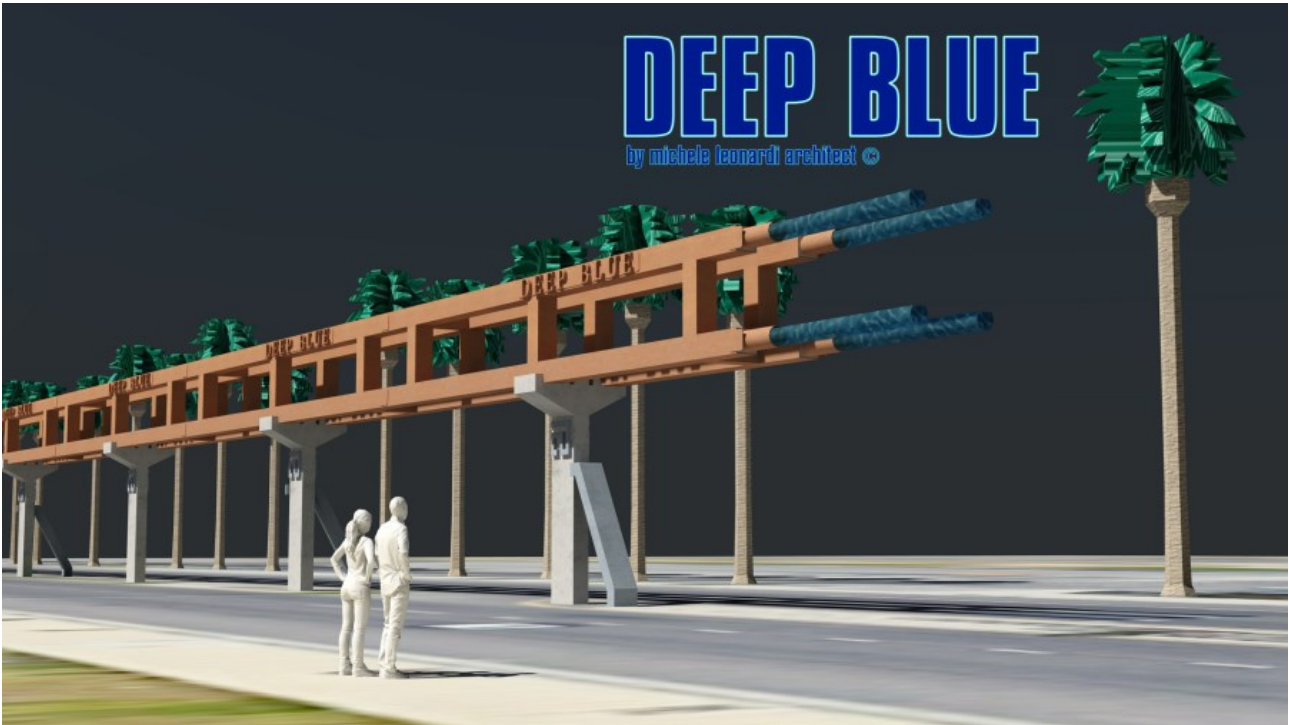
*Link to the video in high definition on YouTube.*

## THE PROJECT

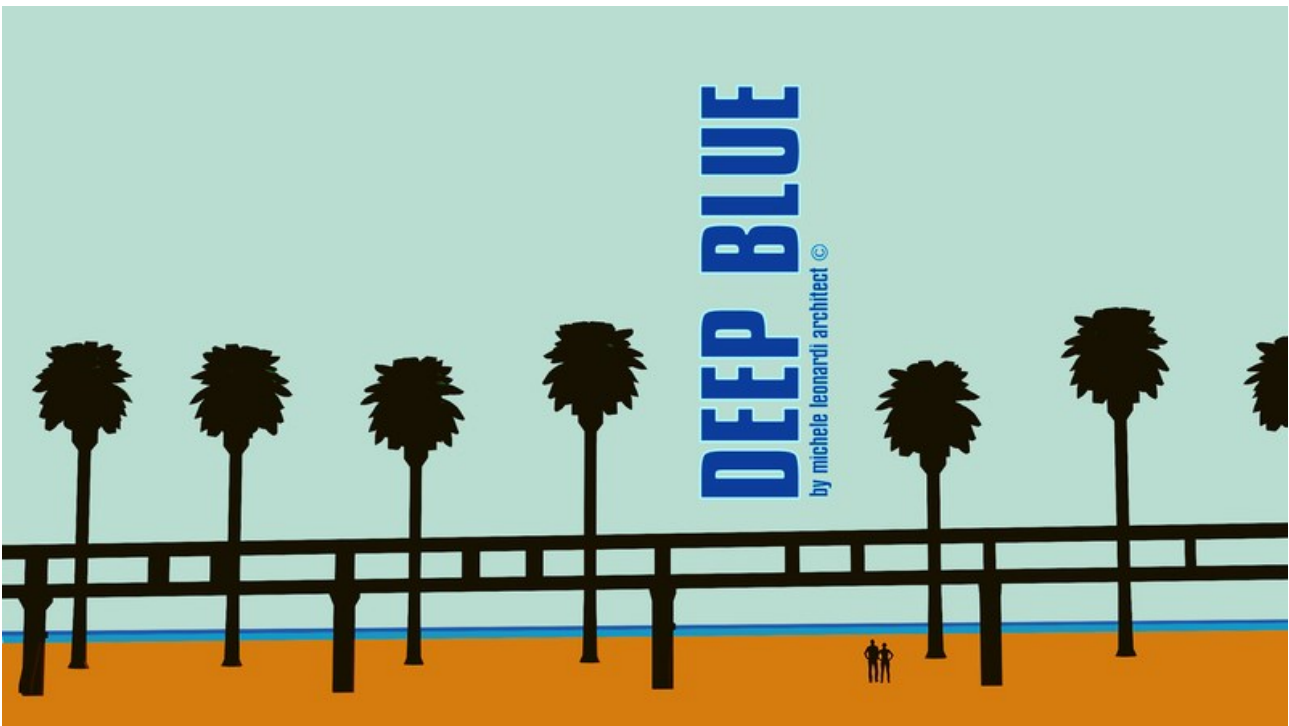
in broad terms, no details:

## LEVEL ZERO

**Status quo, the present situation. Some aerial views of Los Angeles, with over 200,000 swimming pools.** All background aerial images, as well as the three-dimensional ones, are taken from Google Earth Pro. Design, text, report, rendering and graphics by Michele Leonardi architect © September 2022.



*An anticipation of the later implementation of Deep Blue by marinducts.*



# DEEP BLUE

SEAWATER FOR OVER 200,000 POOLS OF LOS ANGELES  
BY MEANS OF A DECENTRALIZED AND MECHANIZED MARINDUCT SYSTEM

LEVEL ZERO - STATUS QUO

MICHELE LEONARDI ARCHITECT, SEPTEMBER 2022











## LEVEL ONE

**Refueling of residential swimming pools using natural seawater, transferred to the pools by tank trucks from the exchange terminal** (tank trucks – cisterns – tank ships - and marinducts, in a second step) located, for example, in the port of Los Angeles Harbor. Subsequent withdrawal of the "used" seawater from each pool, again by tank trucks, and unloading in the cisterns of the terminal.

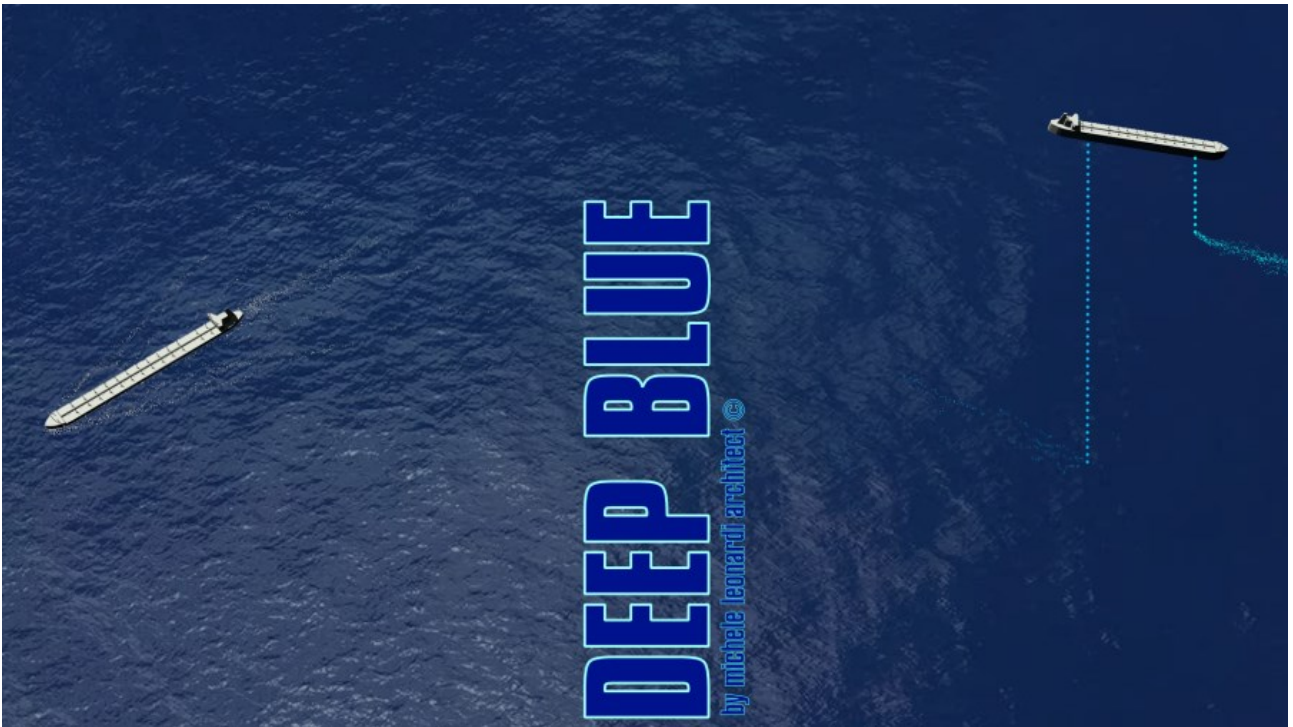
## THE CYCLE

of seawater use for pool supply:

**The seawater is drawn by tank ships off the coast of Los Angeles, in the ocean, away from marine sanctuaries.** The tank ships unload the "used" seawater into the ocean and take the "fresh" seawater.

**Used, yes, but unpolluted** by solvents, detergents or toxic and non-biodegradable substances.

Into the served swimming pools, the evaporated seawater is replaced with other seawater, or in alternative also with fresh water, within a reasonable period of time, i.e. minimizing the use of same fresh water, before being completely removed and replaced with new fresh seawater.



# DEEP BLUE

SEAWATER FOR OVER 200,000 POOLS OF LOS ANGELES

BY MEANS OF A DECENTRALIZED AND MECHANIZED MARINDUCT SYSTEM

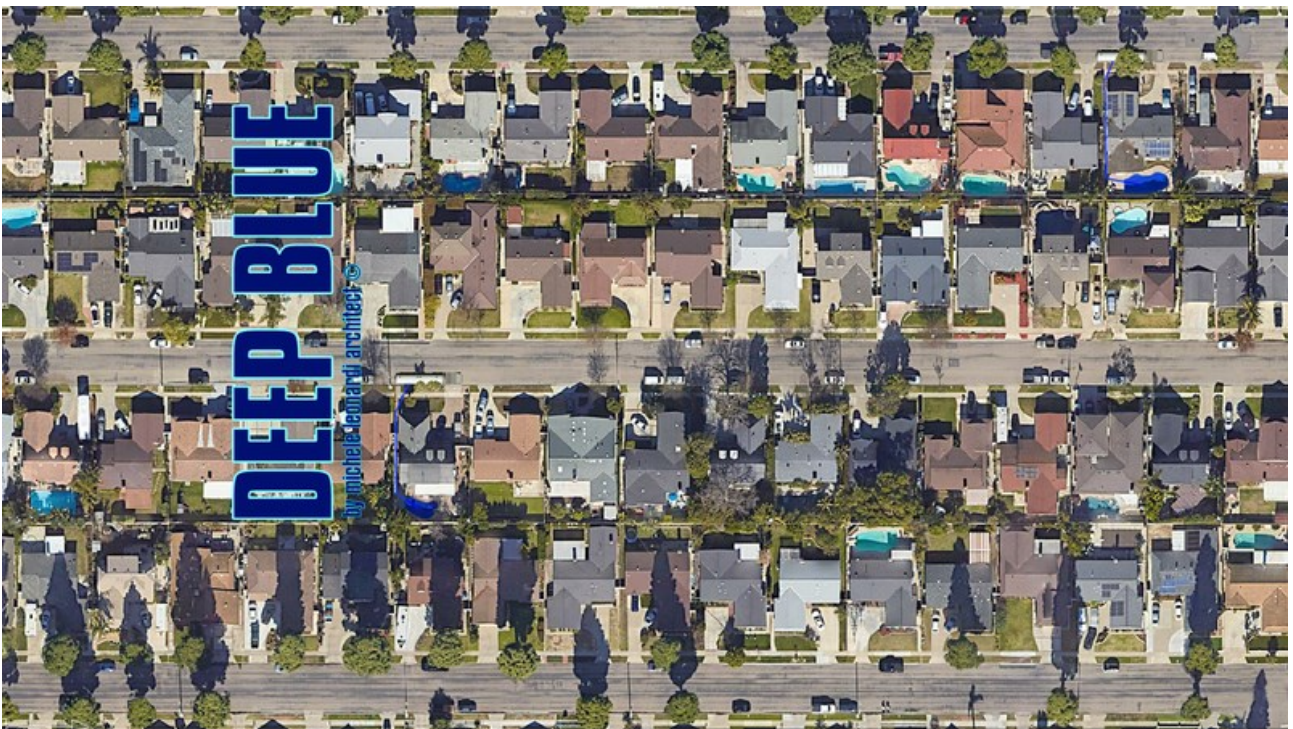
LEVEL ONE - REFUELING BY TANK TRUCKS

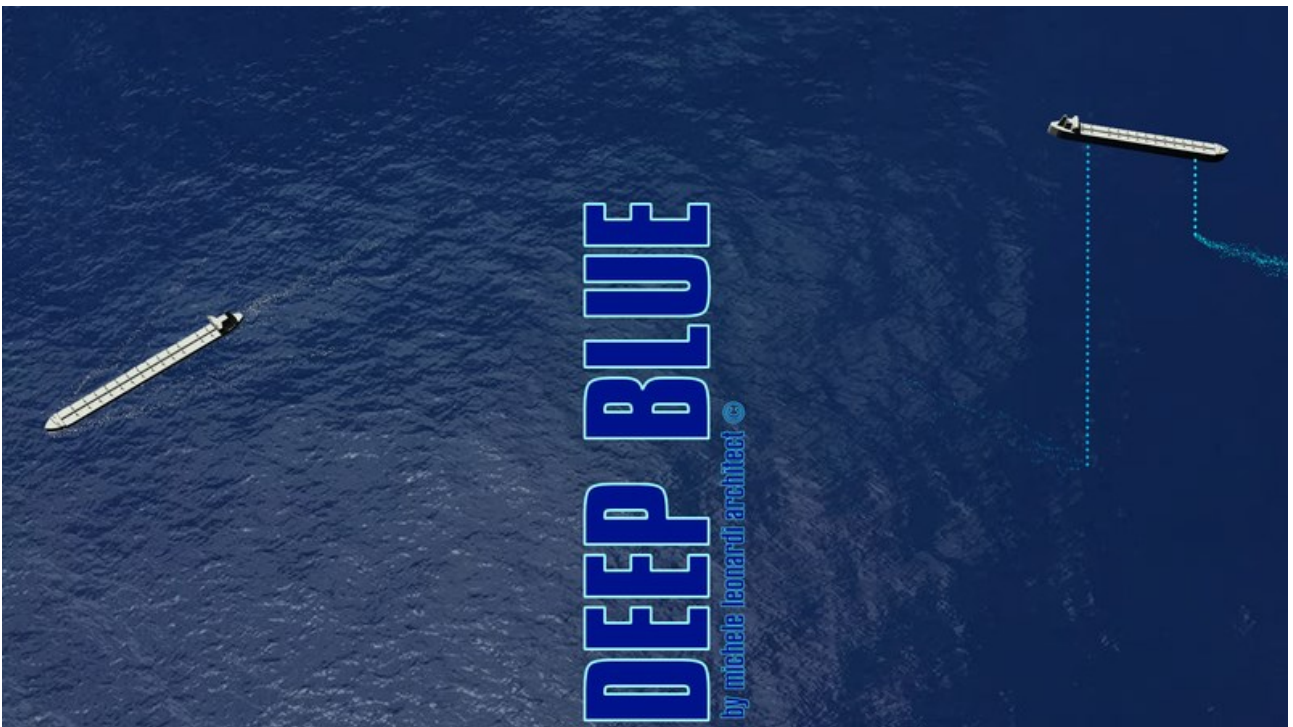
MICHELE LEONARDI ARCHITECT, SEPTEMBER 2022



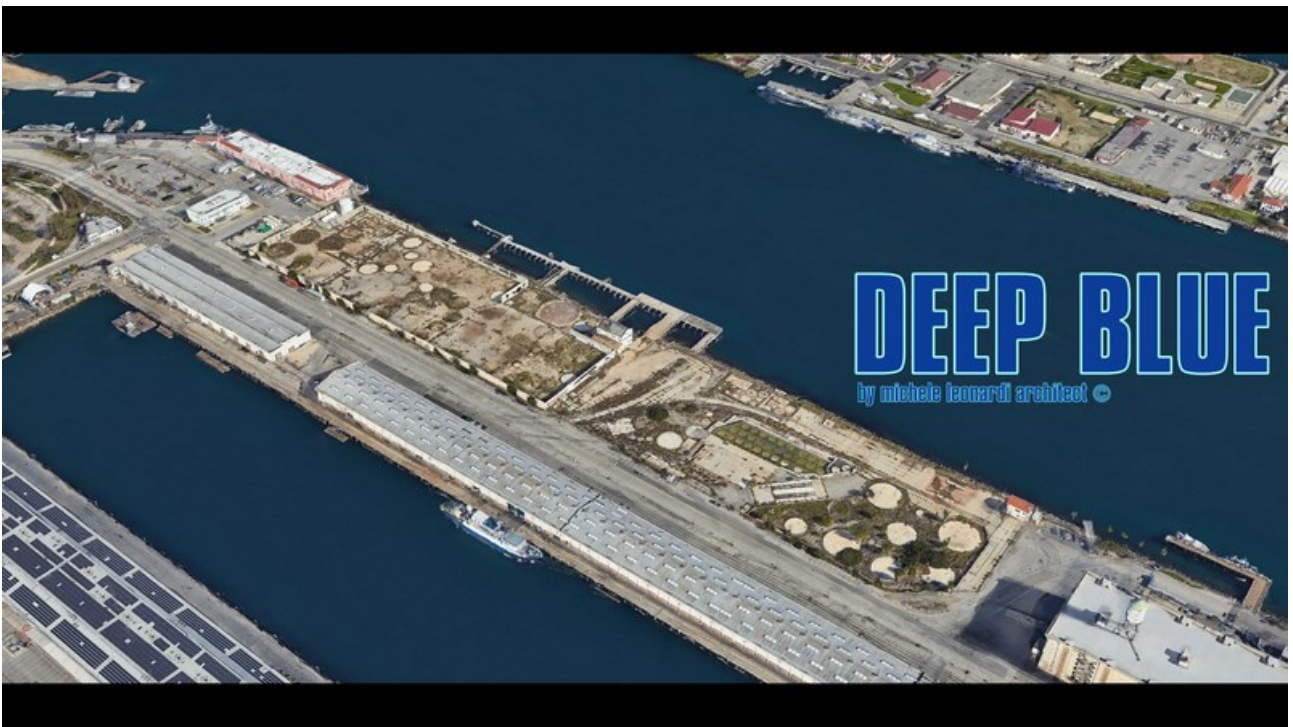


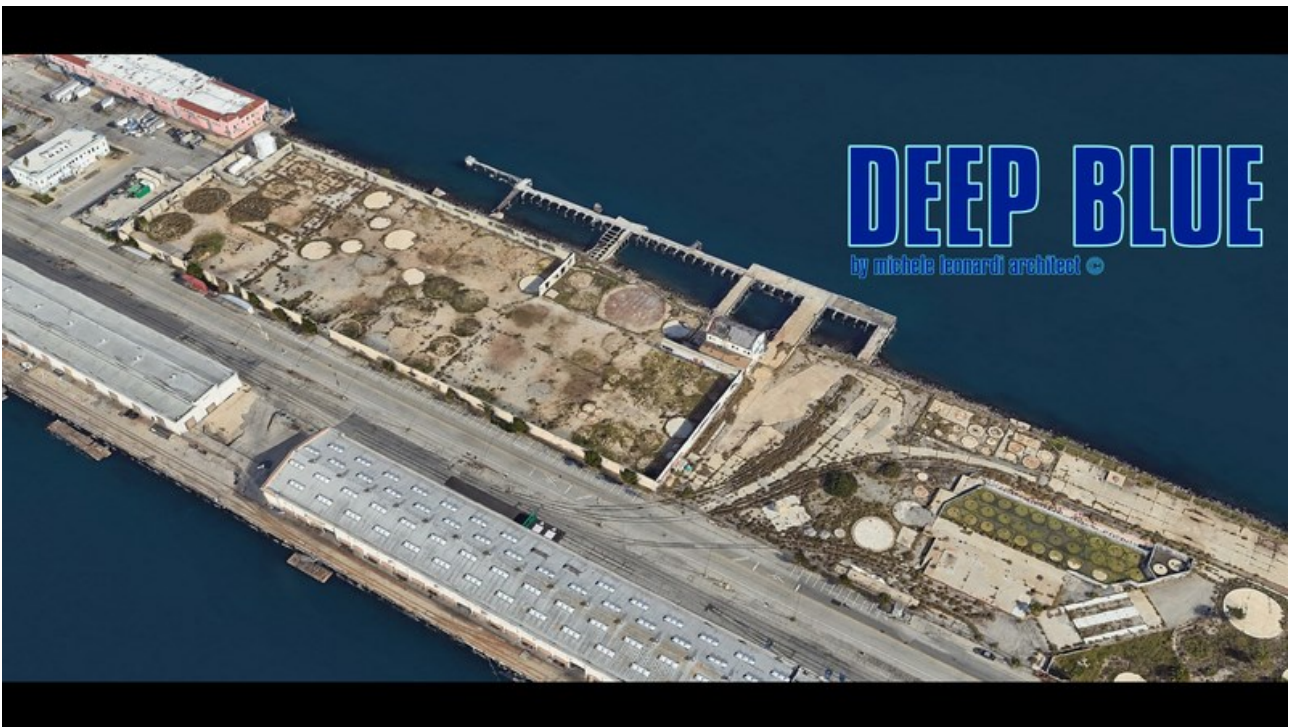














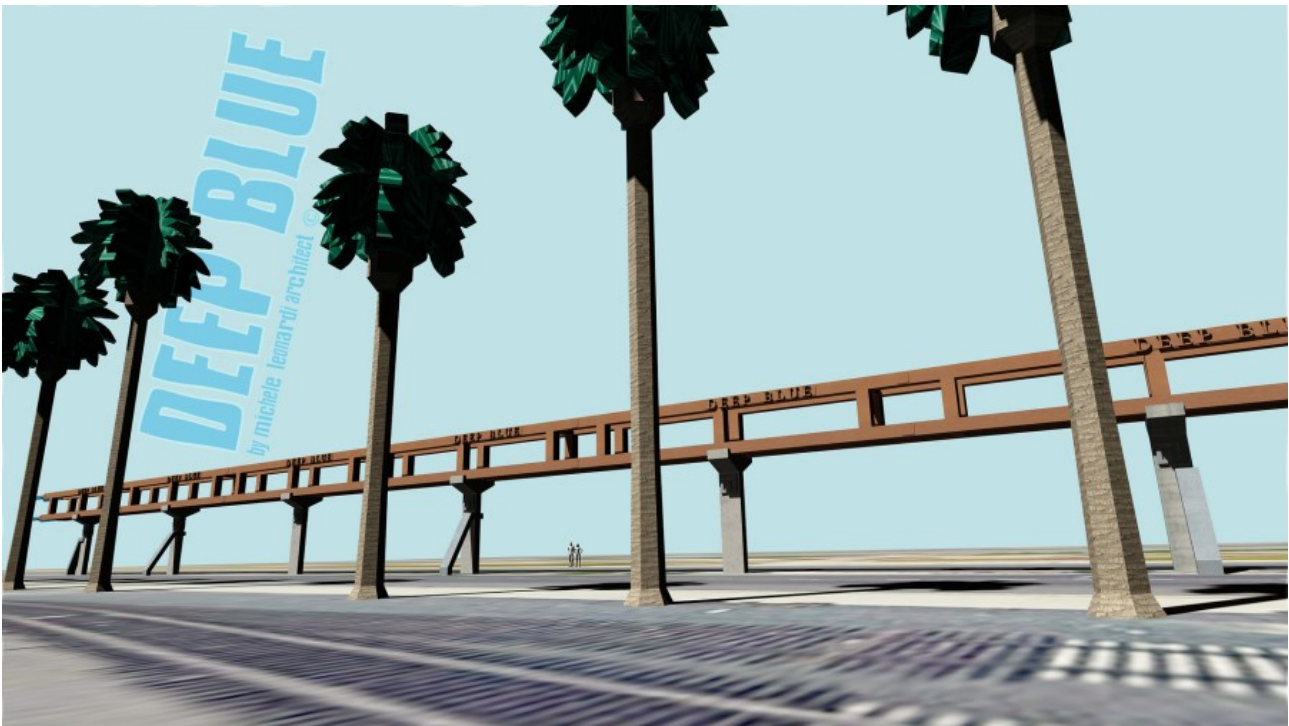


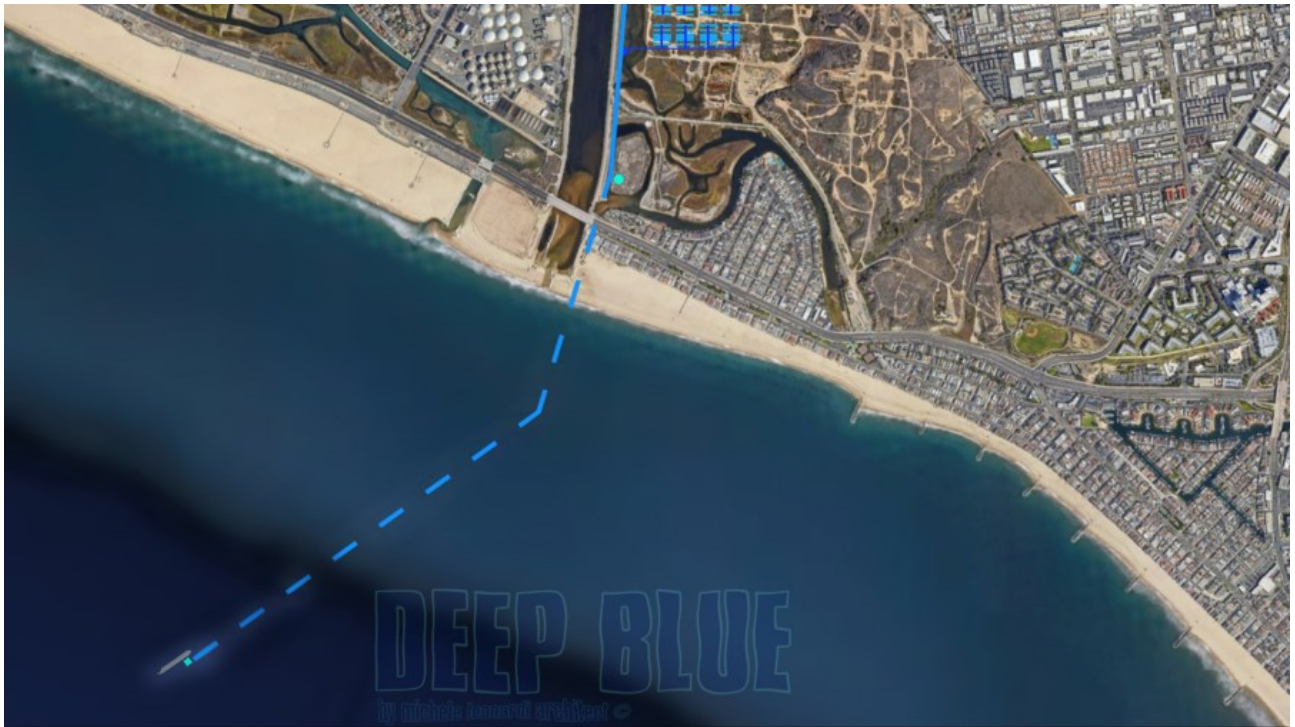
## LEVEL TWO

**Marinducts will be built at various points in Los Angeles, along axes leading to the hinterland.** Along the route of the marinducts, there are in/out cisterns (also underground) for the exchange with the tank trucks; and also at the end of each marinduct. The same is true to small piezometers located where appropriate (and connected to the marinduct system), to lift or pressurize the seawater along the route.

## GUIDELINES

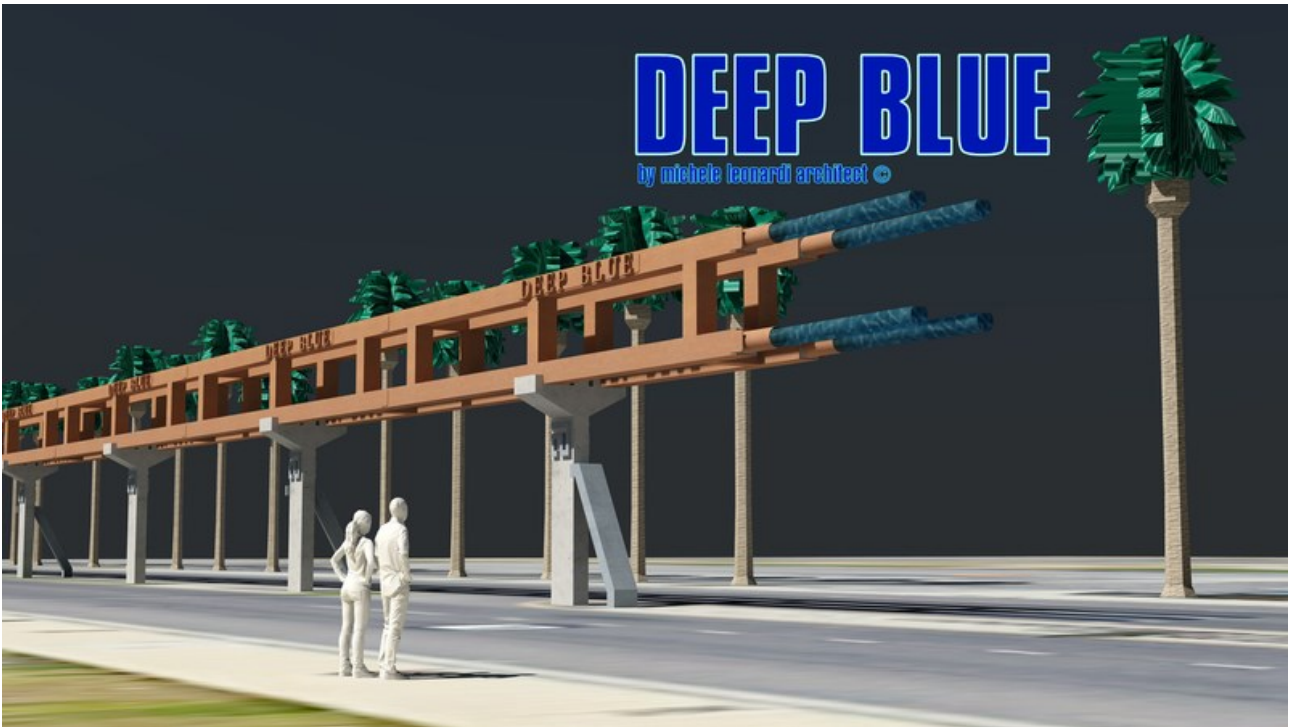
- 1) About the axes of urban penetration of marinduct pipes (above ground) from the coast: By axis we mean a main route, **which does not invade the city with its obsessive presence.** It is not necessarily always a straight line.
- 2) **The environmental impact must be minimal, almost zero, invisible:** along secondary roads, edges of canals, industrial and logistic areas, etc.
- 3) **The final Marinduct network would never be widespread everywhere, door to door.**
- 4) If the decentralized Marinduct network is successful, and after a progression, the final phase it may have underground terminal branches door-to-door distribution routes. But this would be unlikely and also very expensive.
- 5) **Never ever Marinduct pipes (above ground) throughout the city, everywhere.**
- 6) For example: a terminal of a marinduct - that is where tank-trucks refuel with seawater - can be located underground, for example under a parking. And in the meantime the parking lot can be used, because the underground cisterns would be modular, as seen in the project, that is build little by little.
- 7) **The goal is only to reduce the use of fresh water to supply swimming pools** by using the seawater **during the drought.** If the initiative is successful, that is, if all this is pleasing to the people. But if you go from Step 1 to Step 2, it means "Deep Blue" works.

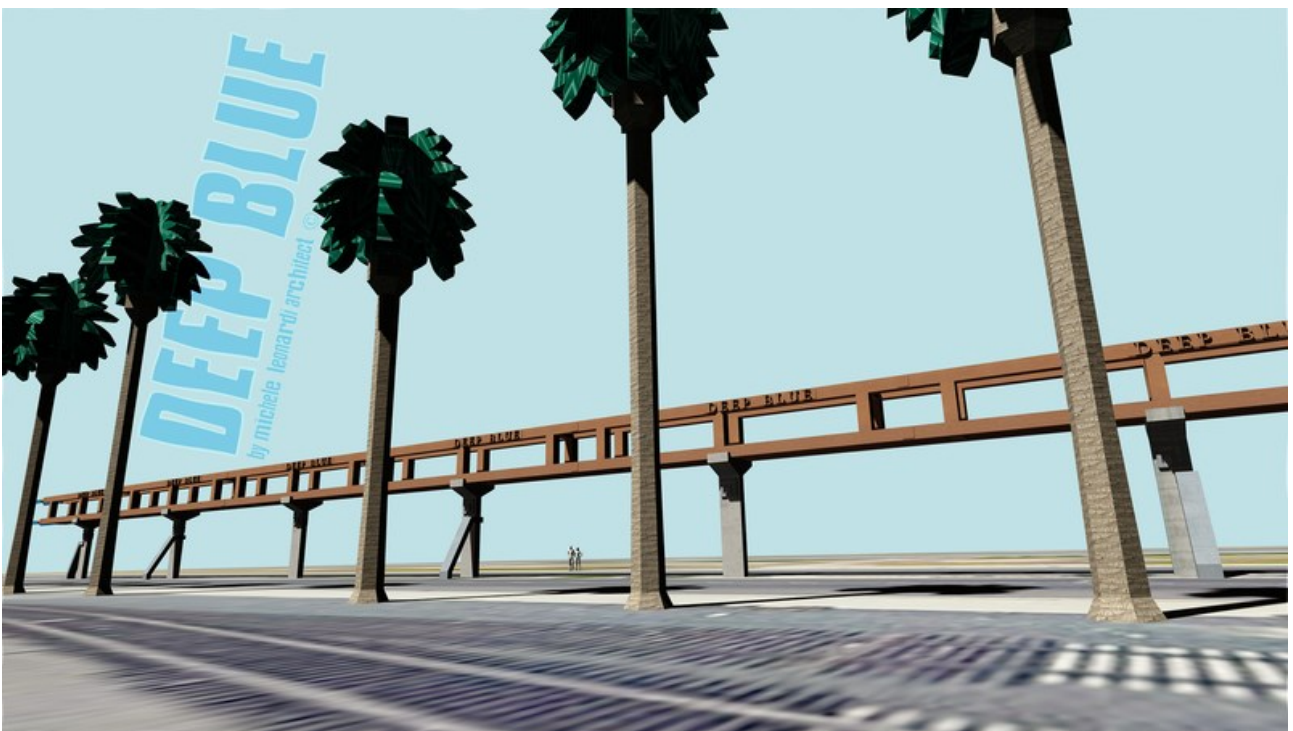




*Long Beach, Los Angeles.*

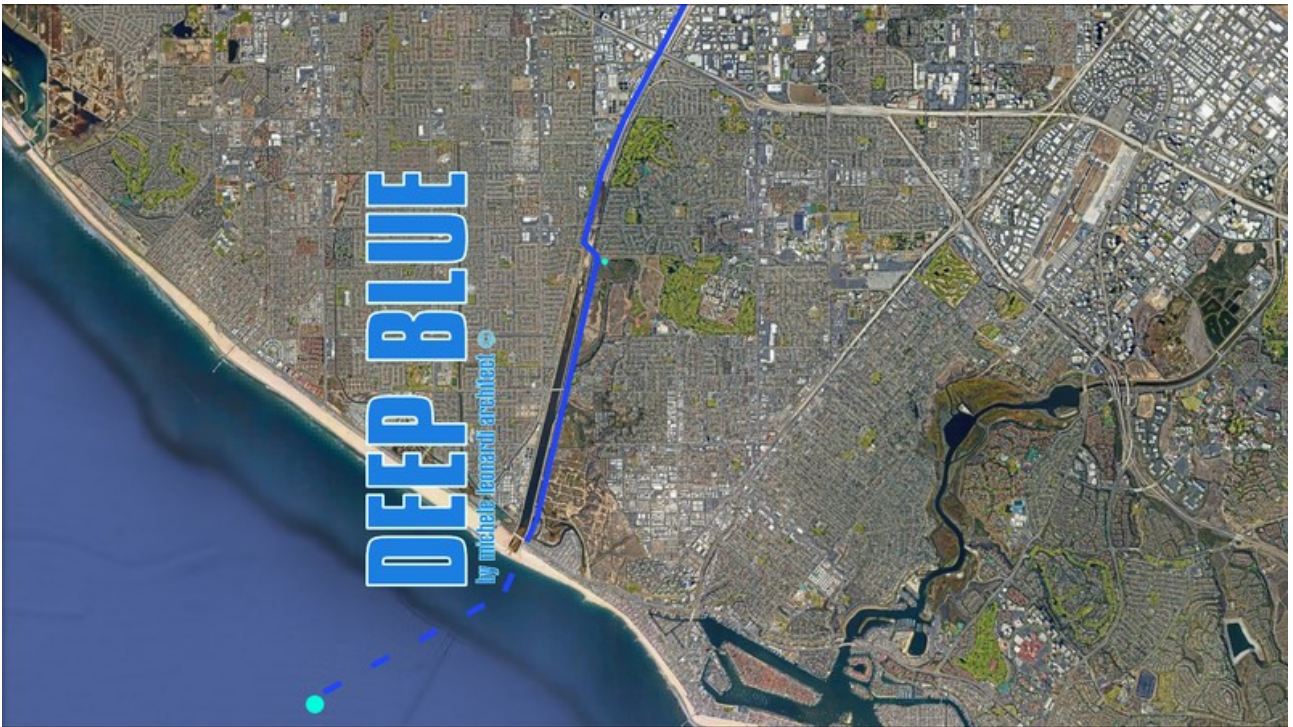












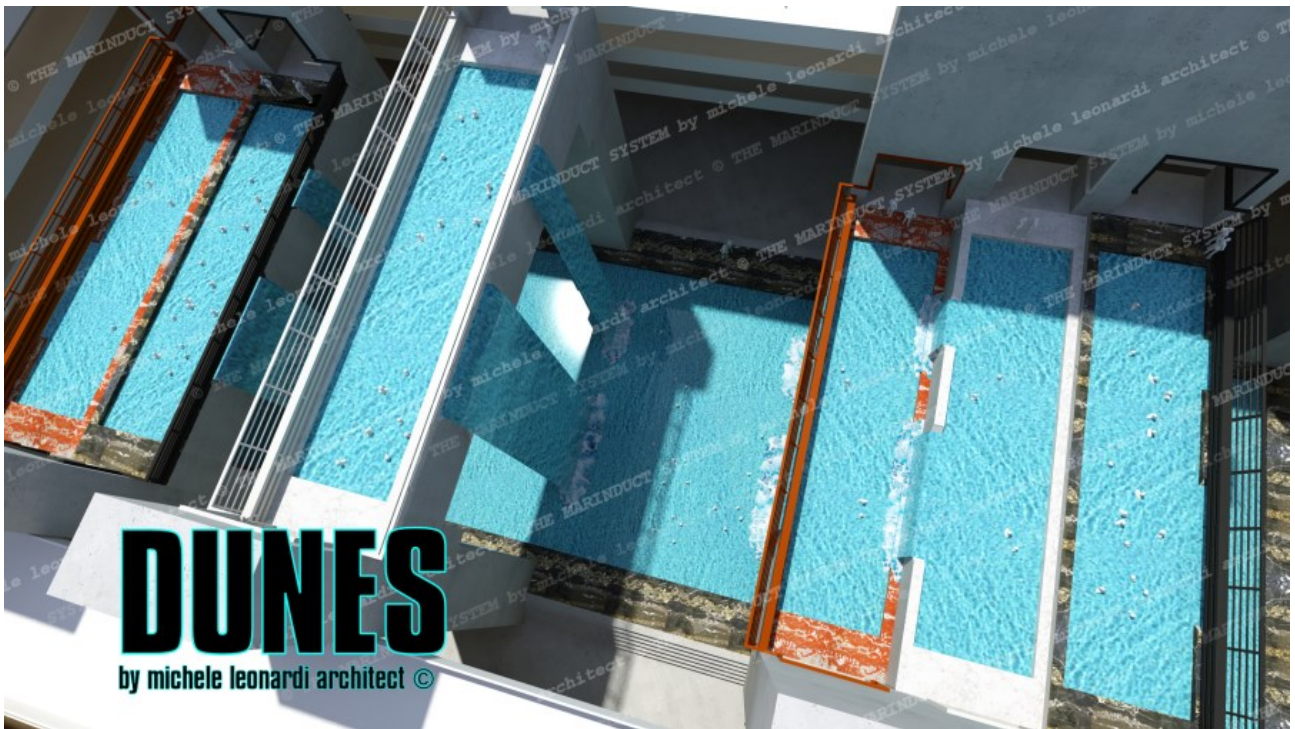


## LEVEL 3

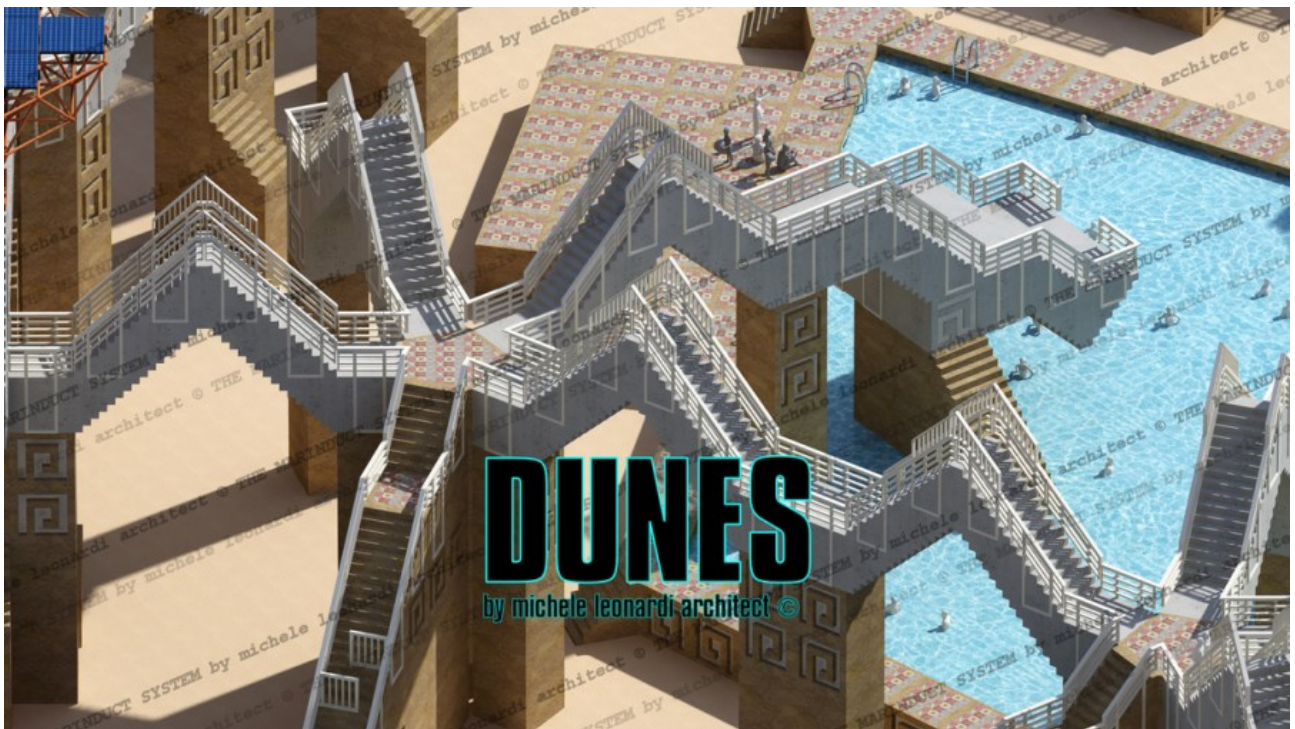
Over time, seawater could also be used for urban firefighting systems, thalassotherapy (spa), and water funs; see for example on the Systemic Habitats website the following projects by architect Michele Leonardi, all based on the use of seawater: [“Stairs in the Water”](#), [“The Roller Coaster of Stairs”](#), [“The Pensile Pools”](#), [“The Great Thermal Baths”](#).



*"Stairs in the Water" by Michele Leonardi architect, a water fun.*



*"The Pensile Pools" by Michele Leonardi architect, sport and water fun.*



*"The Roller Coaster of Stairs", another water fun by Michele Leonardi architect.*

## LEVEL 4

**Construction of an off-shore terminal in the sea and a large axis of several underwater pipelines** (arranged in parallel: not one large pipeline, but several pipelines of the same diameter; system that can be realized by adding in parallel) lying on the seabed, for the direct supply - i.e. without tankships

- of the marinducts network with seawater. With the implementation, tank trucks could be useful one day, except for filling pools of very isolated houses.

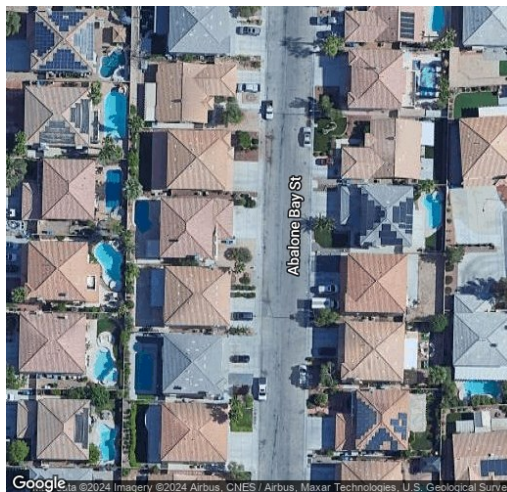


*The Pacific Ocean in front of Los Angeles Coast, California, U.S.A.*

## LEVEL 5

**Implementation of the Marinduct network**, with derivations from Pacific Coast - going up the existing fresh water pathways, aqueducts, open canals, Colorado River, etc. - for transfer in remote places and desalination of seawater by means of solar thermal systems. So: fresh water also for agricultural use. **In final, eventually the Marinducts could also reach Las Vegas and Phoenix.** Here the natural seawater can be used as it is or desalted.

Also in this case the evaporated seawater of served pools is replaced with other seawater, or in alternative also with fresh water, within a reasonable time frame, i.e. minimizing the use of same fresh water, before being completely removed and replaced with new fresh seawater.



*Swimming pools in Las Vegas, Nevada, U.S.A.*



*The Vanishing River: USA's Mega Drought.*



*Swimming pools in Phoenix, Arizona, U.S.A.*



*Geography of Southwestern United States (all maps by Google Earth Pro).*

*There are three big "horizontal" cities, unique in the world, each with over 200,000 swimming pools: Los Angeles, Las Vegas and Phoenix. These "habitat-cities" have enormous potential for implementing quality of life, through a minimal (i.e. "soft") urban renewal, existing culture and natural beauties famous all over the world: architecture, cinema, music, art, literature, fiction, ocean, deserts, national parks, landscapes, mass shows.*

## A QUESTION

**Why not desalinate the seawater and put it in the water supply network?**

In principle, yes, but the costs will probably be higher. And above all: sea water has different properties that fresh water does not have. In short, seawater could be perfect for swimming pools, sport, water funs and spa, if this life is not just a Valley of Tears.

## LOGISTIC

All other technical specifications, logistics, static and dynamic process etc., are reserved **and not reported here**, intellectual property of Michele Leonardi architect.

## THE ECONOMIC

viability of seawater supply for swimming pools:

Of course if there is no economic return, i.e. a minimum of substantial profit from the entire operation, both in the initial phase and in the subsequent ones, the solution to the problem of how to fill pools with water during the drought emergency is very simple and obvious: **any swimming pool will not be damaged if it remains dry during the drought**, even if a pool without water is sad. The pool can also be converted into a fire-fighting water tank, equipped with a fire hydrant. It is possible that the people who can spend a lot, they will bring fresh water even from Alaska, if necessary. What else? A quote cannot be missing:

*"Water, water, every where,  
And all the boards did shrink;  
Water, water, every where,  
Nor any drop to drink."*

*From "The Rime of the Ancient Mariner,"  
originally published on the "Lyrical Ballads", in 1798,  
by Samuel Taylor Coleridge (1772-1834).*

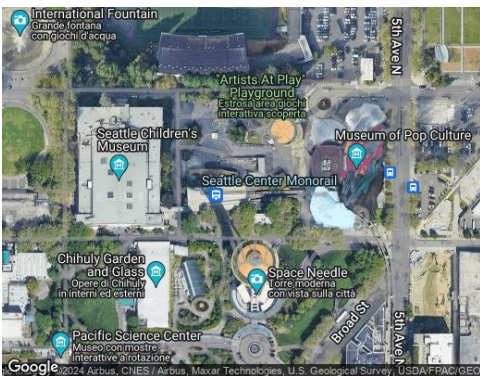
M.L.

# MONORAILS

## PUBLIC TRANSPORT SYSTEM

*The Seattle Center Monorail,  
Washington, U.S.A., 1962*

More info on Wikipedia: [Seattle Center Monorail](#), Seattle, WA, U.S.A.





## *The London Heathrow ULTra Pods, United Kingdom, 2011*

More info on Wikipedia: [ULTra at Heathrow Airport](#), Greater London.



## *The Dortmund University H-Bahn Monorail System, Germany, 1984*

More info on Wikipedia: [H-Bahn in Dortmund](#).



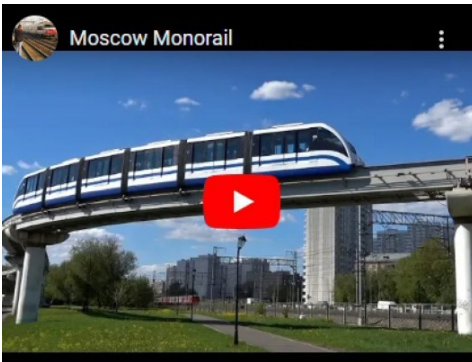
## *Lille VAL- Véhicule Automatique Léger, France, 1983*

Type: "Authomatic Light Vehicle" on tires by Mantra industrial conglomerate, later acquired by Siemens. System: [Lille Metro](#).



## *The Moscow Monorail Road, Russia, 2004*

Type: *Straddle-beam Monorail*. System: **Moscow Metro**. Stations: 6. Daily ridership 16,000. Operating speed: 60 km/h. Line length: 4.7 kilometres. Opened: 20 November 2004 (excursion mode); 1 January 2008 (transportation mode). More info on Wikipedia: **Moscow Monorail**.



## *The China's First Suspension Railway, China*



## *The Chongqing Monorail Line 3, China*



## *China unveils its fastest monorail, China*



## *The Shonan Monorail in Kanagawa Prefecture, Japan*

More info on Wikipedia: [Shonan Monorail in Kanagawa Prefecture](#).



## *The Hiroshima Sky Rail Service, Japan*

More info on Wikipedia: [Skyrail Midorizaka Line](#).



## *The Shōnan Monorail, Kanagawa Prefecture, Japan*



## *The functional test of the first Chinese suspended train, China*



## *Four New Stations of Line 15 - Silver Monorail, São Paulo Metro, Brazil*



## *See what the Line 18-Bronze Monorail will look like, São Paulo Metro, Brazil*



## *Japan high speed monorail: The Osaka Monorail, Japan*

*Transit type: straddle-beam Monorail. Number of lines: 2. Number of stations: 18. Daily ridership: 131,479 daily boardings (2017). Began operation: 1990. System length: 28.0 km. Minimum radius of curvature: 100 meters. Electrification: 1,500 V DC. Top speed: 75 km/h. More info on Wikipedia: [The Osaka Monorail](#).*



## *The Monorail System in Kuala Lumpur, Malaysia*



## *Tokyo Monorail Express Trains, Japan*

More info on Wikipedia: [Tokyo Monorail](#).



*SkyRail: BYD's Silver Bullet for Urban Congestion,  
Huawei Technologies Co. Ltd., Guangdong,  
China*



*Bus on concrete binaries,  
Australia*



# The Bus Rapid Transit System of Curitiba

1974

## AN URBAN AND TERRITORIAL TRANSPORT SYSTEM

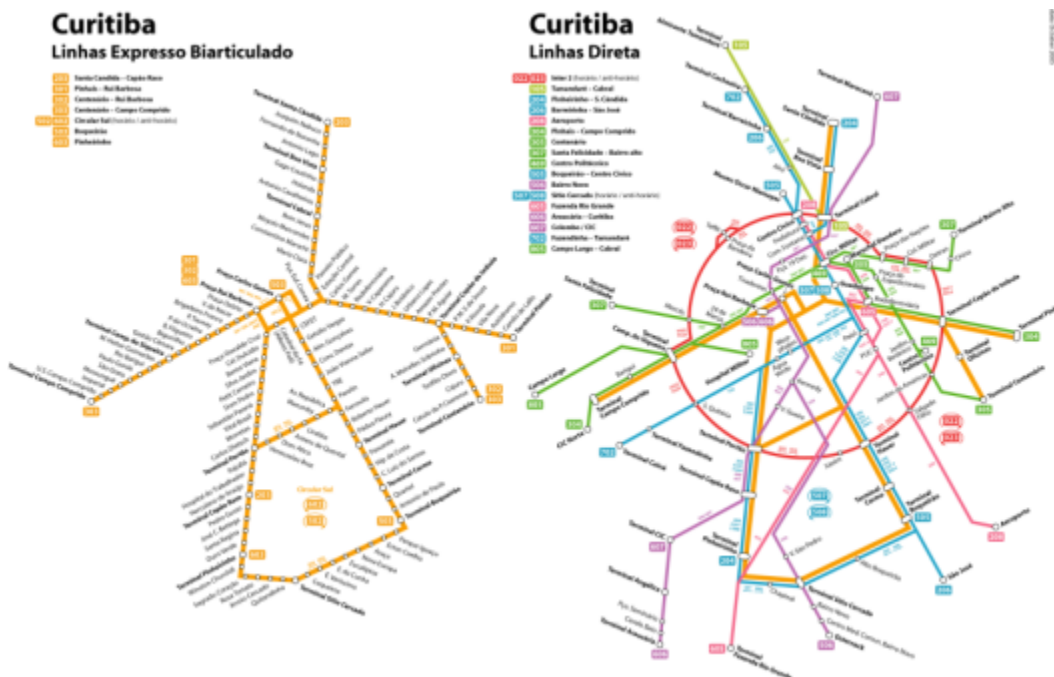
*The urban planning in Curitiba, Brazil, and in particular its transport system, it represents how doing a lot with a little. When 1 plus 1 does not simply do 2, but 3, 4, etc. The solutions adopted by urban planners of Curitiba indicate a method, a criterion. In fact, the example of Curitiba is not automatically replicable anywhere, in any metropolis.*

*The key features of the Curitiba's Overground Metro,  
a "low cost" metro system:*

- *3 types of lines: extra-urban lines of articulated buses with 3 segments, and with few stops; urban lines for the two segment buses; local lines for the standard buses.*
- *Preferential lanes only for all public buses in the main streets.*
- ***Raised platforms for the bus stop.** In this way the bus does not waste time with the ascent and descent of passengers. In addition, the passenger validates the ticket entering into the bus-stop platform space. In other words **each bus stop is a mini-station of an overground metro.***
- *Compared to costs of an underground subway, this "overground metro" is low cost. Alternatively you can use trams rather than buses.*
- *Benefits: silence, quiet, no noise from vehicular traffic; no smog, no fine particle pollution. More space for our feet, more physical and mental health.*
- *Negative effects: zero. No pollution in the main streets as it happens in the ordinary metropolis, full of fine powders present in suspension in the air.*



## The Rapid Transit Bus of Curitiba, Brazil



The Curitiba Public Transport maps. Source: Wikipedia, "**Rede Integrada de Transporte**" in Curitiba, Brazil. Transit type: Bus Rapid Transit. Number of special lines: 6. Number of terminal station: 21. Daily ridership: 2,300,000 per day. Began operation: 1974.

## *The Curitiba Public Bus Transit System, Brazil*



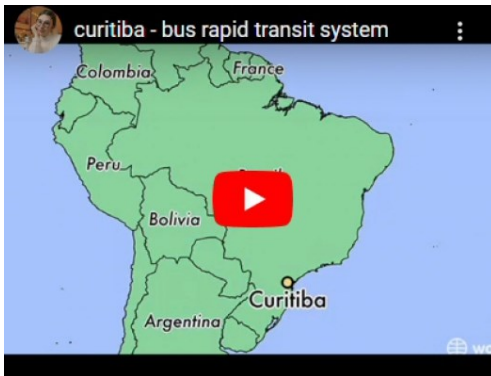
## *Curitiba BRT, Brazil*



## *Cities in Focus: Curitiba, Brazil*



## Curitiba: The Bus Rapid Transit System, Brazil



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*From Wikipedia, etc.:*

- **Bus rapid transit**;
- **Rede Integrada de Transporte** (Curitiba, Brazil, 1974); **URBS-RIT**;
- **Transitway** (Ottawa, Canada, 1983);
- **TransJakarta** (Jakarta, Indonesia, 2004),
- **List of bus rapid transit systems**;
- **List of bus rapid transit systems in the Americas**.

# The next flying car revolution

*The transport revolution by flying cars incoming.*



*That's incredible... It looks like a scene from the movie  
"The Return of the Jedi", 1983 ! But after 40 years it is reality !*



*After focusing on luxury cars and electric cars, in a few years the big car manufacturers will wake up and flying cars will become the rule all over the world.*

*So it is useless to continue building new highways and huge bridges for cars only, because in a few decades they will be used only by trucks and for railways. But maybe those will disappear as well, due to multiple modular "bee swarm" deliveries by drones.*

*It is easy predictable that in a short time the streets will be frequented only by some vintage cars, motorcycles, pedestrians, bicycles, and tram lines or monorails for transporting elderly, families with children, groups, tourists, guests. In this way, new spaces for the social will be freed up. Provided that pedestrian paths are once again separated from mechanized ones. In fact, no one wants to walk with the risk of being hit by idiots who run on mechanized vehicles of any kind, from bicycles to motorized scooters. At the very least, the speed of these vehicles, dangerous for pedestrians, should be absolutely mechanically limited. In any case, it would not be a problem to create protected pedestrian areas for pedestrians along the roads freed from the large volumes of vehicular traffic, which will pour into heaven. It is also foreseeable that until very high safety standards are achieved, the routes of the flying cars will follow those of the roads and they will be nothing more*

than a few meters above the roads. In fact, in the event of an accident, one thing is a flying car that falls on the asphalt, another is a flying car that falls on a house. In terms of risk to human lives and financial compensation, there is no comparison.

Certainly, **at peak times mechanized transport will remain higher than individual transport:** in a line of cars there are a few dozen people inside, while in a line of railway carriages there are hundreds of people. With the same space occupied during its movement, **a train is dozens, hundreds of times more efficient than individual transport** like any car, today, or like the flying car, tomorrow. All things anticipated in the twentieth century by science fiction literature and films. Modern culture.

The excess of people mobility, and the consequent vehicular traffic, is not reduced simply by flying cars. Only architecture and urban planning can offer human-scale solutions for improving the quality of life. I talk about all these things in my e-book in Italian available for free since 2012 on this site, **now also in English.**

M.L.



**"BLADE RUNNER" and his futuristic flying cars:** starring Harrison Ford, Rutger Hauer, Sean Young, Joe Turkel, Daryl Hannah, Brion James, Joanna Cassidy, William Sanderson, Edward James Olmos, M. Emmet Walsh, James Hong, Morgan Paull. Music by Vangelis. **Directed by Ridley Scott, 1982.**

# Urban Renewal of Modern Cities

FOR AN URBAN RENEWAL  
BEYOND ANY FORMALISM:

*form follow function,  
and form-function does not chase anyone.*

## THE URBAN

renewal of modern cities it passes through the recovery of the human dimension in the cities: free outdoor spaces for meeting, exclusive pedestrian paths different from those of urban mobility, public cultural spaces, spaces for sport and leisure: museums, concert halls, urban parks, etc.

In the future, the simply replacing cars with flying cars will change nothing in terms of vehicular congestion or improving the quality of life in the cities and megalopolis. The day flying machines finally become established, anyone can easily imagine that traffic and congestion will simply move from the current roads on the ground to future main routes in the sky.

Therefore today and tomorrow, the mechanized public transport systems will remain the best way to move a large number of people, i.e. with: trains, rapid transit, people movers, monorails, trams, underground subways, bus, etc., and integrating all these transport systems with each other, when they are present simultaneously in a city.

## SO WHERE IS THE NEW?

All this is nothing new, and in cities all over the world solutions of all kinds have already been implemented, which go in this direction: to try to make modern cities more on a human scale.

## THE NEW IS

never losing sight of the ultimate goal: the human beings and a better quality of life. This is what the Meghiddo Architects and Peter Calthorpe Architect say through their proposals for urban renewal:

*"An Urban Corridor Matrix:  
An Alternative Way of Conceiving Mixed-Use Development",  
by Meghiddo Architects*



*"Seven principles for building better cities"  
by Peter Calthorpe Architect*



## BIBLIOGRAPHY

- Michele Leonardi: **Toward a Different Habitat**, Translated in 2023 in English by the Author; SIAE Rome, Italy, 2012.
- Frank Lloyd Wright: **"The Disappearing City"**, 90 pp., William Farquhar Payson, New York, NY, USA, 1932.
- The Worldwatch Institute: **"State of the World 2007: Our Urban Future"**, The Worldwatch Institute, N.Y., NY USA, 2008.



In 2008, half of the Earth's population will live in urban areas, marking the first time in history that humans are an urban species. *State of the World 2007: Our Urban Future* examines changes in the ways cities are managed, built, and lived in that could tip the balance towards a healthier and more peaceful urban future.

- **David Harvey: "The Urban Experience", 312 pp., Johns Hopkins University Press, Baltimore, Maryland, USA, 1989.**

This book makes available to undergraduates the author's recent writing (including a new essay on flexible accumulation and the city of spectacle) on the physical and social environment of western cities, in which he explores the links between the processes and pressures of urbanization, the culture of urban life - in effect the culture of the west - and the nature of capitalism in the post-industrial world. The collection contains three of the five essays from "Consciousness and the Urban Experience" and four of the eight from "The Urbanization of Capital". The essays embody the combination of theory, observation and interpretation most characteristic of the author's recent work, and address the needs and interests of students of urban processes in departments of geography, sociology and politics. The book is aimed at students of urbanization and urban society in departments of geography, sociology and politics.

- **Kevin Lynch: "Good City Form", The M.I.T. Press, Cambridge, Massachusetts, USA, 1984.**

Lynch looks at connections between human values and the physical forms of cities, sets requirements for a normative theory of city form, reviews earlier physical images of what utopian communities might be, sees what is to be learned from hellish images, and helps us place city forms into one or another of three theoretic constructs; cosmic or ceremonial centers, the machine city, and the city as an organism.

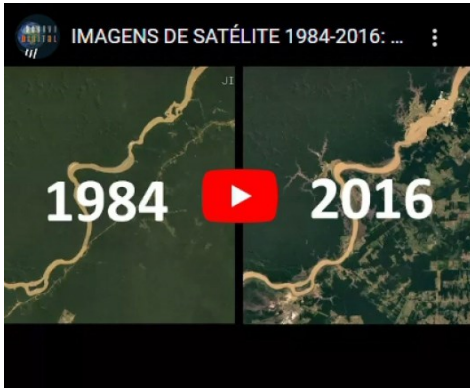
- **Zygmunt Bauman: "Wasted lives. Modernity and its Outcasts", Polity Press, Cambridge, United Kingdom, 2004.**

The production of 'human waste' - or more precisely, wasted lives, the 'superfluous' populations of migrants, refugees and other outcasts - is an inevitable outcome of modernization.

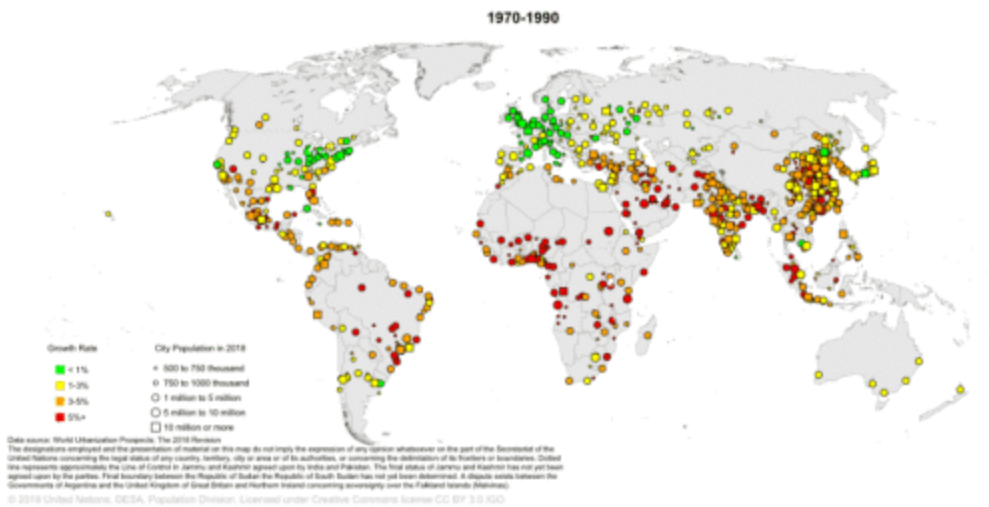
It is an unavoidable side-effect of economic progress and the quest for order which is characteristic of modernity. As long as large parts of the world remained wholly or partly unaffected by modernization, they were treated by modernizing societies as lands that were able to absorb the excess of population in the 'developed countries'. Global solutions were sought, and temporarily found, to locally produced overpopulation problems. But as modernization has reached the furthest lands of the planet, 'redundant population' is produced everywhere and all localities have to bear the consequences of modernity's global triumph. They are now confronted with the need to seek - in vain, it seems - local solutions to globally produced problems. The global spread of the modernity has given rise to growing quantities of human beings who are deprived of adequate means of survival, but the planet is fast running out of places to put them. Hence the new anxieties about 'immigrants' and 'asylum seekers' and the growing role played by diffuse 'security fears' on the contemporary political agenda.

With characteristic brilliance, this new book by Zygmunt Bauman unravels the impact of this transformation on our contemporary culture and politics and shows that the problem of coping with 'human waste' provides a key for understanding some otherwise baffling features of our shared life, from the strategies of global domination to the most intimate aspects of human relationships.

## Satellite imagery 1984-2016: 32 years of changes on Earth

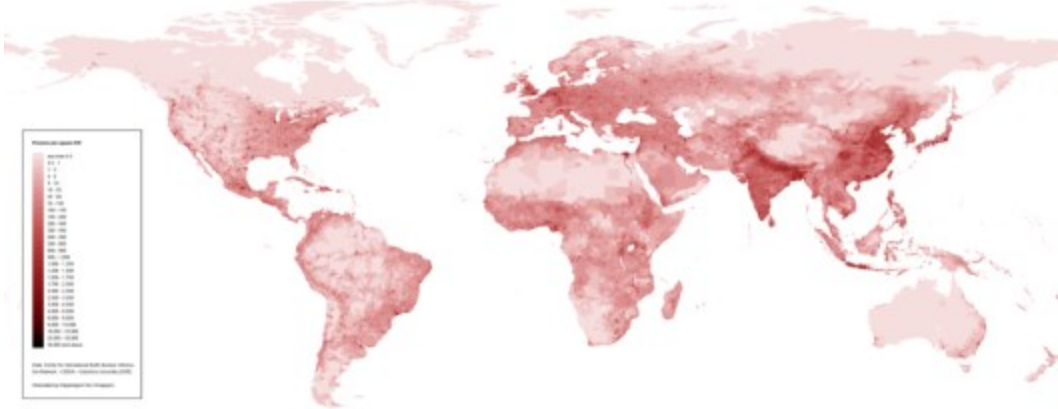


## Urbanization Prospects 2018: Growth rates of urban agglomerations by size class:



Data source: © 2018 **United Nations, DESA, Population Division.**  
Licensed under Creative Commons license CC BY 3.0 IGO.

## World human population density map, 2005:



[World human population density map2005.p\[...\]](#)

Formato immagine portable network [1.9 MB]



[World human population density map2005.p\[...\]](#)

Documento Adobe Acrobat [2.3 MB]

Data source: [Wikipedia](#), courtesy by *CIESIN-Columbia University, U.S.A, 2005*.  
Creative Commons license CC 1.0 Universal Public Domain Dedication.

## Human Population Through Time

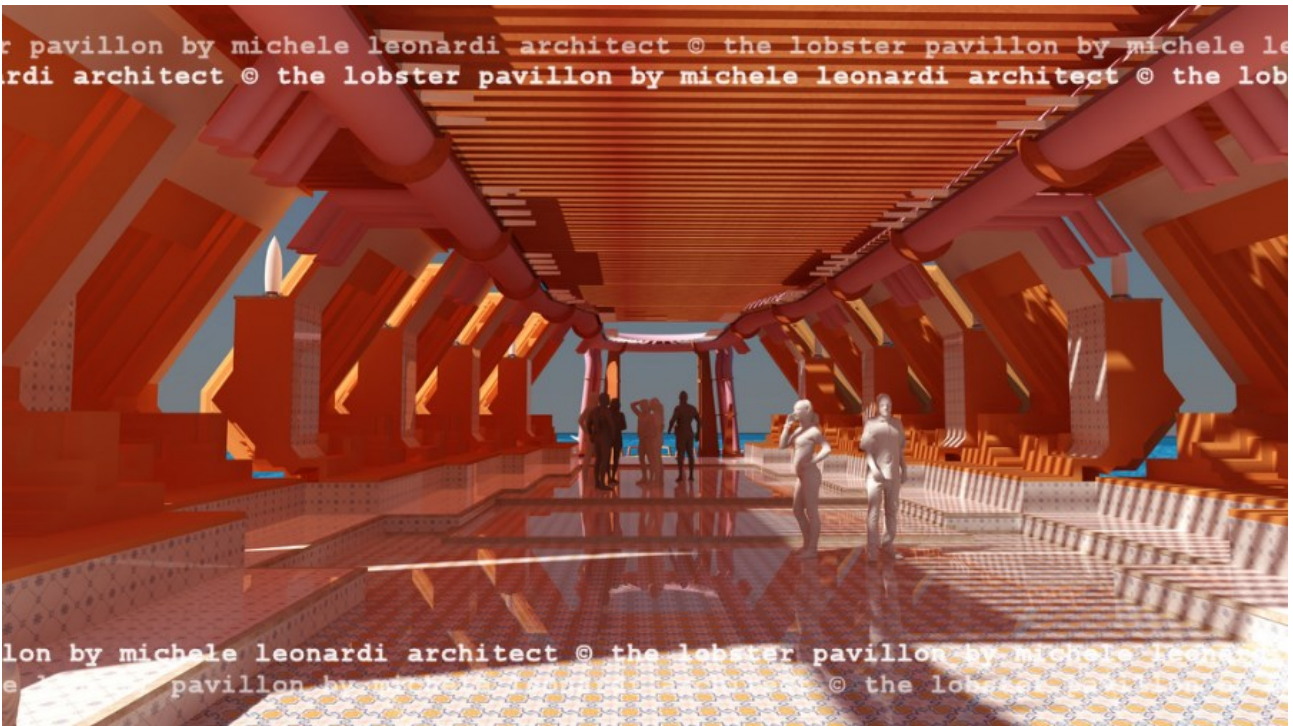


# The Lobster Pavilion

or

*How to turn a generic overbuilt beach into  
something good for Human Beings*

*by Michele Leonardi architect © June 2016*



***The Lobster Pavilion***  
*restaurant - piano bar - ice cream - dancing*



# The Lobster Pavilion

can be used in water and even on the beach, during the summer swimming season. In water, docked in a port or in a river. This pavillon boat is composed of two hulls, such as a catamaran. In a hull is the kitchen of the restaurant. In the other hull technological systems, the larder, the cold room, services. For the displacement the *Lobster Pavilion* it is towed by one tugboats. Of course It can even be motorized and all the rest.

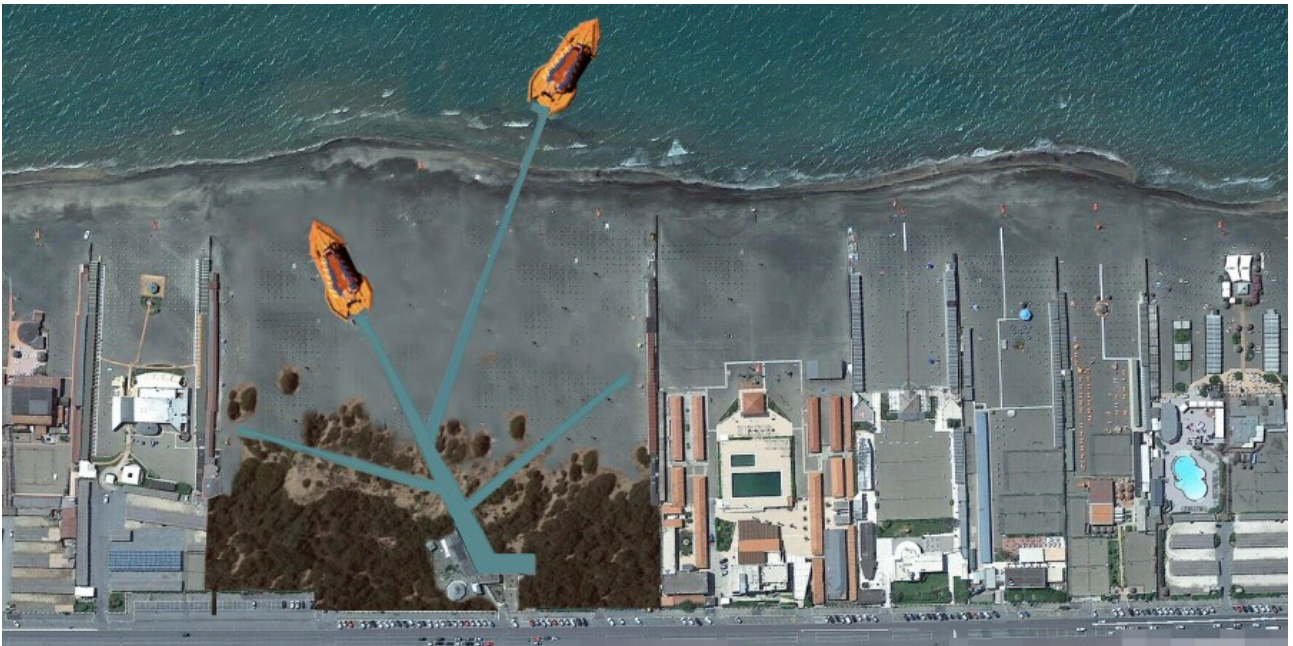
See the next page for *the Lobster Pavilion on the beach*.

M.L.





1



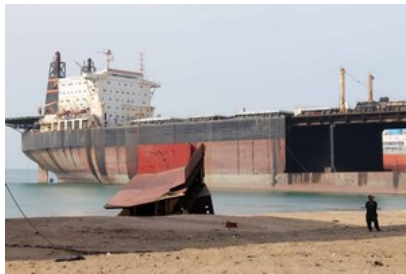
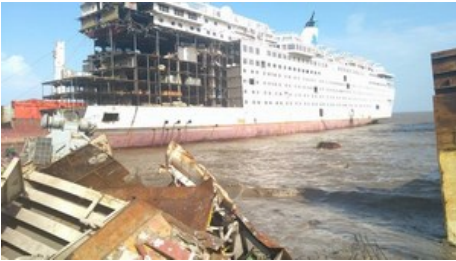
*The evolution of Lobster Pavilion system © by Michele Leonardi architect :  
after **the first step** the overbuilt has disappeared.  
The space for human beings is reborn. And now that makes sense.*

2



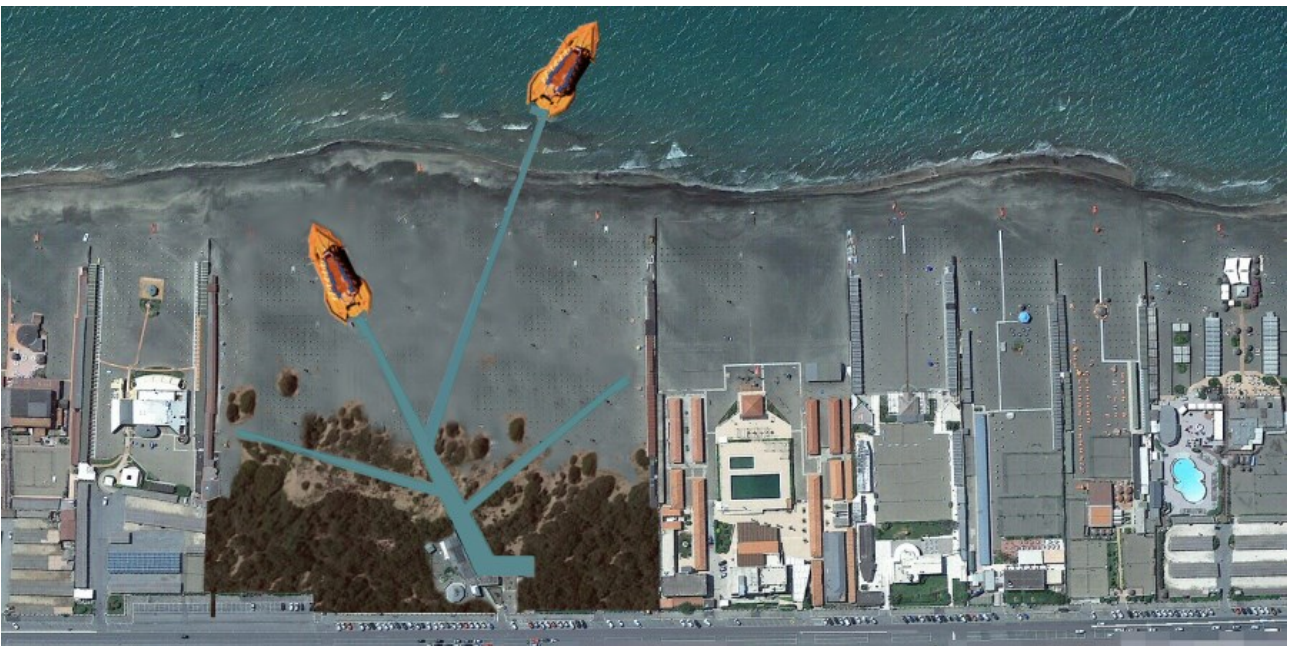
*The evolution of Lobster Pavilion system © by Michele Leonardi architect :  
**the final step**, with the large disused ships brought ashore and  
transformed into local car parking and concentrated services.*







*The shipowners pay good to demolish their old big ships. Instead, some old ships could be reused to create bathing services, exhibition spaces, dance halls, raised restaurants, indoor and outdoor pools, internal car parks, etc.*



***The Aragosta is located on the beach during the summer,  
and in the port during the winter season.***











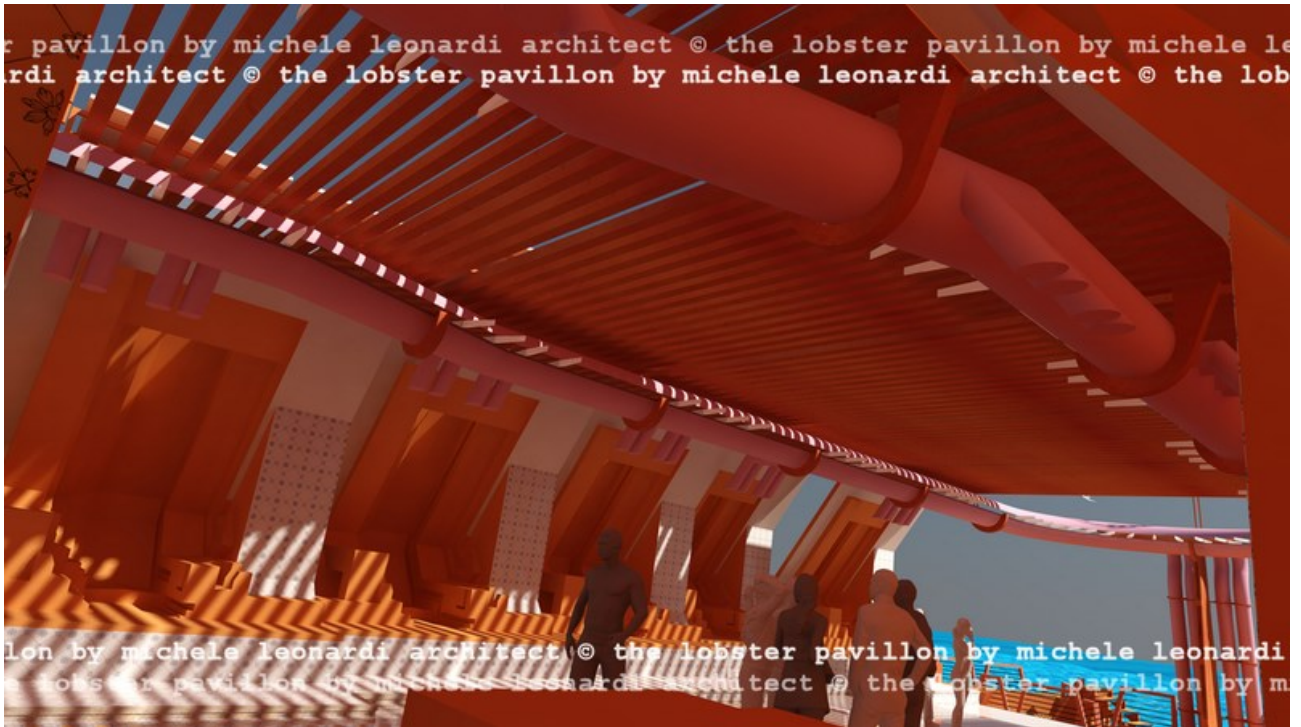


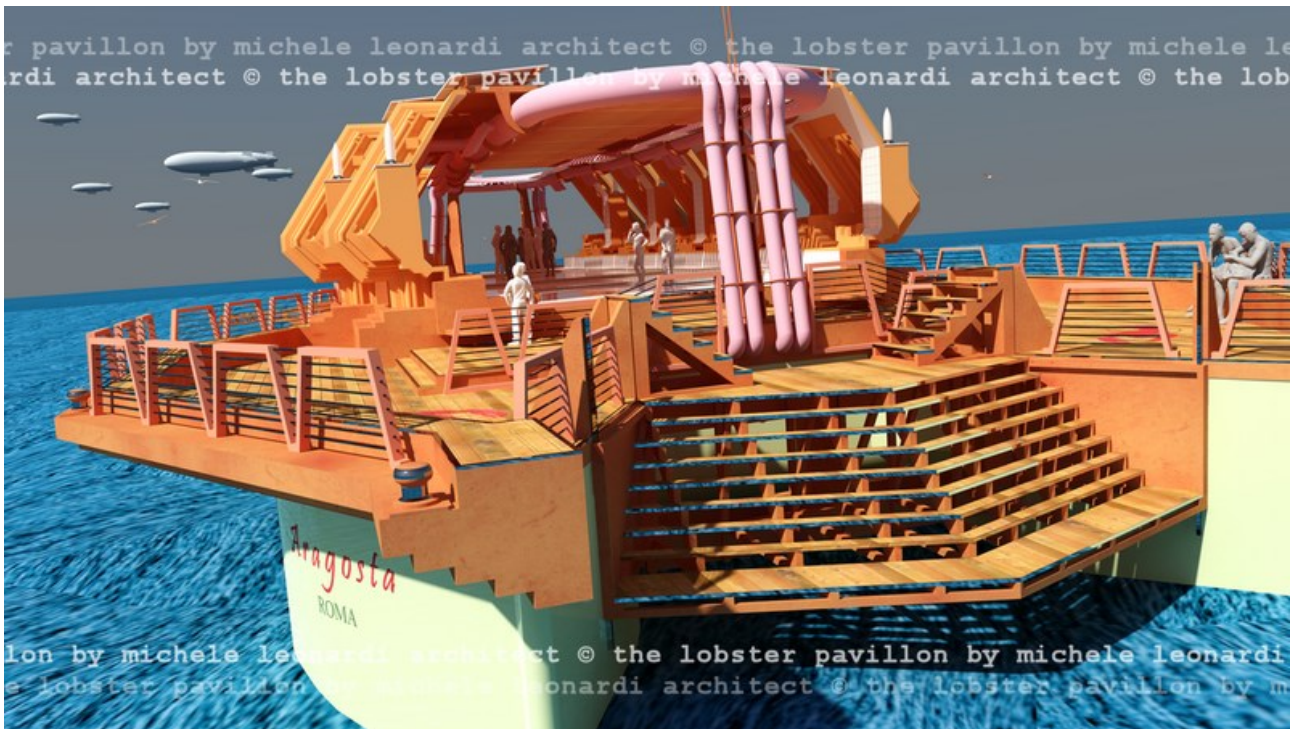


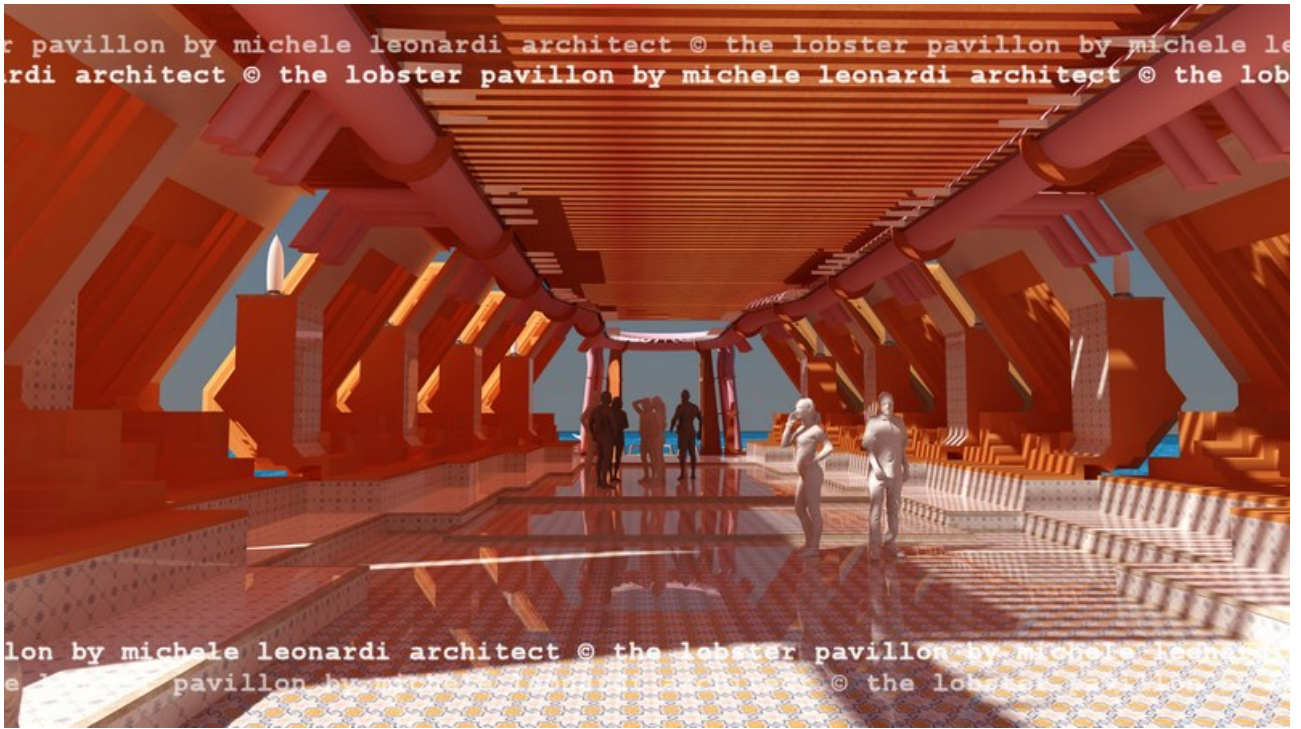




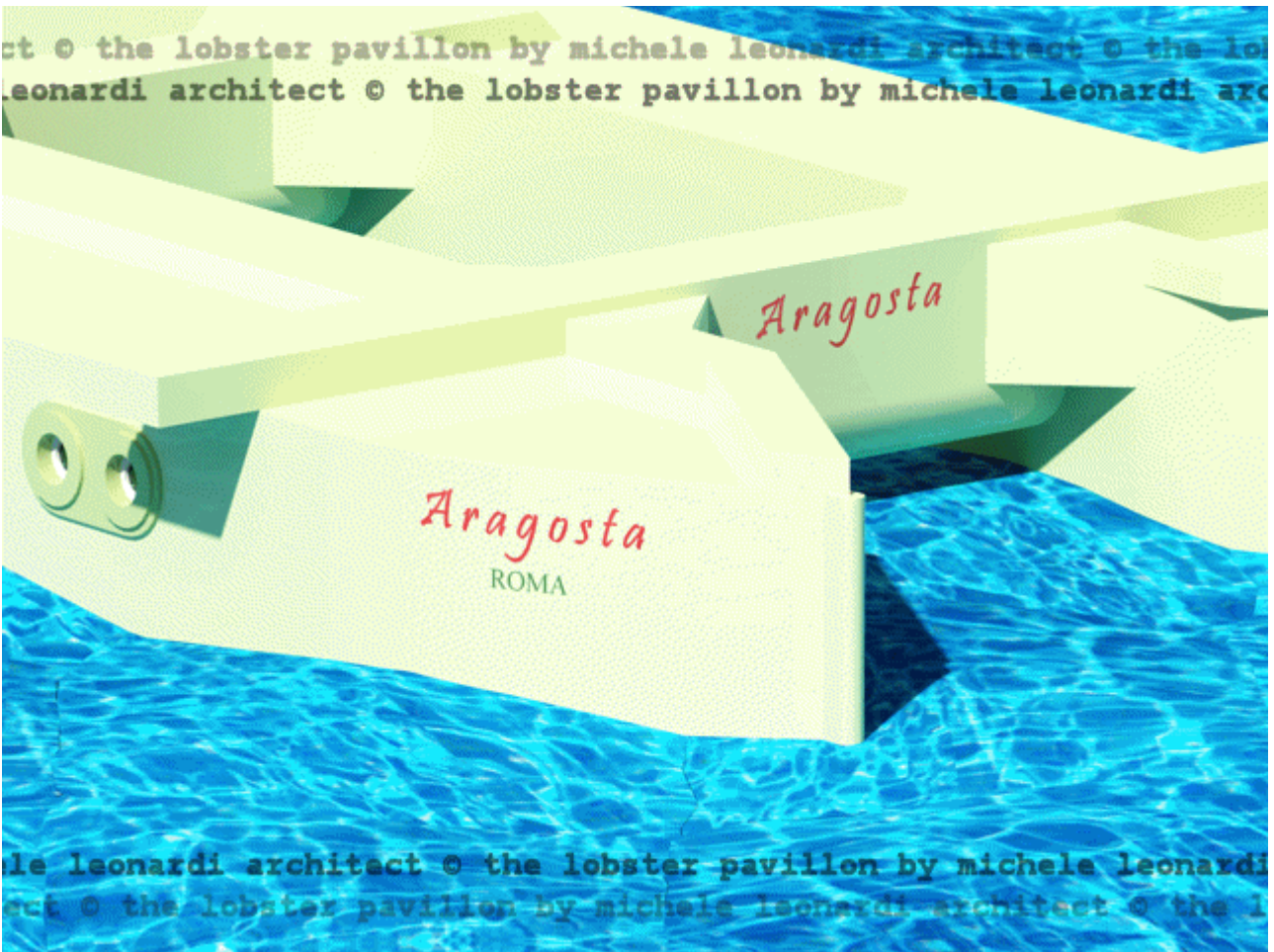












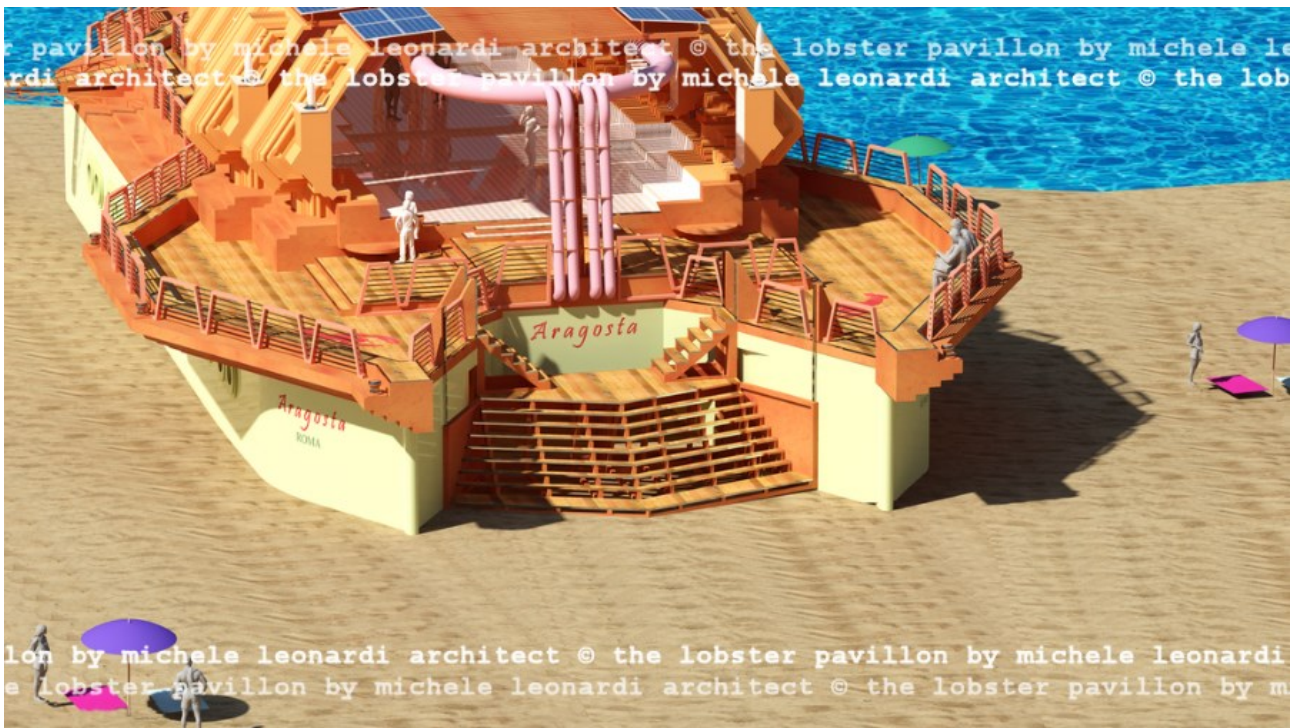
Published on June 12, 2016.



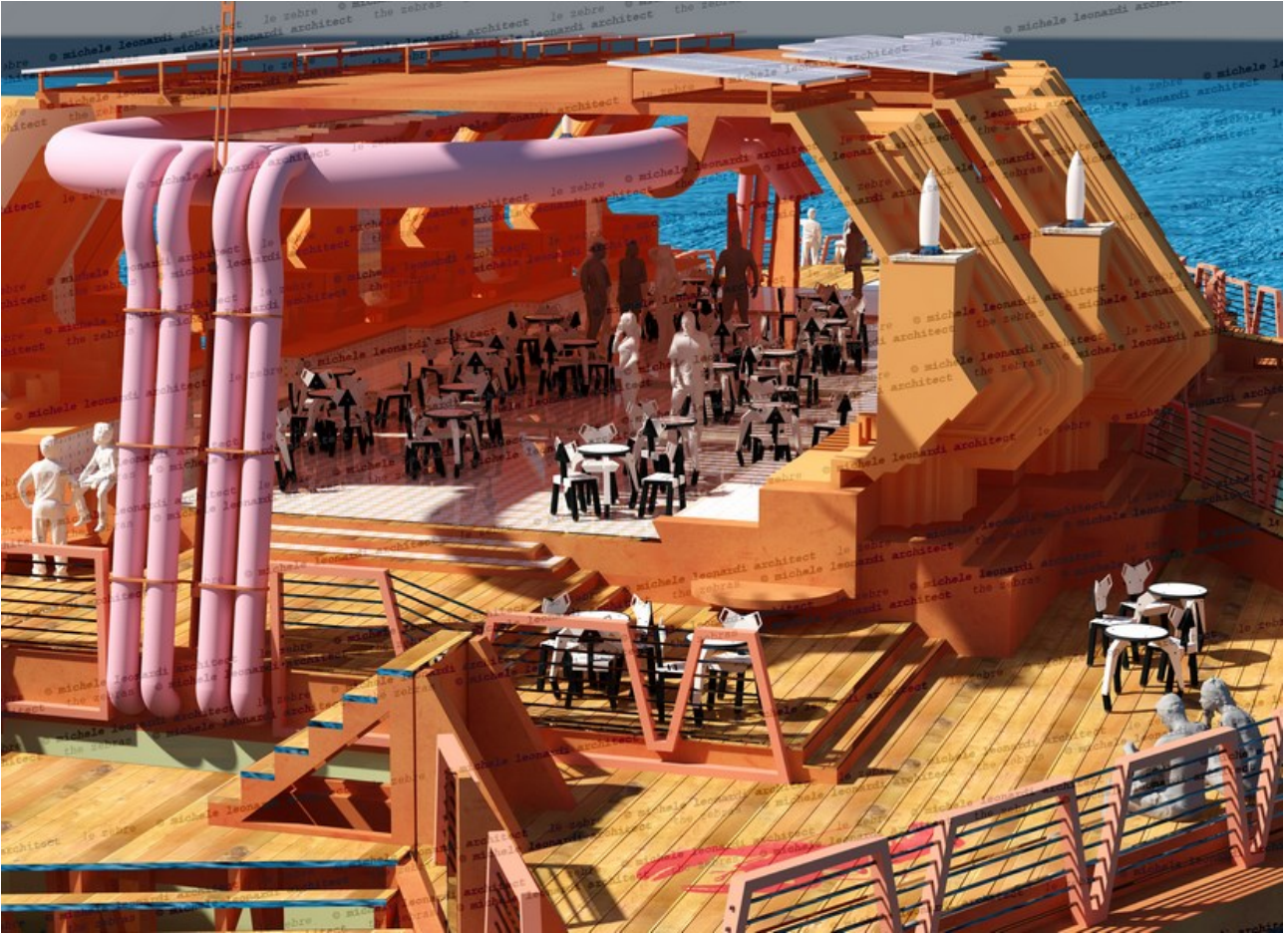
# The Lobster Pavilion on the beach

*For a reduction of coastal overbuilding in the Mediterranean Basin.  
Proposal for a mobile structure on the beach during the summer season.*

*by Michele Leonardi architect © June 2016*



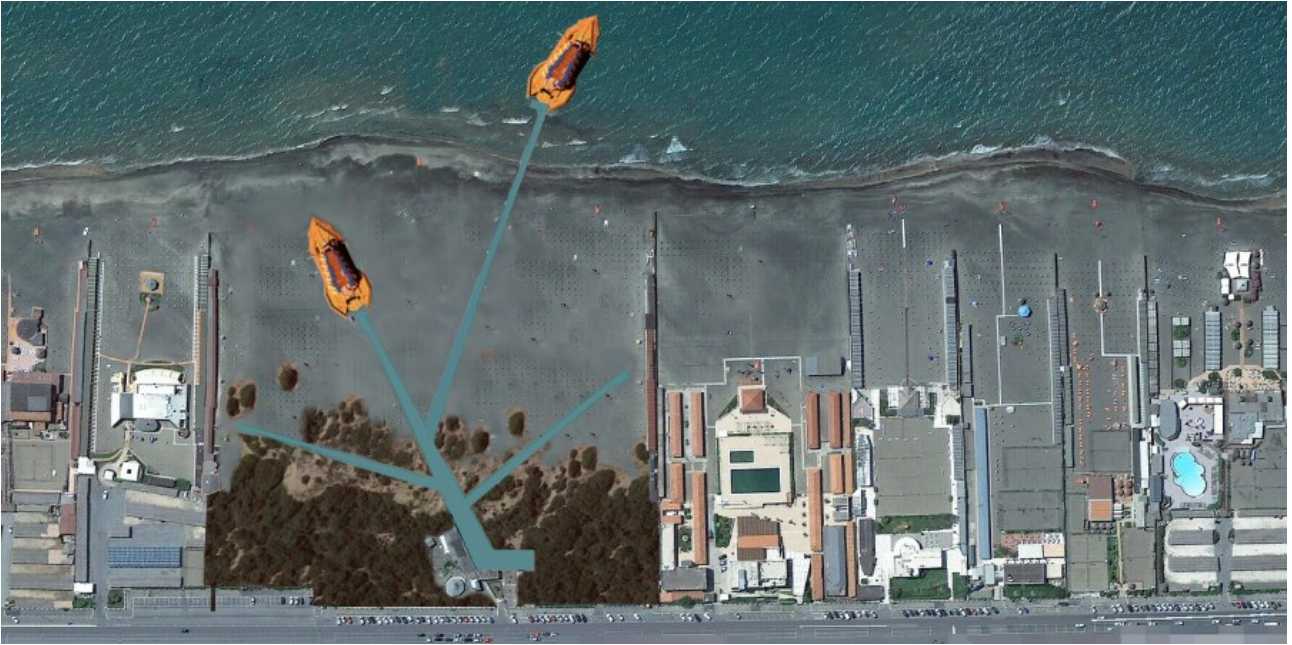
*The Aragosta Pavilion is located on the beach during the summer,  
and in the port during the winter season.*



0



1

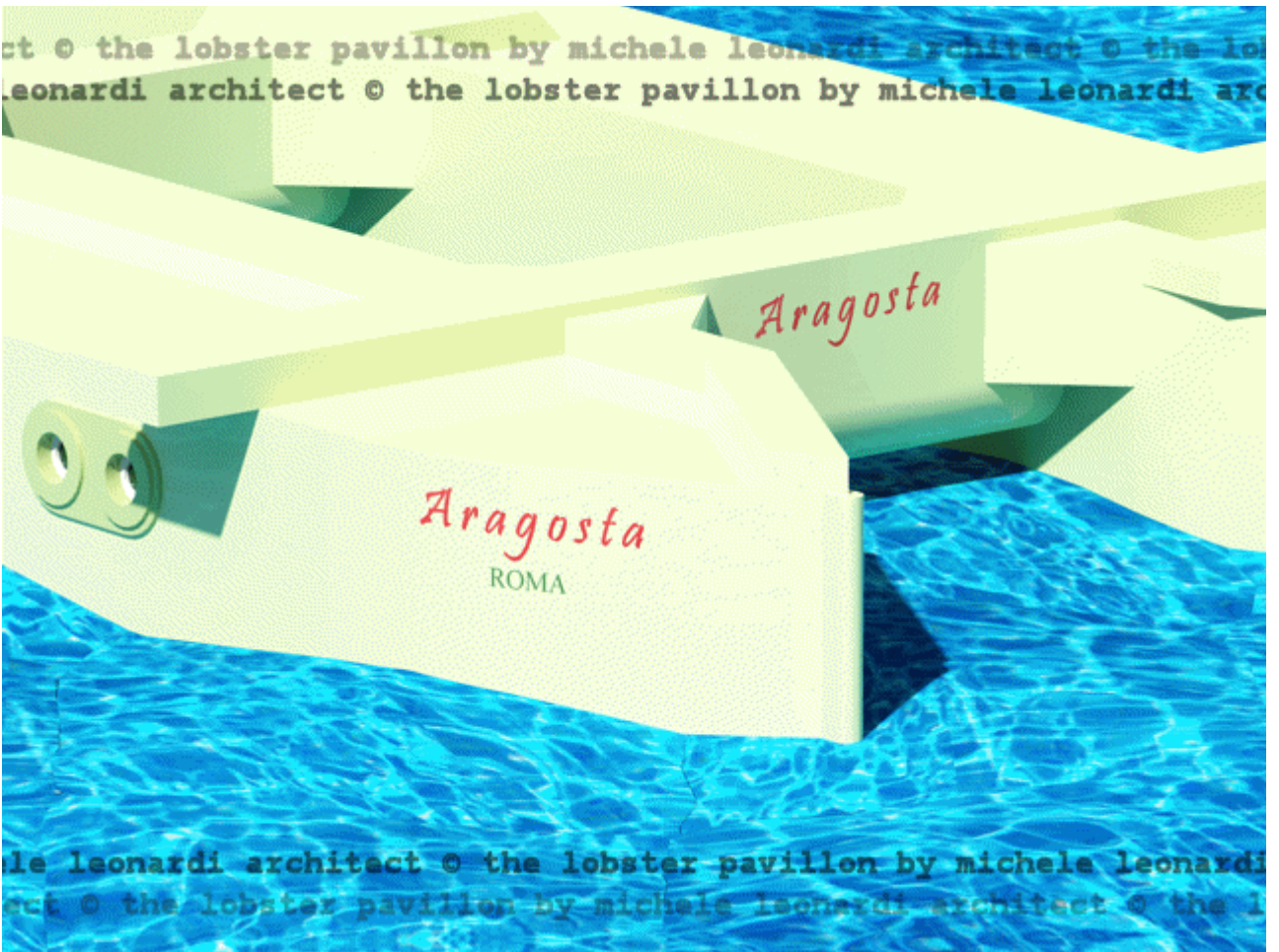


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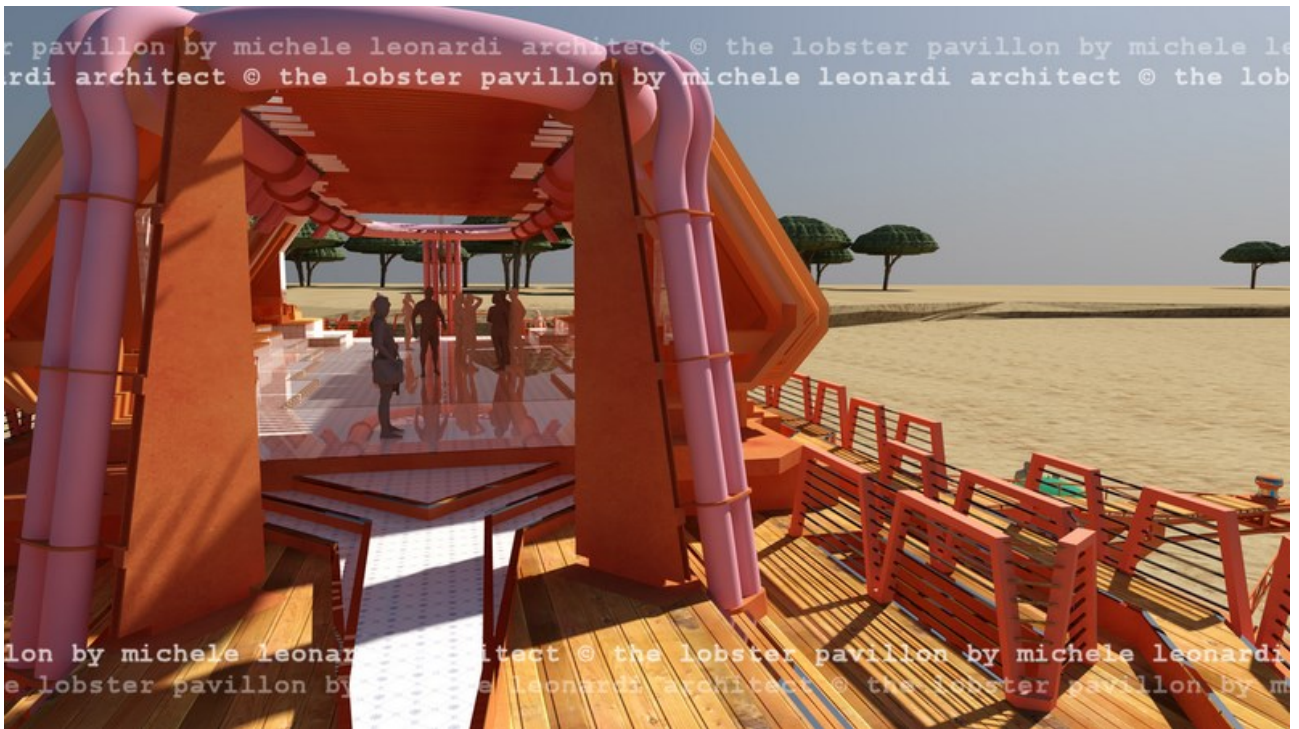
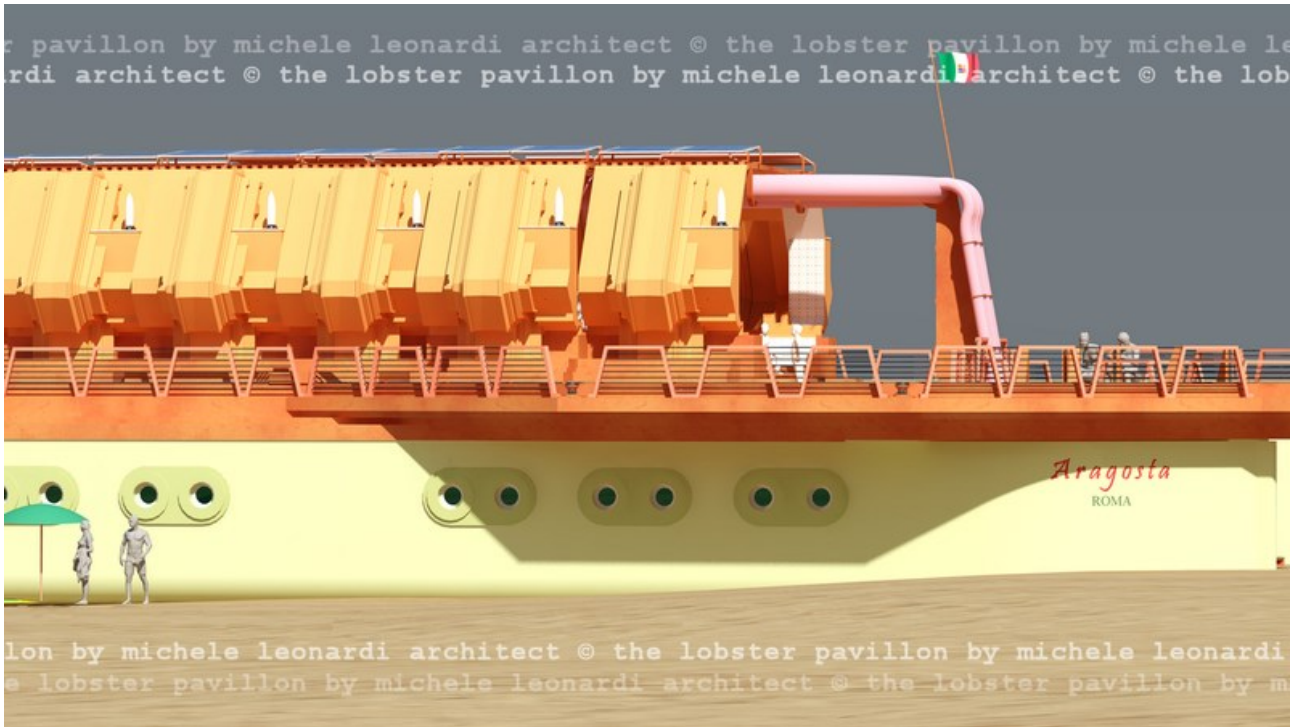




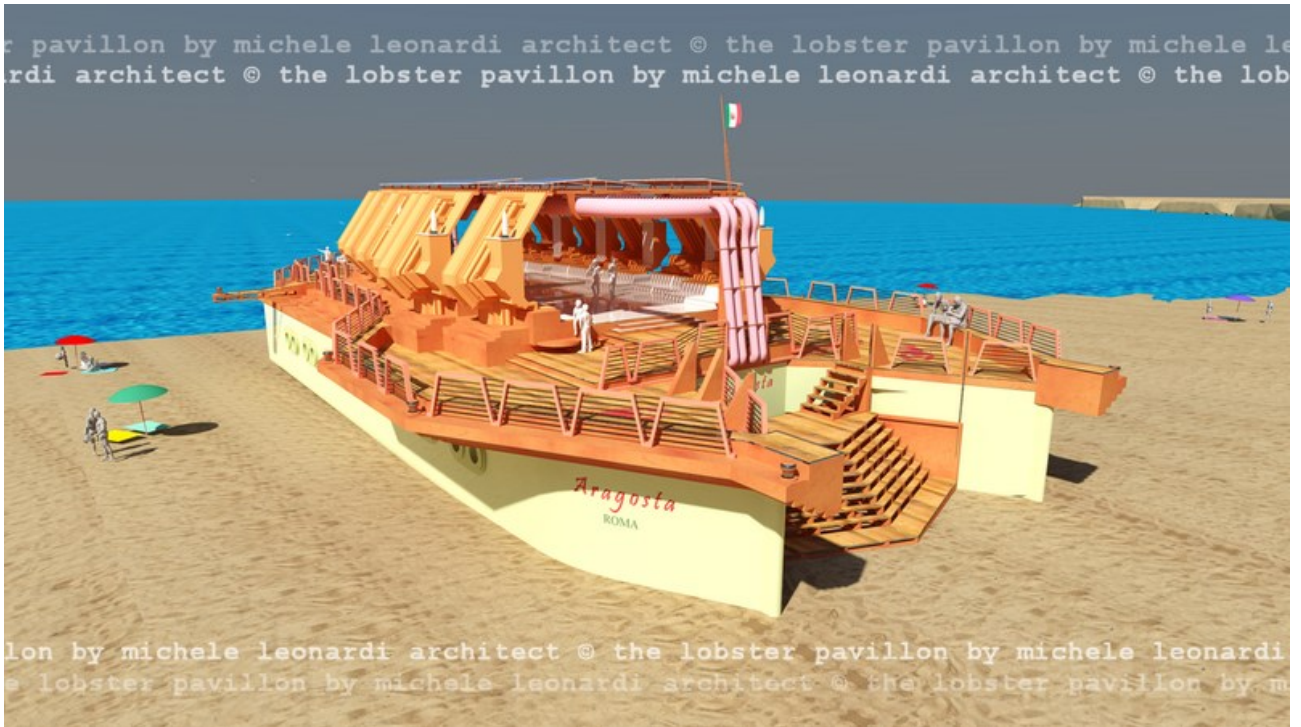
































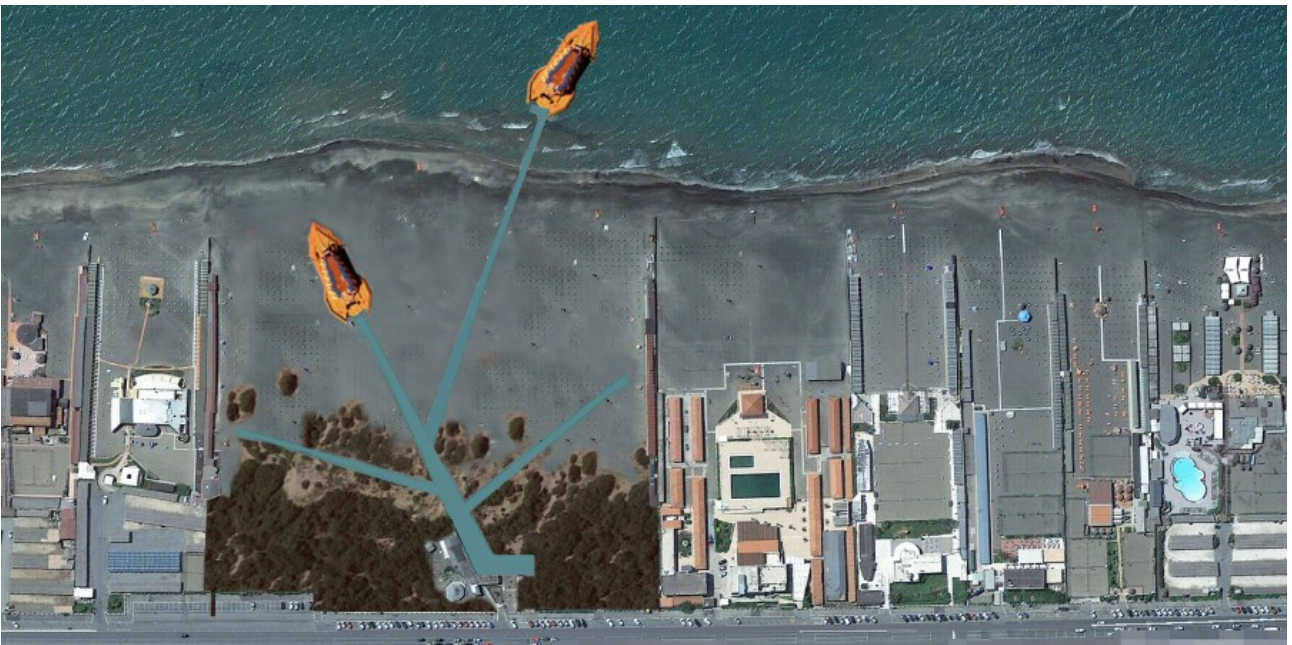
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*The aerial image of a generic overbuilt beach (taken from Google Earth Pro).*

*The evolution of Lobster Pavilion system © by Michele Leonardi architect :  
the first step, and the overbuilt disappears :*

1



***The Lobster Pavilion***  
*restaurant - piano bar - ice cream - dancing*

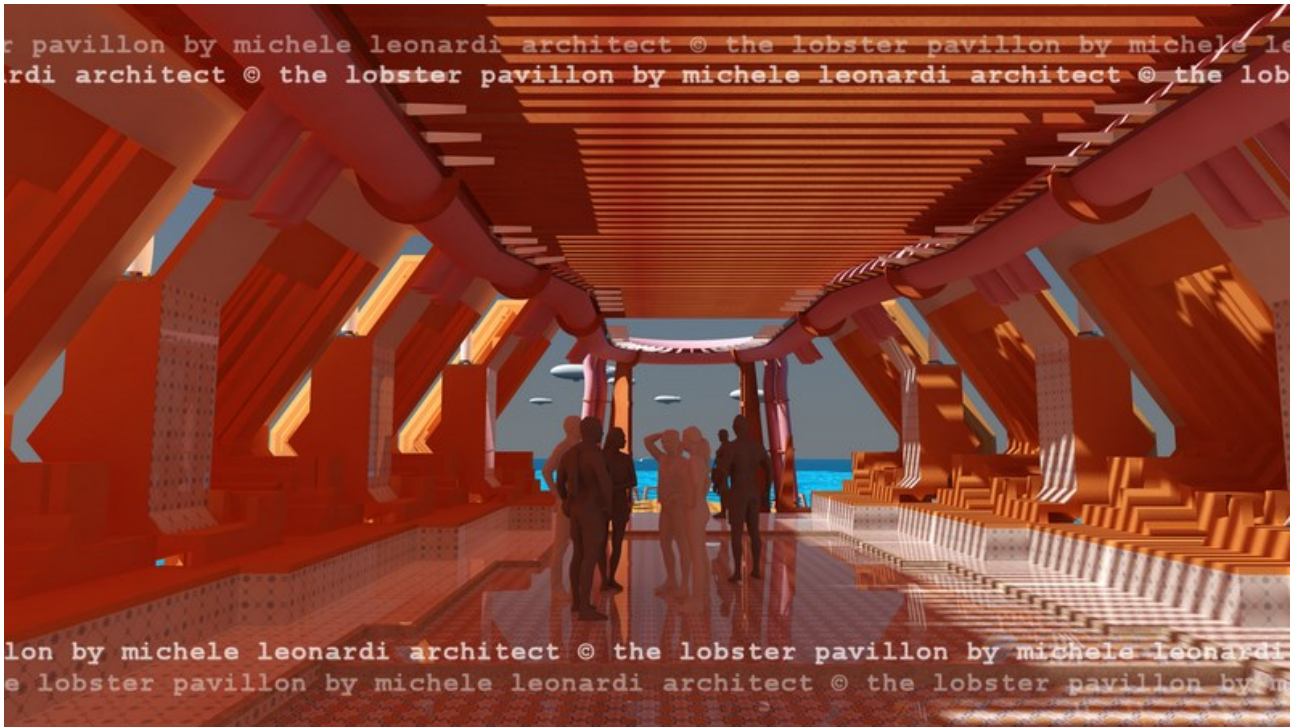


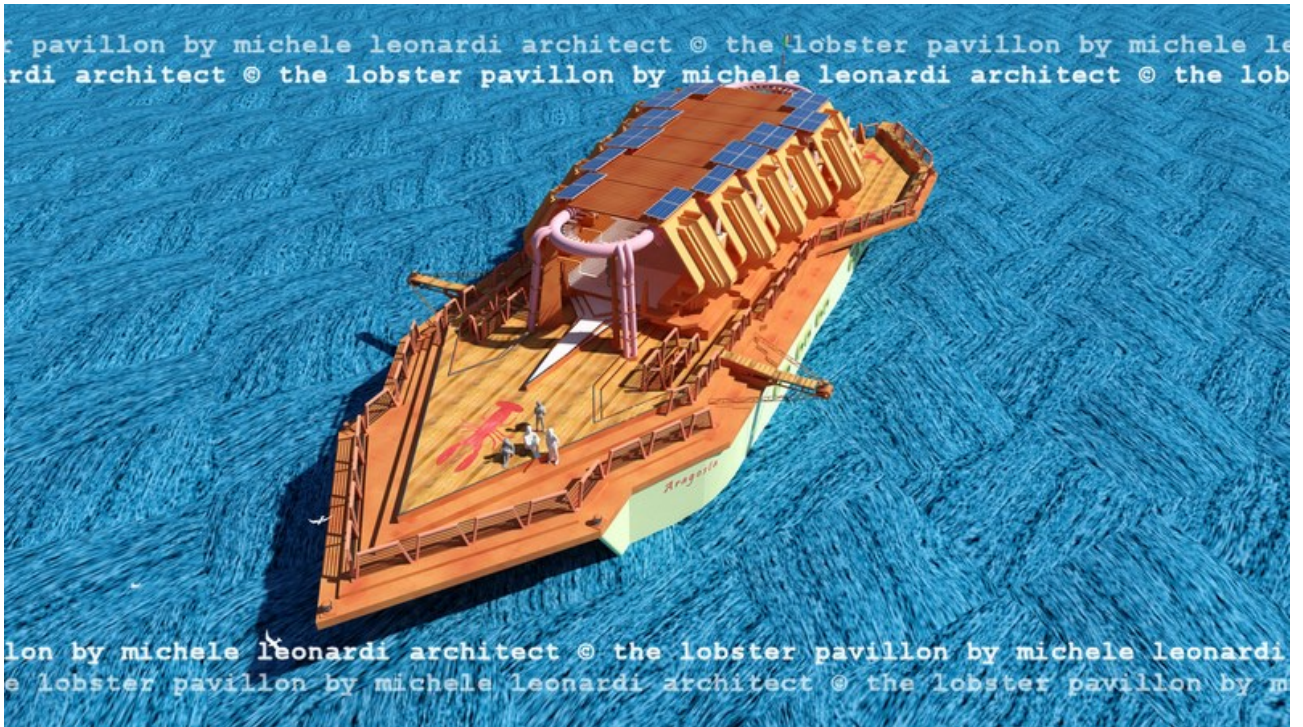


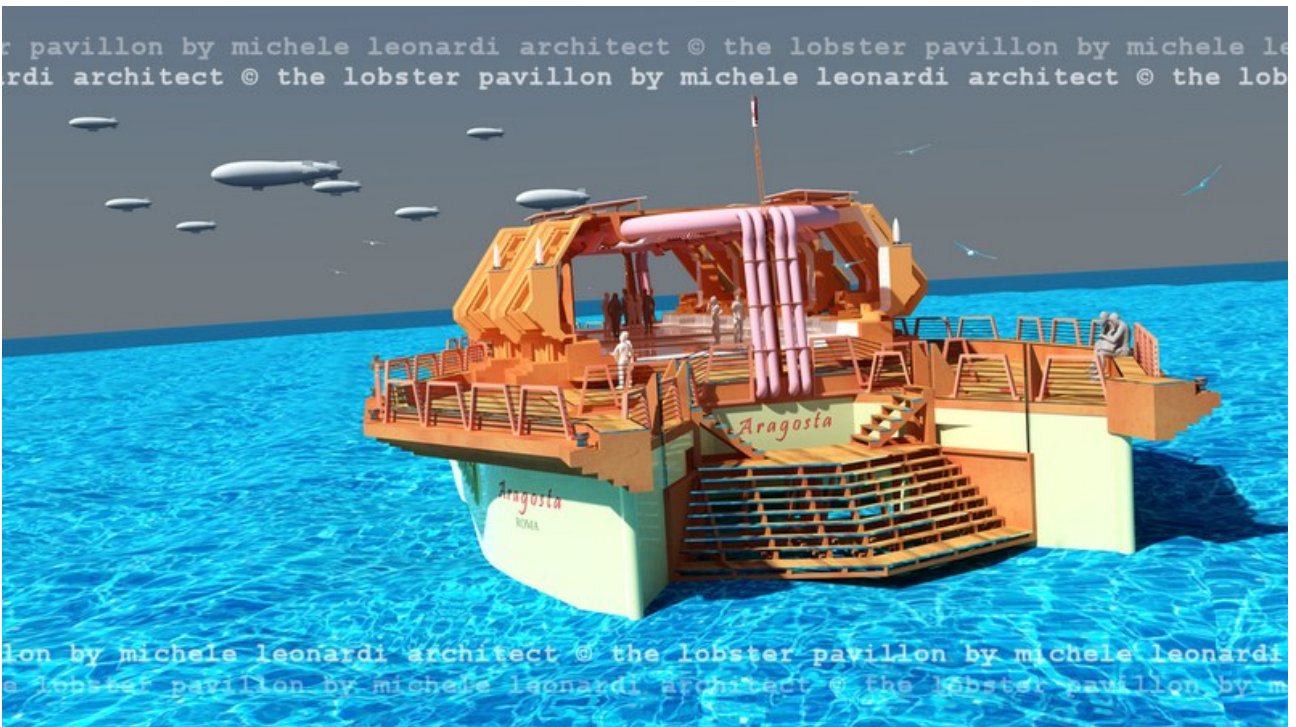


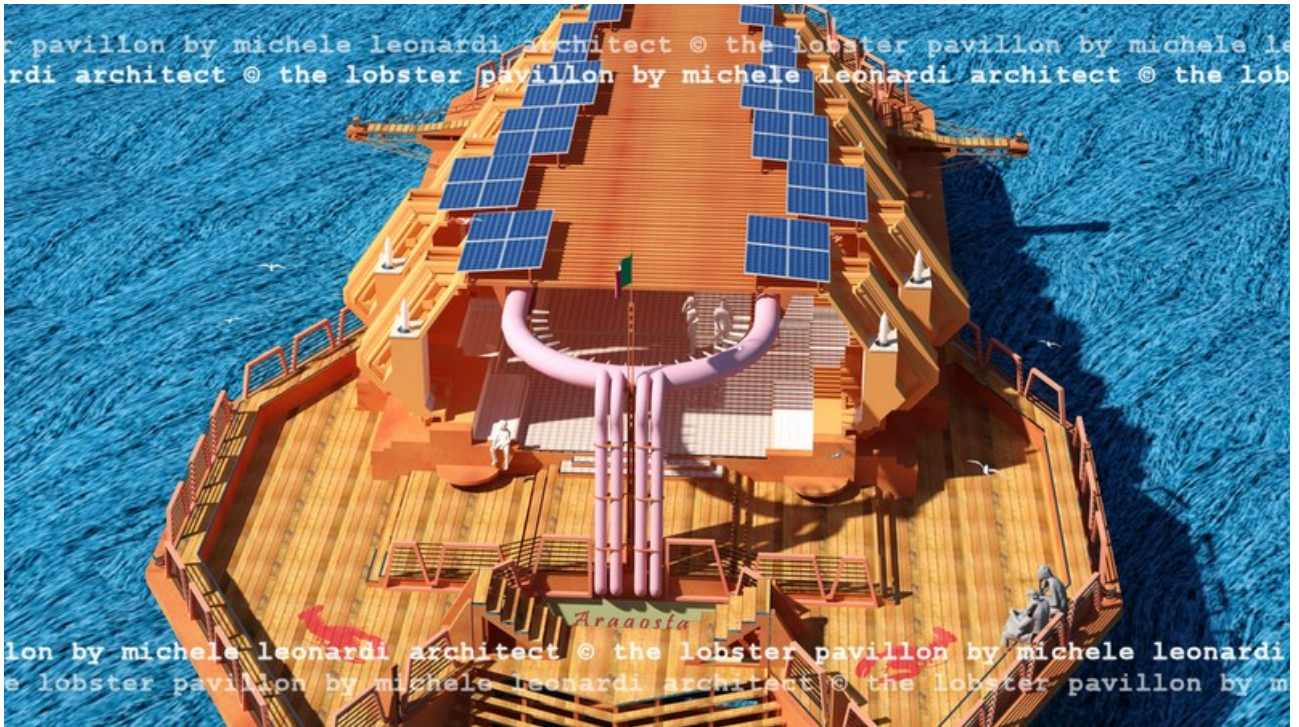














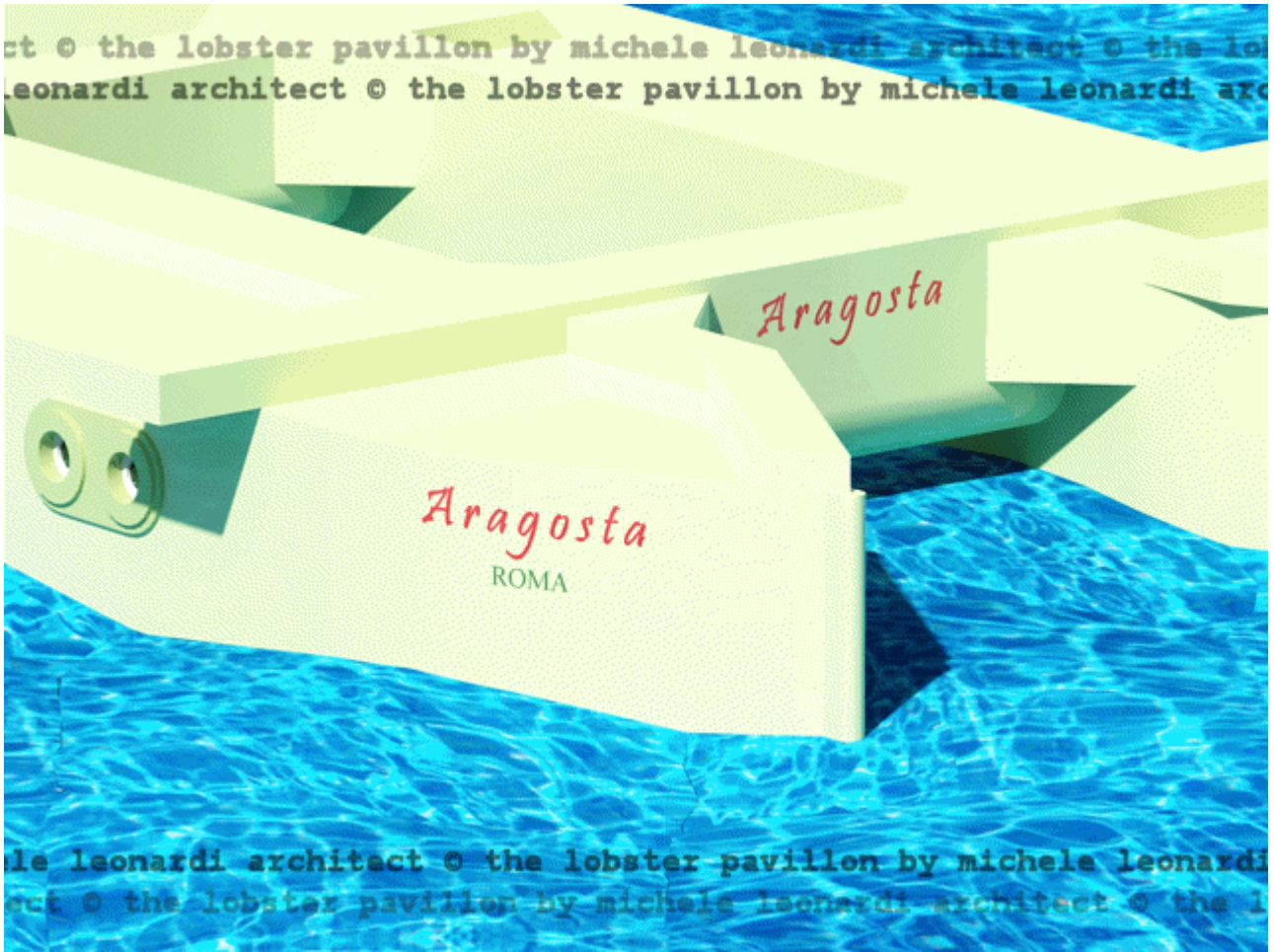










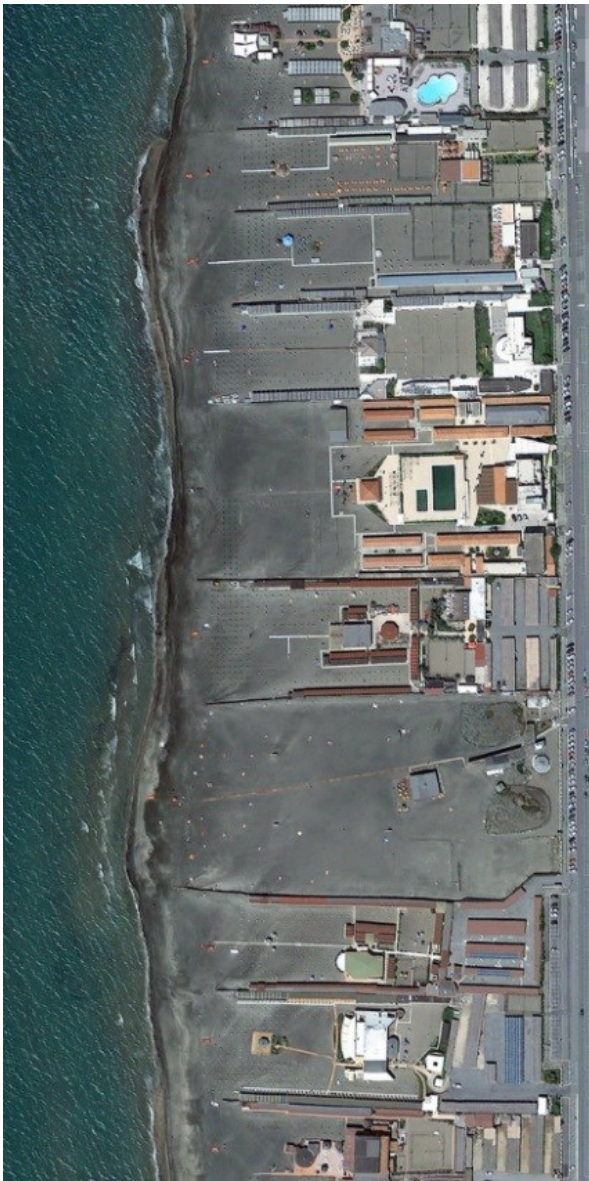


# The Lobster Pavilion

restaurant - piano bar - ice cream - dancing

## BEFORE

## AFTER





*Katsushika Hokusai (1760–1849): "Large Lobster"; Polychrome woodblock print (surimono); ink and color on paper, Edo period (1615-1868), 1800-1815. Source: THE MET - The Metropolitan Museum of Art, New York, U.S.A. Website: [www.metmuseum.org](http://www.metmuseum.org).*



**the products displayed in the renderings:**

**Ceramica Artistica Solimene**

**Ceramica Artisitca Vietrese Giovanni De Maio**

**Weathering Steel ("COR-TEN" Steel)**

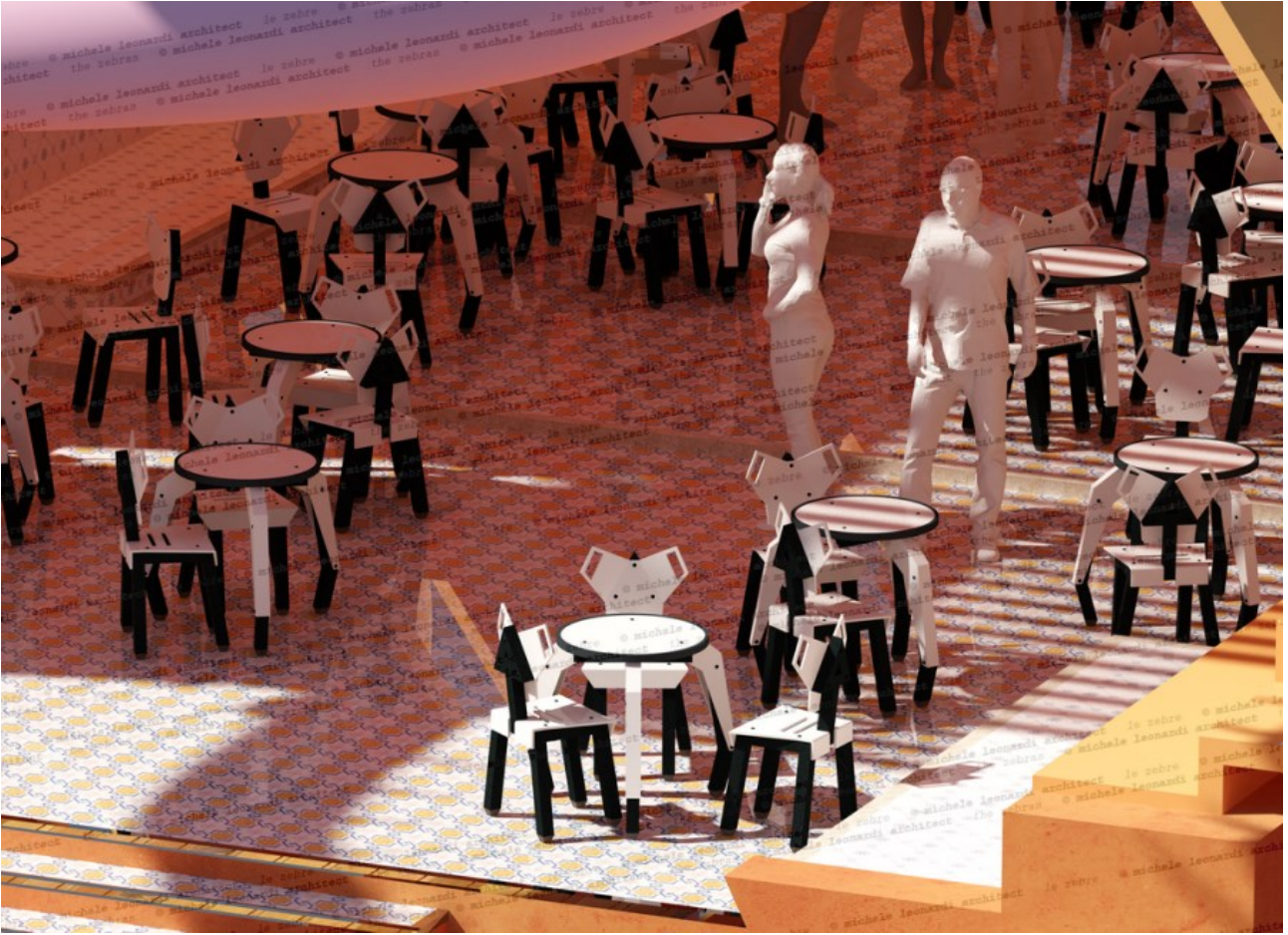


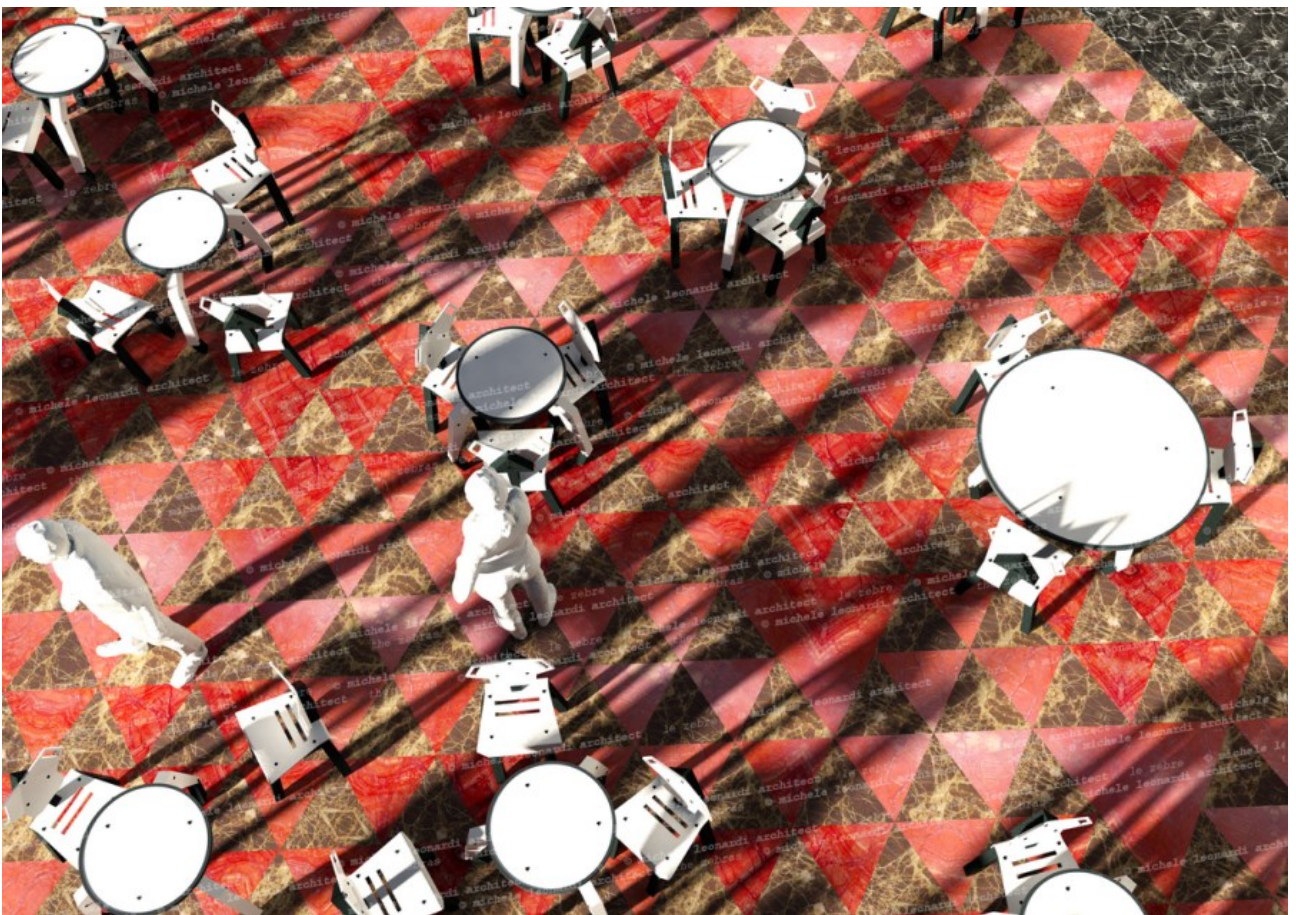
# Le Zebre

*by Michele Leonardi architect © April 2017*

*chairs and tables in polycarbonate and aluminum*











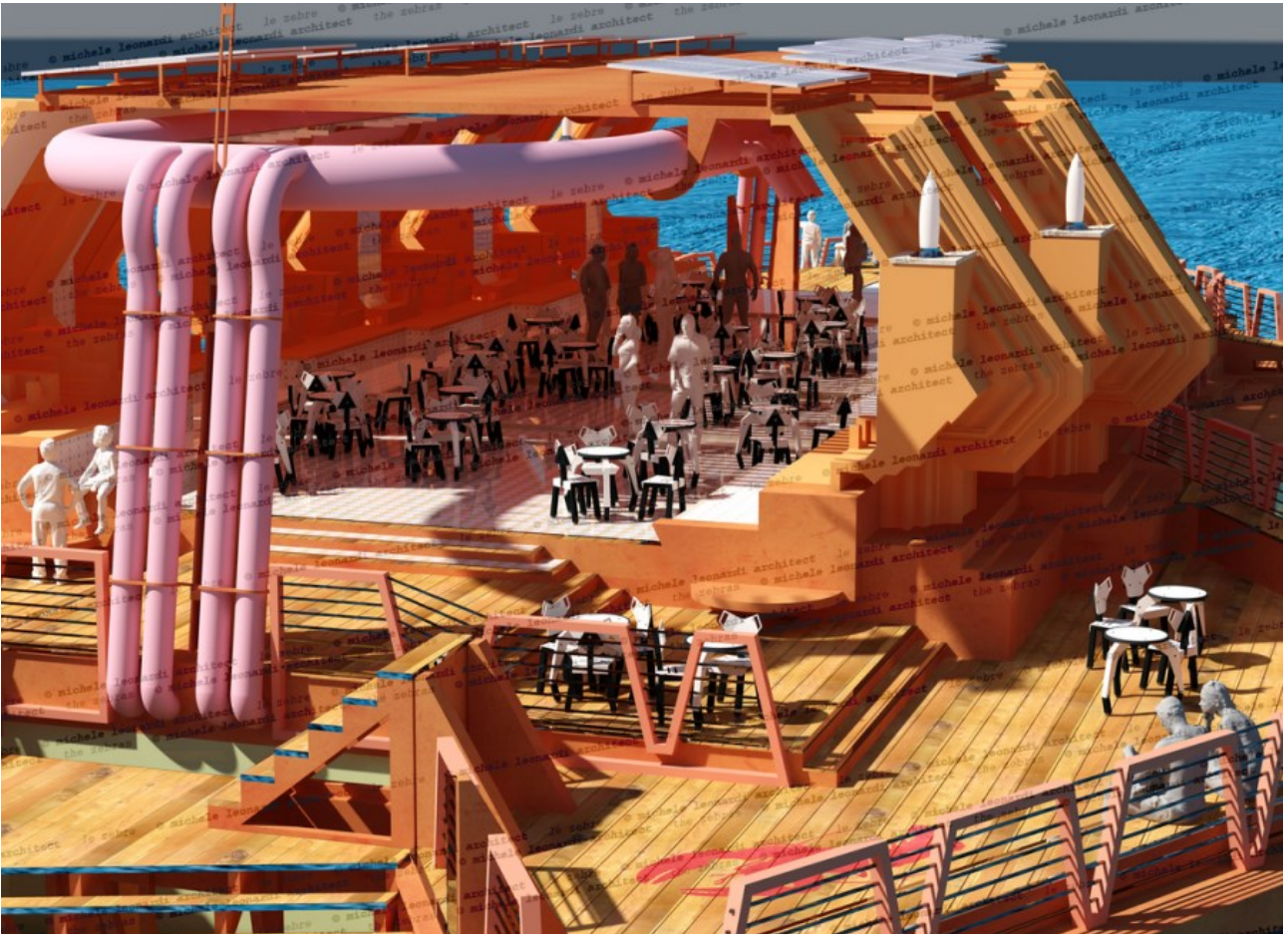
# The Zebras

*di Michele Leonardi architetto © aprile 2017*

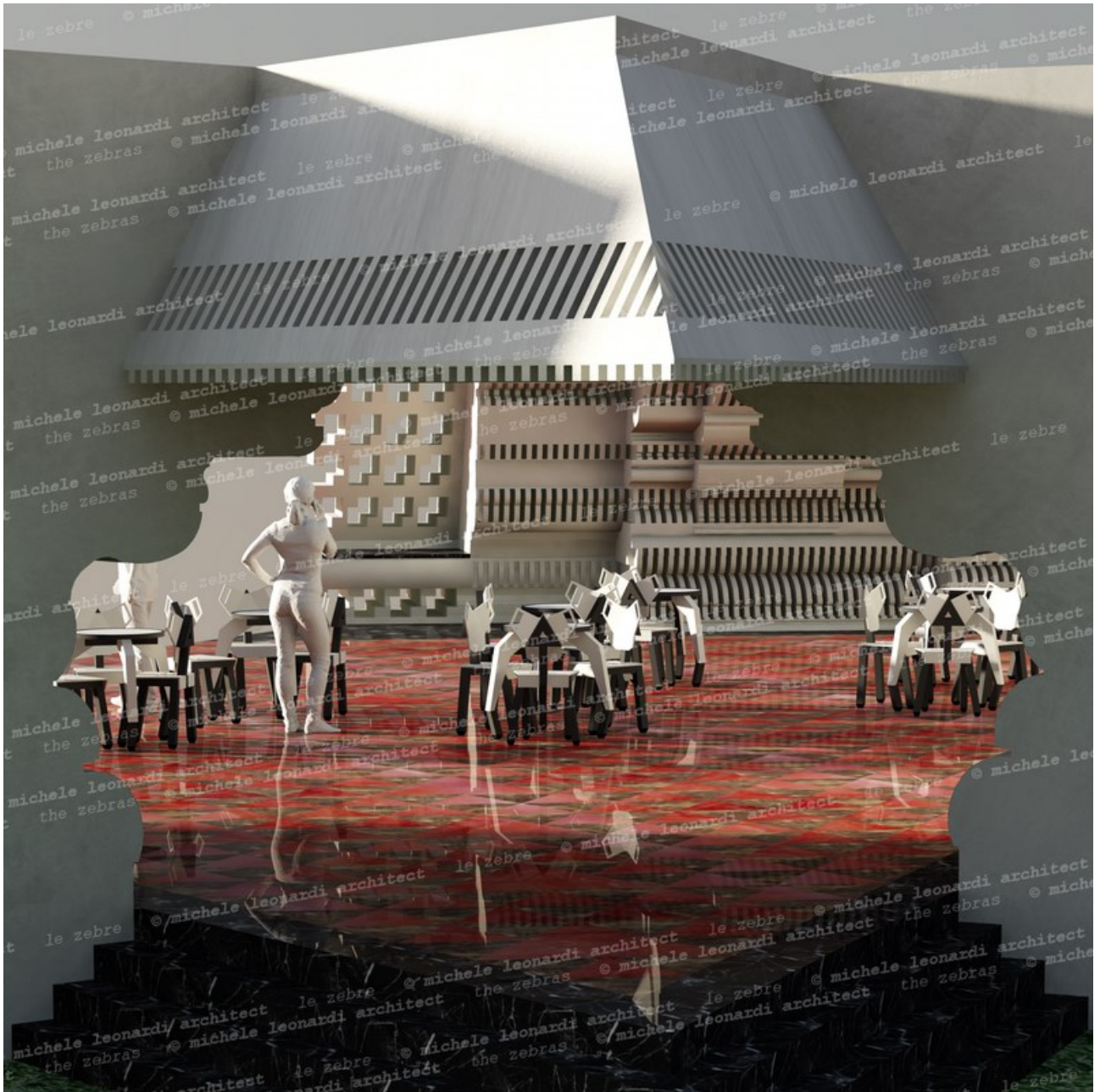
*chairs and tables in polycarbonate and aluminum*











# Nuraghe-C

## the nuraghe cottage

by Michele Leonardi architect © June 2016

*A cottage ideally located in the Mediterranean.*

*All drawing and rendering by Michele Leonardi:*









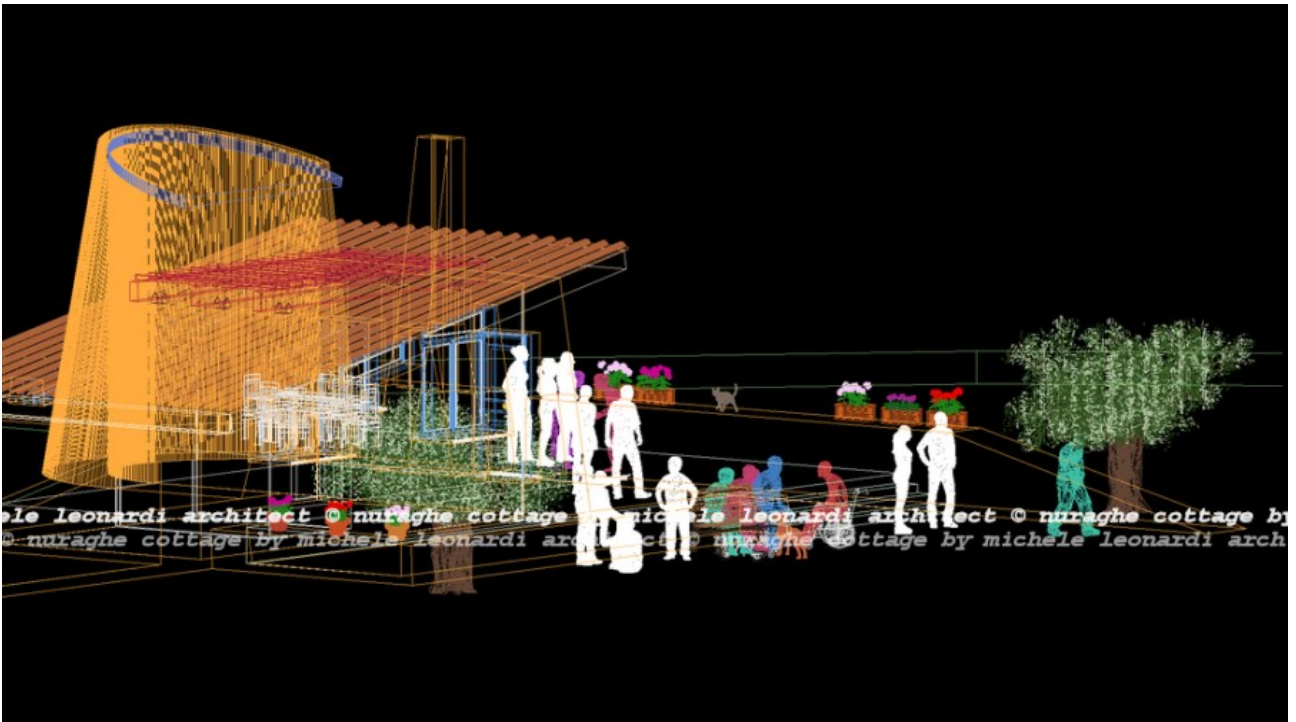












References: Video on YouTube by Nova Lectio:  
“Cosa sappiamo realmente della Sardegna  
di 4000 anni fa?”



# G LIKE GIANTS

by Michele Leonardi architect © October 2022



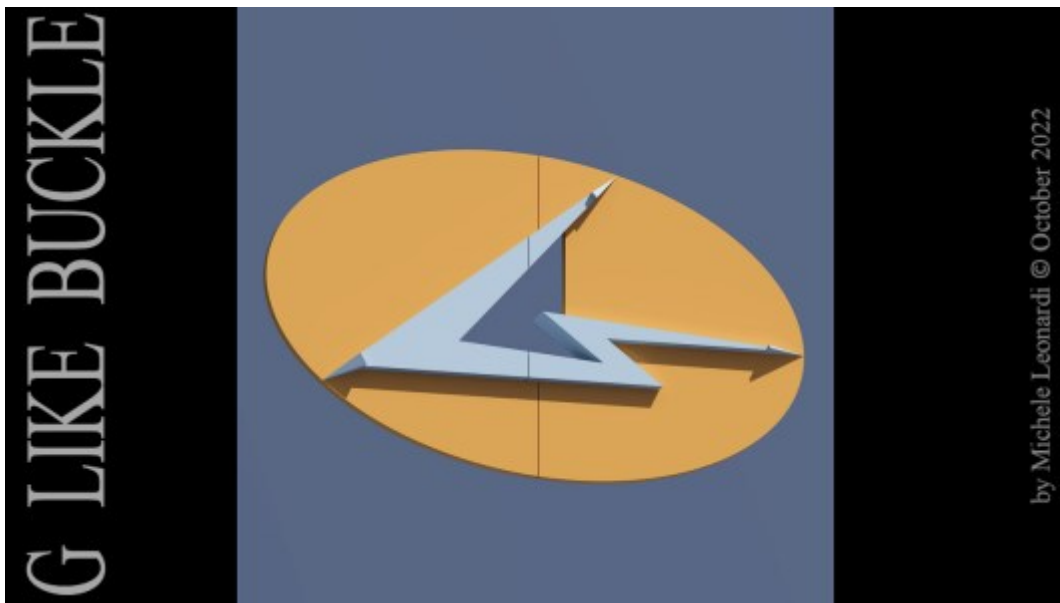
## G LIKE WATCH

BY MICHELE LEONARDI ARCHITECT

*Preview of first frame and link to the video in high definition:*

# G LIKE WATCH

*G LIKE WATCH Animated Gif by Michele Leonardi © October 2022.*







# G LIKE BUCKLE

BY MICHELE LEONARDI ARCHITECT



# G LIKE BUCKLE

*G LIKE BUCKLE and Animated Gif by Michele Leonardi © October 2022.*

## **WE ARE NOT TOO MANY : WE ARE GIANTS !**

Beyond the statistical data on population growth, which tell us that birth rates are in generalized decline all over the world, where by more and where by less, to think that the billions of people populating the Earth are reducible to a problem wrongly and perhaps even in bad faith called "overpopulation" is to have a lazy mind that is too small to contain the complexity all around us. There are not too many of us at all. With a minimum of cooperation, single societies, single social groups, families, people who populate this world, can do great things. Humans are not as cooperative as insects, like bees, ants and termites. But no one has ever asked so much of us. Not yesterday, in the past, much less tomorrow or today. Why is that?

Today's humanity would only need a minimum of cooperation, while otherwise each of us can very well mind our own business and in our own way. **So in this sense we can do great things, things like giants.** We are not dwarfs on the shoulders of giants, that is, all the generations and generations of men and women who have gone before us. We are all just giants. **We are not too many. If we are billions rather than millions there will be a reason, and it is not at all that we "copulate too much".** While for too greedy hands and dried-up minds not even one planet for each would be sufficient. It will turn out well, maybe not for me, but for the new generations it will turn out well. There is no room for nonsense.

We need neither heroes, nor saints, nor geniuses, nor sacrifices, nor resilience and other such futile efforts. Yes, saints, heroes, geniuses and efforts are also needed, sometimes, but not now that we are so numerous, billions. A little cooperative effort is needed now, but from everyone. Once again: there is no room for nonsense. Not now, not ever. If we want trade to thrive, first we must make people thrive, and hence families, the basic unit of all societies, currently miserably one-way "mercantile", in this world.

Otherwise your stained glass beads that you once bartered slaves with in Black Africa, your goods and services, will end up that no one can buy them from you anymore. It would be time to get rid of slavery once and for all. You tell people that if you don't sell colored beads in large quantities, which you call "economic growth", then it ends up that you can't buy enough gas and oil and raw materials for your "needs".

But have you ever wondered how many things you, and all of us, could do without? Have you ever realized how much garbage you produce? Take a closer look at what you bought, you too: they sold you garbage. By dint of selling stained glass beads you got screwed there, you too, by the immense bead scam. ...And what about me, and to whom do I sell my stained glass beads if not to a society that is no more, annihilated and atomized into an infinity of mere individuals? Just individuals, nothing more, goods. No society.

*M.L.*

