

Redefining Petty Island

Designing a development park for a neglected area in the Delaware River

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Introduction

The thesis work deals with the neglected area of Petty Island, located in the Piedmont of Delaware River.

The tidal section of the river served as a conduit for the shipping and transportation that aided the development of the riverfronts of Camden and Philadelphia, that face respectively the southern and northern part of the island.

The physical, historical and social evolution of these areas are deeply linked to each other and their transformations in time and shape due to artificial and natural processes have led to the current neglected and abandoned post industrial scenario.

The first comprehension and study phase of the work allowed to the recognition of the critical aspects that characterized this marginal large area, which unstable conditions are also challenged by flooding risk.

The main idea is that this huge void, interpreted as unattended and deteriorated landscape characterized by emptiness, inactivity, imprecision, without a defined border, can not be observed just through their negative meaning but they can be adapted to new uses, following cultural, social and economical needs of the city.

The thesis aim is therefore a regeneration proposal for Petty Island and its context, starting from considering its weaknesses and resources and address to each of them a specific strategical action pursuing a further qualification of these waste land. The outcome of this approach is a

masterplan design of the whole area through infrastructural reordering and integration, abandoned buildings recovering or dismanteling, reserve areas maintenance and preservation, vacant land consolidation and improvement.

The project design focuses first on the redefinition of the riverfront adjacent to Petty Island.

The new landscape concieved as a riverpark, which is not only a place to enjoy but also a green public network that reconnects the city to the river.

With abandoned buildings dismanteled and the others converted and reuse as public places, a main boulevard passing through the entire park, pedestrian paths recovered from traces, clean-up docks, the refused and vacant waterfront becomes a new place where people desire to be.

The ecological problematic issue is another important aim in the rethinking of the whole area and the measures adopted to overcome the flooding risk are due to adaptation, mitigation and protection.

The green public space of the riverpak achieves the three strategies by immediately help to absorb flood water (mitigation), let space from water to enter, to be store and release slow back into the river (adaptation) forming a natural barrier (protection).

The thesis work moves from the redesigning of the island surrounding areas to the identification of a suitable redevelopment proposal for Petty Island, whose regeneration process follow the same strategical framework of its context.

The energetic resources potentialities of the the area to have a key role in the redefinition process.

The idea is therefore to transform the island into an attractive and productive park of renewable resources energies, leisure spots and wildlife acivities.

The development park provides as well as a resource of energy itself, a chance to learn from it and thesis final phase is related to the design of

the Learning, Research and Development Center of Petty Island, a complex building in which these activities are enhanced.

1. Petty island and its waterfront physical, historical and social evolution

1.1 General overview

Petty island is a tiny urbanized private island on 1.18 km² surface, whose shores are lapped by the Delaware River.

It is located between Camden northern waterfront (NJ) and Philadelphia central riverfront (PA). More precisely, the island is part of Pennsauken Township, New Jersey, from which it is connected by a bridge.

Even though Petty Island is situated in a very heavily industrialized river corridor, it is surrounded by ecologically important riparian land, wetlands and forested wetlands that coexists with an unpleasant brownfield site and also with some facilities destined to fuel storage, to a shipping goods company and to an asphalt manufacturing business.

Due to redevelopment policies of local politics in Pennsauken, citizen action, community leadership and some environmentalist protests, the owner of the island, Venezuelan government, announced in 2009 the wish to donate it to New Jersey after a remediation process. The beneficiaries of this action will include the River itself, wildlife and everyone in the Philadelphia greater region, as the island combines elements of community history, race history, colonial history, slavery and ecology.

Petty's island represents a link between the diverse people and social forces that shaped Philadelphia and Camden.

Opposite to the Northern part of the island, in the River Ward of Philadelphia, there are Port Richmond neighbourhood and Fishtown neighborhood riverfronts which present themselves as a gritty and polluted landscape marked over time by heavy industries.

The huge area facing the river is characterized by brownfields sites and abandoned docks.

In front of the southern side of the island are located North Camden neighborhoods, Cramer Hill, Biedeman, and Pennsauken township. The first one, although impressive view of Philadelphia skyline and beautiful natural water edge, is signed by decades of decline related to poverty, crime and abandonment and its riverfront still reflects this status. Cramer Hill and Biedman instead, are configured as isolated villages that was once active industrial area and now has become underutilized and vacant. Pennsauken township share the same destiny as its vacant lands represent a great amount of its exstention.

1.2 Delaware River : between natural and artificial

Petty island is the fourth-largest island in the Delaware River, which counts 62 others lands surrounded by water.

The Delaware River rises in New York's Catskill Mountains and flows free for 674 km through Pennsylvania, New Jersey and Delaware into the Delaware Bay where its waters enter the Atlantic ocean. In 1609, Henry Hudson led a Dutch East India Company expedition to the river, setting the stage for Dutch colonization of North America. The river passed through different colonial settlements (Dutch, Swedish and English) and was named in honor of an English nobleman, Thomas West, third Baron de la Warr.

The Delaware river played a key role in the economical and social development of the Mid-Atlantic region. Due to the magnitude of the maritime commerce nearby Philadelphia, the U.S. government undertook the formation of a channel from the city to the Delaware Bay.

The "Project of 1855" consists in 7.9 meters depth and 180 meters wide. The River and Harbour Act, made 44 years after, provided 9.1m of depth. Since 1941, The Channel has maintained a depth of 12 meters.

The tidal section of the river served as a conduit for shipping and transportation that aided the development of the industrial cities of Trenton, Camden and Philadelphia.

As a matter of fact, today, the Delaware river and bay hosts one of the most largest port complexes in the USA. Every year, over 70 million tons of cargo move through Philadelphia, Camden, Salem (NJ) and Wilmington (DE) ports, which means 3,000 vessels per year.

Petty's Island is located in the Piedmont, where the river flows through the gently rolling hills and sweeping valley of this region. This area is characterized by a rich natural history that has been dangerously damaged by industrialization.

In this part, the quality of water of the river has been challenged since its European colonization. Sewage treatment plants and industrial discharges are just some examples of point source pollutants. In 1972, the federal "Clean Water Act" legislation tried to contain the widespread water pollution problems by giving a waste funding for upgrading wastewater treatment plants. The lack of success of this effort and the expansion of urban and suburban growth and corollary population and infrastructure have been strongly affected the quality of water. More recently, scientists have noticed that the degradation of the Piedmont stream concerns not only the pollution inputs but also the changes to natural flow, habitats,

stream morphology resulting from impervious surfaces and decreasing natural vegetation.

1.3 Historical timeline

The history of Petty's Island can be divided in three segments:

- I. 8000 BC- 1796: The Native american, European and quaker settlemen
- II. 1759-1910: Slavery, ship building and industrial Revolution
- III. 1910- till now: Petroleum and port operation

Obviously, Petty's island timeline is strongly related within its waterfronts on both sides, Pennsylvania and New Jersey, as it has always reflected the vicissitudes of its surroundings.

Native American lived on the site for thousands of years.

1631 PETTY ISLAND

First european, a dutch navigator, to land to the island.

Swedes and Finnish settlers moved into the Delaware River valley.

1654 PETTY ISLAND

Peter Lindestorm, borne swedish, while exploring the delaware river got to the island and called it "Aequikenaska". He picture the island as "Beautiful flat and level land, but entirely invonvenient for reaching the shore with vessel on account of the shallow pf the river (petty's) entirely covered with reeds".

1655 PETTY ISLAND

Dutch settlers arrived.

1678 PETTY ISLAND

Petty's island, originally known as Shackamaxon Island after the local Schackamaxon village of Lenni Lenape, native americans , was patented by Thomas Fairman , whose house was located opposite to it and where also William Penn, Founder of Pennsylvania, colony, spent his first winter.

1681 PHILADELPHIA

The original plan of Philadelphia was drafted. The city was one of the most extensively 'pre-planned' provincial city of the time. The grid plan was meant to allow a great flexibility.

1684 PHILADELPHIA

The city expansion went along the Delaware waterfront

1700 PETTY ISLAND

In early 1700 Elizabeth Kinsey Fairman sell the island to John Petty, an indian trader, whose name it has retained, even though there were other families owning great portion of it.

1720 PHILADELPHIA

Philadelphia is chartered as a city. William Penn signed the Charter of Privileges, based on principles that were later introduced in the U.S. Constitution.

1762 PETTY ISLAND

The Island was used use for detaining Africans to be sold into slavery.

The site was chosen to avoid Philadelphia import duties.

1776 PHILADELPHIA

The Declaration of Independence was signed in Independence Hall.

1800 CAMDEN COUNTY

At the end of 1700, Camden county officially makes the island part of Newton Township, in exchange for assigning the other nearby smith's and windmill island to pennsylvania.

A commercial fishery was established on Pett's island without federal permission.

1790-1800 PHILADELPHIA

Philadelphia was the temporary capital of the United States. Both George Washington and John Adams governed from here as Presidents of the U.S.

1822 PHILADELPHIA

In 1822 the technological system called "The Fairmount Water works" was the first to provide clean water to the city .

1838 CAMDEN

A canal had been cut through Windmill Island in the middle of the Delaware River, making ferry travel easier under all weather conditions. The shortened commuter time combined with an increasing number of businesses and services made Camden an attractive place to live.

Mid and late 1840s PHILADELPHIA

During the 1840s and 1850s, hundreds died each year in Philadelphia and the surrounding districts from diseases such as malaria, smallpox, tuberculosis, and cholera, related to poor sanitation and diseases brought by immigrants; the poor suffered the most fatalities. Small rowhouses and tenement housing were constructed.

1840 PETTY ISLAND

Shipbuilders commence their trade on the island.

1843 PETTY ISLAND

A dike line surrounds the island.

1844 PHILADELPHIA

Violence against immigrants in the nativist riots.

1844 CAMDEN

Camden County's separation from Gloucester County ,the county population, expanded greatly, exceeded 25,000.

New Jersey completely abolishes slavery-

1847 PHILADELPHIA

A was granted to the Pennsylvania Railroad, which has since become one of the great agencies of progress to the city and State.

1849 PETTY ISLAND

The Legislature assigns Petty's Island to Delaware Township-

1850 PETTY ISLAND

Manderson's Shipyard is on the island featuring dual ship railways.

1854 PHILADELPHIA

The lawlessness and the difficulty in controlling it, along with residential development just north of Philadelphia, led to the Act of Consolidation.

1851 PETTY ISLAND

Ralston Laird arrives from Ireland and is hired as a farm manager on Petty's Island. On his arrival he finds an island that is divided into small farms with about 18 families living on it. Laird raises cows and horses.

1852 PETTY ISLAND

Hugh and Joseph Hatch Manderson, in the lumber business at Shackamaxon Street Wharf on the Pennsylvania side of the river, acquire two large tracts on and rename the island "Treaty Island."

1855 PHILADELPHIA

Fairmount Park was established. Later it acquired land on both sides of the Schuylkill River in order to protect the city's drinking water supply from industrial, commercial, and residential contamination.

American Civil War 1861-1864

Philadelphia was an important source of weapons, troops, warship and money during the war.

Many soldiers moved through New Jersey via the Camden and Amboy Railroad and then the Delaware River by ferry.

1860-70 PETTY ISLAND

The west shore of the island was used for repairing ships and for a shipyard. Jacob Armbruster erects a building and manufactures chains on the island.

1868 PENNSAUKEN

River Road, the first highway from Cooper's Creek to Pennsauken Creek is completed. Pennsauken begins as a tiny village.

1870 PENNSAUKEN

Joseph Rilatt installs a marine railway. Rilatt's shipyard began as a construction and repair facility specializing in barges.

Rilatt cuts a notch into the island's western shore for shipbuilding work. Many of the yard's workers reside on the island.

1874 PETTY ISLAND

The island has shipyards and wharves on the Philadelphia side and pierheads and bulkheads on the New Jersey side.

1880 PETTY ISLAND

John F. Betz, a brewer, rents part of the island, plants numerous willow trees, and calls his dancing and drinking resort "Willow Grove."

1880 PENNSAUKEN

Pennsauken village is established.

PHILADELPHIA

Philadelphia's population continued to grow.

The dense population areas were growing north and south along the Delaware River, Philadelphia's rich left for newer housing in the suburbs, and immigrants moved into the city.

1882 PETTY ISLAND

23 acres on the western side of Petty's Island are cut away and bulkheads inserted to maintain the widened and deepened ship channel.

At the lower island end, about 50 acres were cut off. Prior to these "improvements," visitors could gather Calamus (sacred to the Native americans) or Sweet Flag, a semi-aquatic plant, from a veritable bed surrounding the island fed by the tides.

1884 PHILADELPHIA

Completion of City Hall. That was the tallest building in Philadelphia for nearly 100 years.

1884 PETTY ISLAND

Camden attempts to have Petty's Island annexed to Camden Township,

which had been lately created and was adjacent to the island.

1889 PETTY ISLAND

A document titled "What Philadelphia Is," by Albert F. Matthews, states that "a portion of Petty's Island... will be cut away" to deepen and widen the Delaware River channel so as "to admit in easy access the largest of steamships".

1893 PETTY ISLAND

The federal government condemns a portion of the lower end of the island and paid \$200,000 for the land and damages to straighten the Delaware River channel.

Bud deposited enough dredged material on the lower end of Petty's Island to add 21 acres to it.

1902 PETTY ISLAND

Joseph P. Mack purchased all the interests on the island for the purpose of selling the island to the city of Philadelphia for a municipal hospital. This was blocked by New Jersey Legislature.

1904 PETTY ISLAND

Pioneer oilman Henry L. Doherty creates the Cities Services Company.

1907 PETTY ISLAND

Philadelphian businessman, Donovan and Mack decided to invest on Petty's Island. The idea was to build a million-dollar amusement park rival to Coney Island and the design would have included an hotel with thousand rooms, a theater, a casino, ballroom, bathing beach, river amphitheater, sports arena and a 250-foot central tower.

Architect Louis Sullivan was called to design the whole thing. In 1907 An advertisement on the Philadelphia Inquirer declaimed "The Island City will comprise a unique blending of beautiful gardens and magnificent structures, presenting a combined landscape and architectural effect, unequaled on any other amusement ground in the world."

Sullivan's drawings show a series of buildings with his characteristic organic throughout, that remember his angelic figures Transportation Building of Chicago World's Fair (1893) and the Midwestern Bank buildings from the early 1910s. A banner-draped tower above the theater building boldly announces "AMERICA." Louis Sullivan's designs for Island City were published in the *Architectural Review* in 1909

1907 PHILADELPHIA

The city constructed the first subway.

1920 PETTY ISLAND

The Philadelphia Electric Company (PECO) constructs the first of four Delaware electric generating station on the Pennsylvania shore opposite Petty's Island and arranges to store vast piles of coal on the lower end of Petty's Island to prevent an interruption of fuel to its riverfront plants.

1926 PHILADELPHIA

Construction of Delaware River (Benjamin Franklin) Bridge to New Jersey. Sesqui-Centennial Exposition in South Philadelphia. The senior draftsman for the design of the exposition buildings was a young Louis Kahn.

1942-1945 PETTY ISLAND

Petty Island as a storage yard for Cramps Shipbuilding.

1951 PHILADELPHIA

Integrating city and county offices and providing the current structure of government, the Home Rule Charter enumerated the duties of the City Planning Commission for the first time.

1952-60 PHILADELPHIA

The 1960 Comprehensive Plan most notably transformed Center City from an industrial relic to a thriving metropolis.

1964 PETTY ISLAND

The last house on Petty's Island burns down.

1965 PETTY ISLAND

Cities Service changes its marketing brand to CITGO, retaining the first

syllable of its name and ending.

1975 PETTY ISLAND

Petty Crowley Maritime Corporation is formed.

1978-2000 PETTY ISLAND

Petty Crowley develops the world's largest roll-on roll-off barges for the mainland/Puerto Rico service.

1.4 Urban dynamics and recent development

Philadelphia

Founded: October 27, 1682

Area consolidated city-county: 365 km²

Land: 347.3 km²

Water: 19.4 km²

Elevation: 12 m

Population of consolidated city: 1,560,297

Population density: 4,492/km²

From the time of its founding in the late 17th century, Philadelphia has been shaped by thoughtful planning to make the most of its location, urban form, and access to resources.

As the heart of a new nation, Philadelphia's port on the Delaware River was a center of commerce. In the early 19th century, the port was augmented by railroads that fed Philadelphia with raw materials for manufacture and distribution making it, for a time, the "Workshop of the World." In the mid-20th century the construction of interstate highways and a new airport increased the flow of goods and access to and from the city.

Philadelphia has nearly 170 distinct neighborhoods, spread across 135 square miles. Influenced by the urban street grid, Philadelphia's neighborhoods are walkable and interconnected by public transit and rail networks.. The grid is upon ancient principles of city design, long straight

streets run east-west and north-south forming an efficient grid within which housing, commerce, and open space are all accommodated and balanced, William Penn's city plan continues to promote sustainable, urban growth.

Railroads built in the mid-1800's propelled Philadelphia's economic growth and population during the 19th century. Freight rail brought coal, iron and other goods from the interior of the country for distribution at Philadelphia's seaports and to feed the city's factories. In the 20th century, rail served the critical purpose of transporting people. Subways, elevated lines, and regional rail connected neighborhoods and central Philadelphia to expanded development in the city and surrounding suburbs.

Industry concentrated along the rivers and in large discrete tracts in south, southwest, and select northern portions of the city. Industrial output peaked in the 1950's. Decades of de-industrialization have left the city with acres of underutilized land along its waterfronts and transportation corridors, and in many 19th and early 20th-century neighborhoods.

By the mid-20th century the highway system supplanted rivers and railroads as the most important mode of transportation to, from and within the city. Construction of interstates and the Roosevelt Boulevard helped spur population growth in Northeast Philadelphia and surrounding suburbs. The placement of I-95 along the Delaware River physically separated the city from this expansive waterfront.

Philadelphia's population peaked by the early 1950's. As in many cities of the Northeast, a decades-long period of de-industrialization resulted in closed factories, population loss, vacant land, and urban decay.

Today the city is the sum of its many assets – a strong metropolitan center, the engine of business/institutional/ cultural output and employment; a fabric of diverse and authentic neighborhoods; and industrial-legacy areas.

However, over the next 50 years, Philadelphia experienced a major period of disinvestment and decline as employment and population decentralized towards surrounding counties.

The hugely underutilized asset for Philadelphia are the central and the North Delaware Riverfront.

-Port Richmond neighborhood (PA):

Pop: 34,118

Area: 9,07 km²

-Fishtown neighborhood

Pop: 15,974

Area: 1,1km²

-Olde richmond neighborhood (PA):

Pop: 30,022

Area:1,17 km²

-Camden city

Settled: 1626

Area: 26.784 km²

Land: 23,103 km²

Water:3,677km²

Pop: 77,332

Population density: 3,3/ km²

Camden contains the usa first federally funded planned community for working clas residents (yorkship village) in 2006 half of the city's residents lived in poverty, in 2011 camden's rate of unemployment rate was at 19.6% Camden was ranked the third-most dangerous city of usa in 2002.

-Cooper point

Pop: 2,793

Area:0,6 km²

-Pyne point

Pop: 5,591

Area:1,19 km²

-Cramer hill

Pop: 4,460

Area: 1,62 km²

-Biedman

Pop: 5,666

Area:1,32 km²

-Pennsauken township

Area: 31,291km²

Land: 27.027

Pop: 35,885

Population density: 1,3/ km²

Pennsauken is home to a large industrial park.

2. Petty Island and its waterfronts: spatial, functional and ecological description

The observation and study of Petty Island and its waterfronts let the interpretation of these areas as vacant and marginal.

In there, the urban grid is not clearly defined, the build up space is characterized by abandoned and semi-abandoned buildings, the infrastructural network doesn't allow the connection between the city and the waterfronts and between them and Petty Island.

This is linked to the mainland only by a fixed bridge extending from Pennsauken(Camden)36th street.

The abandoned tanks, containers, warehouses and offices building on the island depicts the post-industrial neglected landscape that defines the overall site.

The ecological issues are related to the flooding risk projection, which make these territories even more unstable.

U.S. Climate central department has estimated risk combining local sea level rise projection with historical flood statistics from the NOAA water level station at reedy point, 36 miles from the center of Camden. Based on the National climate assessment intermediate high sea level rise scenario, they project 4.2 feet of rise locally by 2030.

This areas are strictly connected to the the presence of water and it has to be considered in the planning practise, especially as the flooding projection will severely challenge them.

3. Landscape: Value, Perception, Recovering. Some theoretical notes, consideration and references

The site analysis clearly describes a residual, abandoned and refused landscape.

To rethink this kind of place in a design perspective, it is necessary to pursue the “Landscape” theme, and especially what it is defined “unstable”-

The term “Landscape” is related to a multitude of meanings and it is interpreted by the European Landscape Convention as “« an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors »”¹

The article emphasizes the importance between the area and the socio-cultural and economical vision of the people. The idea of knowing a place just through the sensorial discretion of sight is overcome, and the anthropic component is in this way linked to the common naturalistic meaning.

The European Convention has introduced a new way of considering the landscape, as it has now a key role in individual and social wellness, and its protection and management must be carefully take into consideration.

¹ European Landscape convention (2000), Art.1.

Moreover , this document clarifies that a landscape should not be inevitably “beautiful” as one can imagine , but it is the reflection of the quality of everyday life of people.

“Acknowledging that the landscape is an important part of the quality of life for people everywhere: in urban areas and in the countryside, in degraded areas as well as in areas of high quality, in areas recognised as being of outstanding beauty as well as everyday areas”.

As a result, these areas, exposed under the cultural experience of man, can be both wealth or fear sources.

In this last case, the landscape assumes a negative implication due to its perception but also in its use and as a consequence, its negligence becomes obvious.

There is a multitude expressions of neglected spaces according to their specific nature.

“ Places, designates the sum of the space left over by man to landscape evolution - to nature alone. Included in this category are left behind (délaissé) urban or rural sites, transitional spaces, neglected land (friches), swamps, moors, peat bogs, but also roadsides, shores, railroad embankments, etc. To these unattended areas can be added space set aside , reserves in themselves: inaccessible places, mountain summits, non-cultivable areas, deserts; institutional reserves: national parks, regional parks, nature reserves”.²

Waste landscape are used in literature to define a way of using the landscape strictly connected to the consumptive exploitation of soil.

² Gilles Clément, (2004) .*Le Tiers Paysage*, Sujet.

Waste in general indicates municipal waste, sewage systems, plants; all that spaces considered dangerous by people and so somewhere to avoid.

The abhorrence to this lands limits our ability to transform it. We use the expression "waste places" when referring to abandoned and polluted areas, with unfinished structure or uninhabited buildings.

"Wasteful places" instead are to indicate incongruous areas according to their use, left behind to deterioration and negligence .

So the landscape described in this context are the obsoleted, deteriorated, abused, places . they are characterized by emptiness, inactivity, unproductiveness, imprecision, without a defined border and normally come from the alteration of their own natural resources.

Furthermore this landscapes, because of how they are perceived, are associated to the word

"marginal" , in the sense of a delimitation, border, something that separates, isolates different land with different peculiarities.

But The "margin" should be interpreted as something that connects different places so that is possible to experience a new landscape..

Instead of an empty spaces, we should look at this places as they were fertile and full of possibilities and potentialities. As they are dynamic and constantly changing they could represents unexplored territories to be experienced.

This possible alternative places are called by Morales as Terrain vagues defining them as *"(..)obsolete places in which only a few residual values seem to manage to survive, despite their total disaffection from the activity of the city. They are, in short, external places, strange places left outside the city's effective circuits and productive structures. From the economic point of view, industrial areas, railway stations, ports, unsafe residential neighbourhoods, contaminated places, have become the areas where it can be said that the city is no longer.*

They are its margins, lacking any effective incorporation; they are interior islands voided of activity; they are forgotten, oversights and leftovers which have remained outside the urban dynamic. Converted into areas that are simply un-inhabited, un-safe, un-productive.

In short, these are places that are foreign to the urban system, mentally exterior in the physical interior of the city, appearing as its negative image as much in the sense of criticism as in that of possible alternative".³

The idea is that this forgotten spaces, this undefined "terrain" are certainly characterized by an emptiness (vacuus) but at the same time this void is available, open, free.

So the uncertainty of this condition is instead is pretest to become new unexpected scenarios

This landscape can be considered in this way "the space of the future", what Gilles Clément called the Third Landscape.

"If you stop looking at the scenery as the object of human activity once you discover a number of spaces undecided, no purpose to which it is difficult to name. This set does not belong to the territory of the shadow or in the light. It is located on the edge. Where the woods fray, along roads and rivers, in the depths of the forgotten crops, where the cars do not pass. Among these fragments of landscape there's no resemblance but only one point in common: they all represent an area that is a refuge for diversity. Everywhere else, this is dispelled. This makes it justifiable to collect them under one term...I propose Third Landscape".⁴

³ De Solà Morales Ignasi, "Terrain vague" in *Quaderns* n. 212.

⁴ Gilles Clément, (2004) *Le Tiers Paysage*, Sujet. Italian version:

"Se si smette di guardare il paesaggio come l'oggetto di un'attività umana subito si scopre una quantità di spazi indecisi, privi di funzione ai quali è difficile dare un nome. Quest'insieme non appartiene né al territorio dell'ombra né a quello della luce. Si situa ai margini. Dove i boschi si sfrangano, lungo le strade e i fiumi, nei recessi dimenticati dalle coltivazioni, là dove le macchine non passano. (...) Tra questi frammenti di paesaggio

The common element of this interpretation is that if we consider all the possible forms of the landscape, as it is written in the European Convention, “in urban areas and in the countryside, in degraded areas as well as in areas of high quality” , the terms marginal, residual and empty has to be associated to an open space to be preserved, a void that become protagonist, nor a background,nor a space to build up, nor an absence, but part of the composition, something has the ability to give a new structure to the residual fragments of the deteriorated reality”.

“Void that becomes the protagonist , not background , not space to build, not an absence, but the material of the composition , something able to give new structure to residual fragments of the degraded reality”⁵ .

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This landscape can not be observed just through their negative meaning but as resources to count in the planning practise, as they can be adapted to new uses, following cultural, social and economic needs of the city.

In a project design perspective this places offer the possibility for people to regain a reality that they have lost.

The architectural practice that percieved this perspective has elaborated satisfactory outcomes.

1. River Port Island, Saarbruecken DE

Location Saarbruecken Germany

nessuna somiglianza di forma. Un solo punto in comune: tutti costituiscono un territorio di rifugio per la diversità. Ovunque, altrove, questa è scacciata. Questo rende giustificabile raccogliarli sotto un unico termine. Propongo Terzo paesaggio, terzo termine di un'analisi che ha raggruppato i principali dati osservabili sotto l'ombra da un lato, la luce dall'altro”.

⁵ Spirito F.,(2008) *Ricomposizione di vuoti: due aree 'cavate' e un 'parco*, notes.

“vuoto che diventa protagonista, non sfondo, non spazio da costruire, non un'assenza, ma materiale della composizione, qualcosa in grado di dare nuova struttura a residuali frammenti della realtà degradata”

Dimensions 9 hectares

1985-89 Project Designer Latz + Partner (Peter Latz)

The former river port in Saarbruecken was left destroyed and abused due to coal shipping activities. Peter Latz and partner envisioned this place as a new ecological urban and natural part of the city center that should keep its historical layer. Gardens location determined by traces of the past allows this goal to be reached, as well as the water of the pond which serve as an oxygenation and purification plant.

2. Landschaftspark in Duisburg Nord, Germany

Location Duisburg Nord, Germany

Dimensions 230 hectares

1860 Coal and steel production plant

1985 Abandoned

1991 Project Designer Latz + Partner (Peter Latz)

The recovery of this industrial site was made by Peter Latz and partners by allowing the past residue to be part of the present remediation technologies, including in it the abandoned structure adapted for new uses.

This place, beside perpetuating the story of the industrial facilities, manage to control the ecological damage done by the infrastructure themselves in a flourishing vegetation. New program of public activities came from the reuse of the existing elements such as bunkers used for hosting gardens, diving schools in gas tanks, climbing wall emerged from concrete walls, Zoning is linked to the industrial settle and allows different

themes to be developed, sport Park, industrial park, Event and recreational park, Natural Park.

In this project, The disturbing presence of the industrial facilities and the complex condition of the site were taken as potential to regain this landscape, which should not be erased, but transformed in a park representing the unification of industrial heritage and the cultural one.

“Duisburg-Nord Landscape Park in Germany, [...]and numerous other projects designed and built by Peter Latz and Partners stand as examples of an up-to-date and intelligent approach to alternative environmental technologies and the reclamation of extensive industrial landscapes. In Peter Latz’s landscape architecture, ecological and social concerns are translated into an individual aesthetic language that aims to achieve a timeless quality. The different layers and meanings of the sites rich in history are revealed and woven into networks of spatial and temporal relationships that follow rules of their own – the syntax of landscape. A sense of process and dynamism in sustainable landscape structures characterises the works, works that are open for change: they are spaces in development, not parks as finite set pieces”.⁶

In the specific case study, the instability that characterized Petty Island and its adjacent riverfronts on both sides, is not only due to its marginal, residual, abandoned condition, but also it is deeply connected to the consequences that its exploitation has generated throughout time, causing a much more exposure to climate change risk, especially in matter of surging seas.

⁶ Weilacher Udo, (2007) “The Landscape Architecture of Peter Latz and Partners”, in Syntax of Landscape, Springer Science & Business Media.

This kind of unstable condition is common to most river cities around the world and all that territories strictly connected to the presence of water. The pressure that has challenged the territory can be seen as the main causes, Eroding, digging, industrial plants abusing and transportation are just some examples.

“River spaces have been exploited, modified and subverted during the years, in accordance with the typical rules of the industrial era, producing fringe spaces, where the instability lies into a constellation of waiting spaces”.⁷

This forgotten and leftovers spaces have been transformed into uninhabited and un-safe areas without an identity or a specific form, they are just outside the urban dynamic

The abuse of the land together with the action of nature, have challenged this territories and caused their instability condition.

“Unstable spaces as they are subject to the vagaries of nature [..] but also marginal spaces , heavily modified, recycled through the ages and rejected, [they are] now impossible to recognize as places”⁸

“They are areas , not places yet . They are fragile because they induce conditions of displacement and are inhabited by disoriented multitudes”.⁹

⁷ Oldani Andrea,(2014), *Designing Unstable Landscapes*, Proceedings of the 2nd ICAUD International Conference in Architecture and Urban Design Epoka University, Tirana, Albania, Paper No. 19.

⁸ Oldani Andrea, (2013), “Fiumi e città: Esperienze europee a confronto”, in *Territorio*, n 64. Original version
“Spazi instabili perché soggetti alla imprevedibilità della natura [..]ma anche spazi marginali, pesantemente modificati, riciclati nel corso dei secoli e rifiutati, oggi impossibili da riconoscere come luoghi”

⁹ Augè Marc,(2005), *Non Luoghi*, ed. Elèuthera, Milano. Versione originale “Sono zone, non ancora luoghi. Sono fragili perché inducono condizioni di spaesamento e sono abitate da moltitudini disorientate”

This responsibility in designing practice lies the European convention “ the possibility to create or recreate landscapes starting from neglected abandoned forgotten or weak territories.”

Even though this imminent risk involved a multitude of river cities, just some strategical projects were experimented in this field and it is worth to remember the Hafencity public area.

1. Hafencity Public Space, Hamburg, Germany

Location Hamburg, Germany

Dimensions 150,000 sqm

Beginning year 2002

Completion year: 2015

Landscape Architect: EMBT

The project area, an open space of the western part of Hafencity, has changed throughout its history of industrial uses and harbour activities.

The land is obviously affected by the influence of tides and the main idea was that to protect the space from flooding not by containing it but instead by giving water space to expand.

In this way the new public spaces are floodbale., instead the city is always protected.

The project is characterized by a system of ramps, stairways, and catwalks connect levels:

Water level ($\pm 0,00$) A big floating platform provides access to boats and some leisure areas. There are special floating elements used to allow the presence of greenery and trees on the water level.

Low promenade level (+4,50) that will be flooded only on specially bad days and Street level at (+7.50) where there are pedestrian and playing areas. Tradition harbour material and plants were used in response to the

climate. The interplay of land and water and stands as a key issue for the overall project. The unstable landscape is something dynamic, in continuous mutation, as it changes in time. According to the forces that had, and still have operate on it.

“A landscape is the evolving work of an entire community”¹⁰

Its transformations are intrinsic and connected to the action of humans which are constantly trying to adapt the territory to respond their needs. That's why man should preserve and valorize it and in the planning design practise filed one must follow this principle, according to European Convention statement: “the landscape performs an important public role, from a cultural , ecological, environmental and social point of view and it constitutes a necessary resource for economic activity and if protected, managed and planned properly , it can help to create jobs and thus fostering economic regeneration of the area, bringing social benefits and everything that goes with it”.

This interpretation, when it defines the landscape as an economic resources, is probably referring to some economic activities related to tourism, but other alternatives could be valuable as well. Among other socio-economic models linked to the landscape, are the efficiently energyscapes, which are able to activate investments, economic flows, jobs and other activities, where, of course, there is a notable energetic potential .

Energy has always influenced human settlements and their landscape. The introduction of new sources of energy corresponds, in history, to social-economic and territorial planning changes .

As a matter of fact, “urban settlements have changed over time according

¹⁰ Ferriolo M.V., (2009), *Percepire paesaggi, la potenza dello sguardo*, Bolla Boringhieri, Torino. Versione originale “Un paesaggio è l'opera in continuo movimento di un'intera comunità”

to the availability of energy”.¹¹

Energy infrastructures has deeply affected the territory, from fossil fuel resources to electric power plants.

From the beginning of electrification invented by Thomas A. Edison's to the decision in 1893 of building the hydroelectric power station at Niagara Falls, and the consequent transportation of all this energy to different places using wireless transmission, it is easy to imagine the size and scope of certain project that affected the environment and the landscape.

The first decades of XX century were characterized by an optimistic, enthusiastic and even utopistic vision of science and lot of project were made and proposed.

in the late 1920s and early 1930s, even utopistic ones like the Atlantropa project, presented by the German architect Herman Sörgel.

The project's main goal was to build an hydroelectric dam across the Strait of Gibraltar, providing in this way an enormous amount of hydroelectricity. This process would have lower of the surface of the mediterranean sea by up to 200 mt, giving space to new lands and settlements and unifying all the countries around it. At that time, nobody doubted the feasibility of this project, and for sure nobody even imagine the impact that this would have on ecosystems and landscapes.

The history of energy passes through the remarkable infrastructures of coal mines and oil.

The use of petroleum in products and as a fuel had an enormous impact on social and economical assets.

Moreover, as the internal combustion engine and so the private petroleum-powered automobiles, had the major influence on the Oil Age, the urban setting changed to a diffused model.

In the 1960s, when the Nuplex concept was devised, nuclear energy became the big promise of developmentalist and consumerist currents,

¹¹ Ivancic Alex,(2010), *Energyscapes*, Editorial Gustavo Gili.

The concept was to generate electricity through desalination complexes, leading to the formation of industrial clusters focused on agroalimentary industry, feeding industrial and agricultural activities with water and energy.

Recently, some newer and larger infrastructures also affect landscapes by transforming natural resources of energy into electricity, the wind and solar farms.

Masdar City is a sustainable mixed-use development project in United Arab Emirates, designed by Architects Foster and Partners.

The city relies on wind, solar energies and other renewable energy sources and will use a mix of electric vehicles and clean-energy mass transit inside of it.

It's true that most of the energyscapes at a certain point became obsolete and most of the time they are left abandoned or become ruins after cases of disasters or ghost towns.

But as it is explained in the previous part, it is possible to reuse not only the single infrastructure but complete regions and territories, encouraging the ecological, economic, and urban revitalization as it happened in IBA Emscher Park.

Converting a polluted ex-industrial area into an experimental new neighborhood, using new technologies and renewable energies can also be a valid alternative as it possible to see in the Ecodistrict of Hammarby Sjostad in Stockholm.

A strong feature of it is the system of interdisciplinary planning of physical flows of energy, water and waste using the *Hammarby model* so share of *renewable energy* using bioenergy and incineration of local waste to produce both locally generated heat and co-generated electricity. Implementation of Large-scale local wastewater and stormwater harvest and filtration plus stormwater devices.

Petty's Island and its adjacent waterfronts, as it is emerged from the physical historical description, are ascribable to weak, unstable, abandoned landscape.

It seems clear at this point that including in the landscape project elements of renewable sources could be reasonable, as it reflects the needs of our time, the energyscape becomes in this way the expression of the energetic culture and its relationship with the context.

4. Redefining Petty Island and its waterfronts.

4.1 Strategy description

The previous phases of the thesis work allowed a thorough comprehension of the spatial, functional ecological issues of the island and its context, as well as their transformations in time and shape due to artificial and natural processes that occurred and still challenge this territory.

The result of this study and analysis have highlighted the critical aspects that characterize the current post industrial, neglected abandoned and marginal lands.

Redefine Petty Island and its waterfronts begins by considering their resources, weaknesses and potentialities to elaborate a regeneration and development proposal.

In this perspective, the site can be seen as a superposition of layers, each one representing a critical aspect, positive or negative, to which a strategic action can be addressed.

The description of the resulting critical framework begins with the built up space layer, characterized by abandoned and semi-abandoned industrial buildings for which the strategy consists of reusing or demolishing actions.

Another weakness aspect are the infrastructures that link the city to their waterfronts and to the island. Petty Island is achievable only from Camden waterfront by a bridge.

These connections have to be reordered and improved to allow people easily reach, use and live these abandoned places, as this is the main goal of the

regeneration proposal, and for this reason the proposal includes a new bridge infrastructure from Philadelphia to rediscover Petty Island.

The urban grid of the cities Philadelphia and Camden, nearby their waterfronts, tends to be unclearly defined. In the first case this fact is due to the huge infrastructure that delimits the city from the riverfront and in the second case the grid seems to finish nowhere. The action meant in this case is to extend the grid till the waterfront where is now interrupted and use its extension to define the main axes of Petty island redesign.

Left abandoned are also the reserve areas on the island to which a maintenance process is addressed.

In the first phase of the thesis work, the flooding forecast has allowed to define clearly the the area subjected to this risk and action that follows is to practise some methods to deal with the increasing in frequency and severity of flood risk.

These adaptation/transformation strategies will be discuss further in the next paragraph.

Vacant lands, this huge areas that basically define most of the case study are considered to be consolidate and the to be the starting point for the designing of new landscapes and development spaces, which concerns also to the orographical conformation response, the memorial use of the historical grid of Petty Island and to the recover of the traces on Philadelphia waterfronts.

As a matter of fact, each of these last three layers , orographical conformation, Petty Island historical grid and Philadelphia waterfront traces are considered as resources in the overall critical framework.

After defining the strategies that lay on the basis of the project proposal , and according to the theoretical studies about landscape, perception and recovering made in the previous phase of the thesis, the attention move on

to the energetical potentialities of the site to think a possible alternative in the redesign of these abandoned areas.

The research point out that, especially on Petty Island, that including in the landscape project elements of renewable sources could be a reasonable choice as the potential water, wind and solar energy potential are valuable as well as the biomass residue.

Data observed on Petty Island:

Terrain

Altitude: 5m

Slope inclination: 1°

Slope azimuth 279° (W)

Air temperature

Yearly: 11.8°C

January: 0.3 °C

July: 23.9 °C

Landscape:

Type: Aree artificiali

GLC artificial surfaces and associated areas

Energetical potentialities:

In water depth of 8.4 meters, the mean tidal current magnitude is 0.46 m/s, (maximum is 0.79 m/s) The mean kinetic power density is 76.7 W/mq (maximum power density is 251.49 W/mq).

The wind speed average is 0.5/7.00 m/s and the wind power is classified in Class 2.

Solar Photovoltaic is calculated 4.5 to 5 Kwh/mq/day.

The biomass residue is 50 to 100 thou/tonne/year

4.2 Waterfronts new landscape and development area

As previously specified, the design idea is based on the recognition of the specific characteristics of the area, meant as resources or weaknesses, each addressed by its own proper strategy, pursuing a further qualification of these waste lands through reordering, consolidation, preservation, development and integration.

The outcome of this first approach is the redefinition of the waterfront on both sides of the island.

The new landscape is conceived as a green riverpark for the city, which is not only a place to enjoy, but also it reconnects the city to the river creating a new green public network and acts as protection from flooding.

With abandoned buildings dismantled and the others converted and reused as public places, a main pedestrian boulevard passing through the entire park, pedestrian paths recovered from traces and along the river, clean-up docks, and the new bridge connection, the abandoned neglected waterfront becomes a new place where people desire to be and to live.

In between the riverpark and the city, where the land is secured from flooding thanks to its orographical configuration and coming for the urban grid extension, there is a new grid pattern, destined to mixed-use development, and in the case of Philadelphia waterfront, this is detached from the huge road infrastructure on the back side by green smog absorbing protection.

For what it concerned the flooding risk, three main measures are adopted.

The first is the mitigation approach, which is related also to the causes of flooding, and it is about lower the carbon economy footprint by improving pedestrian, bicycle and emission free vehicle paths instead of carbon ones. The second one is adaptation, that address living with water, and it means allowing water to flood, in some more porous part of the river park where there are also reused buildings that can be adapted with floodable groundfloor, almost making an attraction of what it is considered a problem. Adaptation strategy considers also the construction of new architectures on stilts.

Protection is the third measure and referred to keep water out by artificially raised ground

level higher than the predicted water level. The green public space of the river park achieves the three strategies by immediately help to absorb flood water (mitigation), let space from water to enter to be store and release slow back into the river (adaptation) and protection.

In this way the river become a unifying element instead of a dividing barrier.

What will make the river and the riverpark even more attractive will be the development park on Petty Island, now connected on both side of its waterfront by the fixed bridge of Camden and the new bridge of Philadelphia.

4.3 Development park

Petty Island, from being a native american village to a slavery prison for Africans, a farm settlement for the European, a shipyard during american civil war, an illegal gambling and drinking market meeting point, a potential amusement park designed by Louis Sullivan for Philadelphia entertainment, passing through a long history of coal and petroleum

industrial business and becoming at the end a waste abandoned land, is redefined now as a development park.

The idea is to transform the island into a attractive and productive park of renewable resources energies, leisure spots and wildlife activities.

The strategy at the beginning of the chapter explained the actions involved in the redesign of Petty Island weaknesses and resources. More specifically, they are the dismantling of the abandoned warehouse and containers and the reuse of the tanks as digester in the energy production, the new bridge infrastructure connection to Philadelphia waterfront.

The extension of the urban grid and the memorial use of the historical grid that allow to define the main axes that subdivide the island due to the different functions, and the preservation and maintenance of the reserve areas. The flooding areas of the island are treated in the same way of its adjacent waterfronts, as so, to apply the mitigation strategy and allow water to enter the island (and then to be released) in its lower part and protection by raising artificially the energetic park above the level of predicted water level.

The access to the island is permitted from Philadelphia riverpark by an electric mass transit vehicle transporting people by the bridge, which stops in the learning, research and development center of Petty Island, and from Camden by the existing bridge.

The activities one can experience in the park include the walking park through the energy part, looking out the different energy resources, from the algae pond, the crop sunflower and water hyacinth flowers fields, the for producing biofuels, to the photovoltaic farm and the wind turbines. Passing throughout this new landscape people can enjoy the island by learning how renewable energy resources work, knowing that it is a productive environment, whose outcome will be useful for everyone.

Beside the energy production, some leisure activities are also possible while visiting the park,

as the fishing point with small green area dedicated to families, the wildlife park where the idea is walking into the reserve area of the island observing the different ecences and to passing through the two lagoons until the tidal mudflat paths, where bird migration and mitigation from flooding take place.

Thought as a public open space for events to accomodate, is the square facing Philadelphia waterfront, from which you can enjoy the view of the city and the river.

The production of energy, is coming from the renewable resources as solar, wind and biomass on the island new energetic park and also from the water turbines located under the new bridge connection.

In this way, visiting Petty Island new development park allows to experience and enjoy and new landscape that is at the same time attractive and productive and gives the opportunity to learn and observe new technologies and methods to produce energy. The energetic park provides not only a resource of energy itself, but a chance to research and learn from it and this activities are enhanced in the learning, research and development center of Petty Island.

4.4 Learning, research and development center

Extending from the main axes on the energetic park, the Learning, research and development center is directly connected with the bridge coming from Philadelphia waterfront, The new infrastructure enters into the building becoming the main entrance platform suspended at 2.50 meters, where is possible to admire the park and the center itself.

The idea behind the design is to keep the external grid of the landscape in the inside and shaping the overall structure reffering to it. This axes, the main ones, allows also the funcional subdivision of the building which are cultural, learning and research, and productive.

The center groundfloor, where there are the entrance hall and the Petty Island cultural center, is partly public and partly dedicated only to the learning and research activities, including classrooms, study rooms, a laboratory with its glass house as well, as the productive one, that consists of offices, warehouses, dock/transit.

At the firstfloor the center become entirely public, with the exception of the temporary housing to accomodate the researchers, and it is possible to share knowledge in the didatic classroom and the open library and archives, to study, to stop by the restaurant.

At the very end of the building, the internal path enters the auditorium, that provides, a part of its common funcion, an panoramic view of the wildlife park and Philadelphia city.

The wooden profile and glass structure of the center let the natural light always to illuminate halls, passages and the main path, but also the internal subdividisions.

The entire public fruition is due to the ramp that rises and decreases along the building from the entrance to the auditorium and allowing to achive different levels. The promenade comes from the extension of the energetic park walk as it is a unique path passing through the island.

In the design practise of the Learning, research and development center, this main axes cuts

Petty island culture center in two parts and divided its program into the Petty Island historical, spatial and funtional evolution exhibition and the interactive exhibition dedicated to the energy renewable sources and technologies. This building inside the building is internally connected by its own ramp promenade that raises from the groundfloor to the firstfloor allowing a dynamic fruition of the different exhibitions which give also space to some panoramic spots to the river and the park.

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