

SPACE IN THE INDUSTRIAL RIVERFRONT OF LISBON. PROCESSES OF SPATIAL FORMATION

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ABSTRACT

Being a plural space – in space and in time – the Lisbon riverfront is composed of multiple spaces with its own logic and distinct characteristics, being its pre-existent areas or spaces conquered to the river, located by the water or separated from the river somewhere in time.

At first occupied by the industry of the city, by the port or by the new accessibility infrastructure, this riverfront has known variable dynamics of use through time.

Specifically during the industrial period, a large expansion of the riverfront occurred, resulting simultaneously (1) in the creation of the new port, industrial and urban areas, and (2) on the separation of the former riverfront areas from the Tagus River.

During this period different process of territorial formation occurred:

1. The formation building by building;
2. The structure of pier, street and warehouse;
3. The spontaneous growth supported by corridors of accessibilities (streets and railway);
4. The project of the industrial company;
5. The master plan of the port in front of the city;
6. The industrial allotment;
7. The large and autonomous industrial complex

Within this complex reality, several types of public space were also created, being the axes of accessibility or the structure of squares, both verifying a graduation of different levels of importance.

This article tries to present a typological classification of this reality in the Lisbon riverfront formation during the industrial period.

Later, with the post-industrial transformation of the Lisbon's riverfront, new public space was also created; this contemporaneous dynamics will be object of analysis in a subsequent publication.

This research is supported by a previous work, focused on the identification of a group of common patterns in the formation and transformation of the riverfront starting in the industrial period; these patterns were identified in the Lisbon case study and confirmed in four other working cases – the riverfronts of Rotterdam, Shanghai, Duisburg and Hamburg.

Studying the territory and its several primary and secondary fonts, it was divided in two parts. The first, specifically, proposed the definition of the seven formation processes of the industrial riverfront – identifying for each its predominant period in time –, and analysed the forms of creation and different characteristics of the resulting public space.

This article is a dissemination of parts of an author's previous research (2006), the «Riverfront between projects», available in Spanish on: <http://www.tesisenxarxa.net/TDX-0322107-120012/>

RESUMEN

Siendo un espacio plural - en el espacio y en el tiempo - el río de Lisboa está compuesto por múltiples espacios con su propia lógica y características distintas, siendo sus áreas de pre-existencia espacios conquistados para el río, situados sobre el agua o separados por el río en alguna parte en el tiempo.

En un primer momento ocupado por la industria de la ciudad, por el puerto o por la nueva infraestructura de accesibilidad, este río ha conocido variables dinámicas de uso en el tiempo.

En concreto, durante la era industrial, se produjo una gran expansión de la orilla del río, lo que al mismo tiempo supuso (1) la creación del nuevo puerto, la industria y las zonas urbanas, y (2) sobre la separación de la ex zonas de la ribera del río Tajo.

Durante este periodo ocurrieron los diferentes procesos de formación territorial:

1. La formación edificio por edificio;
2. La estructura del muelle, calle y almacén;
3. El crecimiento espontáneo de los corredores de accesibilidad de apoyo (calles y ferrocarril);
4. El proyecto de la empresa industrial;
5. El plan director del puerto frente a la ciudad;
6. La parcelación industrial;
7. Los grandes y autónomos complejos industriales

Dentro de esta compleja realidad, también fueron creados varios tipos de espacio público, siendo los ejes de la accesibilidad o la estructura de plazas, tanto la verificación de una graduación de los diferentes niveles de importancia.

Este artículo trata de presentar una clasificación tipológica de esta realidad en la formación de la ribera de Lisboa durante el período industrial.

Más tarde, con la etapa posterior a la transformación industrial de la ribera de Lisboa, el nuevo espacio público también se ha creado, con lo que la dinámica contemporánea será objeto de análisis en una publicación posterior.

Esta investigación se apoya en un trabajo anterior, que se centró en la identificación de un grupo de pautas comunes en la formación y la transformación de la orilla del río en la era industrial, estos patrones fueron identificados en el estudio de caso de Lisboa y confirmados en otros cuatro casos: los riverfronts de Rotterdam, Shanghai, Duisburgo y Hamburgo.

El estudio del territorio y de sus diversas fuentes primarias y secundarias, se divide en dos partes. La primera, en concreto, propone la definición de los siete procesos de formación industrial en el río - la identificación de cada período y de su predominio en el tiempo -, y se analizan las formas de creación y las diferentes características de los espacios públicos resultantes.

Este artículo es una revisión de parte de una investigación anterior del autor (2006), el «La Ribera entre proyectos», disponible en español en: <http://www.tesisenxarxa.net/TDX-0322107-120012/>

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«It is the idea of the “Port of Lisbon” itself that emerges.

Before, the city communicated with the sea through several different piers, specialised in the types of products or in its origin (...), complemented with the piers of each institution or private palace on the river.

A general vision occurs only in the 18th century, with the Project of Carlos Mardel (1742-1745), proposing the unification of the Costumes until Belen through a single pier; but it only become a reality a century and a half later, with the landfill and wharf construction by the Belgium engineer Pierre Hersant starting in 1865». MOREIRA, Rafael (2004); O Cais do Mundo. in: Prefácio a CAETANO, Carlos; A Ribeira de Lisboa; Pandora; Lisboa, pp.9/10

I. THE FORMATION OF LISBON'S INDUSTRIAL RIVERFRONT, IDENTIFICATION OF SOME COMMON PROCESSES

As well in other port cities, the extensive transformation of the Lisbon riverfront during the industrial period was particularly rich and diverse, assuming several different forms.

The development and transformation of the different riverfront areas did not occur at once; neither were its growing dynamics, first located in the north margin – in front of the city and, in the 20th century, progressively achieving a metropolitan dimension – and later achieving a significant dimension in the southern banks.

The former reality of the city/port integration, based on a structure of multiple piers and buildings with direct access to the river, was progressively transformed into a specialised port district segregated from the city, assuming different forms according to the evolution of the port/industrial paradigms in time.

The former citation reflects the transformation of the spatial paradigm, that took place in this period, accentuating the 150 years that separated the first plans from the construction of the port of Lisbon by Carlos Mardel, and the beginning of its effective realization, starting in the second half of the 19th century and assuming an extensive relevance in its last decade and the beginning of the 20th century.

Focusing on the reconstruction after the 1755 earthquake – resulting in the creation of the new central riverfront of the city, including the squares of the *Praça do Comércio* and *Cais (pier) do Sodré* –, the observation of Lisbon's territorial dynamics might help to assume the middle 18th century as reference to characterise the riverfront in the beginning of the industrial period; due to different reasons, it didn't suffer significant spatial change until the middle 19th century.

During this period, in the urban territories – central and western riverfront –, the physical transformations were local and non-coordinated, resulting from isolated small scale initiatives – having the first one a major impact with the creation of the railway corridor in the eastern riverfront, in the beginning of the second half of the 19th century.

Corresponding to the beginning of industrialization, in this first period, riverfront development took happened on a plot or single space scale.

In the entire north riverfront of the city, during a first moment, (1) the absence of new industrial plots resulting from public promotion, and (2) the availability of vacant riverfront areas– suburban farms and buildings –, allowed the establishment of several industries, which occupied the empty space, such as fluvial beach corridors in front of urban areas, or the rural areas in between the suburban agglomerations.

This spontaneous phenomenon took place in areas as distinct as the *Boavista* area, from the *Casa da Moeda* to the west, in *Rocha de Conde de Óbidos*, *Ribeira de Alcantara*, and *Calvário, Bom Sucesso* area, the oriental riverfront down to *Santa Apolónia* or in *Xabregas*.

By analyzing the way in which this riverfront occupation was produced, I aim to systematize in two large groups the discovered typologies of riverfront occupation: the riverfront buildings – public buildings of port activity, religious buildings, military buildings and installations and average assortments – and the

urban spaces – representation docks, common dock and building structures, private docks and regularization of margins and unoccupied areas such as beaches, agriculture fields or gardens.

It is from the interpretation of this first dynamic that takes place in the city of Lisbon, that is defined the first formation process of the industrial riverfront, entitled **formation building by building**.

In the first half of the century, Lisbon suffered a first port embankment, where the urban facilities were also added.

With a demarked location and focusing on a very insalubrious area (incorporating since a component of sanitary project, contemporary to others occurring in many European cities) in the construction operation of the *Boavista* embankment was formed (1) the new “modern” dock of the city, in deeper waters, (2) the “noble” public riverfront promenade (river promenade), taking advantage of the new and wide longitudinal avenue, important in the road structuring, and (3) the new industrial plots with public and mix use buildings in the subsequent edified façade of the avenue.

Result of a territorial planning component, the *Boavista* embankment corresponds to the culmination of the interaction port / city in the new industrial riverfront of Lisbon, integrating the Tagus River in the urban life, and the origin of the formation process that we entitle as **dock, street and warehouse structure**.

However, the big transformation in the shape of the Lisbon’s Riverfront began in the second half of the 19th century, based on the city’s new infrastructures projects, specially the coast railway and the port embankments, a difficult process and of great territorial impact.

These where no longer uncoordinated initiatives of pinpoint scale, but correspond to the first riverfront interventions inspired in combined planning concepts and sectorized territorial management.

In the course of the implementation of the riverfront railway and the planning and accomplishment of the port embankment in front of the city, from the end of the century, both with their conditionings, the project of both these big infrastructures of the city’s industrialization marked the central and occidental riverfront – in port ambit and in city ambit – the new urban riverfront roadway infrastructure or the new public spaces.

Focusing on the occupation typologies of the riverfront, in an accomplished parallelism in the previous exercise, it can be observed that in this new riverfront predominated the buildings and port infrastructures, in which the public representation buildings such as the railway, the pluvial and maritime terminals constitutes a unique exception.

To this Lisbon riverfront formation process was associated the conception of **the general plan of the port in front of the city**, which leads us to suppose that in other river port cities the dynamics were similar.

In the transformation of the occidental and central riverfront of Lisbon, it is verified that the urban renovation process of the port fronts of the industrial period started before the arrival of the post industrial city, in the Lisbon case in the first half of the 20th century, and focusing on terrains gained to the river in the end of the 19th century.

On the other side, the development of the oriental riverfront of the city, from the construction of the railway until the middle of the 20th century, had rather distinct characteristics.

In an opposite way to the occidental and central areas – where the occupation of the riverfront was associated to large infrastructure projects and took place in terrains conquered to the river, in front of an pre-existing edification – in the oriental side of the city (at the beginning of the industrial period a periphery), the availability of extensive open terrains and the inexistence of an edified riverfront line, associated with the implementation of the railway in the 50’s and a smaller urban dynamics growth– that had been focused on the axis connection to Belen – were the starting point for an occupation of a different nature.

In a first moment, the availability of a riverfront corridor, structured by a preexistent longitudinal roadway and by the new railway, allowed the development of a spontaneous industrial growth, along the infrastructure, taking advantage of the connection to this infrastructure and the accessibility to unoccupied terrains.

With some units implemented by public initiative, the new infrastructure functioned as a congregator of the industrial development, that unified in a lineal continuous the, until then, isolated suburban agglomerates of *Xabregas*, *Beato*, *Marvila*, *Braço de Prata*, *Matinha*, *Olivais* and *Sacavém*. Along this infrastructure were located, one by one and as they were created, distinct industries of variable dimension.

This spontaneous formation process of the oriental industrial riverfront, supported by the longitudinal riverfront that it serves, we entitle **growth over the roadway or railway**.

Even more, it was also in this territory that the change of scale that occurred in some of the industrial units here located, earned its classification as an autonomous process.

Effectively, in the end of the 19th century, several companies composed by more complete edification gatherings began appearing, occupying bigger parcels – already large in a hectare scale – disposing sometimes of private piers that integrated in the complex different complementary industries within their specialty.

Public as well as private, this riverfront occupation, named **project of the industrial company**, had precise location logics – outside of the planning and of urban management - even though its dimension, its connection with the infrastructures and its impact on the territory, differs from the process previously identified as building to building formation.

Emerging in the oriental riverfront, based on the spontaneous development along the longitudinal infrastructures, this type of riverfront occupation also took place in the occidental front, where some units can be identified and on the south shore of the Tagus as well.

Also in the oriental riverfront, the development of the areas of *Cabo Ruivo*, *Beirolas* and *Olivais*, from the transition of the 30's decade to the 40's of the 20th century, had its origin in the planning of the modern industrial territory, by a number of coordinated public initiatives – definition of industrial area, big port construction, new roadway system, new naval airport and the development of public industrial complexes or of public initiative.

In this second oriental industrial riverfront transformation period, the public intervention and the industrial planning had its role – substituting the previous spontaneous formation – promoting (1) the development of the emerging industrial sectors, from which the petrochemical was the most noticeable – and (2) benefiting from the new roadway routes of the infrastructures in areas that substituted the preindustrial ones to create new industrial parcels, outside the frame of development of the port.

From this double manifestation of public intervention over the riverfront, resulted two formation processes.

Having as most significant reference the industrial development of the *Infante D. Henrique Avenue* in *Olivais*, from the 50's, the **industrial parcelling** was accomplished within the formation of categories of the industrial riverfront identified in the research.

Finally, the **big autonomous industrial complex** was first recognized in the development of the petrochemical compound in *Cabo Ruivo*, with the installation of gas and petroleum, starting in the transition of the 1930's to the 1940's, converting into a specialized group of large dimension, totally autonomous of the urban activity.

But if this formation process initially took place on the oriental riverfront of the city, it was on the south shore of the Tagus where it achieved its most important development.

The *CUF* facilities, in *Barreiro* since the beginning of the 19th century, the naval complex of the Army in *Alfeite* since the 30's and the naval construction complexes of *Lisnave*, in *Almada* and the *Siderurgia Nacional* in *Seixal*, both since the 60's, were the contemporary expression of this formation process in the extended riverfront of the south bay and its essence of exclusive characteristic.

The fast reading concerning the formation of the Lisbon riverfront allows identifying a synthesis frame of the seven formation processes of the industrial riverfront.

Previous research allowed a successful test in the application of the referred processes of formation in the cases of Rotterdam, Shanghai, Duisburg and Hamburg I.

2. THE PROCESSES OF FORMATION OF THE INDUSTRIAL RIVERFRONT:

Recognizing some former industrial projects, it was after the middle of the 19th century that Lisbon's dynamics of projecting and realizing works in the riverfront knew a new expression.

The amount of information collected through site analysis and archived work, complemented with specialised bibliography, allowed identifying four main periods and dynamics in Lisbon's riverfront formation, selecting a representative part of the riverfront to illustrate it with several local examples.

Those main moments were:

1. The beginning of the industrial period: the industrial plot in Lisbon's first riverside growth.

In this moment it was identified a formation through a phenomena of isolated construction on former riverside plots, mainly located in the occidental and central areas.

Box 1: Processes of formation of the industrial riverfront – synthesis / tendency

	1850	1850	1900	1950
1. Formation building by building	■	■	■	■
2. Structure of pier, street and warehouse	■	■	■	■
3. Non planned growth on corridors of accessibilities	■	■	■	■
4. Project of the Industrial company		■	■	■
5. Master plan of the port in front of the city		■	■	■
6. Industrial allotment		■	■	■
7. Large and autonomous Industrial complex			■	■
	Industrial Period			
	Number of case references			
	1 or 2 references in the 5 cases			
	3 references in the 5 cases			
	4 or 5 references in the 5 cases			

The last 1850's Boavista landfill and the associated opening of the new D. Carlos I Avenue, connecting it to the Courts Palace, was a period of essay to a new riverside scale of intervention in the city.

2. The riverfront as a project of infrastructure: from 1850's to 1950's, the industrialization and the new scale of Lisbon's central and occidental areas.

Starting with the arrival of the train in different moments of the 19th century, through riverfront alignments, it associated the major harbour landfill of the final of the 19th century and beginning of the 20th.

This large longitudinal landfill also allowed the construction of the new longitudinal infrastructure of the city; simultaneously, several new public squares were created.

This territory had known, since the 1930's, the first dynamics of urban renewal, which was followed by the Portuguese World Exhibition in 1940.

3. The progressive plot growth in the occupation of Lisbon's east riverfront, starting in the middle 19th century: from the single plot to the large industrial companies.

A first moment of riverfront growth was identified, supported on the preexistent road infrastructure and on the new train line; the riverfront still maintained its natural profile of fluvial beaches.

In the 1940's a new change was introduced: supported by the construction of the modern road system, new forms of industrial occupation marked the territory.

4. The emergence of the large industrial complexes in the southern banks of the Tagus River.

Starting in the beginning of the 20th century and suffering a larger dynamic during the 1960's, some large industrial complexes were installed in the southern riverfront, profiting from the large vacant territories in the estuary.

The intensive study of the Lisbon's riverfront territorial formation was the basis for the construction of a theoretical classification on the processes of formation of the industrial riverfront.

This previous classification was tested in the four working cases, aiming to identify the typologies deduced in Lisbon on each reality; the crossing of information allowed essaying the conclusions of the first part of the investigation, which are presented on Box 1.

With the definition of these common patterns – which are neither an absolute data or an indispensable matrix –, the processes of formation and transformation of the industrial riverfront can be used to support the interpretation of this specific territory in other river-port cities.

As a tool, this conceptual structure is available to inform the work in other riverfronts, always assuming the supposition that guided its own definition: each river-port city is a specific case in which not all the defined processes occur and where the ones that might be identified have their own forms.

The identified categories in the formation of the industrial riverfront were:

2.1. The formation building by building

A succession of single occupations of the riverfront by building or industries – from warehouses and private piers to free support spaces of the industrial activity –, inside the city or in periphery riverfronts.

It didn't obey to any rule but the succession of individual decisions in a spontaneous process and it implied the availability of vacant areas.

Having been an answer to the first needs of port/industrial growth, before the development of the larger infrastructure plans, it could have resulted on the change of the riverfront profile.

2.2. The pier, street and warehouse structure

The occupation of the riverfront through a rule which dictated the creation of a pier, associated with a longitudinal urban road axis – simultaneously, a harbour area and an urban promenade –, which organized the front - commercial, warehouse or mix buildings.

It is a typical process of formation of the 19th century riverfront, integrating the port and urban functions.

The basic rule for these structures might be diverse, e.g., a located landfill or an urban administration guideline, reintroducing planning in the creation of riverfront areas.

2.3. The spontaneous growth supported by corridors of accessibilities (streets and railway)

A non planned process in the occupation of the riverfront, support by an urban growth along a infrastructure corridor, parallel to the river – being it a road, a train system, or both.

It occurred in situations where there were available riverfront territory served by the infrastructure corridor and the activities needs weren't answered by the planning activity.

In the identified examples, the infrastructure corridor was interior, allowing the development of companies on the lands located between the infrastructure corridor and the river – therefore served by both.

2.4. The project of the industrial company

The occupation of the riverfront through a succession of single decisions of the industrial companies with a larger dimension (normally occupying areas of some hectares), each having a more relevant territorial implication – e.g., in terms of accessibility and housing.

These projects frequently include several installations and buildings, conceived at the same moment, sometimes incorporating their private piers and connections to accessibility infrastructures.

In this process, the unit element is the industrial company, whose location obeys to individual logics and to land availability.

Normally it takes place outside of planning processes, on former rural territories.

2.5. The master plan of the port in front of the city

The first planned moment of specialization of port activity, initiating a segregation dynamic between city and port.

As formation process, it is supported by the planning activity to transform the riverfront territories and/or to conquer new land to the river – normally in front or side-by-side with the existent city –, therefore creating a new port or industrial district.

Constituting a large territory, neighbour to the city, it normally includes the creation of longitudinal corridors for new, modern infrastructure – train and/or road; in some cases, it might also include new connections over the river.

It is the typical act of integrated planning of the harbour territory, promoted by public companies, being its realization continuous or executed in phases.

It is a common process of formation in the last decades of the 19th century and beginning of the 20th, although in some cases, it might have occurred before or later.

2.6. The industrial allotment

A riverfront occupation through a simple division of former rural property in industrial plots not developed as part of the port growth.

The industrial allotment considers the definition of the local accessibilities and the creation of new industrial plots with different areas, allowing the installation of companies with different dimensions.

2.7. The large and autonomous industrial complex

A riverfront occupation through large specialised industrial complexes, normally occupying areas of sets of ten or hundred hectares; autonomous, it is located far from the city centre and segregated from the urban activities.

Frequently integrating companies from similar sectors of activity – such as oil and chemicals, steel, shipyards, containers or logistics –, it results from planning initiatives and assumes a larger importance on a regional scale. Although some started before, it is the large contemporary industrial riverfront of the second half of the 20th century.

3. THE CREATION OF PUBLIC SPACE IN THE FORMATION OF THE INDUSTRIAL RIVERFRONT

Having had a heterogeneous formation, Lisbon's industrial riverfront exemplifies not only the occurrence of the seven different processes formation, but is also a laboratory on the creation of public space.

Having a tendency for occurrence in specific periods of history, as seen in Box 1, some different processes of formation tend to generate specific types of public spaces, resulting from its urbanistic and technological characteristics.

Differences in the creation of public space could, therefore, result from factors such as, (1) the evolution of port activities, integrated or segregated to the city, (2) the planned or non-planned territorial development, (3) its relation to pre-existing urban fabric and to industrial infrastructure, (4) its adaptation to physical transformations, (5) its specific context in the riverfront, or (6) its transformation during industrialization.

The following lines focus on tendencies of creation of public space identified in Lisbon's riverfront, during the industrial period.

3.1. Types of riverfront occupation during the industrial period: ity/port spatial relation, from integration to segregation

Continuing a pre-industrial practice, port-city integration was maintained as main characteristic of riverfront public spaces.

In the specific context of Lisbon's industrialization riverfront territorial impact, (1) the development over a pre-industrial urban structure, and (2) the dominance of the building by building process of formation, resulted on the mix of urban and port/industrial functions, several times re-using pre-existent buildings (e.g., religious) or occupying free areas in the riverfront such as vacant plots, beaches, etc.

During this period, except for the central area of the city – totally rebuilt between the Casa da Moeda and the Santarem pier, the changes in the city's riverfront infrastructures did not result of a joint

idea, but therefore from the accomplishment of precise public building constructions, ports and fluctuation ports.

The intense relation between the city and the river maintained a morphologic diversification until the arrival of the industrial period, in the continuity of (as mentioned by Rafael Moreira in the citation in the beginning of the chapter), the fragmented occupation of the period previous to the earthquake – organization thru distinct areas, corresponding to the specialization of each pier, the origin of the products or the public buildings and private palaces.

«In the beginning of the 19th century, the port of Lisbon still didn't have a general improvement plan. The works made until then were focused on precise improvements, consisting normally and in general on the construction or improvement of piers and cauldrons. It can be stated that more than a big port, Lisbon had at the time an endless number of small piers that received their names according to the genres that docked there or according to its provenience» [Referências Históricas do porto de Lisboa (1991); APL; Lisboa, pp.142].

Without aiming a detailed description, a systematization of the occupational typology of the riverfront of the city can be attempted, as exemplified:

1. Occupation by characteristic buildings, specifically:

1.1 The public buildings of naval and/or commercial activity, over the river, as well as the city's supply infrastructure buildings, which its construction was a dynamics that also started before the earthquake – the buildings that resisted the disaster like Casa da Moeda and Alfandega do Tabaco, or the Codoaria Real or the Public Cellar.

1.2 The buildings of religious origin near the river, some of which affected to other activities, in most part with the particularity of presenting its main orientation towards the interior street of the riverfront; the relationship with the river wasn't the most important, being its back side a different reality of the one on the other side of the street – e.g. the Bom Sucesso Convent, the Sacramento das Religiosas Dominicanas Convent, the Parochial Church of Santos, the Bernardas Convent, The French Barbadinhos Convent, the Santa Apolonia Convent, the St. Francisco de Xabregas Convent or the Grilo Convent.

1.3 The military buildings and installations such as the Armada Arsenal and the Army Arsenal or defence installations that stood until the 19th century as the Bom Sucesso Deposit, the Torre de Belen or the Sacramento Fortress.

2. The standard buildings, located directly over the river with their private piers, served by an interior street being (1) buildings with various usages located over the structuring interior longitudinal street with rears over the river, (2) groups of buildings in which the ones of riverfront façade are affected to port or industry usage, with access from small transversal streets (eventually gaining prestigious positions) and (3) the ones located in its interior, over the structuring longitudinal street, affected to urban uses.

3. Occupation by pier spaces, specifically:

3.1 The representative piers of the city, in a plaza shape, with riverfront function before the earthquake, rebuilt with new dignity in its urban and architectonic design, per example the Praça do Comércio, the Praça dos Remulares – that after acquired the pier name it had before - Cais do Sodré -, or the Praça de Belen.

3.2 The normal piers and docks of the city, maintaining the previous specialization by activity type and its preferential location to the east of the city centre (with the military defence infrastructures to the west) such as the Ribeira das Naus, the Ribeira Nova, the Ribeira Velha or the Cais dos Soldados.

3.3 The private piers and the regularization situations of the margin, in several specific locations.

4. The areas without riverfront occupation, such as the beaches of Santos (Boavista), Junqueira, Belen and Algés and the rural areas or periphery palace gardens, mainly west of Alcantara, west of Belen or east of the Santa Apolónia Convent.

3.2. The new riverfront structure of the industrial city



Pictures 1 and 2:

Lisbon riverfront, main urban structure in 1850 and 1998, showing the new longitudinal axe, built in the end of the 19th century harbour landfill, and the new transversal connections

The big change in the shape of the Lisbon's riverfront, which began in the second half of the 19th century, had as basis the accomplishment of the new infrastructure projects, specially the implementation of the railway and the construction of the port landfill, initiatives that although distinct, had common aspects.

At this moment, the significant change in the central and occidental city riverfront resulted directly from the construction of two big infrastructures of the industrialization of the territory, with exception to the constructions developed by successive small initiatives, lacking the result of joint visions of the respective sectorial general plans.

This is the moment of implementation of the new urban railway network and the general improvement plans for the port, which also led the city to launch its new road riverfront infrastructures.

Significant is the fact that its impact in the city is felt in distinct areas of the central and occidental areas and on the oriental side.

In the central and occidental areas, the infrastructures occupied the new land, gained to the river, located in front of a frontal margin and occupied in all its extension.

In the occidental front it wasn't about consolidated urban tissues – in the interior there still existed many rural areas – although is it certain that this littoral front was already constituted by at least one or two longitudinal streets, with structuring functions in the accessibility to the city with one, two or three edified fronts built.

In the previous years, this area responded to the orientation of the urban and industrial expansion of Lisbon towards Belen, also the new port territories had no possibility of direct connection with the interior territories for the development of their activity.

On the other hand, the transversal accessibilities theme assumed a very important role in the connection with the city, obliging to an effort towards the search of areas where expropriations and demolitions could be possible.

In the central and occidental side of the city, the territory of the big industrial infrastructure was conquered to the river and the new planed port and industrial activity took place in this contained space, limited in its extension by a preexistent city front.

The port and industry of the central and occidental riverfront were part of the infrastructure project.

The growth of the riverfront port and industrial activity developed in a distinct form, directing east, where extensive vacant territories awaited the arrival of the city.

In this riverfront territory formation process dominated by infrastructure, with the assessment of a double process – (1) the formation of the port territory as an infrastructure project, from great landfill works and (2) the consolidation of the anterior riverfront, on a parcel scale – a new form of riverfront was born, not exactly correspondent to the sum of the two realities.

In this new formal reality that is the riverfront in front of the city, the following parts were identified:

1. The longitudinal preexistent street and its edified interior front, being:

1a) The street as preexistent front river element, with no edification side, constituted by beaches, gardens or vacant lands;

1b) With an edified front also on its other side, being edified the rear of this front (and its eventual terrains) in the industrial period preexistent front river.

2. The edified front of the riverfront of the first industrialization, in the 18th and 19th centuries, formed by the succession of interventions on a parcel scale, specifically:

2a) Occupying the vacant lands colliding with the edified side of the preexistent longitudinal street or;

2b) Occupying the terrains in the posterior part of the preexistent edified front, creating a new riverfront accessibility or serving from the longitudinal street as a resource to transversal connections.

3. Sometimes, in particular in concave areas in its preexistent profile, where there was more space, a second edified industrial front of the city, occupying the terrains gained to the river already within the large port landfill projects, eventually creating (or not) a second longitudinal access.

4. The big longitudinal corridor of the new infrastructure of the port and the city, in gained terrains already included in the great projects of port landfills, eventually constituted by:

- The city's new accessibility road system in the littoral;
- The city's new public transportation system;
- The railway corridor;
- The road and railway accessibility corridor exclusive to the port;

5. The port space in itself, where distinct forms of this activity is developed.

In this synthesis of the shape of the port front in front of the city, points 1 and 2 correspond to a growth process on a parcel scale, contrary to points 3, 4 and 5, that result of great infrastructure projects of the industrial period.

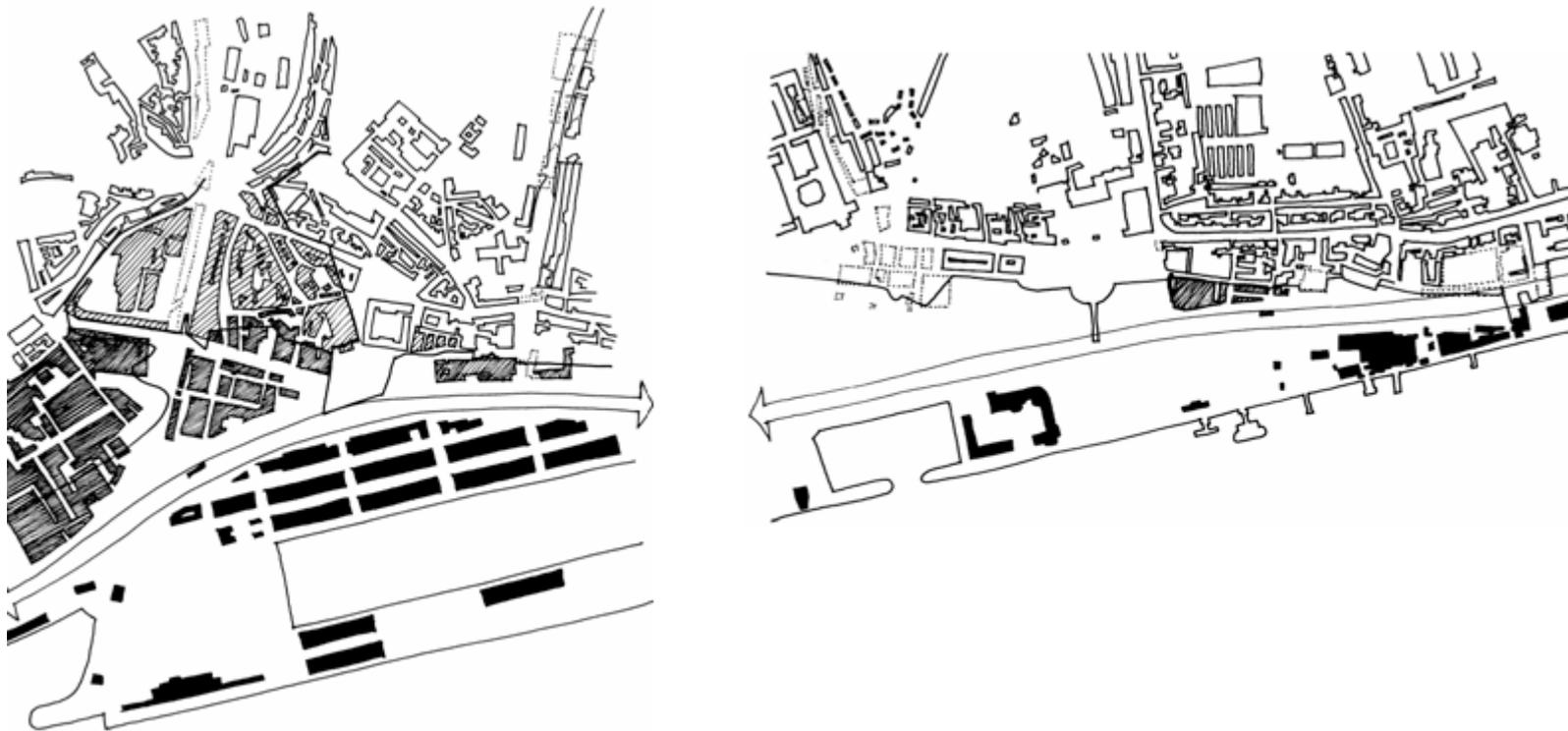
But, as we verify in the case of the riverfront fronts of central and occidental Lisbon, both growth processes of the port territory (parcel scale and infrastructure project) did not necessarily correspond, with the division of spaces between the port and the city.

In general, this longitudinal profile, the gained terrains to the river through port landfill, also served to incorporate the longitudinal corridor axis of the new accessibilities as well as in specific situations, to edify a second line of industrial buildings, located between the anterior edified front and the accessibility corridor.

In other words, the formed port territory as infrastructure project did not dedicate itself totally to this activity, leaving a part of this territory to the city's new road and railway accessibility system that didn't have available spaces to do so in these areas, but leaving other terrains on this corridor for the city's usage.

In that new territorial reality of the pluvial front, it was the accessibility corridor that became the border between the port and the city, constituting a frontier with strong urbanistic expression.

Pictures 3 and 4:



Components of port / industrial riverfront in front of the city, example of the Alcântara and the Belen/Junqueira areas, in Lisbon, based on the 1963/1973 plan. The following components of the new riverfront territory are identified: (1) the territories of the first industrialization, with the larger dash grisé, (2) the demolitions for the new industrial road system, in point-lines, (3) the industrial territories of the city, located in areas conquered to the river by the port landfill, with the smaller dash grisé, (4) the new corridor of infrastructure, and (5) the new port territories, in black

3.3. The forms of the port riverfront in front of the city

The formation of the port territory, since the end of the 19th century, in central and occidental Lisbon, this is, in front of the edified façade of the city, obeyed to a distinct process of what had occurred until then.

The growth and occupational process of vacant lands, parcel by parcel, gave place to a formation process generated from a “general improvement plan of the port territory” this is, occurred based on an ensemble vision for a new longitudinal territory to be taken from the river, in front of the urban agglomerate.

The sedimentation urban process and local interventions was replaced by a general sectorial plan of the port activity, coordinated also, as seen, with the implementation of the railway.

The forms and dimension of this new riverfront, port and industrial space are therefore distinct of the typologies until now verified.

In a synthesis exercise, having present the characterization of this process in Lisbon, the following riverfront occupation typologies, in the port landfill located in front of the city, can be identified –:

I. The representation public building, that in the port landfill is not so much a public industry (now occupying a great extension, being more frequent to find buildings with architectural quality) or the Customs (now more a service and not so much a building), some buildings of the maritime, fluvial and railway stations, representing a door to the city or some service buildings located in key areas, such as hotels or port administration buildings.

2. The riverfront industrial equipment, where two levels can be identified:

2.1 The normal industrial building, with distinct forms and bigger or lesser architectural quality, specifically:

- The generic warehouse resultant of type-projects accomplished in different periods and according to different construction technologies (from the iron and tile to the cement warehouse);
- The specialized industrial building, with variable forms in distinct periods, with a unique building or repetitive project, for example a combustibles deposit, a market, administrative buildings, a refrigerator warehouse, construction and naval repair, workshop hangars and energy centrals, etc.

2.2 The port equipment and infrastructures of several orders, such as the port service railway, the several cranes with different technologies, lighthouses and towers that marked the different time zones, floating docks, etc.

3. The port infrastructure resultant of the landfill, specially:

3.1 The port dock, in its different forms, including the vacant back land for deposit or transshipment of the different merchandise or technologies;

3.2 The interior nautical docks, in its variable shapes and dimensions, more or less specialized, protected or not by divisions, accomplishing similar port functions to the docks with bigger river protection;

3.3 The factory complex, mixing different morphological elements as the docks, dry docks, specialized port infrastructures, administration buildings and industrial buildings in combinations where the limits of each limit is not so clear.

In comparison with the riverfront occupation typologies in the beginning of the industrial period, in the port landfill in front of the city predominates now, almost in exclusivity, the industrial or port types, that in many areas is inaccessible to the city.

The port landfill accomplished its function and except in located areas, without space for the urban usages.

The more “urban” typology of this “new” port city were the public representation buildings, with special relevance to the maritime, fluvial and railway station buildings and the docks that in broad industrial period, were already associated to leisure activities.

Specifically, as occurred in the landfill in front of the Cais do Sodré, or as occurred and was predicted to continue in front of the Praça do Comércio, the port or industrial activity created gaps, allowing both public spaces, previously classified as representation docks, to continue to maintain the contact with the river – the Praça do Comércio maintaining its morphology, the Cais do Sodré duplicating its vacant space and gaining more urban significance, when integrating the representation building of the Railway Terminus Station of Cascais.

But, included in these two cases, remains the doubt of what would have happened if the railway connection hadn't been interrupted, in the end of the 19th century, and had continued its path up to Santa Apolónia.

It is therefore comprehensive the predominance of the industrial typologies in the riverfront occupation of the industrial city, which, in the end of the 19th century and beginning of the 20th, started the large infrastructure projects of that time.

3.4. From pier to square: Processes of formation of public spaces

In the formation process of the port territory in front of the central city, the formation of the public space did not settle in the substitution of the described road accessibility system.

Further to these corridor-spaces, two other big groups of public space were also created, and important to mention: (1) the plaza system located on the infrastructure corridor and (2) the spaces between this corridor and the river that, being jurisdiction of the Administration of the Port Lisbon, were progressively released for the city's usage.

For what concerns the first group, the dynamic process of formation of the port territory was the justification for many alterations of usages, between the port and the urban, which interacted in several moments.

In the second case, as in the ancient spaces of the current docks, the residual spaces of the port landfill that remained on the longitudinal infrastructure corridor, had a partial occupation by industrial buildings – already mentioned before – causing situations in which the inexistent occupation allowed the creation of residual public spaces.

Concerning the second large group, the public spaces created between the infrastructure corridor and the river, in most of its extension, was meant, initially, for port activity.

With exception of the previous representation spaces – the Praça do Comércio, Cais do Sodré and Belen Plaza – even these incorporated port functions, all the new lands were dedicated to the distinct activities of the port, actually turning out to be restricted areas, in regards to each activity's characteristics.

In synthesis, leaving behind the infrastructure corridors, already object of analysis and integrating the different origins of the riverfront territory of the industrial city, eight distinct processes of formation of public space can be identified:

1. The riverfront public space of the beginning of the industrial period:

1a) The dock / representation plaza, that could also be object of transformation or amplitude with the accomplishment of the port landfill, e.g. the Praça do Comércio, Cais do Sodre, Praça de Belen, (Praça Afonso de Albuquerque), in front of the palace.

1b) The public spaces that not were not acknowledged as riverfront in the beginning of the industrial period, had, in a certain moment, a relation with the river, e.g., the Largo do Terreiro do Trigo, the Praça de Alcantara, the Rocha de Conde de Obidos or the Largo da Princesa in Bom Sucesso.

2. The transformation of the port dock, of the beginning of the industrial period, into plaza of the industrial city, as a result of the river's detour during the port landfill, e.g. the Largo do Museu da Artilharia, the openings in Rua do Cais de Santarém, the Largo do Conde Redondo, the Largo do Marques de Angeja or the Praça do Império.

3. The subtraction plaza, located in spaces that were riverfront in a certain moment, in which the formation originated in the demolition of the edified, e.g. Campo das Cebolas, the public space west of the Armada Arsenal, coinciding with Largo do Corpo Santo, the Santos church Largo, the junction of Alcantara (Praça General Domingos de Oliveira) or the Largo dos Jeronimos.

4. The new representation plaza, created in terrains accomplished from the port landfill, e.g. the Largo dos Caminhos de Ferro, created in the second half of the 19th century in front of the "new" railway station of Santa Apolónia, the public space in front of the fluvial station of the Terreiro do Paço, the Praça D. Luís I, the public space of the Maritime station of Alcântara or the Praça das Industrias.

5. The public space resultant of the encounter of urban tissues or of preexistent edified front with the new areas conquered to the river, from which resulted spaces with residential morphologies, such as the Largo Vitorino Damasio or the Largo de Santos.

6. The residential space of the port landfill that stayed on the longitudinal corridor of infrastructures and that didn't have an edified occupation – previously described process – with special emphasis in the area of Belen / Junqueira in front of the Largo do Marquês de Angeja and west to the Cordoaria building or the area of Belen, Bom Sucesso.

7. The integration space port / city, located in the area under the jurisdiction of the port of Lisbon, between the longitudinal infrastructure corridor and the river.

The seven formation processes of the riverside public space described can also be included in two big general groups, corresponding the first three to the ones that occurred in the preexistent areas of the port landfill and from the forth to the seventh, to the ones that took place in the "new" territory gained to the Tagus river.

All of them maintain a relationship of past or present with the river, in the first three the origin of the public space was the transformation of the preexistent spaces, while on the other four, the common denominator was the riverfront expansion and the treatment that was given to the new spaces.

In both cases, the preexistent and the new, the accomplishment of the port landfill was the changing indicator and it is important to retain that from then, the transformation process that occurred, took place in each site, one by one and according to the specific characteristics of its evolution.

3.5. Living within the industry (1): neighbourhood public spaces in Lisbon's east riverfront industrialization

Quite different from west riverfront, Lisbon's east industrial riverfront formation was first based on the occupation (1) of the rural areas located between small agglomerations – Xabregas, Beato, Marvila, Braço de Prata, Olivais and Sacavém – and (2) of the non-built fluvial beaches along the entire the riverfront.

This growth was supported by the train corridor since the 1850's and by the pre-industrial road system until the 1940's, in this period exemplifying the «non planned growth along the corridor of accessibilities» and the «project of the industrial company» processes of formation.

Since the end of the 1930's, the public intervention on port and road infrastructures and its assumption in planning documents in the industrial area of the city, generated a new growth dynamic, allowing the occurrence of the «master plan of the port in front of the city», the «industrial allotment» and the «larger and autonomous industrial complex» processes of formation.

The industrial formation of this territory in two moments during almost 100 years, in a progressive industrial specialization, generated urban tissues where the creation of public space wasn't a main goal; on the contrary, it dominated the functional development (industry, accessibilities and infrastructure) and some housing–work relations.

In the first mentioned period, when particularly the area located between Xabregas and Poço do Bispo was developed, the more spontaneous (non-planned) growth only occasionally had known the formation of public spaces.

The two identified examples are clearly exceptions. They correspond to the typology designated as «the public space resulting from the encounter of urban fabrics» and occurred when new industrial areas were built in rural areas along the pre-existent road system: the Largo Leandro da Silva, in Poço do Bispo, and in the square of the Madre Deus Convent, on Rua do Grilo.

This lack of public space must be understood in the specific context of the industrial development of the east riverfront and should partially be compensated by the first generation of work-housing relations in the industrialization.

Specially in this corridor the working class «villas» were an interesting and specific phenomenon, adopting, within its diversity, a common form of neighbourhood public space and social and economical relations – e.g., the Vila Dias, the Vila Amélia Gomes, the Vila Amélia, the Vila Moreto, the Vila Flamiano, the Vila Cristina (demolished), the Vila Maria Luisa (former Vila Zenha), the Vila Alzira, or the workers neighbourhood Francisco Alves Gouveia.

Public space characteristics in these riverfront villas is certainly a theme for future research, once they can be distinguished from the public spaces generated in other areas of the city where contemporary villas also occurred – e.g., the Graça area.

Another specific public space type of that period, in the east riverfront was the «patio», a common area frequently resulting from former building structures, assimilated during the first industrialization, around which small scale housing and community development took place – e.g., the Patio da Quintinha, the Patio do Marialva, the Patio do Coelho, the Patio Augusto de Aguiar, or the Patio da Matinha –, inherited from the structures built and assimilated in the first years of the industrial development of the 19th century.

Since the end of the 1930's, the industrial specialization of the riverfront and the rationalist segregation of functions, reinforced the work-housing dualities, supporting the creation of larger residential neighbourhoods of public promotion in the interior areas, such as Madre Deus, Encarnação, Chelas and Olivais.

In this period, the specialised industrial districts of Matinha, Cabo Ruivo or Beirilas were function orientated and no significant public space was generated; on the contrary, the housing developments were progressively rich on public spaces typologies.

The neighbourhood was the place for public space and the industrial area was mainly functional, applying modernist paradigms for the correct organization of the city – the functional zoning.



Pictures 5 to 10:

Examples of the workers «villas» in the first industrial development of the eastern riverfront of Lisbon: the Vila Dias, the Vila Amélia Gomes and the Vila Moreto, in Xabregas; the Vila Amélia, in the beginning of the Chelas Valley, the Maria Luisa, in Beato, and Vila Flamiano, in Poço do Bispo

3.6. Living within the industry (2): public space in the city of the large industrial complex

Another form of public space within the industrial developments of Lisbon's riverfront occurred together with process of formation of the larger and autonomous industrial complex; located in the southern banks of the Tagus River, the industrial complex of the CUF (Companhia União Fabril) in Barreiro, can illustrate one of these complexes.

Developed in Barreiro since the beginning of the 20th century, associated with a train line, the chemical company territory progressively grew by conquering new areas to the river until it achieved an area of about 280 hectares.

The economical development of this large company, considered from its beginning, a social component, e.g., in 1917 it included, apart from the industrial installations, its own train station, a fire brigade, a medical service, a food shop, a baker's shop and a workers neighbourhood.

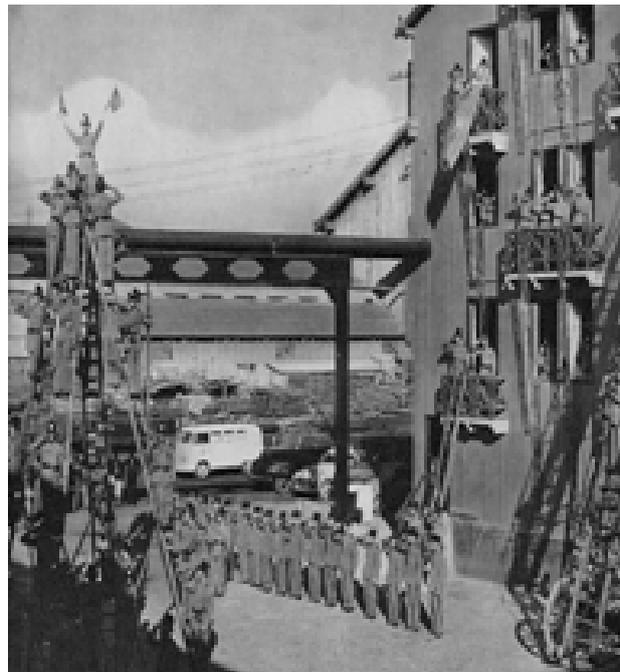
In the large economical and territorial expansion of the company in the 1930's and beginning of the 1940's, new social programmes were developed, e.g., a primary school, a football stadium (with its own club in the first league), two canteens, a new medical service, a new skate ring and an expansion of the workers neighbourhood.

In the end of the 1950's the CUF company was almost an autonomous city within the municipality of Barreiro, offering social installations for the workers such as a third canteen, a cinema, a social centre, a gymnasium and social services as holiday colonies for the worker's children.

In this period, a second workers neighbourhood was built inside the company territory – the Lavradio Neighbourhood –, followed in 1966 by a third one, the Alfredo da Silva Neighbourhood, with 204 dwellings.

The creation of a large industrial complex such as the CUF example is a research theme deserving detailed study, focusing on the community and spatial development during industrialization; even so, as showed, generating an autonomous industrial city, developing inside its own forms of public space and social relations.

The conception of this example of semi-autonomous industrial city, with its productive and social parts, were approximately 8.000 workers laboured, generated a different type of public riverfront spaces where a life-style available for the workers was programmed and reflected in the spatial organization of the activities in the complex.



Pictures 11 to 14:

Social infrastructures on the CUF Company, in Barreiro in the end of the 1950's: the new workers Lavradio Neighbourhood, the canteen, the company's football stadium and the fire brigade station

3.7. The riverfront urban renewal in the industrial period

A final note must be made regarding the creation of public space in the industrial riverfront of Lisbon: being the dominant logic of territorial development in industrialization, the creation of new areas – mainly port and industrial territories –, and the re-use of space isn't exclusively a post-industrial dynamic.

In the Lisbon riverfront of the first half of the 20th century also knew tendencies of transformation on previous industrial/port uses, corresponding to (1) situations of evolution in the activities, with specific uses occupying new areas and liberating the previous ones, and (2) processes resulting from the implementation of new accessibility systems.

In specific cases, such as Belen (1940 urban renewal due to the Exhibition of the Portuguese World) and the Navy Arsenal (transferred in the 1930's) exogenous factors displayed larger transformations, offering former industrial areas for city activities.

In Lisbon, the first processes of urban renewal of the port areas conquered to the river in the last decade of the 19th century took place approximately 40 or 50 years later, still in the industrial period, generated specific forms of representative public spaces and public equipments.



Picture 15:

Plan for the renovated area of the Exhibition of the Portuguese World, in Belen, 1940

4. THE CREATION OF PUBLIC SPACE IN THE INDUSTRIAL RIVERFRONT: REPAIRING THE POST-INDUSTRIAL DYNAMICS?

Focusing on the Lisbon's riverfront, the article tries to show how rich, different and heterogeneous was the creation of public space by the water during industrialization.

Referring to the industrial riverfront processes of formation, seven different forms of public space by the water were identified:

1. Port-city public spaces, corresponding to the first moments of industrialization, when both maintained its physical integration as in the past, systematizing different occupational typologies –
2. The new riverfront structure of the industrialization, resulting from the large infrastructure works starting in the last decade of the 19th century, and generating new industrial areas for the city, new road and railway infrastructures for the city, for the port and new port areas;

3. The new port territories resulting from that process, introducing port-city physical segregation;
4. The physical and functional evolution of the former public spaces in this context and the creation of new ones, systematizing eight distinct processes of formation of public space
5. A first group of public spaces of the industrial territories, exemplified in the eastern riverfront of Lisbon, identifying a first moment until the 1940's and a second one after it;
6. A second group of public spaces of the industrial territories, exemplified by the CUF Company, focusing on the specificities of the large industrial complexes with its own forms of organization of public and social life within;
7. The transformation and the urban renewal of port and industrial areas of the industrialization still during industrialization, generating programmes of public space and equipment.

As observed in a synthetic form, riverfront public spaces during Lisbon's industrialization weren't a single type of spaces, neither resulted from established processes.

On the contrary, the riverfront territory was characterised by different dynamics in time, corresponding to the evolution of technologies and the development of infrastructures, and by different dynamics in space, due to the specificities of its different parts, resulting on different reflexes in the territory.

In Lisbon there wasn't an industrial riverfront, but several industrial riverfronts in space and in time and neither one was stable in time, but it had known evolutions in its forms and uses.

Simultaneously, the reuse of the port/industrial areas conquered to the river since the end of the 19th century and the urban renewal processes aren't a patrimony of the post-industrial city, since several situations were identified during the 20th century.

Some changes in the occupation of the riverfront were (at least) as strong in the first half of the 20th century as they are today; that is why we must conceive the riverfront occupation during industrialization as a dynamic process, as it is today, and understand these territories in a continuum perspective since its creation when we look at it from our post-industrial perspective.

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BOX 2: LISBON, TYPES OF RIVERFRONT OCCUPATION IN THE BEGINNING OF INDUSTRIALIZATION

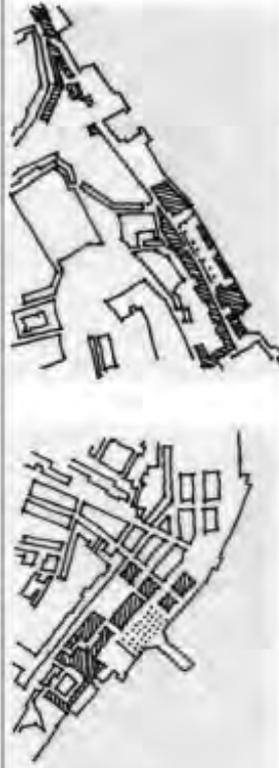
FORMER RELIGIOUS BUILDINGS



CURRENT BUILDINGS AND GROUPS OF BUILDINGS



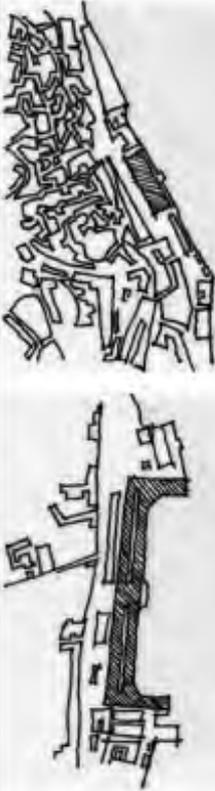
CURRENT STRUCTURES OF PIERS AND BUILDINGS



UNOCCUPIED (BEACHES, FARMS, GARDENS)



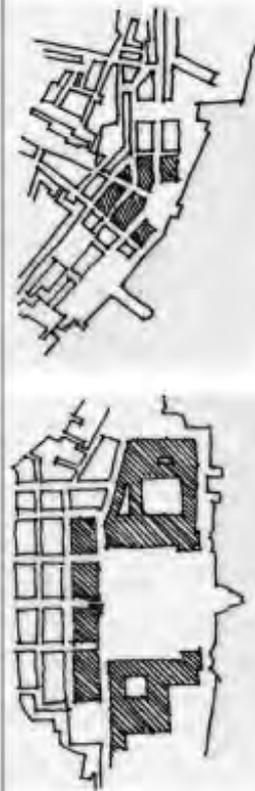
PUBLIC BUILDINGS OF THE PORT ACTIVITY



MILITARY BUILDINGS AND INSTALATIONS



REPRESENTATIVE PIERS



PRIVATE PIERS AND RIVERFRONT REGULARIZATIONS

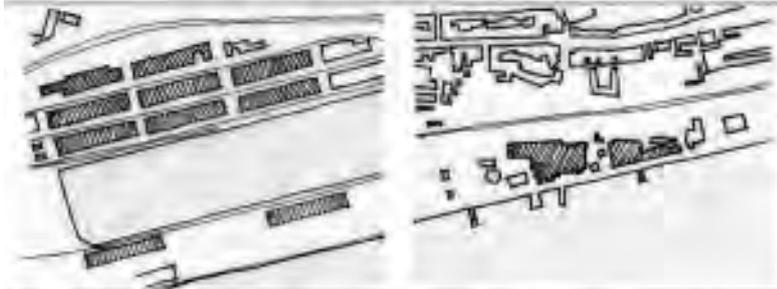


BOX 3: LISBON, TYPES OF RIVERFRONT OCCUPATION IN THE INDUSTRIAL LANDFILL, IN FRONT OF THE CITY

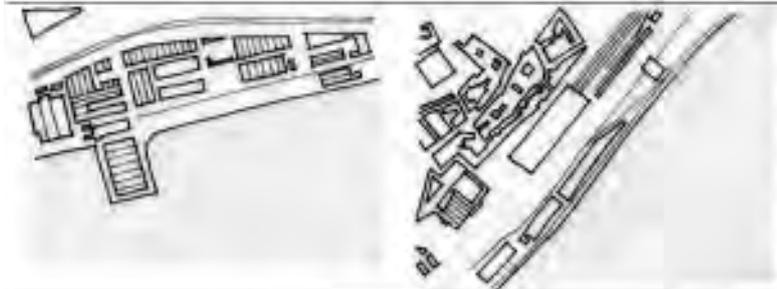
REPRESENTATIVE PUBLIC BUILDINGS



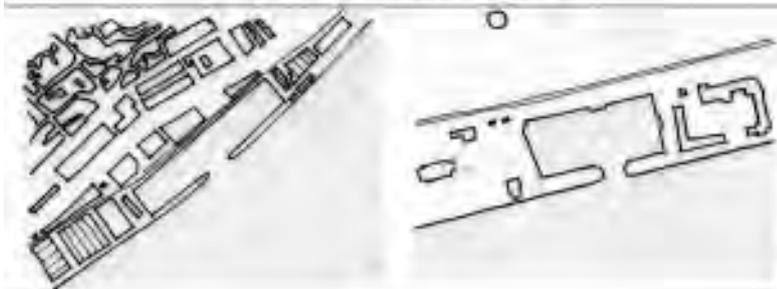
INDUSTRIAL BUILDINGS AND EQUIPMENTS



PORT / INDUSTRIAL PIERS



PORT / INDUSTRIAL DOCKLANDS



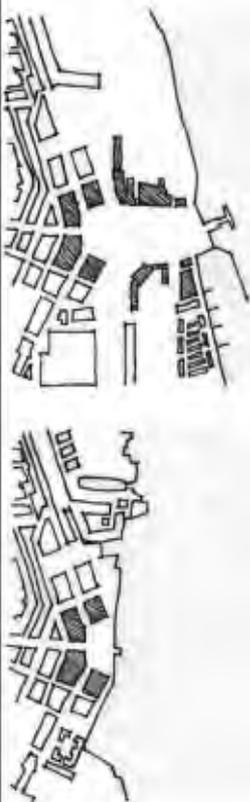
COMPLEX HARBOURS



BOX 4: LISBON'S CENTRAL AND OCCIDENTAL RIVERFRONT, PROCESSES OF FORMATION OF PUBLIC SPACE

PRE-EXISTENT TERRITORIES

1.1 – REPRESENTATIVE PIER/SQUARE FROM THE BEGINNING OF INDUSTRIALIZATION



1.2 – SPACES IN RELATION TO THE RIVER



2 – FROM PIER TO SQUARE

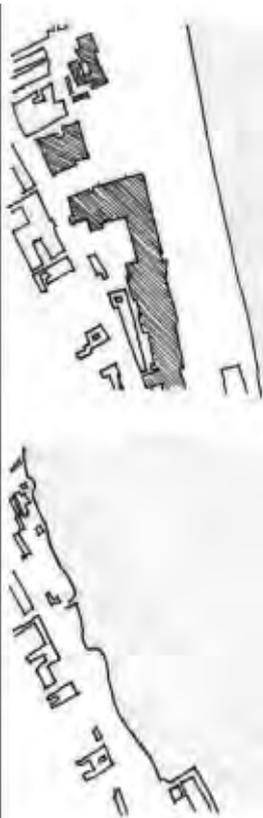


3 – SUBTRACTION SQUARE

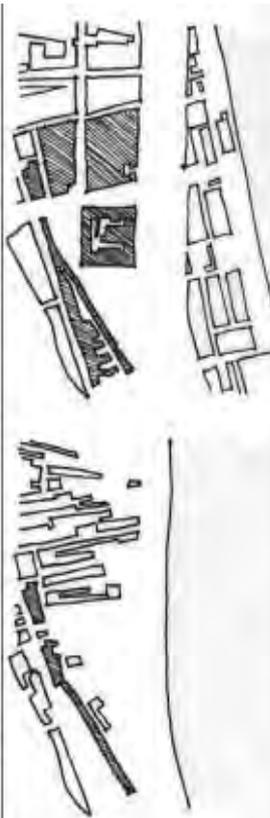


HARBOUR LANDFILL

4 – NEW REPRESENTATIVE SQUARE



5 – PUBLIC SPACE RESULTING FROM THE ENCOUNTER OF URBAN FABRICS



6 – RESIDUAL PUBLIC SPACE IN THE HARBOUR LANDFILL



7 – PORT/CITY INTEGRATION SPACES

