UNIVERSITY OF NOVA GORICA
GRADUATE SCHOOL

FOOTBRIDGES AS NEW URBAN SPACES

DISSERTATION

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Venice, 2011

Foreword

By now, it is ascertained that towards the end of the 20th century a radical process of renewal concerned the *modus operandi* that regards the infrastructural design. The theme of footbridges, in particular, has undergone a change that has led to an enrichment of the engineering project with values and meanings that once were only typical of architectural works.

Until a few decades ago, the importance of the bridge was usually defined on the basis of its length and of its size and, in this sense, footbridge often had a subordinate role. Many designers were convinced that these small structures had not a real importance and that therefore they were suited to those engineers that took their first steps in the construction of bridges. This led to prefer especially the use of girder structures for pedestrian bridges, for which the process of dimensioning and verification could simply be carried out manually, i.e. without the use of a computer.

As Hugh Pearmen has however noted, in conjunction with the advent in the new millennium these singular works have been rediscovered as "vessels of metaphors" and a growing number of architects, as well as a new class of project engineers, have started to notice the potential hidden behind their design.

The reasons for this transformation are multiple and find a common denominator in the response that the main European cities, since the middle of the last century, have been trying to give to the big ecological, social and urban crisis weighing on them. Drawing inspiration from the principles of *sustainable urban development*, these facts have marked the beginning of a new project season that has also seen the birth of a new generation of footbridges: deeply different from what was previously produced, they are a tangible sign of the change occurred in the way of conceiving these structures, both by virtue of a new aesthetic and of new semantics. So from simple, anonymous structures capable only of crossing an obstacle, they have become, in little more than 20 years, real "urban devices" that, with their renewed

appearance, contribute to redefine the image of contemporary city giving it a more sustainable dimension.

As attested by the success achieved in recent years also at a media level, that of footbridges is therefore a very topical theme of great world interest: above all, it is no longer an issue just for the experts of this field. More and more magazines, specialized and not, deal with this topic. The cycle of conferences on this theme, Footbridge[1], is a three-yearly international event inaugurated in 2002, which draws the attention of numerous designers and critics of architecture. Also at a communication level, the pedestrian bridge has recently found a place also in unusual areas such as, for example, cinema and literature, a sign that this reality is appreciated not only as urban signified but also as social signifier.

The topicality of the theme is easily recognizable even in the current events. The conference on climate that has just taken place in Copenhagen deals with complex issues that affect the entire planet with answers, yet so uncertain, that don't seem to be avoidable. The reflection on climate and environment protection, as well as the preservation of the reality in which man lives and wants to live his own future, concern the same issues underlying the reflection on the quality of life, and therefore man's space. This work wants to be a contribution also in this sense.

Therefore, this research aims at understanding the importance of the cultural revolution which at the end of the XX century marked the birth of modern footbridges. The ultimate purpose is to define what the pedestrian bridge represents today and the real factors that helped to build its current popularity.

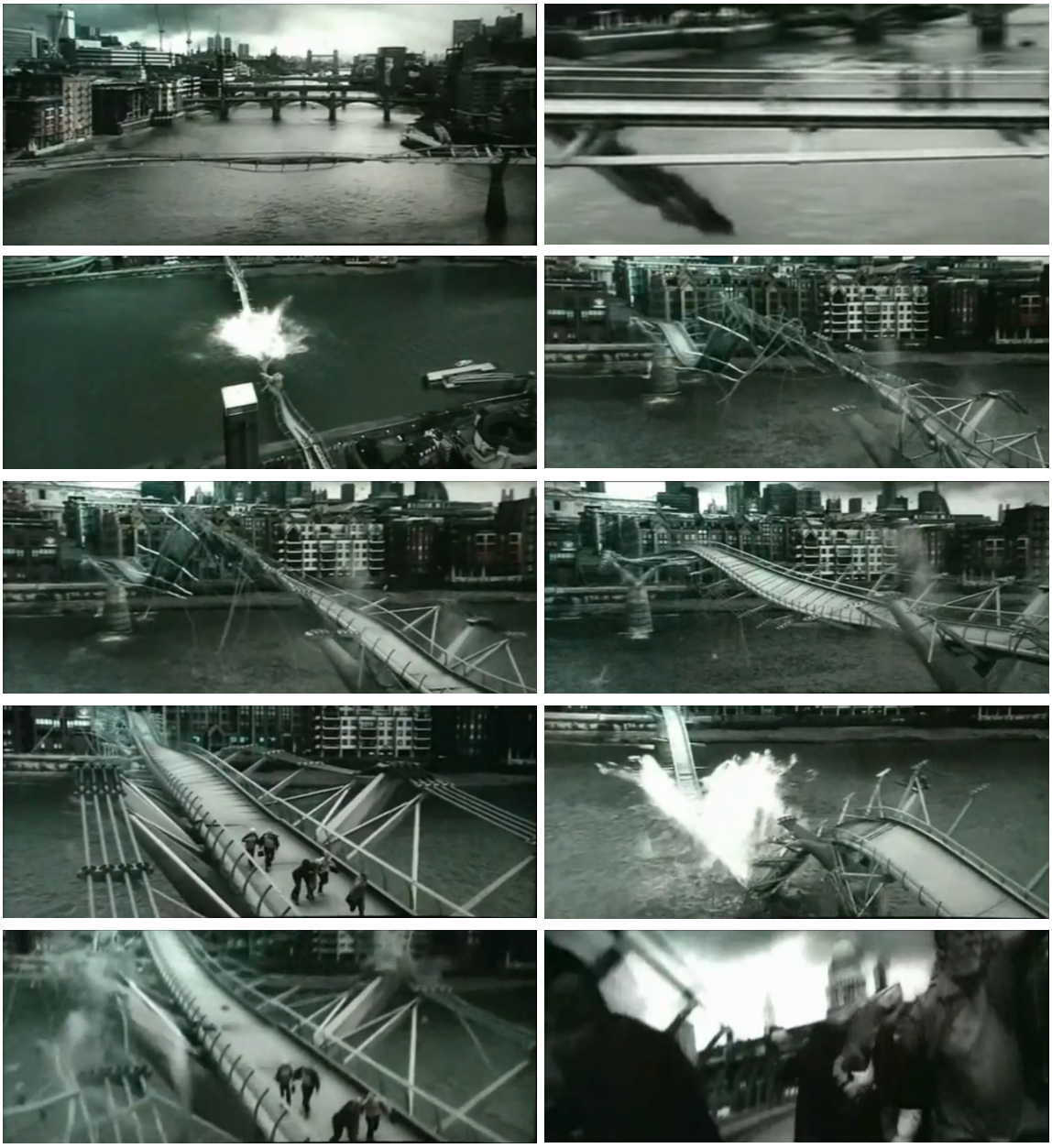
1 The first international *Footbridge* conference dates back to November 2002. It was organized by Otua (Office Techinique pour l'Utilisation de l'Acier) in Paris with the purpose to create a point of meeting and technical and scientific discussion about the theme of footbridge for the designers and scientists from all around the world. This event, apart from its practical results, had the great merit to develop a growing interest around the design of these special structures, which are dealt with today according to an approach that is not only technical and functional. In this sense, in December 2005, under the influence of the IUAV University of Architecture of Venice and on the wake of that media success that concerned some of the most famous bridges of the last ten years, the second edition of *Footbridge* proposed to extend the debate to the wider topic of conceptual design from a perspective of integration between architectural language and structural language. The city of Oporto offered in 2008 the basis for a new debate between landscape designer, urban planners, designers, researchers, entrepreneurs and experts of the sector. With the title "Footbridges for urban renewal", the event was attended by more than 300 people from 23 different countries that met in Oporto to discuss about the themes of design and conceptual design, of restoration and renewal; of analysis of structural behaviour; of dynamics and control of vibration; of innovative materials; of regulations. The fourth edition of this cycle of conferences will take place in Wroclaw (Poland) in 2011 and the fifth in London in 2014.

Introduction

As a focus of interest, the "bridges theme" has always provided much to be reflected upon, and it continues to excite the curiosity and imagination of many authors. Indeed, the contemporary scientific literature includes very many essays and technical analyses that consider this question in considerable depth and from any number of viewpoints. Among these, we may note Joerg Schlaich's masterly lessons on the structure of bridges and the lucid, impassioned reflections of Enzo Siviero which, on the other hand, point to the deeply humanistic nature of these works. However, as Prof. Siviero points out, it is only over the last two decades that this question has stepped into the media limelight, with an outreach that (most strikingly) takes us beyond the natural confines of the theme's specific academic ambit. Perhaps spurred on by the events surrounding the Calatravra project – which, from the 1980's on, has done so much to heighten public awareness of such work over time – the bridges theme, nowadays, has attracted considerable interest also among people not belonging to the close circle of, so to speak, arbiters within this field.

Indeed, daily papers and non-specialised magazines dedicate more and more space to bridges and pedestrian bridges. Nowadays, films, also, as well as advertising, frequently include evocative representations of the work of today's leading archistars. Automobile advertising campaigns frequently portray hyper-modern bridges with considerable emotional outreach. We may also note the latest Harry Potter film in which certain key scenes portray the disastrous, but spectacular, collapse of Norman Foster's famous Millennium Bridge.

These examples provide confirmation as to the strikingly sharp rise in public



1. From Harry Potter 9: the collapse of Millennium Bridge in London.

and media interest in this theme over the last few years, sustained in part by the revived and increasingly passionate and active public interest surrounding the construction of such works, accompanied by interest on the part of communities and public bodies. Wilkinson&Eyre's Gateshead Millennium Bridge is a case in point. Indeed, the bridge has become a source of pride for the locals, who soon renamed it the "Eye of the North". Another key event, of course, which generated considerable press attention, was the building of the Calatrava bridge in Venice, and the coverage of the nights during which, despite the endless bickering, the world's attention was riveted by the two enormous skeletons which, as they inched their way along the Grand Canal, looked set to rival the renown of the Rialto bridge itself. Over the following days, the major newspapers published thousands of articles and images charting in considerable detail the progress of this enterprise, minute by minute – while the locals followed developments closely, endlessly recasting and embroidering upon events according to their own particular "take" on the situation.

These events, still fresh in the minds and hearts of the people concerned, are just two of the many instances that indicate how – over the last few years, and in the light of a revived and keen interest – the bridge theme has at last broken away from the tremendous impasse situation that infrastructural design had reached during the 1960's and 1970's (when designers seemed capable only of producing cold skeletons and shells devoid of memory). Bridges seems to have gone on to discover their real worth and true meaning: the result of establishing a bond with locations and with the people who live there, as a metaphor linked to a revitalised memory of "days of yore", of a time when bridges (especially "inhabited" bridges) were the hubs of cities, and – given their considerable power of attraction – when bridges were considered major landmarks within the urban community hosting them.

The merit for this "reawakening" goes, undoubtedly, to the architects and the new generation of engineer designers who, toward the turn of the century, pioneered a radical process of renewal of the manner in which infrastructural work is to be conceived. Distancing themselves from the standard design practices of the post-war years, whose focus was limited to technical and economic considerations, these architects and designers heralded the arrival of a new artistic approach rooted in a "higher brow" culture of design which also targeted the needs of people and of the people's environments.

This is especially the case with modern footbridges, which, from the late 1980's on, have excited the interest of a growing number of local government authorities. This growing interest may be ascribed precisely to the specific significance which

footbridges have gradually come to assume within contemporary urban contexts. As a product of a cultural revolution which has radically revised their aesthetic and semantic profile, bridges and their meaning tie in with the desire of the mankind of today to escape the alienation of a life spent inside that padded capsule that goes by the name of "car". Here, people can reconstruct their ancestral ties with the world that they themselves have built, and yet which, unfortunately, they apparently see only from afar. On reviving our capacity for profound experience, for which we need the eyes of our skin, we can rediscover the true significance of our existence as a body within a given space at a given time.

Hence the focus of this work on the issue of meaning. The aim is to provide a personal contribution to the theme of footbridges and arrive at an understanding of what these specific infrastructures really represent for people and for contemporary society. Starting out from the obvious (i.e. that such infrastructures no longer figure merely as structures provided to overcome obstacles), the aim is to arrive at considerations such as may fill in the gap which, unfortunately, we currently find in the contemporary literature. Despite the considerable quantity of articles and essays dealing with this theme, none seem willing to take on the task of providing as objective an account as possible of the meaning the footbridge has assumed today, as a part of the landscape and as the *locus* of the concrete experiences of people.

With these aims in mind, the work has been divided into three main parts. In the first part, we attempt to pinpoint the reasons behind the cultural revolution which came about at the close of the twentieth century, leading to the creation of modern footbridges. Temporal and geographic contextualization of this revolution shall be provided. Dating back to the later 1980's, it falls within the ambit of the policies of urban regeneration adopted by the main cities of Europe in their attempts to tackle the major ecological, social and urban problems besetting the contemporary world. In particular, we are dealing with projects which aim to reconfigure the urban fabric through large-scale operations of regeneration of public space, it being understood that public spaces constitute the element which, more than others, contributes to the construction of the image of a city. These projects also include modern footbridges which can so rapidly provide ideal instruments for fostering sustainable urban development policies, as set forth on the occasion of the 1992 Rio de Janeiro conference.

The radical change taking place in how infrastructural work is conceived contributes to this process of renewal, with such work (formerly, structures) morphing into an "urban projects". Footbridges themselves therefore also become

urban spaces, thus enabling urban reorganization that starts out from one of its basic elements. Hence the emergence of a new design methodology according to which bridges are no longer seen as context-free objects but rather as urban architecture morphologically integrated into the city's structure. This issue crystallizes around the prime need to delineate the key elements which concretize this new approach to design (an approach which has been subscribed to practically by all, but which has as yet not been actually decoded). Starting out from the today's meaning of "landscape" (the city is part of), the themes, dealt with in the second chapter, are taken up to provide the cognitive bases for a reading of the work, going beyond standard technical descriptions to dissect instead the design features that reflect this new way to conceive the footbridge.

Consequently, a substantial support comes from the phenomenological ambit, where landscapes constitute the tangible expression of the connections of space we live in and architecture the metaphor of the way we relate to landscapes. In particular, the central part of the second chapter consists of a careful analysis of the main constructions in the last twenty years, as indispensable means of investigation in the relations outfitting the man to the landscape.

Lastly, the third part shall look into variations of a semantic nature that derive from consideration of footbridges as a part of the architecture of contemporary cities. The transformation of infrastructural work into "urban projects" entails re-defining the object not only morphologically but also conceptually. Starting out from a number of considerations regarding the semiotic nature of architecture, and with recourse to the notion of "semantic connotation", by means of which it is possible to broaden out the functional attributes of an object, here, our intention is to provide an updated re-examination of the contemporary meaning of the footbridge – a meaning which should, in the light of the results already attained, optimally deploy these results within a cultural synthesis which shall constitute the true literary contribution made by this research.

Note: Quotations by italian Authors has been translated by Fabrizia Zorzenon.

The footbridge
in the observations on contemporary city

1.1. The parable of modernity and the effects on contemporary city

Between the 1960s and the 1980s of the last century, the European city begins to take a definitely new physiognomy with respect to the past; a physiognomy with still undefined and ever-developing features. In particular, nowadays the contemporary city have to face one of the great unresolved problems of the modern world: the Development.

In the modern perspective, development should have ensured, through technology and innovation, wellness, abundance, a rational social organization, justice and peace. Nevertheless, these promises have not been maintained and the city, which should represent the «*human creation par excellence*»[2], has become on the contrary the more fragile product, that is the place in which the modern project risks to fail inexorably under the pressure of a considerable ecological and social crisis.

These critical points, which appear more and more to be structural problems of our days, are the direct result of a strongly anthropological world vision that appears at the end of the 1700s with the advent of the Industrial Revolution and is one of the main aspects of the so-called *modern society*. Unlike medieval man, whose acts were mainly influenced by barriers imposed by natural world, modern individuals find in themselves and in their rational thought their existential foundation: «*... industry, with its ability to use energies present in nature and to turn raw material into works and manufactured products, [...] has made man more aware of his condition of*

2 Luigi Fusco Girard, *La città, tra conflitto, contraddizioni e progetto*, ACE Architecture Magazine, City and Environment n°1/2006, Barcelona. According to the Author: "The city is the human creation par excellence and, for this reason, it represents the highest product of human work".

Artifex, of Creator [of the] Regnum hominis»[3]. Indeed, the industrial city, product of the new modern culture, is based on the «*model of scientific rationality introduced by Galileo and reaffirmed by Newton, which has led us to believe (and hope) to prefigure and control the world*»[4], while nature becomes a highly predictable entity: «*made of separable parts like a machine, controllable by man and in unchangeable balance since created by the divine Creator*»[5].

At the beginning of the third millennium, however, this model of scientific rationality goes through a crisis from which emerge a completely different nature, not orderly and pre-determined anymore, but dominated by the paradigm of complexity, or rather by laws that apparently don't belong to the world of Galileo and Newton.

The attempt to subdue the Earth through Science and Technology has so displayed its obvious limits under form of a possible ecological disaster and a consequent man's material and spiritual decay.

As a result, Development and Progress have betrayed its original vocation and their promises for a world focused on the individual's social growth and emancipation: «*you can therefore say that we are faced with a kind of crisis of modernity that fell on the city and made it suffer from those same ideals of progress and development that had originated it*»[6].

Ecological crisis and social question represent substantial contemporaneous problems and, inevitably, they also affect issues related to contemporary city.

1.1.1. The environmental question

The development of science and technology has certainly freed man from ancient slavery, but has generated at the same time a new and more terrible dependence: the birth of the modern *environmental question*[7], «*a Pandora's box*

3 Eugenio Turri, *Il Paesaggio degli uomini: la natura, la cultura, la storia*, Edizioni Zanichelli, Bologna, 2003, p 136. The author also adds: "Man is Artifex not only when he builds a house (an architecture that accepts him, protects him from the changing atmospheric agents, accepts his things, etc.), but also when he builds a bridge that overrides a water course, an elementary example of the possibility that a man Artifex has to reconfigure a territory with respect to that built according to nature rules".

4 *ibid*., pag 9

5 *ibid*., pp 33,34

6 Enzo Scandurra, *Città del Terzo Millennio*, Edizioni La Meridiana, Molfetta, 1997, p 49

7 Simplifying, you can identify two significant dates that mark the relevant passages in the way of conceiving the so-called "environmental question". The first date may be made coincide with the publication in 1972 of the Report of MIT in Boston, *The limits of the Growth*, which identified the limit of further growth and expansion (not only economic) of the system in the shortage of resources.

capable of unleashing, at one time, all the ills of the planet»[8].

In the 1950s and 1960s, the industrialized countries went through a phase of great expansion which corresponded to a considerable increase in the income per capita of the populations. Technological development and the distribution of wealth seemed to have freed man from his material needs and led to the illusion that the "unlimited growth" could remain unchanged in the time. Towards the end of the 1960s, some negative effects resulting from this model began however to become objectively relevant. They expressed, on one hand, in the form of excessive exploitation of natural resources and, on the other hand, of pollution and environmental degradation, as a consequence of the release of huge quantities of waste that the environment could not assimilate anymore. Especially within urban areas, following the strong increase in car traffic, the massive production of CO2 becomes soon an inescapable emergency and the main cause of the increasing air pollution.

Only with the publication of the Report Mit, in 1972, starts really to spread the feeling that «*the advent of the technological age would have inevitably modified the individual and collective behavior of the society, or that the dominance of the economic and technological development together, would entail the risk of a loss of environmental values and ideals of the society itself*»[9].

The *environmental question* originates therefore at the beginning of the 1970s, as a conflict between economic progress and exhaustion of renewable resources. The model of the "unlimited growth", according to which nature was a source of almost unlimited resources begins definitively to decay.

In this sense, the Report Mit and the following Report Brundtland (1987) introduce the concept of "limit"[10] to growth. According to this concept, the development is possible but it has to comply with certain rules of nature. In this new perspective, it is no more man that lays down the law, but it is nature that determines rules and procedures. More specifically, the Report Brundtland can be given the

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The second date refers to the publication of another Report, that of the Brundtland Commission, *Our Common Future*, which dates back to 1987. With respect to the Report Mit, the Brundtland Report includes within the environmental question also aspects of social character, involved in the dominant development model, through the introduction of the concept of intra- and inter-generational fairness. The concept of environmental degradation therefore includes a more general degradation of human relations (increase in poverty, marginalisation, crisis of the human condition in industrial societies, etc.).

8 Enzo Scandurra, *Città del Terzo Millennio*, Edizioni La Meridiana, Molfetta, 1997, p 60

9 *ibid*., p 5

10 About the concept of "limit" see also: Ruffolo G., *Lo sviluppo dei limiti*, Laterza, Bari, 1994; A. Magnaghi (edited by), Il territorio dell'abitare, F. Angeli, Milan, 1991

2. Hussmann's renovation of Paris - Traditional scale

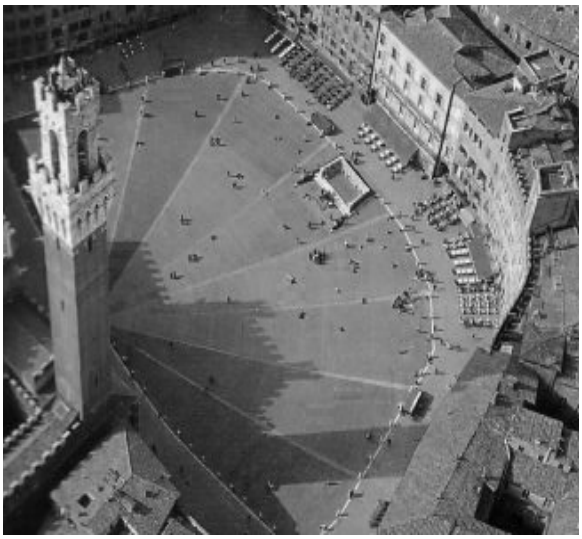
3. Example of planning in a territorial scale

credit for introducing the model of "*sustainable development"*, which is based on the simple idea that the terms "growth" and "development" can no more be considered synonyms. The first term describes a quantitative wealth increase, while the second refers to qualitative changes, meaning an increase in cultural and immaterial capital, a different use of resources and a different relationship with nature. According to this difference, Brundtland Commission defines "*sustainable development*" as a "*development without growth*", or a process that leads to an improvement (almost) without involving a quantitative increase. If growth destroys therefore the natural heritage taking away resources, development does not cause this kind of damages, but it produces quality instead[11].

1.1.2. Urban and social crisis

Today, it is known that you cannot think of the city referring to those urban models that belong to the culture of the 19th century. At the end of the last century, as a matter of fact, the idea of traditional city is definitively replaced by the more contemporary expressions of *urban sprawl* and *generic city*. These terms clearly underline one of the main morpho-typological characters of the current formal structuring of contemporary city: from a physically compact and well-defined entity, with a physical and civil centre, it becomes an urban phenomenon characterized by a

11 Enzo Scandurra, *Città del Terzo Millennio*, Edizioni La Meridiana, Molfetta, 1997, pp 68-69



4. Places - Piazza del Campo, Siena

5. Non places - Subway

fragmented, disorderly and shapeless conformation, so far from that urban model that finds in the nineteenth-century Paris of Haussmann its maximum exemplifications.

Until the second half of the 1800s the form of the city followed a precise order set on a consistent and unified integration between physical and functional organization between architecture and urban planning: it planned a clear hierarchy of spaces, open and built, each of them with a specific importance and role inside the urban settlement. This was an idea of centre that brought together people and spaces, organizing them in a unit and made it possible a global outlook of the city. With respect to this idea of centre it was also possible to determine a hierarchy of roads, radial or cyclic, along which the buildings were aligned with the richer and expressive fronts turned outwards and the more private, less decorated fronts, turned inwards, towards the court or the garden. However, when during the 1900s the new sources of energy, the spread of new means of transport and communication allowed industry to enormously extend its area of economic influence, well beyond the national borders and the traditional areas of localization, the "*design of the city*" and the "*planning of connections*" suffered a clear gap: the traditional urban street was progressively replaced by a system of "*spaces of connections*" that, no more directly connected to the buildings, began to develop independently. Therefore, the city consolidating at the end of the last century was a city grown up without precise rules and morphological connotations, other than that given by the overthrow of the connection with infrastructural networks. They have now turned from appendix of the compact city to the essential instrument for the survival of urban environment, while every single building escapes from the control of a declining architecture,

acquiring the status of autonomous technical objects.

According to Françoise Choay, this was the result of the transition from a *traditional planning*, connected to the local context and typical of historic cities to a planning in a territorial scale that strongly imposed in the second half of the 1900s in connection with the development of high speed transport, electronics and telecommunications. This new planning scale, conceived in terms of knots and interconnections, extended, in little more than 20 years, through regions, territories and continents as an isotropic mesh of links on a world scale: «*Now, the human project of space settlement is no more forced to integrate and place itself in a local natural or cultural context. It has only to be connected to the system of networks. […] This system has led to the substantial dissociation from all local conditions imposed by physical geography, vegetation and the settlings of urban and rural history*»[12]. The traditional planning scale is different, that is the scale of local territories: «*it manages to adapt what is built to its context, […] – physical or human –, to tailor the project to the measures of our corporeity, to foresee the presence of full and empty that allows the spreading of inter-subjectiveness and the establishing of social connection*»[13]. This scale is characterized by his reference to human body and by the use and implementation of the materials; therefore, it deals with architecture and, in this sense, it is a fundamental anthropological value in the identity development of a place and of the society that lives in it. As specified by Choay[14], the combination and the synergy of this set of technological innovations can be identified as the main causes that led, in the 1960s, to a substantial break in the process of European urbanization. This has led to the end of the discrete urban entities and the beginning of a universal widespread and exploded urbanization.

However, from the 1980s, this process of traditional city disappearance was also due to the gradual establishing of that socio-economic phenomenon that takes today the name of *globalization*[15], and that led to the substantial end «*of a pact that*

12 Françoise Choay, *Del destino della città*, edited by Alberto Magnaghi, Edizioni Alinea, Florence, 2008, p 164.

13 *ibid*., p 98

14 *ibid*., p 165. As the author explains: «The Age of universal connection is also that of universal, widespread and exploded urbanization».

15 The term *globalization* indicates the phenomenon of progressive growth of relations and trade in the world in different fields, whose main effect is an effective economic and cultural convergence between world countries. This term, recently introduced, had been used by the economists since 1981 to refer mainly to the economic aspects of the relations between populations and big companies. However, the phenomenon must be also seen in the perspective of social, technological and political

for 2,000 years had connected the space of the city to the civil society and had made it possible, through the creation of the identity, to turn the space into a place»[16].

Globalization, defined by Lepenies as «*...the image of a world that is increasingly becoming unified*»[17], is one of the main phenomena that led to the mass media contemporary age and, consequently, to a new and decisive view of men and their environment. It has an immense pervasive capacity, an aspect that soon allowed it to invade and influence not only the economic sphere, with the triumph of goods universality, but also the individual's social and cultural sphere in the perspective of a huge operation of worldwide standardization. Globalization has therefore realized in a good part of the planet «*the definitive divestment of local cultures*»[18] , replaced by new forms of social and urban organization, among which the *global village,* where the traditional idea of "community" has gradually been replaced by the de-contextualized and de-identified idea of "group". The same concept of "people" has given way to the most anonymous and uprooted concept of "crowd", "mass", "people" and "multitude". What emerges is a society that is based no more on community values of belonging and cooperation, but on the new myths brought by globalization. In this new de-socialized scenery the traditional places of public life (squares, avenues, markets, municipalities) inevitably lost their function of spaces that contribute to develop the social identity. As Michel Foucault explains: «*The urban phenomenon implies the meeting of two separate aspects: one, at a social level, concerns the nature of the connection existing between the inhabitants of the city, the other, at a formal level, concerns the architectural structure of the city. Now these two aspects, which are closely connected within the urban experience and in the conception of the city, are different and autonomous*»[19]. The social link is more and more intangible and not connected to a settlement, a place, a territory, while the public spaces of the historic city are silent and neglected. According to Foucault: «*The disintegration of social relations, the*

changes and of the complex interactions on a global scale that, particularly since the 1980s, have been suffering a significant acceleration in these fields.
Although, simplistically, this phenomenon is often connected only to the end of the XX century, attentive observers to history speak of *globalization* also in the past centuries, when, however, globalization mostly identified the internationalization of production and trade activities.

16 Paolo Desideri, *Tra non luoghi e iperluoghi verso una nuova struttura dello spazio pubblico,* in *Attraversamenti: i nuovi territori dello spazio pubblico*, edited by Paolo Desideri and Massimo Ilardi, Costa&Nolan, Genoa, 1997, p 21

17 Wolf Lepenies, *Una politica delle mentalità: esperienze europee e aspettative sull'Europa*, in *Pluriverso* n°4, Rizzoli, Milan, September 1996

18 Enzo Scandurra, *Città del Terzo Millennio*, Edizioni La Meridiana, Molfetta, 1997, p 60

19 Michel Foucault, Eterotopia: luoghi e non-luoghi metropolitani, Mimesis, Milan, 1994, p 14

weakening of real personal relations, the decline of the meetings not aimed at achieving a purpose, the computerization of communication instruments and the enlargement on the national, international and global scale of the sphere of interests, are the main causes of that gap»[20]. It means that public life expresses today in those places that offer «*the possibility to enjoy a social context without sharing anything with it, without ever running the risk of integrating with the many individualities that temporarily occupy those spaces*»[21]. They are the so-called *non places* described by Marc Augè, which characterize the contemporary city (autogrill, shopping centers, motels, discos, airports, railway stations and tangential), where we find the «nomadism and loneliness of postmodern man, incapable of producing experience of durable relationships, both with the others and with the territory»[22].

In this sense, the disappearance of a strong and rooted collective identity, can be identified, together with the supremacy of a planning on territorial scale (rather than local), as one of the factors that have mostly contributed to transform the contemporary city from a discrete and compact entity in a *nebula of non places* without identity and structure. Here the model of urban sprawl emerges, in which the centre, from rich place of social, aesthetic and architectural quality (which have always been the historical memory of a community), is turned into a space «*that exists only in its physical dimension of geometric space, equidistant from the suburbs*»[23].

1.1.2.1. Building the city from the urban space: historical background of a relationship

As Françoise Choay writes in one of her famous essays, the urban space is «*the obliged way of every human behaviour, according to which man is forced to design all the systems of signs that builds and that in turn build him: writing, painting, city*»[24]. Through this vision, the urban space acquires within the city a role and a meaning that go far beyond a simple summation of open and public spaces that interpose to

20 *ibid*., p 14

21 Paolo Desideri, *Tra non luoghi e iperluoghi verso una nuova struttura dello spazio pubblico,* in *Attraversamenti: i nuovi territori dello spazio pubblico*, edited by Paolo Desideri and Massimo Ilardi, Costa&Nolan, Genoa, 1997, p 21

22 Marc Augé, *Nonluoghi: introduzione a una antropologia della surmodernità,* Elèuthera, Milan, 1993

23 Enzo Scandurra, *Città del Terzo Millennio*, Edizioni La Meridiana, Molfetta, 1997, p 63

24 Françoise Choay, *Espacements: figure di spazi urbani nel tempo: l'evoluzione dello spazio urbano in Francia*, cura di Ernesto d'Alfonso, Skira, Milan, 2003, p 15

the building in the urban and territorial context.

In the past, the street, urban space par excellence, was considered as the most important civil space for urban connection and, therefore, the main instrument for the city government both at a physical and social level. At the same time, it was a fundamental element to define the urban settlement and one of the most important places of the collective scene. In the street that particular human ritual that created an absolute identity between individual and society took place. For this reason, its meaning within the historic city often transcended the mere functional question in order to become the means for the expression of the ways, forms and relationships which a company represented its own character through. Its role was therefore structuring and contributed to the building of the image and the meaning of the city, together with the square and the market.

With its different aspects, this principle has remained valid until the beginning of the 1900s and has found its maximum exemplification in Baron Georges-Eugène Haussmann's work.

At the end of XVIII century, the advent of Industrial Revolution caused a large immigratory phenomenon to the big cities with massive farm-workers' flows in search of work in factories and wealth. In a short time, the main cities became important crossroads within the principal lines of territorial connection and started growing to the detriment of smaller urban centres and scattered rural settlements, changing their structure both at an economic and social level, both in the physical and functional organization.

Following the substantial increase in urban and territorial infrastructures and transportation, the narrow and inaccessible lane mesh of the ancient settlements eventually was insufficient for quick movement of goods and people and essential for the correct functioning of a capitalist environment and new urban population's social and cultural needs. In order to cope with this new condition, Haussmann, appointed Prefect of the Seine in 1853, arranged a radical restructuring process of the urban fabric of the city of Paris in less than 20 years. The idea behind this draft was the decisive role that circulation would have played in the life of the city. Paris became soon the emblem of the modern industrial city, a city in the sign of movement and time. Its urban space, that Choay defines «*space of movement*», was radically transformed and reconsidered in terms of networks and systems connected between them and the extra-urban space: large roads, big openings in the interstitial and closed spaces prevailed, while the boulevard (the great tree-lined avenue) became the symbolic image of the modern city.

6. Introvert and empirical fabric of medieval villages - Carcassone, France

On that account the Boulevard was the symbol of movement, the expression of capitalist concept which goods mobility, exchange and monetary value were decisive for. But the boulevard was also the place for social relationships and as such it kept that multi-purpose character of habitable space and way of communication. As a matter of fact, in the large, regular, wide and tree-lined street, pedestrian mobility, vehicular traffic, commercial activities, entertainment and free time areas and middle classes residences cohabited. As Marco Torres reports, «*the Boulevard is the best expression of urban life and modern cities, and has a dual function: on one hand, it is configured as an area of mobility, which changes the urban and economic-functional structure of the city; on the other hand, it appears as an area of free time and entertainment, which changes the ways of life and being together, the culture and ideology of citizens*»[25]. Walter Benjamin[26] shared this opinion and thought that the great urban street was the stage of the new social mass centre of attention.

Speculating on the case of Paris, Marshall Berman wrote: «*At the time of Haussmann and Baudelaire, urban adventure was crystallized around the street, which has thus acquired the fundamental symbolic value of modern life*»[27]. Sharing his opinion, Rosario Pavia describes the Boulevard as «*infrastructural works and urban*

25 Marco Torres, *Luoghi magnetici: spazi pubblici nella città moderna e contemporanea*, F. Angeli, Milano, 2000, p 56

26 Walter Benjamin, *Parigi, capitale del 19. secolo: I "Passages" di Parigi*, a cura di Rolf Tiedemann, Einaudi, Torino, 1986

27 Marshall Berman, *L'esperienza della modernità*, Il Mulino, Bologna, 1985, p 388

7. Boulevard - The simbolic image of modern city

architectures together, which give functionality to the city and in the same time build the new image of Paris back»[28].

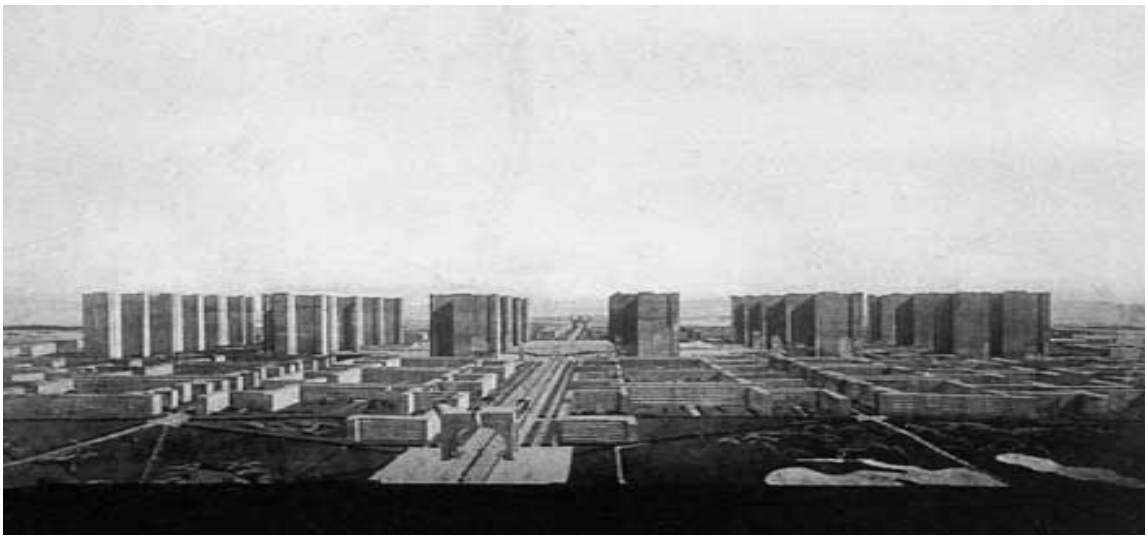
However, the progressive enlargement of the street, proper of the city transformation processes in XIX century, was already pre-announcing a fundamental step that in a few time would have forced it to lose its structuring role inside the urban settlement.

In fact, at the beginning of the 1900s, the frenetic growth that characterized the major European cities and the revolution in transport systems, with the appearance of cars, focused attention on circulation and street network organization. The street was so reconsidered both in its morphological and functional articulation and, in order to satisfy the increasing volume of traffic, it became from public space par excellence and place of multiple relationships (social, economic and cultural) a place exclusively for transit, a mainly technical area against its original prerogative of urban space.

The enlargement project for Barcelona drawn up by Ildefonso Cerdà[29] is

28 Rosario Pavia, *Infrastrutture, urbanistica, governo del territorio*, in *Infrastrutture e piani urbanistici*, a cura di Alberto Clementi, Quaderni Blu, Roma, 1996, p 319

29 In 1859s, Ildefonso Cerdà draws up, on behalf of Spanish central government, a new expansion plan for Barcelona, past to the history as *Cerdà Plan*. In territorial terms, this plan see outside of the historic city (for which provides for the demolition of the walls), according to a isotropic vision of employment of the surrounding territory through a regular mesh that extends, following the main directions indicated by the geography of the place, up to incorporate the country. This homogeneous employment is done through the *Ensanche*, which in its etymology means exactly expansion, extension, of the city on the surrounding territory with a regular draw made up of block (manzanas) of a size



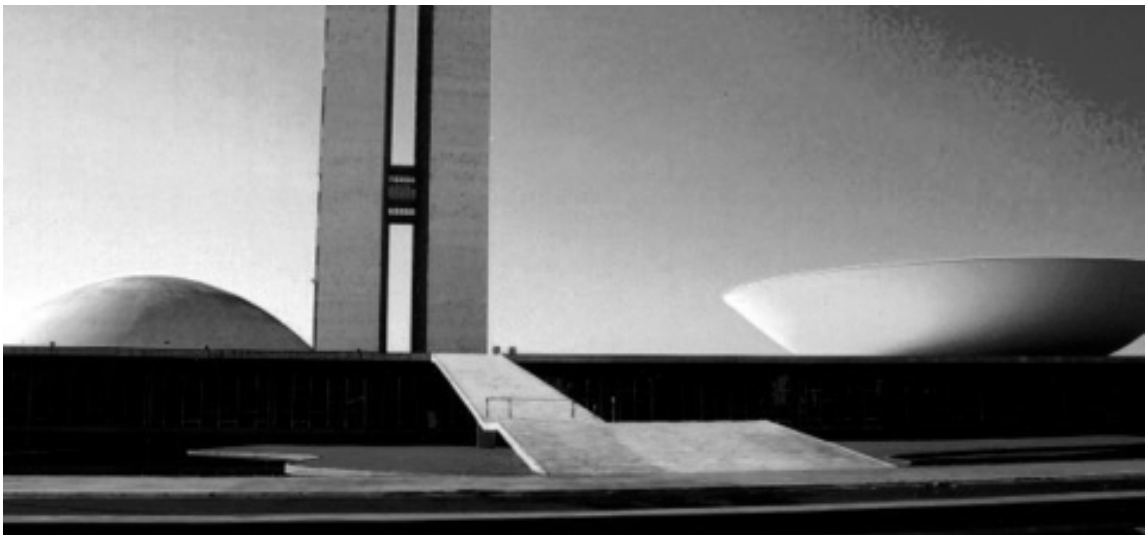
8. Ville Contemporaine, Le Corbusier, 1922 - Mort de la rue corridor

forerunner in this sense. His work placed emphasis on the irreconcilability of the opposition that can be observed in the street between "two fundamental functions of living ", that one of "stay" and that one of "movement".

Half a century after, Le Corbusier faces the urban problem in the same terms. Deeply convinced that the development of the industrial city and the consequent, greater need for traffic will inexorably make the traditional town disappear, he displays that in front of the scope of the change small simple remedies are not enough; on the contrary, a total reversal of the settlement process is strongly required. The only possibility for salvation is a new project of city, that is, the construction of that modern, rational, more democratic and beautiful city only a machine civilization allows its achievement.

Therefore, from the 1920s, within the Modern Movement, he tries to re-establish the idea of street in the context of a broader reflection on the city and its organization. The "*mort de la rue corridor"*, so emphatically proclaimed, is in some way the formal statement of the revision process of the concept of urban street. According to Le Corbusier, the abolition of the corridor street, enclosed by blocks and defined by construction curtains, depicts a necessary passage for the realization of a really

113x113 metres. In the chessboard planting of Cerdà there is a particular attention to the relationship between full and empty spaces managed by the section of the streets and the bevel of corner near the crossings of orthogonal streets. The road acquires not only a new value of connective space able to structure with its hierarchy the urban fabric and the relationship with the ancient city, but at the same time acquires a representative role that configures new public spaces in which the city, unconsciously, will find its identity.



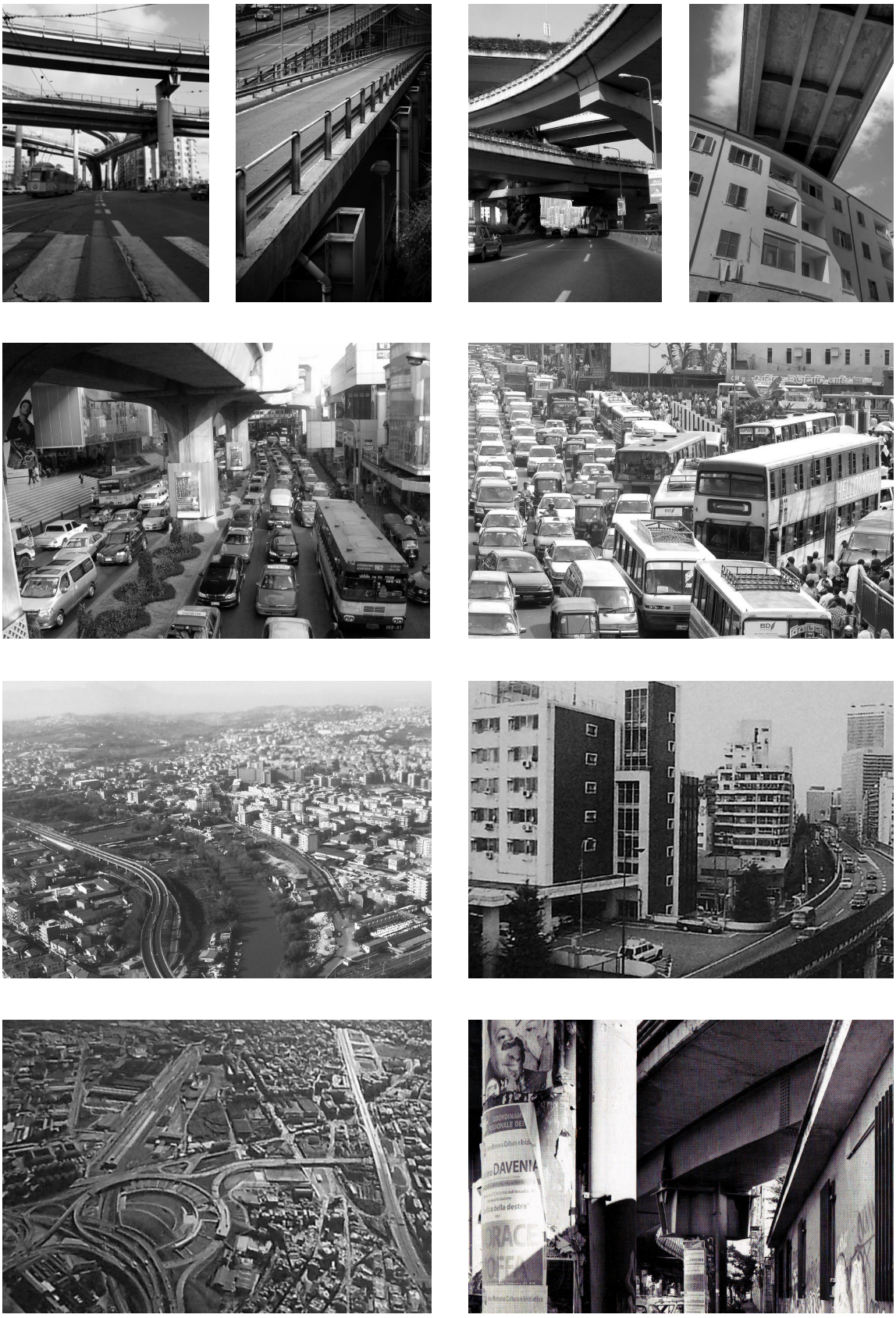
9. Brasilia, Oscar Niemeyer, 1956-1960 - Example of city planning based on theories of Le Corbusier

new model of city based on strict space separation of urban functions. This is the city that comes to life in the Congress CIAM of 1933[30] and that has its doctrine in the articles of the Charter of Athens published 10 years later. The autonomy recognized to the street as an area only for traffic and movement is so translated in the concept of the "*street without houses*"[31], which carries two inevitable consequences. Firstly, the realization of the overthrow of the 19th century urban model: street and buildings become independent and as a result mark the end of the relation of continuity between built space and spaces of connections that characterized the form of the historic city. Secondly, the social dimension of the street is totally subordinate to that functional characterization for which the car is configured as the absolute protagonist of this space exclusively intended for traffic and movement.

In addition to what has been said, since the World War II, the urgency in Europe to cope with the problem of the house ulteriorly contributes to emphasize the acting transformation. The urgency to meet the ever-growing demand for

30 The International Congresses of modern architecture (*Congrès Internationaux d'Architecture Moderne*), or CIAM, spring from the need to promote an architecture and a town planning that have to be functional. The first meeting took place in 1928 in La Sarraz (Switzerland) and was organized by a group of 24 European architects on the initiative of Le Corbusier and Sigfried Giedion. CIAM presented also the Charter of Athens in 1933, founder text of the modern architecture and town planning. This text sets out the tools to improve the conditions of existence in the modern city which will allow to carry out harmoniously the four basic human functions: living, working, enjoying oneself and moving.

31 Sergio Crotti, *Strade, frontiere interne della trasformazione urbana*, in *Urbanistica* n. 83, May 1986, p 16



10. Fragments of contemporary city which reflect an idea of “streets without houses”

automotive mobility forces to deliver the engineer and transportation technical ambit the infrastructural planning: an approach totally related to engineering disciplines, where the only criteria for the building of new streets refer to work maximum functionality and cost-effectiveness principles, is so facilitated. Paradoxically, the massive automobile diffusion coincides, therefore, with the loss of interest in the issue of major infrastructure design by the architectural disciplines.

There are inevitable negative consequences of these policies concerning the quality and pattern of the urban fabric. A deep laceration is now present between architectural design and urban planning: excluded the aesthetic purpose, infrastructural projects shade the more general question of urban design. The main objective of new works is no more that of representing the new image of the city but, reductively, helping the traffic flows.

Since the mid 1960s, the city began therefore to grow in a disorganized and fragmented way and it is so clear that the urban space has lost its role as privileged role to shape the city and the social life. The huge increase in private transports (and the phenomena of commuting, promoted by zoning, require as a matter of fact a continuous enlargement and strengthening of the road system: the mass use of automobiles becomes therefore a destructive factor of the form and the historic urban culture in its foundations[32].

The crisis of the classic principle of buildings alignment along the street led the city to grow less morphologically determined: «*Streets get wider, multiply, but stop being demarcating points for places and lose their ability to establish significant connections between physical and functional elements of the urban space*»[33]. From then on, the attention focused on planning on a large scale has moved the attention from the design quality of the individual architectures, encouraging a considerable disintegration of the social and cultural fabric of the modern city with its consequent semantic weakening.

As a response to this situation, in the beginning of the 1980s, new processes of restructuring and regeneration of the city take embody starting from new strategies for reuse of public space. The urban experience of Barcelona is emblematic in this sense, reaffirming the fundamental role of planning for the urban space.

With Franco's death and the nomination as host city for the Olympic Games

32 Mario Mocchi, *L'architettura dell'infrastruttura*, in *Architettura, progetto, reti*, edited by Fabrizio Zanni, Libreria Clup, Milan, 2000, p 146

33 *ibid*., p 147

of 1992s, the capital begins an important process of rebirth that finds in the Spanish architect Oriol Bohigas its reference figure. With the appointment of Bohigas as municipal delegate of urban planning, Barcelona is completely transformed through many important urban interventions and infrastructure projects. In continuity with the work of Ildefonso Cerdà, Bohigas implements a plan of regeneration in which public space and its infrastructures acquire a decisive role as structuring elements of social and urban fabric. Pivotal points are streets and squares. They are not only physically redesigned, but also the connection system between individuals and groups that is exactly consumed within the public space and that gives meaning to outdoor life again. So, collective and connective space becomes a renovating matrix and acquires again the role of "*builder of the city*", just like in the traditional urban conformation[34].

This experience, which takes the name of "*projects versus planning*", realizes that idea of cities that Rosario Pavia revises in the Haussmann processing of Paris: the city comes to be a novel told through its routes and infrastructures which give it a uniform perception, just like a tale that ties the different parts of the story in a unique sequence[35].

For this purpose, Bohigas writes: «*We must ask the public space, that is the form of the city, legibility, consistency and meaning. The morphology of the public space has not to be regarded as a simple ornament, or process of adornment, […], but as a democratic vehicle indispensable for a proper use of the city. The essence of the city is in the form, the image, the meaning of its public spaces. All this means that the city should be designed beginning from the public space, i.e. from emptiness and not from the mass of autonomous buildings. Also in the 1800s, the best architecture was that giving priority to the urban structure*»[36]. The Spanish experience echoes also in Secchi's proposal "*project of soil*" [37] that highlights the regenerating potential of open

34 Giuseppe Marinoni, *Metamorfosi del progetto urbano*, Franco Angeli, Milan, 2006

35 Rosario Pavia, *Spazi pubblici, spazi infrastrutturali*, in A. Clementi, R. Pavia, *Territori e spazi dell'infrastruttura,* Transeuropea, Ancona, 1998, p 42

36 Oriol Bohigas, *La città come spazio progettato*, in Paolo Caputo (edited by), *Le architetture dello spazio pubblico: forme del passato, forme del presente*, Electa, Milan, 1997.

37 «Each town planning project, of every plan, on every scale, has to focus on a *project of soil*: this is what the city plan draws in the first instance. […] A project of soil defines the concrete and precise ways, if necessary classifies by typology, the technical, functional and formal characters of open space; it defines its variability, it interprets the relations with the activities and functions carried out or that can be carried out within the built space that overlooks it, it integrates different open spaces and covered spaces: streets, alleys, squares, gardens, vegetable gardens, parks, churchyards, widenings, car parks, but also courts, halls, loggias, etc.; it arranges them in sequences and paths, according to

spaces; spaces whose civic qualities reaffirm themselves because of «*their systematic, fluid and cross character, i.e. of those aptitudes for crossing, change of course, overstay, chance encounter, which characterize the historic urban street maps, fundamental tools of knowledge of the information produced by the city*»[38]. Bohigas writes about it: «c*itizens often circulate in the streets and the squares without the clear intention to find some specific information. He is not looking for it but he finds it by accident, and that's in this casualness that we find the immense social and cultural richness of the city. Information and accessibility are mixed up in a single operation based on the unpredictable offer of the urban scenario. In order to maximize this scenario in the cities that still want to be useful, two fundamental conditions are required. The first one is the "arbitrary" coincidence of functions, i.e. the lacking division in functional areas. […] The second condition is the permanence of some clear and easily identifiable public spaces […] that orientate the citizen and offer him comprehensible itineraries to the different alternatives for information and accessibility*»[39]. The recovery of meaning density associated in the first place with streets, both communication tools and physical spaces, in contrast with the purely circulatory use assigned to them by functional specialization, is felt today by many authors as an essential tool for the reconstruction of the city, of its image and its deepest meaning of «*point of intersection and exchange*»[40].

1.2. Sustainable Urban Development, a possible solution to the crisis

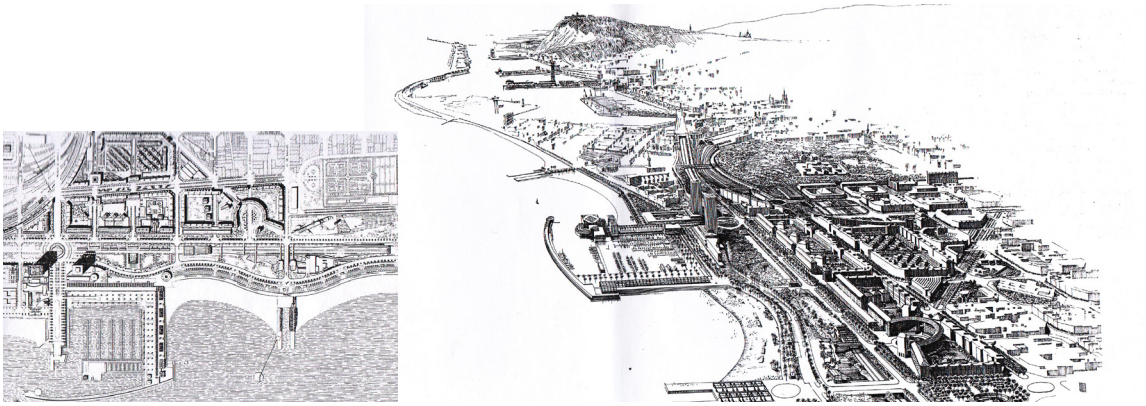
As previously told, contemporary cities are today responsible for the main world crises, such as the ecological crisis (the city is the principal source of environmental pollution) and the social crisis (the city increasingly disintegrates

signifiers systems of associations and oppositions; it defines the elements responsible for its layout, organizes the mediation between one another», in Bernardo Secchi, *Un progetto per l'urbanistica*, Einaudi, Torino, 1989, pp 272-274

38 Francesco Alberti, *Progettare la mobilità,* Edifir, Florence, 2008, p 98

39 Oriol Bohigas, *Contro l'incontinenza urbana : riconsiderazione morale sull'architettura e la città*, Gangemi, Rome, 2008, p 20

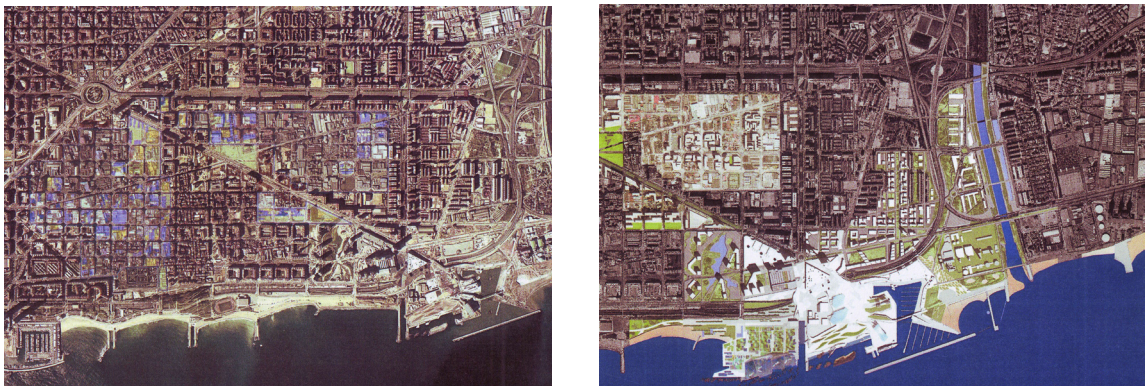
40 In this sense, it is interesting to note that this aspect for the anthropologist Ulf Hannerz coincides with the definition itself of city, that is that place where it is possible to find something while we are looking for something else. (Ulf Hannerz, *Esplorare la città: antropologia della vita urbana*, Il Mulino, Bologna 1992). From here comes the idea of urban place where you can certainly get lost, but that in history was also the mother of all innovations. The variety of experiences that the city permits and the variety of situations in which you may be involved, allow indeed the man to experience new and unexpected cultural synthesis.



11. Parque del Litoral alla Vila Olìmpica, Oriol Bohigas, 1988-1992

12. Parque del Litoral alla Vila Olìmpica, Oriol Bohigas, 1988-1992 - Scenic view

13. Urban space in Cordoba, Argentina



14. Esplanada Forum 2004, José Antonio Martines Lapena, Elìas Torres Tur, Barcelona, 2004

15. Zoom into the Esplanada Forum 2004

16. Forum Footbridge, Ángel C. Aparicio Bengoechea, Gonzalo Ramos Schneider, Barcelona, 2004

17. Towards a more "human" city

cohesion and social relations). Globalization and urbanization are consequently the two main problems of our time.

However, the future of the city is also connected to the future of society and the future of the Earth itself: as noted by Luigi Fusco Girard, «*The future of mankind and that of the city are closely intertwined: one will influence the other. Therefore, if the future of the 21st century will be built in the city, the improvement of human life will depend on the ability to govern/manage the city itself*»[41].

Twenty-first century cities are thus the new engines of local and national development and any recovery policy (economic, above all) is nevertheless possible only if it is founded on an improvement in living conditions in the cities. That is to say, there is a close connection between economic development and urban development to the extent that the future of urban settlements will depend almost exclusively on the choices that will be made to deal with the more critical issues. In view of these choices, many authors suggest the model of *sustainable urban development* as the only innovation that has been suggested until now to face the urban crisis[42].

The model of sustainable urban development begins to take shape and to be known in the United Nations Conference of Rio de Janeiro in 1992, as underlined also by the subscriptions to the different Charters of Sustainable Cities (Aalborg, Lisbon, Hannover, etc.). It expresses the idea of a general interest to be pursued that links the

41 Luigi Fusco Girard, Nicholas You (edited by), *Città Attrattori di Speranza. Dalle buone pratiche alle buone politiche*, Franco Angeli, Milan, 2006, p 11

42 *ibid*., p 12

18. When city becomes "point of intersection and exchange"

Wellness of present and future generations to the balance of the ecosystem and, as such, has all the potential to give the change of the city a more "*human*" direction[43].

On one hand, a more "*human*" city is able to reduce the differences and the growing inequalities creating a bond that takes together the different actors of a society; on the other hand is able to focus its attention on men and their inalienable rights to health and therefore to a quality environment, to work and to culture[44]. It is a city that takes into account both material and immaterial capital, meaning with the latter all the social, cultural and spiritual values; as remarked by Fusco Girard, «*the loss of immaterial capital*[45] *is perhaps one of the most alarming aspects of the contemporary city*»[46].

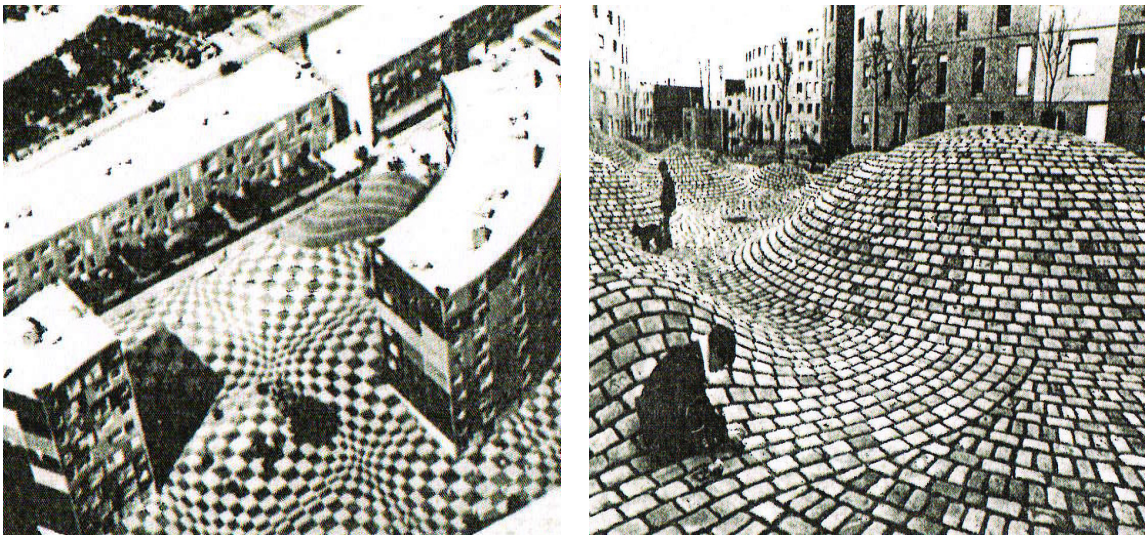
A more "*human*" city must therefore be able to reflect through its form the soul of the city, i.e. all the uses and social customs, traditions, symbols and life style that characterize it. This soul is reflected in the so-called *places*, that is in the urban spaces through which the city acquires its aspect. As incubators of community and relational

43 The expression more "human" city is codified by Luigi Fusco Girard in *Città Attrattori di Speranza. Dalle buone pratiche alle buone politiche*, Franco Angeli, Milan, 2006, p 12

44 Fusco Girard, *La città, tra conflitto, contraddizioni e progetto*, ACE Architecture Magazine, City and Environment n°1/2006, Barcelona

45 The «immaterial capital» of a community is all the human, social and cultural resources that represents it.

46 Luigi Fusco Girard, Nicholas You (edited by), *Città Attrattori di Speranza. Dalle buone pratiche alle buone politiche*, Franco Angeli, Milan, 2006, p 12

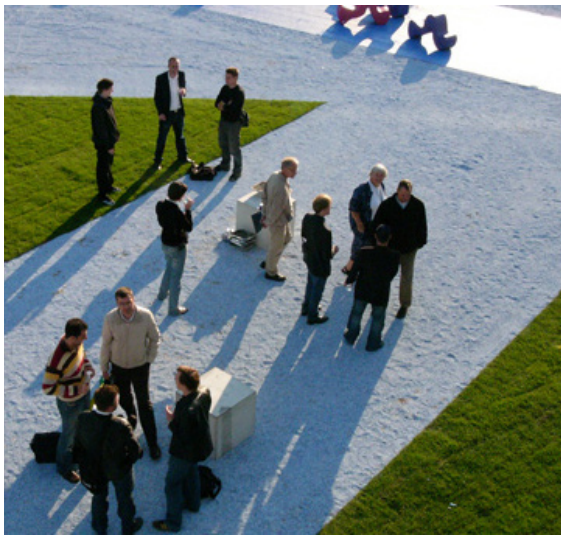


19. Walking in Chanteloup Les Vighes, France

values, public spaces are especially «*spaces of humanity, proximity and centrality*»[47] and, as such, can't be designed in the light of a purely commercial exchange. The historic squares of the European city are amazing places from this point of view and express the concept of relationability which is the essential dimension of humanity. On the contrary, the lack of places creates discomfort, crisis and degradation of the city.

In this sense, Fusco Girard identifies Architecture as an important instrument of «*recreation of the immaterial capital*». The work of "real architecture" can be the ideal way of recreating the attractiveness and contagious energy that makes each space a place of life[48]. It has the characteristics to be seen as a real place of aggregation for the community, insofar as it encourages the dialogue and is respectful of the ecosystem integrity. Consequently, the architectural quality of physical space may have a positive influence both on human capital (state of health, sense of identity, predisposition to interpersonal meeting, greater productivity) and social capital, promoting this way a deeper sense of belonging to the community. This is based on the fact that «*there is the belief that between the characteristics of the built environment and the perception of "well-being" there is a real interdependence. The improvement of one has a positive effects on the other: when the architectural project manages to determine an overall increase in the quality and the beauty of the physical-spacial scenario, the latter inevitably increases its power of attraction, which results, therefore, also in a greater*

47 *ibid*., p 18
48 *ibid*., p 18

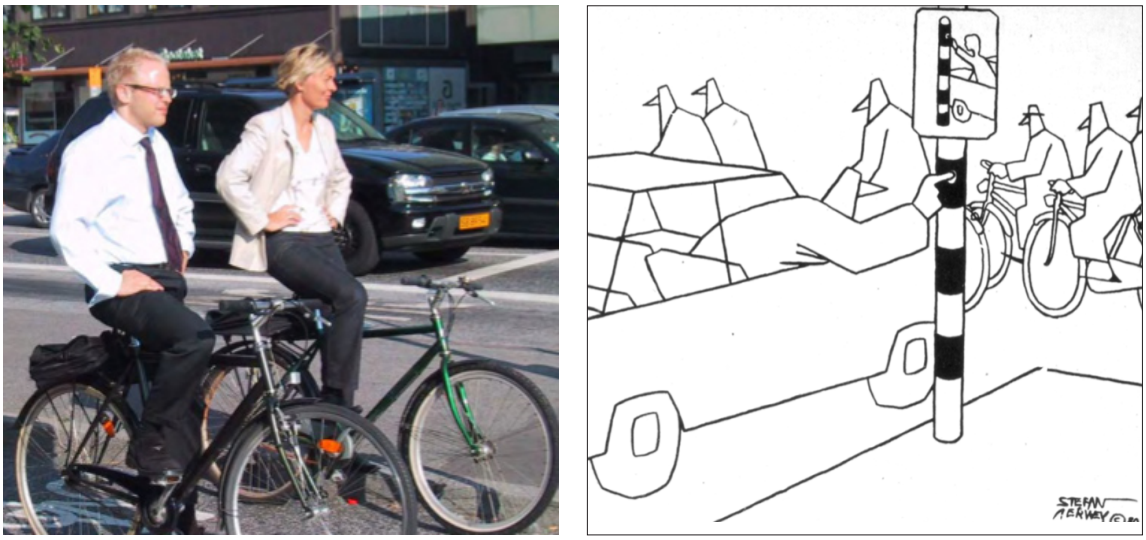
20. Mikado Square, Mutopia, Ørestad Nord, Copenhagen, 2005.

economic wealth, essential for the sustenance of the city»[49].

This idea finds also verification in the branch of research on public spaces that had among its major representatives Kevin Lynch (1960), Jane Jacobs (1961), William. H. Whyte (1980) and Jahn Gehl (2003) [50]. These studies particularly explore the relationship between physical space and perception, according to a shared idea that finds in urban life (the presence of other people, the recurring events, activities and stimulations) the highest index of quality of a public space. Humanizing the contemporary conurbations means therefore to launch processes of regeneration

49 *ibid*., p 18

50 Jahn Gehl, *Vita in città: spazio urbano e relazioni sociali*, Maggioli edizioni, Rimini, 1991. Danish architect Jahn Gehl carries out here an analysis on the activities that generally characterize the public space and how these interact with it. The three main categories they include them are: necessary activities, voluntary activities and social activities, each of which raises totally different questions to the built environment. While the first ones (going to school or to work, doing the shopping, catching the bus) are only minimally influenced by environmental context because we are obliged to carry them out, we dedicate to voluntary activities, connected indeed to entertainment and free time, more enthusiastically when environmental conditions are more advantageous. Walking outdoors, stopping here and there enjoying the view, sitting in the sunshine are indeed actions that are possible only when the external conditions are optimal, i.e. when the climate and the environment are inviting. Finally, we can define as social all those activities that depend on the presence of other people in the same public space. These can be, for example, the games of children, the conversations and the exchange of pleasantry, collective activities of different kind, but also the simple act of observing and listening to others. This kind of activity develops spontaneously as the effect of the presence and movement of other people in the same space: «People go where other people are». Social activities are thus indirectly favoured whenever the public spaces, offered to necessary and voluntary activities, prove to be of better quality: the degree and extent of these are indeed strongly influenced by the physical design of environment.



21. Priority to bicycle

of the urban fabric starting from the morphological reconsideration of the places that determine the form and structure of the city. Indeed, its quality and livability depend on good design of the urban space on the basis of which the kind of bond is established that connects inhabitants with their places of living, services and civil institutions. For this reason, the urban space should not be regarded as an isolated and separate unit, but as a vital frame of the urban landscape. Public space should be thought as an outdoor room where you can relax and enjoy urban living; a place for a wide range of activities: outdoor cooking, entertainment on the street, sports, playing, civil and political activities, but especially a place to walk and sit in. Safe, well maintained, attractive and continue public spaces are a vital binding agent necessary to make a city more "*human*".

This vision appears today also in the strategies promoted by the European Union aimed at guiding the overall development of the city in a "more sustainable" direction, which does not separate but integrates and enhances every component in a systematic perspective.

Instruments like Agenda 21 Locale (worked out in the Rio de Janeiro Conference in 1992) and the Agenda Habitat (1996) help in this sense to build, overall, a more desirable future. Agenda 21L, for example, is an environmental action plan that involves public institutions, private economic society and civil society in the implementation of a program of concrete actions to improve the conditions of the territory and the quality of life of citizens. These objectives have been then redesigned and enriched with specific reference to human settlements in the United Nations Conference Habitat II in Istanbul in 1996, when the Agenda Habitat was

22. Priority to bicycle

drawn up. It is the instrument with which the city builds its future by promoting its role as the engine of economic growth compatible with the ecological cycles but, at the same time, becoming also engine of social change. The Agenda Habitat is based on the criteria of human development and on the culture of the person's rights. Its implementation refers particularly to two main issues: a) the availability of adequate housing for all; (b) the promotion of sustainable settlements in an increasingly urbanizing reality.

A settlement is sustainable, first, when it can reduce the levels of air pollution (CO2, NOx[51], etc.), in order to meet the Kyoto treaty, through a regulation of transport, waste and production systems. For example, giving priority to a not pollutant system of transport, improving the offer of pedestrian and bicycle paths alternative to the car, is certainly a first step taken in this direction. Moreover, promoting a different use of soil by favouring the model of compact settlement[52], rather than the widespread one, would facilitate the process of regeneration of the settling heritage, so that a more livable and aesthetically pleasing city is created and, therefore, more suitable to attract resources, goods and persons. A compact, continuous and well designed city, as it was in the past, provides the residents with an unprecedented freedom and

51 Oxides of nitrogen

52 *In order to contain the consumption of soil and the urban dispersion*, a more dense settlement is needed. A compact city is a well designed, high-density settlement, with houses of medium height and mixed functions, focused on urban centres and other public transport junctions, with an adequate dimension to offer a series of social and economic benefits in a distance that can be walked from houses.

variety in daily movements without necessarily using automobiles. The result is a greater integration between people and places, an aspect that the "kinetic dimension" of the motor vehicle is not actually able to offer. In substance, the matter is «*to develop more sustainable forms of production, consumption and mobility, by promoting cities and communities able to achieve greater social inclusion and ensuring that their rich historical and cultural heritage can bring an effective contribution to today life and to future generations*»[53].

1.3. Livable Copenhagen

Some years ago, Copenhagen implemented an effective policy for urban regeneration, starting from the development and promotion of public spaces: thanks to this policy, in 2008 the city gained the title of more livable city in the world. The urban space Action Plan 2006, drawn up with the advice of the French architect Jean-Pierre Charbonnau, aims at the creation of a unique European metropolis created for people. As Søren Pind, Mayor of Building and Construction Department, reminds: «*Our aim is for the city of Copenhagen to become a unique European metropolis created for people. The city will be an international meeting place which offers an attractive environment. It will also be a place for living in that it offers numerous possibilities for excitement, interest and delight. […] New squares, commercial streets, connections and pedestrian streets will create a more coherent city. Dull streets in residential areas will be transformed into recreational oases. It will be inspiring and challenging to live in the city. There will be a new type of urban space which will encourage more outdoor city life*»[54].

This plan is given the credit of creating a consistent and articulated pattern of public spaces through the exploitation of linear elements of connection, such as footpaths and bicycle paths, and of specific elements (nodes on the network), like squares and other spaces for the rest. All this was possible giving up the realization of few big and expensive projects in favour of many smaller and cheaper projects distributed throughout the city.

Thanks to this system, based on basic principle of sociality widespread in an urban context of high architectural quality, Copenhagen has today become an

53 United Nations, *Habitat agenda, agenda habitat: verso la sostenibilità urbana e territoriale*, Franco Angeli, Milan, 2002, p 102

54 Urban Place Action Plan 2006, Municipality of Copenhagen

23. Old centre of Copenhagen

international metropolis characterized by a dynamic identity and pleasant to live in.

The Centre for Public Space of the Royal Danish Academy of Fine Arts, who studies the public spaces in Copenhagen, has noticed that during the last 40 years, life in the city has amplified in time and space. In 2005, for example, the number of pedestrians in the main streets of the city centre between 10 a.m. and 6 p.m. of any weekly day has been in average of 218,000 in summer and of 146,000 in winter. The same pedestrian speed in summer is reduced by 20% in winter, because the pleasure of walking increases. The average number of people for the 14 squares of the centre between 10 a.m. and 6 p.m. has been in summer of 2260 and 285 in winter. The climate undoubtedly influences outdoor activities, but it is possible to improve the heat comfort with some simple ideas: for about 10-15 years, restaurants and bars, for example, have made plaids available for customers and in this way the use of external spaces, initially from May to September, has gradually expanded from April to October, and today from March to December thanks to the use of gas lighting. The policy to extend the outdoor season was supported by the idea of enhancing the different seasons: the possibility of swimming in the Channel near the old town centre in summer or of skating in winter, are examples of activities that were not present in the past.

However, Copenhagen is also known today as the *city of bicycles*. The policies of the traffic, developed from the 1970s, have made it a place in which moving by bike is safe, pleasant, easier and quicker than by car or by public transports. From 1970 to today, the number of bikes has doubled. At the end of 2001, the city of Copenhagen had 307 Km of bicycle paths, usually made by lanes wide more than 2 metres from

24. Scenes of Danish life in the open air

both sides of the street, and 9 Km of greenways. In 2003, 36% people used the bike to move from house to work. With the Traffic Plan 2004, the issue of cycling has become an integral part of the urban planning, in line with the principles of Aalborg Charter. Drawn up during the Conference on Sustainable Cities & Towns, which took place in Denmark in May 1994, this document reads as follows:«*We, cities & towns, shall strive to improve accessibility and sustain social welfare and urban lifestyles with less transport. We know that it is imperative for a sustainable city to reduce forced mobility and stop promoting and supporting the unnecessary use of motorized vehicles. We shall give priority to ecologically sound means of transport (in particular walking, cycling, public transport) and focus our planning efforts on realizing a combination of these means. Individual motorized means of urban transport ought to have only an auxiliary function in order to facilitate the access to local services and support the economic activities of the city*»[55]. This is to say that the combined adoption of Traffic Plan 2004 and Urban Space Action Plan 2006, have in fact made Copenhagen an exemplary model of sustainable city, and easy to export. The Danish capital reflects so that idea of a "*more human*" city described by Fusco Girard, in which «*man, in his relational and community dimension, is the focus of attention with his inalienable rights to health, environment of quality and culture*». Through strategic plans for mobility and interventions of architectural refurbishment of its urban spaces, Copenhagen managed to create a place in which a community is something more than a mass of people.

55 Aalborg Charter Conference on Sustainable Cities & Towns, 27 May 1994, chapter 1 par. 9

25. Stroget today, Copenhagen

1.4. Footbridges and the policies of sustainable urban regeneration

In this climate of sustainable urban regeneration, at the end of the last century, the main European cities implemented important strategies of urban renewal in order to cope with the main crisis in the contemporary city. This process, still in progress, is based on the implementation of specific programmes aimed at promoting an improvement in the architectural quality of public space in order to promote a higher level of social welfare[56] and greater environmental consciousness. In cities like Barcelona, Bilbao and Berlin, only to mention some examples, important projects of architecture on an urban scale have been launched with the aim of making the image of the city clearer and more understandable, to create the conditions for a real social cohesion within the community, and to prevent the presence of cars in populated areas, especially through considerable operations of pedestrianization and development of public services.

In this context you can find therefore the origins of modern footbridges or those bridges that, since the end of the 1980s, have caught the attention of more and more public administrations, which consider these manufactures as the ideal instruments for promoting a more respectful urban lifestyle for men and environment. Different from the traditional concept of pedestrian overpasses, they belong to a new generation of infrastructures, born specifically to give a concrete answer to the main crisis that today affect the contemporary city and in few years they become key elements in many urban policies for a sustainable development, as well as ideal instruments to give the urban settlement a more human dimension.

The process of morphological redefinition that, at the end of the XX century, has totally revolutioned the conception of pedestrian infrastructure has been decisive.

If in the past it was considered as a service artifact characterized only by territorial planning logics – typical behavior of the 1960s and 1970s, just producing scarce quality and context uprooted artifacts – nowadays the bridge is an integrating part of the city architecture. The footbridge has completely changed from an infrastructural to a real *urban project*: it acquires from the project the instances and the design methodologies through which it becomes part of the contemporary city no longer as an annexed infrastructure but as a urban space. Becoming a place, according to Fusco Girard, the footbridge has now a renovating matrix valence to be indicated as "*urban architecture*" in urban landscape regenerative policies for the

56 Please refer to the concept of "well-being" described by Fusco Girard, note 49

26. Solferino Bridge, Marc Mimram, Paris, 1999

physical reconstruction of public spaces. With relation to what I have told, the actual metamorphosis of footbridges can be then considered as functional to the necessity to recover that meaning density typical of urban spaces and perceived by many authors as a fundamental means for "city regeneration".

In detail, a new designing methodology that considers the city as a supporting material of the project and not as simple background: it is a planning approach that realizes complex and stratified readings of the city to hit the elements of its historical and material physicality, its size, forms, types and all those characteristics that represent the features of urban reality the bridge has to confront with. Consistent intervention with respect to the context of belonging; congruent choice of materials with relation to the construction techniques adopted; adequate dimensional and proportional ratios between the parties and the whole; compliance of the architectural language with the civic and public characteristics of the urban space: these are some of the features that the footbridge should express when it is meant to complete or transform an urban site, be it historically consolidated or recently built.

So, what had always been the domain of engineering, soon turns into a new field for architects and for a new generation of designing engineers, who are responsible for giving urban landscape a new quality through an infrastructural planning no longer dependent only on economic choices.

This also legitimates, therefore, the expression *architects as bridge builders*, with which the main newspapers renamed a phenomenon that from the second half of the 1980s saw more and more architects employed in the design of these works. First of all, it was the Spanish architect Santiago Calatrava that, between 1987 and 1992, realized the Alamillo Bridge on the occasion of the Seville Expo and, subsequently, between 1994 and 1997, the Campo Volantine Footbridge in Bilbao. The latter is part of an urban regeneration programme that also included the building of the famous Guggenheim Museum designed by Frank O. Gehry.

However, it is necessary to specify that this expression does not intend to deny the subordinate relations of architects in the infrastructural design, but intends to recall how, through a collaboration between engineering and architectural knowledge, it is possible instead to fill a gap in the cultural background of architects making them able to give a fundamental contribution to bridge design. To this period also belong the first works of a new generation of engineering designers among whom, only to mention a few, Jörg Schlaich[57], Javier Manterola Armisen, Juan José Arenas, Jiri

57 Jörg Schlaich can be certainly considered the first of a new generation of engineering designers.







27. Traditional pedestrian bridges - Typical examples of the 1960s and 1970s

28. Campo Volantin Footbridge, Santiago Calatrava, Bilbao, 1997

Strasky and Enzo Siviero himself and his "School of Bridge Architecture" at the IUAV University of Venice. Their works hark back to the engineering tradition of Masters as Eduardo Torroja[58], Pier Luigi Nervi, Sergio Musmeci, Otto Frei and Fritz Leonhardt[59] and are characterized by a cultured and refined design and, for this reason, could be considered as good examples of a new structural architecture.

From a temporal point of view, anyway, the "urban turning-point" of

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He has focused his studies and his experience on the search for a different approach to the project of footbridge. In his essay *Leichtbau – Wieso und Wie?*, he especially discusses the need to develop, from an engineering viewpoint, a structure that must be as light and transparent as possible. These terms are seen in the perspective of abandoning , through the "recent" scientific discoveries, a design that produced throughout the 60s and the 70s squat and dull works. This means we have to pursue a process of structural optimization thanks to which the superfluous is eliminated making way for a new architectural quality based on the dissolution of material: « emptiness, as well as mass, becomes protagonist in the work while the structure gets light and, rising from the ground in few points, lets the eye cross it». In this way, it becomes possible to realize works that really manage to be part of the landscape in a conscious and respectful way, both at a social and cultural level and with the perspective to reduce raw material waste.

The issue of light structures, only partly mentioned here, was widely discussed in the extensive literary production of Jörg Schlaich and his school. In particular, the consultation of some basic texts s recommended, such as: *Fußgängerbrücke 1977-1992, Katalog zur Ausstellung an der ETH Zurich* (J. Schlaich e R. Bergermann, ETH, Zurigo, 1992); *Guidelines for the design of footbridges* (M. Schlaich, Fib Bullettin n°32, Lausanne, 2005); *Leicht Weit: Jörg Schlaich, Rudolf Bergermann* (edited by Annette Bögle, Peter Cachola Schmal, Ingeborg Flagge, Prestel, Monaco, 2003). We can add to these several scientific articles by authors such as Christian Menn, Jiri Strasky, Javier Manterola Armises, only to mention a few.

58 See: Eduardo Torroja, *La concezione strutturale, logica e intuito nell'ideazione delle forme*, edited by Franco Levi, UTET, Turin, 1966

59 Fritz Leonhardt, *Brucken: Asthetik und Gestaltung,* The architectural Press, London, 1982

the footbridge can be dated back to 1992, when the advertisement for the first international competition of pedestrian bridge designed by architects was published:
29| it led in a few years to the building along the Seine of the new Solferino Bridge, by the French engineer Marc Mimram.

Organized by the Ministry of Culture in collaboration with the Etablissement Public du Grand Louvre, the competition included the design of a new bridge in place of the historic Pont de Solférino, which was in a state of advanced structural degradation. This operation, whose goal was also the enhancement of the gardens of Louvre, aimed at obtaining a design solution that could especially recreate that historical, almost natural link, between the Orsay Museum and Quai des Tuileries. In this case, having recourse to an architectural competition was the clear expression of the desire to have a work that went beyond pure technicality and possessed an architectural quality suitable for the environmental peculiarities of the context of Louvre. The basic idea was to inscribe the structure of the bridge in the continuity of landscape and of urban streets. For that purpose, Mimram presented a solution that met this twofold requirement: on one hand, to incorporate a modern object in a historical context and landscape with a form that would place itself coherently in the great tradition of arc bridges in Paris; on the other hand, to create an architecture that took its value from the geometrical conditions of the place, giving new fluidity and harmony to the paths along and through the Seine.

In the UK, in 1993, the approval in Parliament of the National Lotteryact was decisive, i.e. the establishment of the national lottery which was accompanied with the Millennium Commission in order to distribute funds collected for the most
30| interesting public projects. So, in 1996, the advertisement of the new Millennium Bridge of London was published, an international competition won by the team made up by Norman Foster, Arup and the sculptor Antony Caro.

The proposal is an exquisite element of connection that reflects the dialectic between art, architecture and engineering and that has made this footbridge a symbol of urban renewal for Southwark and Bankside. At the beginning the bridge was conceived as an urban space you could contemplate the city from, but with the building of the Tate Modern (2001) it has become one of the most important places of the River Thames. An article written by Dejan Sudjic, and appeared in the Observer for the official inauguration of the bridge, reports: «*the most beautiful thing that you can say about this path that in seven minutes of walking takes you from Bankside to Saint Paul, through the only bridge built in London in the last century, is the following: at the end, you get somewhere. The bridge has changed not only the aspect of one of the*

29. Solferino Footbridge, Marc Miram, Paris (1992-1999)

30. Millennium Footbridge, Norma Foster, London (1993-2001)

31. Gateshead Millennium Bridge, Wilkinson&Eyre, Gateshead (UK) (2001)

32. Pedestrian Bridge over Rhine-Main-Danube Channel, Jorg Schlaich, Kelheim (DE) (1987)

main parts of the river, but also the way it works. For the first time it is possible to go on foot directly from the halls of the stock Exchange on the north bank to the world of the south bank. Walking across this bridge is also an intense physical experience. Under the gray and threatening sky, there is in the air the London unmistakable smell of mud from low tide. In the breeze you can feel the prodromes of the rain and under your feet the vibrations of Aluminium»[60].

Moreover, at the threshold of the third millennium, two British municipalities, Gateshead and Newcastle upon Tyne, following what was renamed *Bilbao Effect*, gave a pedestrian bridge the great task of promoting the economic regeneration of their cities, which had been suffering a strong decline for many years. So, in 2001, the inauguration of the new, and today famous, Gateshead Millennium Bridge took place as well as the establishment of the architects Chris Wilkinson and Jim Eyre as authoritative designers of bridges.

These three events, that can be conceived as three basic stages of the buildup, are therefore the clear indication that, at the end of the last century, the way of conceiving and perceiving the footbridge fast and radically transformed to give back to the city a *more human* dimension.

Before this change, however, it is necessary to point out that the Calatrava phenomenon, which is often discussed today, has certainly had an important role in bringing this issue to the forefront of the media. As Enzo Siviero recalls, the works of Calatrava, real "sculptures" on an urban scale, have contributed enormously to spread the meaning (also symbolic) of these works, spread worldwide, among an increasingly wide audience. Many bridge designers, following the Spanish architect, have recently adjusted their style to Calatrava's iconographic one. Anyway, these dynamics should not lead us to consider the popularity of footbridges as a simple matter of fashion or taste. Such an association would only diminish the real value of the process of transformation achieved, which finds its raison d'être in deeper and more rooted considerations.

60 Dejan Sudjic, *Quanto i ponti tremano*, Domus, n°847, 2002

1.4.1. The ecological dimension of the footbridge

In line with the new urban and management policies, which aim at reorganizing the human settlements on the basis of a sustainable urban development, for several years more and more attention has been given to forms of environmentally compatible mobility such as, for example, moving on foot or by bicycle. As it appears from Aalborg Charter, in order to achieve a sustainable city it is now necessary to reduce forced mobility and to discourage the unnecessary use of motor vehicles, supporting at the same time the social and economic welfare of citizens. The current life styles in urban areas are indeed the main cause of many environmental problems that mankind has to face today. This is particularly important if you keep in mind that 80% of the European population lives now in the city. For that reason, a settlement, in order to be defined as sustainable, requires activities that improve the supply of pedestrian and cycle routes alternative to vehicular ones, consequently reducing the emission of polluting gases. That should be achieved through a planning that improves the pedestrian and cycle accessibility to the various services of the city, reducing the obliged vehicular traffic.

In this perspective, footbridges become key elements in the promotion of new transport logics. Particularly in those conurbations equipped with a network of alternative routes to vehicular ones, pedestrian and cycle bridges have the fundamental task of giving continuity and comfort to path networks. Making movements more fluid (especially considering the needs of cyclists), eliminating the interruptions caused by the intersection with other infrastructures and encouraging walking and cycling among architectures making paths aesthetically more beautiful and pleasant are therefore the factors that make a footbridge an ecologically sustainable infrastructure. As a result, their use is strongly connected with the matter of road safety (with regards to children and seniors) that aims at reducing the number of accidents due to a mix of vehicular flows and pedestrian and cycle routes.

The case of Copenhagen is emblematic is in this sense: thanks to 40 progressive but targeted policies, it is today a city where cycling is safe, pleasant and very fast compared to cars or public transport means. In this perspective, the Municipality of Copenhagen has implemented in 2008 a project called “Green Cycle Route”[61], i.e. a new network of routes that extends over the whole urban settlement for totally 115 km, in addition to the existing system.

61 City of Copenhagen, *Bicycle Account 2008 - Copenhagen City of Cyclist*, 2008

33. Views from Green Cycle Route, Copenhagen, 2008

In order to face the recent and remarkable increase in the use of cycle vehicles by inhabitants, it was necessary to modernize and strengthen the old and inadequate pedestrian and cycle network. The priority of the project was therefore to make new safer and more comfortable routes. In this sense, the Municipality has realized new "motorways" that allow to reach the different parts of the city in a safe and pleasant way through green areas and away from cars and buses. Today, in Copenhagen, there are 22 main routes that cross several parks and this network represents the main alternative for those people who wish to cross the city by bicycle, but also for those who intend to relax and do excursions surrounded by nature.

35| In one of the routes there is the new Green Path Footbridge on Via Ågade, completed in 2008. Designed by the Dissing+Weitling Architects, this bridge is the main link between the Noerrebro and Frederiksberg districts and its building has offered a good solution to the problem of dangerous crossings, where the mix of flows and users often causes many road accidents. The bridge crosses a busy artery road of the centre of Copenhagen, Via ågade, with a structure that realizes an arc both on the vertical and horizontal plane, in harmony with the sinuous curves of the Green Path that goes through the whole city.

36| The Bryggebroen, the first pedestrian and cycle bridge built in the last 50 years on the port channel of the city, is a work realized by the same architects. With its light arched form, it connects Havneholmen with Islandsbrygge creating a pleasant shortcut for cyclists and pedestrians that from the centre of Copenhagen wish to reach the recent University Campus in the area of Ørestad, beyond the river.

The interesting mobility plan covering a broad region of the city of Stuttgart, in

34. Green Cycle Route, Copenhagen, 2008

35. Green Path Footbridge, Dissing+Weitling, Copenhagen, 2008

36. Bryggebroen Footbridge, Dissing+Weitling, Copenhagen, 2006

the south of Germany is instead some year older. Today almost 20% of the territory of Stuttgart is protected by rules on the protection of landscape. The city has numerous public parks and green spaces, which cover an area of 5, 6 km2. In this system, the real attraction is the so-called "U GRÜN", a green U-shaped space completed on the occasion of the "IGA Stuttgart Expo 93", the first international gardening exhibition in Baden-Württemberg, which has allowed to bring a piece of nature in the centre of a big city. This is a single 8 km long green area where you can relax and have relax. Inside this place, the most prestigious area is certainly Rosensteinpark, magnificent and ancient heritage located between some important roads and railway lines. In order to improve the accessibility to the park, the Municipality of Stuttgart has realized between 1976 and 1992 an articulated system of routes and footbridges that links the park to the surrounding area. In this context, Prof. Jörg Schlaich planned in those years seven small works of art, which connect the park with the surrounding districts and to the S-Bahn. Anyone who had the opportunity to visit those places would remain stunned: everywhere you look there is a footbridge and you have just to cross one of these to reach the others. From the two thin red bridges over
38| Pragstrasse and Heilbronner Straße (1992) at Pragsattel, you can reach the bridge at Löwentor through a pedestrian promenade surrounded by green areas (1992). From the latter, whose decks are supported by a strained structural network, you can get to one of the main entrances of Rosenstein Park. Instead, a sequence of three other
39| footbridges (the Rosensteinbridges I and II and the suspended bridge on Heilbronner Straße) allow instead a quick connection of the Park with the Stations of the Subway and the rest of the city. Finally, the bridge over Neckarstrasse (1989) has the role to reconnect the park to the districts in the south of the "U GRÜN".

In Italy too, fortunately, many municipal authorities have recently begun to promote new policies aimed at promoting some policies aimed at favouring the use of bicycles as privileged means of transport for movements within the city. These policies include the *Padova Ciclabile*[62] project that deals with the construction of fast and safe pedestrian and cycle routes, necessary to connect the urban settlement with the country. The aim is to built 115 Km of bike paths (40 Km have already been made) and to create a network of urban routes able to connect the main radial arterial roads of the city, extending this way pedestrian and cycle paths of the old town also outside the walls. For that purpose, in the last years several footbridges have been inaugurated

62 *Padova Ciclabile*, edited by Lorenzo Attolico, Fabrizia Zorzenon, Luigi Siviero e Sabrina Marras, Galileo Magazine, Collegio degli ingegneri della provincia di Padova, Padua, 2009

37. U Grün, Schlaich's Footbridge, Stuttgart (1976-1992)

38. Footbridge across Pragstrasse and Heilbronner Strasse, Jorg Schlaich, 1992

39. Footbridge at Loewentor and Footbridge Rosentein Park I e II, Jorg Schlaich, 1992 - 1976

to give continuity to this system of routes, system that was often fragmented by a lot of flyovers and bypasses characterizing extra-urban panorama. These works
43| include: the RariNantes Footbridge on the river Bacchiglione and the pedestrian and
42| cycle bridge Pelosa on the Brentella channel that were signed by Progeest's team respectively in 2009 and 2008. The new cycle-footbridge designed by Engineers
41| Vitaliani and Morbiato, which links the riverside Piovego with the Venice Park, is currently at the stage of completion.

With relation to this context, Progeest has also carried out an interesting
45-51| feasibility study for the construction of five pedestrian bridges for the functional adaptation of the bypass of Catania. This important road, on which depends the current division of the urban fabric in two separate parts. This aspect is even more highlighted by the lack of safe pedestrian crossings between the districts in the north and south of the bypass. In this sense, this study aims at bringing near these two parts of the city and hopefully mending the break generated by this great road infrastructure. This feasibility study, therefore, provides the Municipal Administration with five projects of pedestrian and cycle bridges to be place on crucial points of the urban settlement in order to promote the development of safe routes, serving those areas nowadays characterized by an intense cyclist-pedestrian mobility. As one of the designers explains: «*A free-moving person, who can walk without fear, is one of the more representative indicators of the quality of an urban area, and when walking becomes "going for a walk" the traveller is also willing to go a longer way. Our cities, with their complex and consolidated fabric of buildings, without inner parking spaces, with narrow streets, are already inefficient for vehicular traffic. High flows of cars have a considerably negative environmental impact, and pedestrians are undoubtedly the most affected category. The discomfort of this category of street users, to which we all belong, pay a heavy contribution in terms of road accidents, caused exactly by the interference between pedestrian and vehicular flows. It is indeed on urban roads that the highest number of dead and injured for road accidents can be observed. Footbridges crossing urban roads characterized by intense traffic […] are certainly necessary to give continuity to pedestrian paths. They also offer new viewpoints and new visions of the urban context, giving back the space a human scale and enriching the pedestrian path*»[63]. So, these bridges configure themselves as real urban furnishings, aimed at

63 Lorenzo Attolico, *Studio di fattibilità tecnica e tipologica per la realizzazione di cinque sovrappassi pedonali a servizio della circonvallazione di Catania*, article drawn up on the occasion of IABSE Symposium on Sustainable Infrastructure, Bangkok, 2009

40. Padova Ciclabile Plan

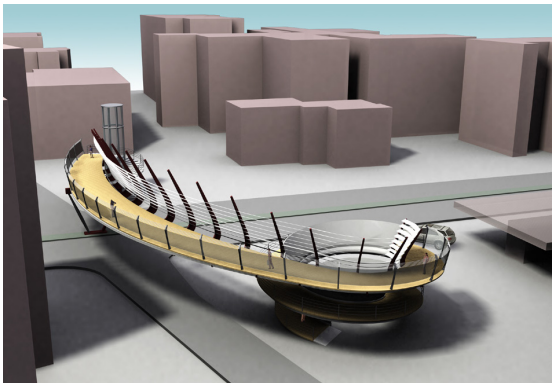
41. Footbridge across Via Venezia, Eng. Vitaliani

42. Pelosa Footbridge, Progeest, 2008

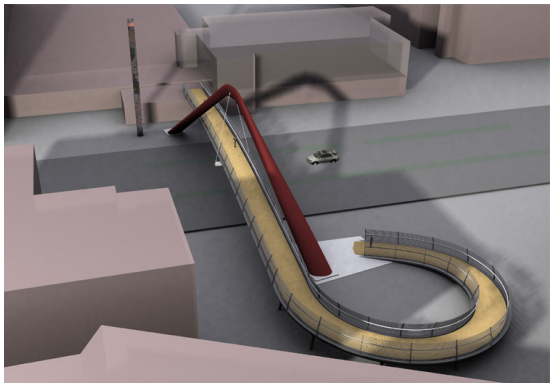
43. Rari Nantes Footbridge, Progeest, 2009

44. Bridge on River Piovego, Eng. De Stavola, 2006

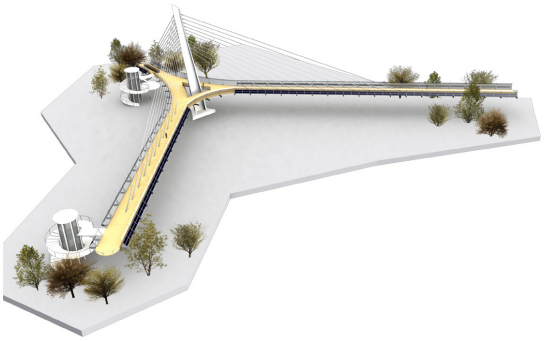
45. 5 pedestrian bridges over the bypass of Catania, Progeest, 2005



46. Footbridge across Via Veneto

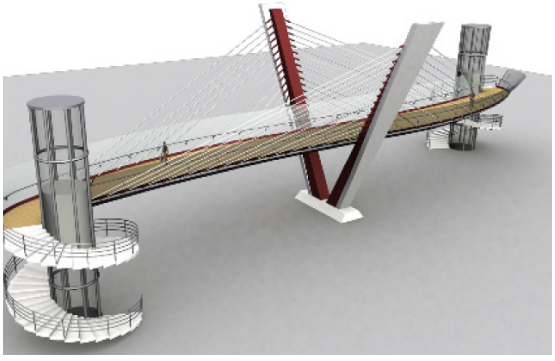


47. Ognina Footbridge

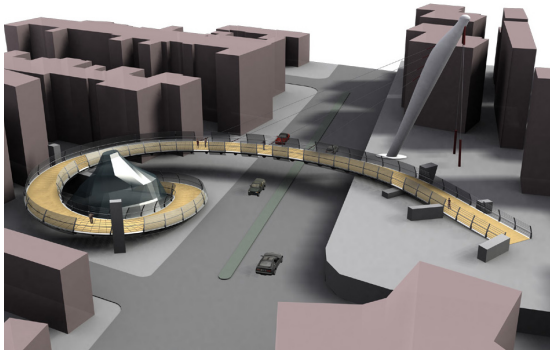


48. Footbridge in the University Cittadel

49. Footbridge in the University Cittadel



50. Our Lady of Lourdes Bridge



51. Nesima Footbridge

characterizing the route and highlighting the operations themselves and the purpose for which they were conceived.

About the issue of pedestrian safety, some studies that Prof. Enzo Siviero has been carrying out for the last 20 years can be considered peculiar. They deal with the issue of functional adaptation of pre-existing bridges through intervention of enlargement of the road layout. The bridges in question are the numerous bridges that characterize today the main streets of our cities and that were built in past ages, as well as more recently, but that, as a matter of fact, appear to be clearly inadequate in terms of safety, with particular reference to more vulnerable users, such as pedestrians and cyclists. These manufactures often present inadequate road sections unable to contain the current amount of vehicular, cyclist and pedestrian traffic. For that reason they are inadequate both at a static and functional level and in terms of road safety because the current physical limits of the bridges are often unable to completely ensure the safety of both user categories. In order to solve this problem, Prof. Siviero has proposed the realization of new types of pedestrian and cycle bridges, built along the existing manufacture, where to channel that portion of traffic that, otherwise, would be dangerously exposed to possible intersections with vehicular traffic. This category includes: a study for the functional adaptation of the "Ponte della Priula" Bridge in Treviso (2004), the building of a pedestrian bridge along the "Principe Umberto" Bridge in Legnago (2004) and the Borgo Tossignano Footbridge (2005), which was awarded the "Footbridge Awards 2008".

1.4.2. The social and urban dimension of footbridge

As we have previously analyzed, considering the footbridge not as an "*infrastructure project*" but as an "*urban project*" means to give this manufacture a completely new role and meaning. In its new physiognomy of urban architecture, the footbridge de facto acquires the regeneration potential that is typical of the urban space and becomes, together with streets and squares, an efficient element of urban renewal. As Alberto Clementi highlights, turning the "*infrastructural project*" into an "*urban project*" [64] means to create the optimum conditions to carry out a large plan of renovation of the existing urban settlement starting from infrastructural works,

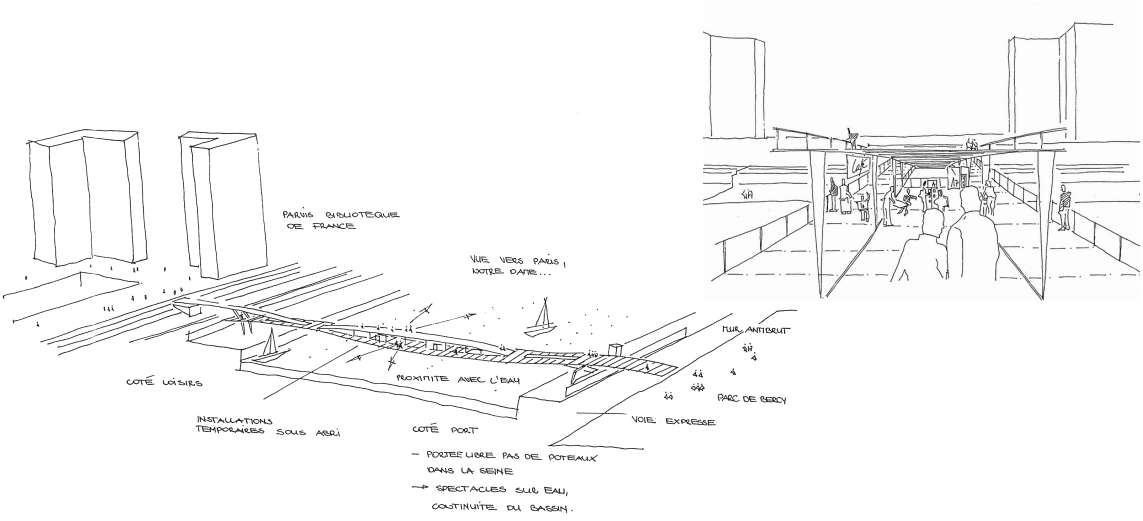
64 In this regard see: *Eupolis: la riqualificazione delle città in Europa*, a cura di A. Clementi e F. Perego, Laterza, Rome, 1990; *Infrastrutture e piani urbanistici*, edited by Alberto Clementi, Palombi, Roma, 1996; Alberto Clementi, Rosario Pavia, *Territori e spazi delle infrastrutture*, Transeuropa, Ancona, 1998

52. Borgo Tossignano Footbridge, Progeest, Bologna, 2005

as happened indeed at Haussmann's time. In this perspective, the pedestrian bridge realizes therefore an important restructuring operation of the public and open space so that the latter, as a patchwork of fragments typical of the morphological condition of contemporary city, can be developed into a system of formally concluded and articulated spaces. However, the infrastructure must be conceived as a place, that is as an «*incubator of new forms of urban space and new experiences of the city and the territory*»[65]. Such configuration allows the bridge to turn, from an object able to merely supply a service, into a structure able to give «*form to unexpected landscapes and to functional [and social] concentrations whose latent innovative potential seems still to escape numerous observers*»[66].

As a kind of outdoor room, the footbridge acquires therefore that the double value of connective and collective space, necessary prerequisite for the creation of that vital corpus of the human settlement called urban space. Translating Bohigas thinking, modern pedestrian bridges have special characteristics to operate a physical redesign of the city and to rebuild the relation system between individuals and groups that happens especially in the public space and that gives back its meaning to outdoor life, and so the city. In detail, at a social level, thanks to their renewed architectural and landscape quality, they give shape to those that Fusco Girard defines as "*spaces of proximity*", i.e. spaces of social relationship. Conceptually similar to squares, footbridges are becoming potential places of community aggregation,

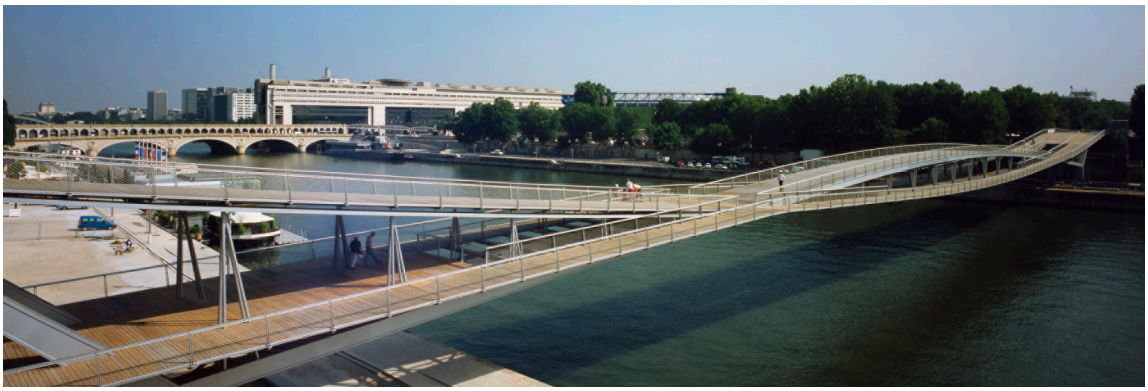
65 Alberto Clementi, *Infrastrutture e piani urbanistici*, Palombi, Rome, 1996
66 *ibid.*



53. Simone de Beauvoir Footbridge, Dietmar Feichtinger, Paris, 2006

places where the collective life within the contemporary city takes place. In their renewed physiognomy, they are ideal tools to recreate that synergy that makes each space a place of living.

For that reason, footbridges are considered today by the community as something more than a mere means of crossing. In many cases, for example, they become a sudden destination within a route, a movement and therefore the temporary stop is, as a matter of fact, one of the fundamental criteria of their identification as urban spaces. Here a lot of people stop in company for a certain period of time, necessary to establish contacts, to develop relationships, to think about identity and social differences: it is indeed possible to meet with similar individuals and observe the different ones. In this sense, the project by Dietmar Feichtinger for Simone de
53| Beauvoir Footbridge in Paris is emblematic. Inaugurated in 2006, this work presents in the centre a suspended piazza on two levels, intended to accept various and
55| temporary activities, like shows and other events. In the hottest days, it is also a real place of entertainment for young Paris people who can spend here pleasant hours in company and enjoy the night life along the River Seine. At the same time, however, footbridges are also places exposed to unforeseen events and occasional meetings with other people (serendipity) and, very often, places where you can show your collective emotions and feelings and where individual and social identity develops. Their presence is so often associated to places where these mass emotions and feelings are represented and can express themselves. This can happen for example
56| through the content of their communicative architecture, as in the case of Gateshead Millennium Bridge designed by Wilkinson & Eyre Architects and inaugurated in



54. Simone de Beauvoir Footbridge, Dietmar Feichtinger, Paris, 2006

55. Urban life on the Simone de Beauvoir Footbridge

56. Gateshead Millennium Bridge, Wilkinson&Eyre, Gateshead-Newcastle, 2000

57. Solferino Bridge, Marc Mimram, Paris, 1999

58. Millennium Bridge, Norman Foster, London, 2001

59. Pedro e Ines Footbridge, Adao Fonseca, Cecil Balmond, Coimbra, 2005

September 2001. Along the banks of the river Tyne, between Gateshead and Newcastle, this majestic mobile bridge has helped to create the conditions for the social, cultural and economic rebirth in an urban environment that had been in state of decay for years. With its architecture, it steered the functional conversion of large part of the surroundings, transforming this stretch of river, previously abandoned, in one of the most important urban spaces for the social life of both Communities. Each day, local people and tourists crowd around the bridge, which has been renamed by the community with a heartfelt expression, "Blinking eye", which is well linked to the city history. This is certainly not a minor detail, because it reveals how an architecturally valid infrastructure is able to relaunch the civic pride of a city becoming its main catalysing element, like any other architecture.

57-59| Both for pedestrians and cyclists, these particular infrastructures are therefore a new category of places, in other words collective spaces, with the task of restoring a sense to the urban environment. So, from a place exclusively destined to traffic, it becomes a meeting and exchange place again where unexpected cultural synthesis, like new strong and rooted collective identities, take form.

According to an urban point of view, instead, if inserted within a comprehensive system of pedestrian and cyclist paths, footbridges create a connective space, necessary to define a network of slow connections and crucial points that gives continuity and a new structure to scattered and isolated spaces, typical of the contemporary city. Comparable to a sort of layout that overlaps the existing urban settlement, this net of lines and points, bars and junctions, brings us back to that Haussmann's idea of city conceived as a novel and recounted through its routes and its infrastructures, which allow as a result a united perception. In this way, it is possible to bring the city not to a compact form but to a complexity of spaces characterized by a structural consistency. According to this logic, footbridges specifically acquire the fundamental role of junction. Generating from the interference of the path with the system of places, it creates, that is, an important connecting hinge between the system of network and the local fabric.

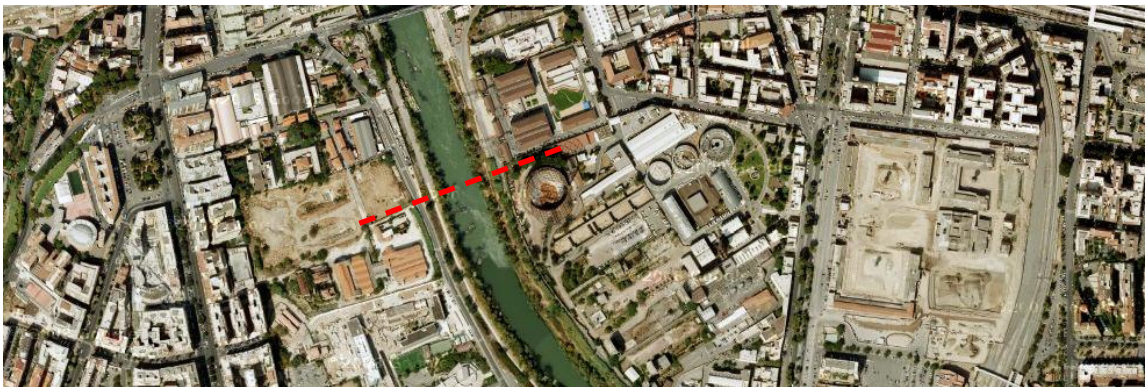
According to this way of thinking, the footbridge also becomes an opportunity for the recognition of the specificity and identity of the territory in which it establishes itself. In the junction the character of the locale space is indeed rooted, which expresses itself through the contextualization of the work within its landscape, namely, through the formalization of a specific individuality. On the contrary, when the junction keeps out of the processes of local structuring, it produces non places.

Proximity, *identity* and *continuity* can be therefore identified as the terms

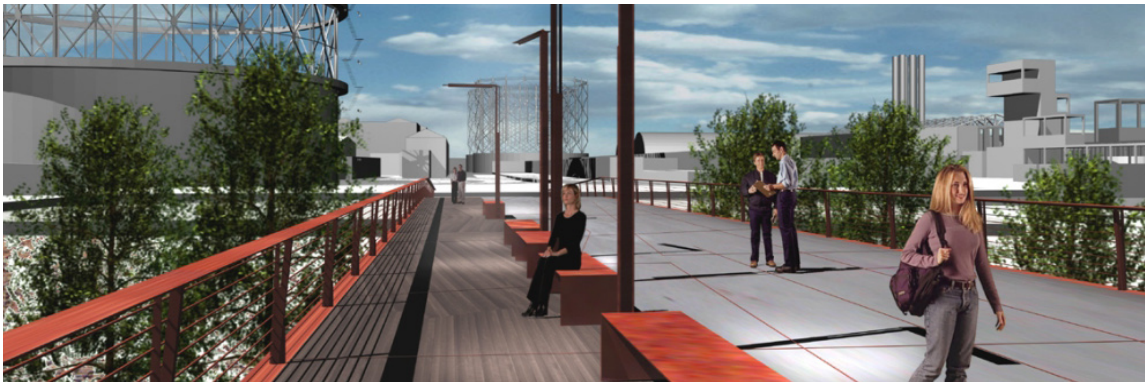
that better explain the social and urban dimension of the today's footbridge, whose form becomes the democratic vehicle indispensable for an adequate use of the city: through the endowment of an objective and collective identity, it turns the space into place, gives back to the urban space its native function of place where the individual, through the relationship with the others, be aware of himself and taking part of a community, and dissolves that nebula of non places that today makes the city an environment difficult to live and move across, if not thanks to the aid of cars.

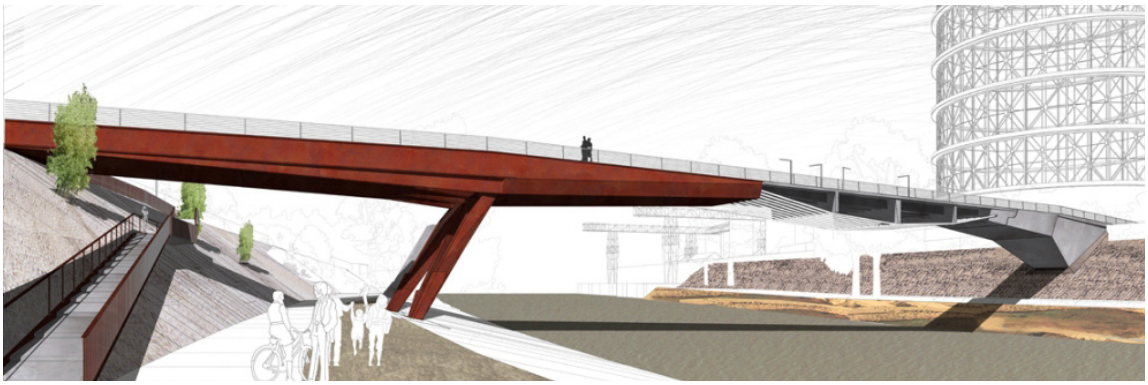
60-61| This is the case of "Ponte della Scienza", designed in 2000 by APsT Studio and today under construction. This bridge is part of a large urban development plan that aims at the regeneration of the ex-area of Gasometer in Ostiense district, enclosed between the river Tiber and the Via Ostiense that leads to the sea. This area is characterized by the presence of big, disused industrial plants, which create a kind of great gap within the urban fabric of the consolidated city. This urban gap is made even more evident by the state of abandonment of the plants. Therefore, building a bridge in this place means, firstly, recreating the link with the rest of the surrounding districts, mending a break mainly caused by the arrest of time. For this reason, one of the main characteristics of this project has been the use of local materials, intended as primary guardians of the lost time. This choice makes it possible to orientate the sense of present time towards a past time, while the new bridge becomes the heart of this operation. The new connection will be the focus of a programme of urban renewal aimed at giving new identity and continuity to the Ostiense district and the neighbouring Marconi and Testaccio districts. With its 10 metres wide and its benches, the bridge will be the hub of a new structural mesh redefining the social and urban fabric. Comparable to a square on the river, it will become an effective moment of exchange and meeting within a network of pedestrian routes that will give life to the new new Gassmann Tiber riverside.

62-63| Along the river Po in Turin, another footbridge by Antonio Capsoni, winner of a design competition, was inaugurated in 2004. This bridge crosses the main Italian river realizing a natural link between the two Po banks and the opposite districts, with the perspective of an enlargement plan of regeneration of the river landscape within the Turin area. This plan, called "Torino Città d'Acque", presents among its goals the implementation of a dense network of pedestrian and cycle paths that can realize a bond between the banks of the river and the internal and densely urbanized area, bringing so a piece of nature within the city. For this purpose, with an elegant and organic work, the appearance of the bridge originates from the structural signs of the surrounding urban context. The morphology of neighbouring districts is



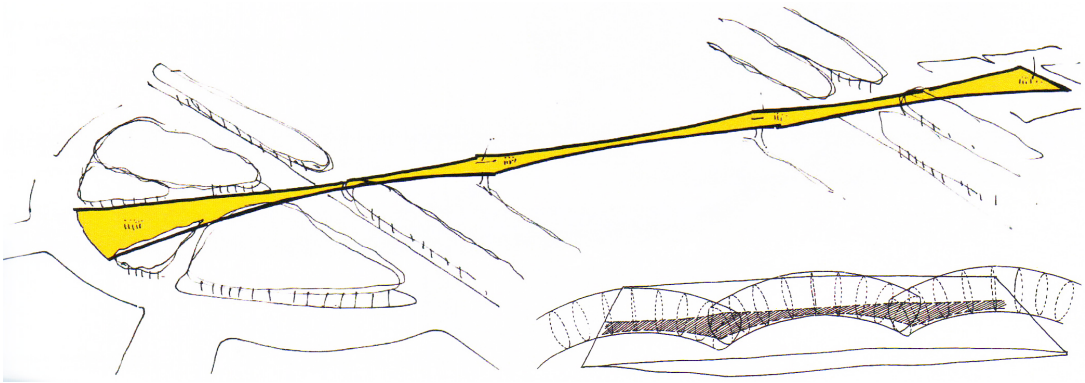
60. Photomap, Ponte della Scienza, APsT, Rome





61. Ponte della Scienza, APsT, Rome, (under construction)

62 - Photomap, Footbridge on the River Po, Antonio Capsoni, Turin, 2004



63 - Footbridge on the River Po, Antonio Capsoni, Turin, 2004

characterized indeed by a distinctive alternating sequence of restrictions (streets and courses) and enlargements (squares). These pulsations of the city artery are reflected in the plan of the bridge, which enlarges in correspondence of the piers creating rest areas with benches: in this way, the bridge realizes the natural continuation of the street above the river. To emphasize this continuity, at the ends of the bridge, the two squares that represent the focal points of the operation combine with the geometry of the structure and create a unicum between the road axis and the River path. The bridge, finally, by interacting with water, assumes the dimension of a nodal connector that originates from the interference between the longitudinal direction of the road and the transverse direction of Po. Crossing the river, the road expands above the water turning from a line into a square: it creates therefore a "reference point" of panoramic observation and collective aggregation suspended over water, which turns this intersection of arteries into a pleasant urban place surrounded by green areas.

With relation to identity, the example of Venice and its fourth bridge on Canal
64-65| Grande by Santiago Calatrava. Inaugurated in September 2008 and renamed "Ponte della Costituzione", this work will allow a worldwide unique reality to rehabilitate that anonymous place called Piazzale Roma (a non place used today just as a parking space) which isn't actually an appropriate access to a city that, in the centuries, has had in the Republic of Serenissima one of the most remarkable signs of human civilization. The opposite end of this line. As Enzo Siviero explains, this work is the hope that «*Venice, after the Calatrava's bridge, will work on the "Porta di Terra" too, as an exchange place between past and future for a city that lives inside all of us as a real dream*»[67]. In the specific, the new bridge is responsible for giving Piazzale Roma an identity worthy of the artistic past of Venice. For that reason, Calatrava planned a structure intended as a natural continuation of an architectural culture deeply rooted in the building history of Venetian bridges. Steps made of glass and Istria stone, crystal parapets and abutments "carved" between the ground and the water are the main features of this work, which, in its contemporary essence, is able to insert itself wisely and elegantly into the urban fabric, realizing a morphological continuity between past and future.

At this point, it is possible to give the right meaning even to that surprising proliferation of pedestrian bridges that has concerned London in a little less than
67| ten years, as no other city so far. The Millennium Bridge (1996-2001) realized by Norman Foster, the South Quay Footbridge (1997) and Flora Street Footbridge (2003)

67 Enzo Siviero, *Editoriale: Calatrava a Venezia*, Le Strade Magazine, n°4, 2008, p 99

64. Photomap, Ponte della Costituzione, Santiago Calatrava, Venice, 2008

65. Ponte della Costituzione, Santiago Calatrava, Venice, 2008

66|

by Wilkinson & Eyre Architects, the Floating Bridge (1999) by Future Systems and Anthony Hunt, the Plashet School Footbridge (2001) by Birds Portchmouth, the Royal Victoria Dock Bridge (1998) and Hungerford Bridge (2002) by the Lifschtuz Davidson Sandiland studio, and finally the Rolling Bridge (2004) designed by SKM Anthony Hunts in collaboration with Heatherwick Studio, the Paddington Helix Bridge (2004) by Buro Happold and the Sackler Crossing Footbridge (2004) by John Pawson with Buro Happold. In line with the policies of urban and environmental sustainability pursued by the "London Action Plan" (2000), these works have contributed with their features to give the city a new image, characterized no more by a unique large centre and a diffuse outskirt, but a plurality of "interconnected "points of interest": a city where living outdoors and moving on foot or by bicycle is easy and pleasant.

66. Planet School Footbridge, 2001

67. Millennium Bridge, 2001

68. Footbridge IGA 1993 Pragsattel Pragstraße, Schlaich Bergermann und Partner, Stuttgart, 1992

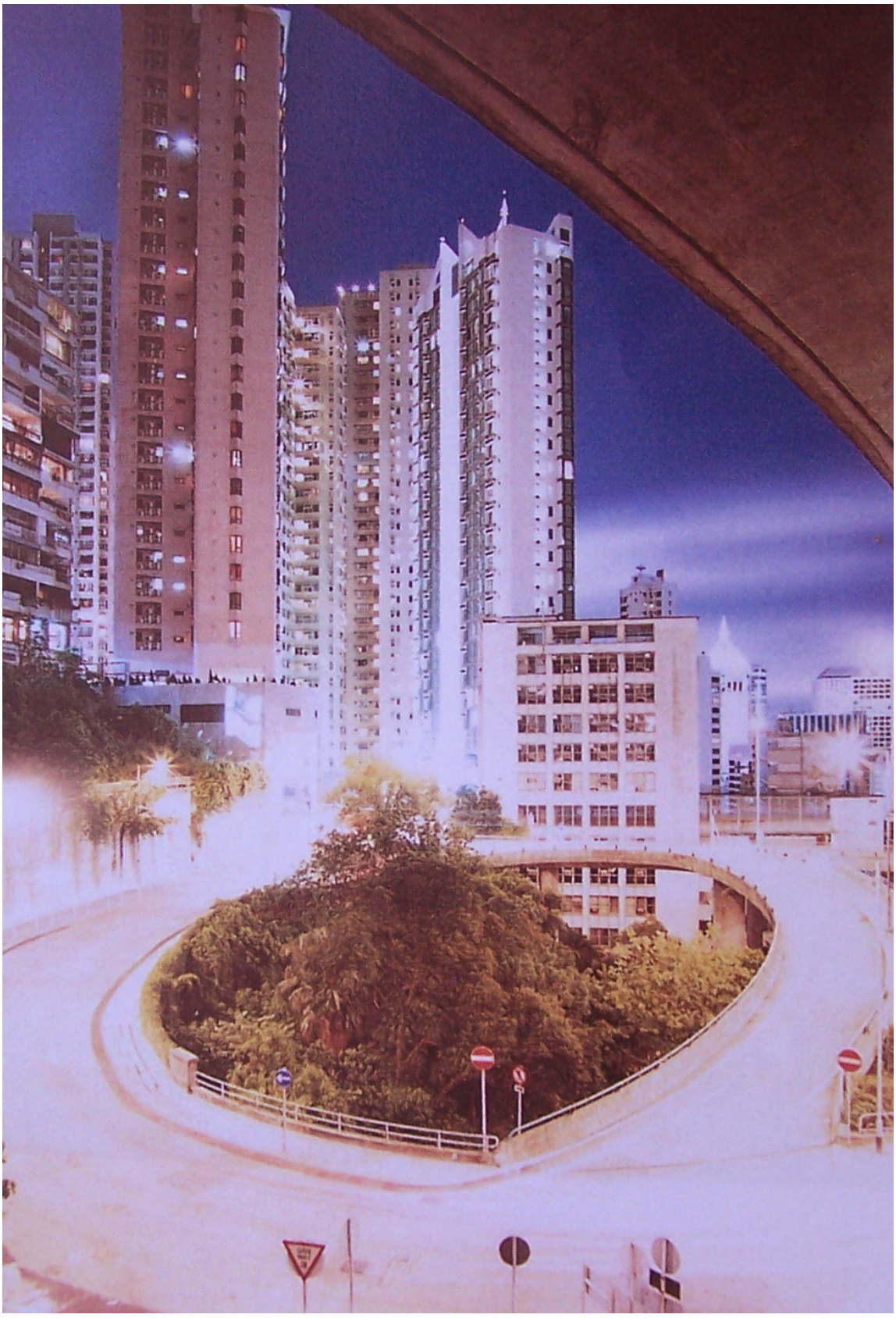
The footbridge
as a project for landscape

2.1. The topographical barriers of contemporaneity.

«*The time of landscape is not the time of man. The time of landscape is the time of silence, the time of man is the time of noise*»[1]. As Eugenio Turri writes, modern society, and in particular western society, has forgotten the practice of silence when it has placed man in the centre of the world. In the past, the search for silence, typical of certain monastic and Buddhist societies, was considered **as** the way of understanding the authentic nature of the human being and the deep truth revolving around mankind and the universe. In close symbiosis with Nature and God, listening to silence meant to go to the origin of things, moving closer to the Beginning. The silence as suspension, moving away from daily routine and from the present, as the only way of understanding the deep sense of our existence and becoming aware of the processes that have created, and still create the landscape we live in. The landscape described by Turri, «*is the visual expression of secular or millennial human activities woven into nature history, geological and geo-morphological history and that, not less long, of the Biosphere. All the events that characterize human life, producing things too, end up leaving a sediment in the soil, giving life to an immense archaeological repository. The landscape becomes then a repository of waste and debris so that everything past becomes a sign, a track, a writing. As the repository of our history, the landscape lives its own time, a very long time, completely incomprehensible to contemporary western man*»[2].

The time of western man is indeed the time of the ordinary, the short time, which considers the landscape only in its dynamism in action. Man's activities, with all the noises

1 Eugenio Turri, *Il paesaggio e il silenzio*, Venice, Edizioni Marsilio, 2004, p 21
2 *ibid*., p 56



69. Tokyo

of daily life, are connected to this time. If he observed the landscape instead, in its fixity outside the contingent, he would perceive its long time, according to which a rock and a house are both things, objects of the landscape, signs as results of history and its long time. In order to understand these signs, these truths rooted in the landscape, silence is therefore required, i.e. abstraction with respect to current living of things with all the related noises. It is in silence that one can get the truth, because «only in silence things, bound to be debris, become signs, signifying forms that tell us about the event that produced them»[3].

Man is, however, not used to pay attention to this landscape, which develops in a long time; «*we can say the landscape is neglected because it is still, doesn't produce noises, almost like a simple and motionless container*»[4]. To catch instead man's attention, the landscape should roar for every offence. This tendency not to pay attention to it, as if it were almost a background, or a fixed and indifferent stage, is perhaps one of the main causes at the base of many ecological and social disasters, daily caused by the man.

Behind these explanations, the origin of one of the most important evils of contemporary city seems somehow to hide: the non-integration between infrastructural networks and the landscape and the realization, in the surroundings, of a space, often defined by Francoise Choay as «*de-realized*»[5].

We make reference to the so-called "infrastructures of mobility", connected with the physical movement of persons and things: in the modern world, they have become increasingly important, with an almost exponential growth. If on one hand this continuous flow is a great opportunity for social, cultural and economic exchange (fundamental interactions for the vital survival of urban systems), on the other hand, they also require a bigger and bigger amount of space. Railway stations and subways, maritime harbors and airports, car parks, motorways, ring roads, service stations, interchanges, underground passages, bridges and viaducts characterize today an increasingly large portion of land without however being able to build *places* and creating, on the contrary, the conditions for their degradation. Conceived and designed to improve community life by increasing individual freedom of movement, these infrastructures contribute to disqualify the contemporary landscape, producing immense spaces of abandoned and waste land. As Alessandra de Cesaris recalls: «*crossing the land, they have created around them - above, under and beside - burnt soil and uncultivated fields. They have defined marginal underused or unused spaces, hardly accessible and consequently degraded, urbanized*

3 *ibid.*, p 56

4 *ibid.*, p 63

5 Francoise Choay, *L'orizzonte del posturbano*, Ernersto d'Alfonso, Officina, Rome, 1992, p 32

70. Bigness - Big Urban Viaduct

only with settling modalities that border on illegality»[6]. Just think of the big urban viaducts, flyovers and ring roads that, with their huge and disproportionate size compared to the scale of the building fabric of our cities, impose their domain and bulky presence without deliberately relating to the local context. It isn't therefore strange often to hear these works are associated with the new topographical barriers of the urban landscape, frequent comparison especially in Italy where for a long time, in the 1960s and in the 1970s, infrastructural planning succeeded in still producing manufactures by standardized, low quality, statically and technically simple solutions. They were bridges and crossovers that have nothing to do with the formal value and the architectural dignity of the works by the great Masters of the 1900s and still today unfortunately scattered on our territory. Because of their stocky concrete piers and anonymous beams, have indeed created deep "failures" in the landscape (the urban one, above all), often damaging that architectural quality that countersigned our country.

As Rosario Pavia marks: «*On the contrary, infrastructures should be a system that fits in well with the landscape, able to contribute, with their architectural project, to the development of the identity and character of the place they belong to*»[7]. The infrastructural design cannot therefore be a rigidly engineering issue: «*it is a subject that requires more than ever a cultured design, which should result from an effective dialogue between aesthetic sensibility, cultural depth and technical capacity. The building of a bridge*

6 Alessandra De Cesaris, *Infrastrutture e paesaggio urbano*, Roma, Edilstampa, 2004, p 35

7 Rosario Pavia, *Spazi pubblici, spazi infrastrutturali*, in A. Clementi, R. Pavia, *Territori e spazi dell'infrastruttura*, Transeuropea, Ancona, 1998, p 42

realizes a syncretism of functional and cultural, but also symbolic values. […] When this doesn't happen, the opportunities of cultural and aesthetic rehabilitation turn into forms of violence towards the territory, which inevitably result in violence against its inhabitants and the needs expressed by their culture and taste»[8].

This scenario makes us necessarily rethink about Eugenio Turri's words. The violence our land and we are suffering every day is clearly the product firstly of a cultural, rather than planning, attitude, unable to understand what landscape really is and basic importance of its anthropological role of history depositary and facts that characterize the evolution of every civilization. This attitude considers the landscape as if it were a motionless and neutral container we are not paying attention to only because it is incapable of producing noise, that daily noise, instead, typical of contemporary men and their short time.

But landscape is different, it lives its own time, a very long time, the time of silence, a time men are unable to pay attention to, just because they are not used to listen to the silence. If only they tried, they could finally perceive its real importance and see that dynamics and mistakes that lead to the many disasters they daily cause and the damage of its one value.

In order to obtain a rehabilitation of infrastructural works, starting from a return to the practice of silence, so that they can become, from a source of discomfort, an opportunity to give new value to the contemporary landscape, it is necessary a return to the practice of silence, that practice of listening that constitutes the unique means at our disposal to understand the real risks deriving from a definitive downfall of this important *patrimony* today called landscape.

2.2. That cultural heritage referred to as landscape

Fortunately, over the past years, a renewed and environmental awareness has been trying to stop the current decay condition affecting our territory and above all stressing the immediate necessity to preserve the important richness this good can offer.

According to Augustin Berque, this feeling was born by a desperate search for place identity and sense, and reflects in a growing demand for landscape that is nothing else but the sign of a deeper uneasiness. As a result, he writes: «*The outstanding growth of the demand for landscape is not only an aesthetic drift of a satisfied society, on the*

8 Enzo Siviero, Michele Culatti, Francesca Siviero, *Il guasto del territorio veneto*, in *De Pontibus. Manuale per la costruzione dei ponti*, (edited by) Sasa Dobric and Enzo Siviero, Il Sole 24 ore, Milan, 2008

contrary it is the sign that man tends to renew his bounds with the Earth, which had been dissolved by modernity»[9]. This is a hope, therefore, mixed with disenchantment for the failure of modern promises and for the realization of the loss of wealth resulted from landscape and environmental deterioration at any level. Such realization recurs every day, before the silent and continuous dismantling of *original landscapes* and the catastrophic devastation produced by the disasters expected when not properly *planned*.

More or less specialized essays, monographs, articles, a new extension of the issues related to an increasing enlargement of the concept has achieved a width of contents and perspectives that exceed any disciplinary restriction and make it difficult to give unambiguous definitions.

Recently, as a matter of facts, an important institutional framework belonging to the European Landscape Convention has been developped. Signed in Florence on September 20, 2000[10], it places the European Union right in the forefront and has found a further close examination in Italian law system, in particular the "Codice dei beni culturali e del paesaggio" [11] (2004), the latest laws promulgated on the subject by a European country.

These documents define the landscape, dictate rules and detailed procedures: above all, give this topic an importance never given before and the concept of landscape a wide and interdisciplinary meaning. As Carlo Tosco writes: «*Recent laws invite us to consider the landscape in a wider way, as a meeting between history and places, as the product of cultures living in the time and operating in the space*»[12]. It is a vision that goes beyond the aesthetic idea of landscape, interpreted as "beautiful panorama" (as it was in the past), to consider also major factors such as history, environment and the accumulated collective values. The Convention itself states: «*"The landscape" means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*» (Convention, art. 1 paragraph a). In virtue of this assertion, as a result, the field of application is extended to natural, rural, urban and suburban areas including «*landscapes that might be considered outstanding, everyday landscapes or degraded landscapes*» (Convention, art. 2). In this way, from only a list of aesthetic excellencies where the recognition of the historical and cultural value merges with the iconographic paralysis of the "beautiful view", the landscape is now the result of a complex system of relationships that stratifies and evolves with the processes of nature and of the inhabitants'

9 Augustin Berque, *L'ecumene*, in *Spazio e società*, Maggioli, Rimini, n°64, 1993.

10 The document was ratified in Italy with the law 14/2006

11 Codice Urbani, D.lgs 42 of 22.1.2004

12 Carlo Tosco, *Il paesaggio come storia*, Il mulino, Bologna, 2007, p 9

life, namely, the tangible representation of the multiple and specific relations that bind the man to the land he belongs to. Such symbolic, cultural, historical, social and ecological relationships are the product of each society that wants to make its identity recognizable strengthening its bond with the territory which lives in.

According to this reflection, which combines land and society, hides therefore a dramatic shift of attention from the object to the system, from the event to the context, with a general reinterpretation of the concept of cultural good, in favour of the more extensive and comprehensive concept of cultural heritage. The landscape thus becomes a global and collective heritage everyone has the right to enjoy, because it is one of the fundamental factors that contributes to define the individual and social welfare of a community. As a result, the higher the quality of the landscape and of the relationships that define its identity, the better will be the life of the people living in it, even at an economic level.

Acknowledging it, therefore, as a general interest element for the welfare of individuals, the Convention proposes "the right to the landscape and its quality" as the citizen's basic right. As an answer to an ever increasing demand for landscape, it affirms the necessity to pursue its protection and development, especially in consideration of its particular identity value: «*The landscape, being a fundamental and collective heritage, is a priority cultural and economic resource, is a social right, the source of welfare, witness of history and traditions, place and subject of memory. It must be taken care of and protected, because it is limited and very vulnerable*»[13].

So, any necessary modification of the landscape should be therefore designed in it and not simply introduced. Therefore, it comes to be desirable that, when the necessity to intervene in a landscape context modifying it is set, transformations are *planned in it* and not simply introduced. Each action, decisive or not, should be thought in terms of sustainable development, based on a balanced relationship between socio-cultural needs, economic activity and the environment.

In this new interpretation, protecting the landscape does not mean thus to freeze the territory at a certain stage of its development, but carry forward future changes respecting environment and cultural traditions. This is because the territories that we build have to consider not only productive and economic problems, but have to be configured as projections of our representing, feeling, living and watching the world. In the designing phase, this means to include necessarily the area of our feelings and emotions (also the symbolic area), the only one that binds us really to a particular place.

Consequently, Turri recalls how the landscape is the stage on which we daily and

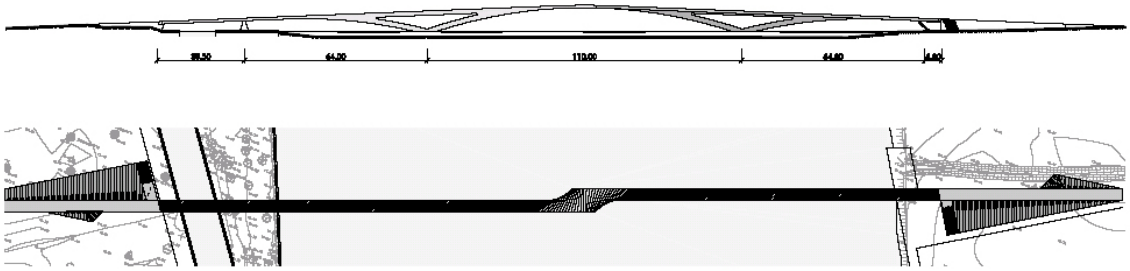
13 Valerio Romani, *Il Paesaggio. Percorsi di studio*, Franco Angeli, Milan, 2008, p 17

historically perform, just because it is able to receive our emotions and our memories. In this theatre, man relates to the landscape not only in his role of actor, i.e. **his** actions, but also and above all, as a viewer: «*Only as a viewer, he'll be able to find the extent of his working, his acting, his being an actor who transforms and gives life to new scenarios: i.e. the reflection of himself, the conscience of his acting*»[14]. Antonio Adão Fonseca and Cecil Balmond seem to take account of this feeling, telling the sad love affair between king Pedro and the enchanting Inês in their project for the new footbridge at Coimbra.

This work is part of a larger process of landscape and environmental restoration promoted in 2005 by the municipality of Coimbra. In the specific, it is a programme of national funding aimed at the enhancement of the city and in particular the redefinition of the connections between the banks of the river Mondego and the old town of the Portuguese city. Apart from being the most important university city in Portugal and the birthplace of six Kings, Coimbra is considered one of the symbols of the country by Portuguese inhabitants themselves both for its traditions and history. In this city, characterized by churches, convents, museums and the ancient university, one of the most emblematic places of this landscape is the river Mondego, whose accommodating banks and ancient legends make it a symbol in the collective memory. Thanks to the recognized natural and landscape quality of its banks, the river Mondego is today the heart of a regeneration process that recently brought to the opening of the Mondego Park, an urban green lung of approximately 23 hectares, bounded by the two main bridges of the city, Santa Clara Bridge and Rainha Santa Isabel Bridge. This landscape project realizes the idea of multifunctional urban garden aimed at the development of cultural, sports and entertainment activities along its banks; easily accessible both on foot or by car, the area, full of bars, restaurants and temporary exhibition pavilions, is today much frequented by young university students, as well as by the families of Coimbra that here can run, cycle or relax in the sun.

The key factor of this intervention is the new pedestrian bridge that takes inspiration from the love story of Don Pedro and his enchanting lover Inês de Castro. Across Mondego, it becomes a kind of monument dedicated to that story that is still strongly felt by the inhabitants of Coimbra. In this sense, the footbridge was designed as a route on two parallel and lateral shifting walkways that, embodying the lives of the two lovers and their reunification after death, find a meeting point only in the middle, suspended over the river's waters. The result is a work of lightness and apparent simplicity, regulated instead by highly innovative structural solutions. It formally appears as a structure with

14 Eugenio Turri, *Il paesaggio e il silenzio*, Venice, Edizioni Marsilio, 2004, p 25



71. Pedro e Inês Footbridge Drawings

72. Pedro e Inês Footbridge, Adão Fonseca e Cecil Balmond, Coimbra, 2005

three spans, but the Bridge is made out of two separate and parallel elements, made each by a sequence of parabolic arches, transversely asymmetric, which combine in the centre balancing out each other. And it is precisely in this meeting point between the two decks, in the centre line, that they form a privileged place along the route of the bridge. In the point the two guidelines meet, they open creating a rest area, a suspended overlook that allows to enjoy the panoramic view of the river and the city.

The low-lying position of the bridge and the possibility to move back its abutments over the natural embankment of the river, have also allowed to contain the weight of its overall dimension protecting this way the image of the Park and its spatial continuity. Also the central supports, which evoke a stone bouncing on water when you throw it, simply seem to emerge from the river. In a very discreet way, which underlines a deep respect for nature, the bridge fits in with the landscape hardly touching it and letting your eye roam free. At the same time, however, it maintains its key role in defining the architectural structure of the park whose it is one of the main guidelines.

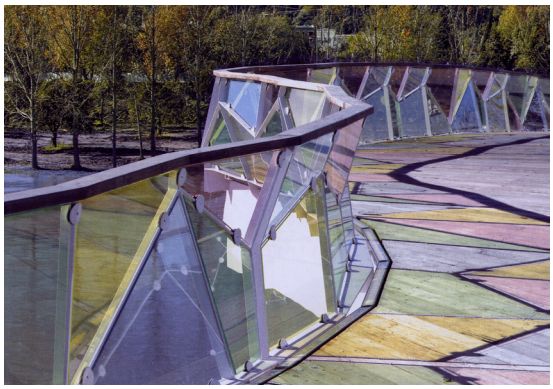
Finally, the peculiar dynamism of its form, highlighted by changeable plays of light and shadow, is particularly interesting. Because of its discontinuous geometry, a part of the structure is in the shadow when the other is illuminated. This generates an effect of continuous movement, which is also emphasized by the characteristics of the handrail. The latter presents a rhythmic design that gives it a zigzag orientation and makes it bend inwards and outwards, creating a sequence of niches that turn the pedestrian's attention from the main axis of the route towards a lateral reading of the landscape. «*At this point, the observer is still, has no speed and the footbridge turns from an endless line into a succession of unique and unusual places, as a small piazza, inviting you to stop and contemplate*»[15]. This sentiment is completed by a balustrade made of coloured and inclined glass plates where the river is reflected on, always producing different and vibrant chromatic notes on the wood deck. As a result, the reflection of light, created by different colours and draws, marks the bridge path, producing a feeling of continuous changeability. As Balmond stated: «*instead of a bridge that connects the two opposing banks, in Coimbra the river is caught between the two halves that meet in the middle, each bank carrying different stories*»[16].

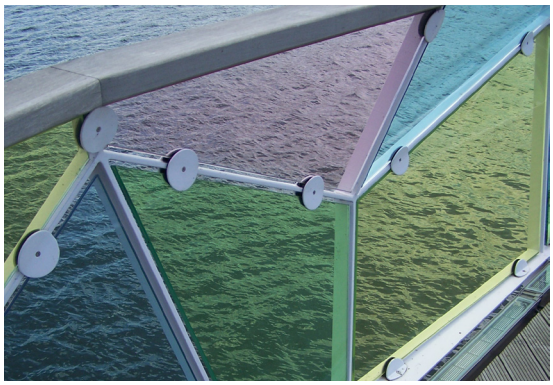
In the North of England, at the border with Scotland, there is also another footbridge, Gateshead Millennium Bridge, designed by Wilkinson & Eyre Architects and inaugurated in September 2001. In this case, the reference context is that of a city that had been on

15 Cecil Balmond, *Un ponte a più velocità*, Casabella n° 757, 2007 p. 70.
16 *ibid.,* p 71







73. Pedro e Inês Footbridge, Adão Fonseca e Cecil Balmond, Coimbra, 2005

the decline for a long time because of the closing down of a significant part of productive and industrial activities. Gateshead and Newcastle upon Tyne are two cities that at the end of the eighteenth century knew a strong economic growth, becoming the most important production centres on national scale, especially in mining, steel and shipbuilding **sectors**. Despite the large economic capital available, the dependence on the economy of the English capital city and the lack of facilities and suitable places to form a local economic elite didn't allow the emergence of an entrepreneurial class prepared to reinvest their profits in the region and the two cities: a large part of the profits was therefore diverted to London. In the phase of de-industrialization, Gateshead and Newcastle were affected by a deep economic recession that led to the beginning of a long decline that lasted for almost thirty years. Unemployment, social discomfort and abandonment of the city were the main signs of this condition of crisis, which transformed the landscape along Tyne in an urban marginal space, heavily degraded.

In the 1980s the first policies for urban regeneration began to develop and one of the methods used to give a boost and new vitality to urban centres was to give space to large cultural projects. In the wake of Bilbao effect, between 1986 and 2001, the municipalities of the two cities founded their rebirth on artistic and cultural projects in order to modify the image of the city and work on the perception of space and imagination.

Several initiatives promoted at a local level permitted to support (and improve) their identity and build new distinctive elements of the place. The considerable investments by the National Lottery Bill and EU Structural Funds created the conditions for the formation of a local network of cultural design: the most representative element of this project was the "Angel of the North", considered the iceberg top. The central idea of this great project was to draw the attention of local inhabitants on visual art's world: events and works during this artistic programme had an enormous success, particularly because they managed to involve the local community and encourage, with efficiency and authenticity, symbolic sphere and historical memory. The Community felt this way not only as an interacting part of the project, but it was able to appreciate the concrete implications in terms of collective participation, visibility of the territory on national scale, tourist influx. In particular, the great stir caused by the installation in loco of the Angel of the North by Anthony Gormley in 1998, with hundreds of people celebrating in the streets, proved there was a growing media identification between this work, become a sort of symbol, and its territory.

This was the first evident step of a regeneration process whose scale and following had been growing over time, until the opening of Gateshead Millenium Bridge in 2001, the transformation in 2002 of Baltic (former grain warehouse) into the biggest contemporary art gallery in Great Britain and the opening of a music venue, Sage Gateshead, by architect

74. Gateshead Millennium Bridge, Wilkinson&Eyre, Gateshead (UK), 2001

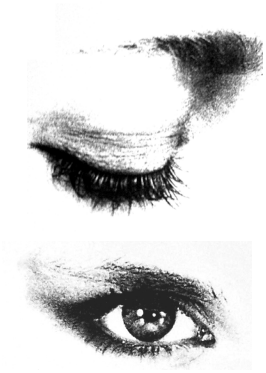
Norman Foster in December 2004. What is **sure** is that, among these, the cities' flagship was the new pedestrian bridge that connects Newcastle to Gateshead, along the banks of Tyne river.

Also in this case, apart from the investment and the immediate effects due to the improvement of connectivity between the two river sides, the exit of the operation should be measured once again in terms of its effects on local identity. The bridge, designed by Wilkinson&Eyre Architects and awarded by the Royal Institute of British Architects (RIBA), one of the most important national architecture awards, is a unique piece of engineering and design: the only bridge in the world designed to open like a rotating eyelid. For this reason, it is also referred to as the "Eye of the North", an expression that has somehow local origins and is linked to the industrial history of the city: «*Everyone remembers that its assembly was carried out over a night without problems and the stability and quality of the work relaunched the pride of the city that, for a long time, had ironically made fun of the rival Millennium Bridge of London and its little problems of stability*»[17]. With its triple identity of walking place, huge string instrument and Magritte's eye kept on the world and the history of a people, Gateshead Millennium Bridge is configured as an illusion, a veiled reference that appeals to the fantasy and memory of those who cross the bridge and live it every day. In particular, the historical river Tyne gains the role of undisputed design referent that, with its great tradition of movable bridges, creates the conditions for a next-generation tilting structure, completely different from each movable bridge built before. Two imposing and plastic white steel parabolic arches, connected by a series of parallel cables and brought together to the skew-back by two pivots the bridge turns on, make this structure an innovative technology hybrid. Comparable, when closed, to a cable stayed bridge, with curved deck and an arch pylon, in the opening phase, the bridge turns into a complicated and original structure whose efficiency is guaranteed by the close opposition and balance relations established between the two arches[18].

After ten years from its inauguration, the opening of this big eye is still today a spectacular event that daily attracts the attention of thousands of tourists, arousing a deep sense of pride in those who feel represented by this bridge. Its strong plastic presence, as well as the drama rooted in its movement, have made this work an urban architecture able to play a catalysing role in a regeneration process aimed at social, economic and cultural

17 Roberta Comunian, Pier Luigi Sacco, *Newcastle Gateshead: riqualificazione urbana e limiti della città creativa*, DADI Dipartimento delle Arti e del Disegno Industriale, IUAV University of Venice, June 2006

18 Exploring Boundaries, The Architecture of Wilkinson Eyre, Peter Davey, Kurt. W. Foster, Birkhauser Verlag AG, Berlin, 2007



75. The Eye of the North

76. The Angel of the North

77. Gateshead Millennium Bridge, Wilkinson&Eyre, Gateshead (UK), 2001

restoration and enhancement of a landscape characterized by a long history.

2.3. Footbridges: a project for landscape

In the ambit of the infrastructural planning, the specific demands for technical and structural project don't always coincide with the landscape preservation applications. The considerations of static, technological and economic character very often have an importance that more delicate topics, tied up to the landscape, pass on a second level. In order to make an infrastructural project a project for landscape, that a certain mastery and a solid cultural basis are necessary, allowing to go over the pure technicality and consider the project not in a linear way but as a syncretism of themes and meanings: the attention must be focused not only on utility and functionality aspects (indefeasible characteristics), but also on the possible mechanisms such works could cause in a physical, social and cultural delimited context. As the European Convention on the landscape emphasizes, the territories we build don't have to exclusively answer to productive and economic issues, but they must be also shaped as projections of ours representing, feeling, living and looking at the world. It happens when the conditions are verified, in order to gush from the new artifact interactive dynamics with that affective, symbolic and emotional nature aspects to build the identity of a determined place and tie us to it. Only in this way, protecting and valorising the landscape and forbidding infrastructures to commit any other violence toward the territory and its inhabitants really changes into something possible.

Consequently, it has been done a lot in the world in the last years. Inside the urban contexts, especially, the revaluation of cities has often been promoted by complex programs that give the infrastructure a prominent position: that is, operating a substantial physical and social restructuration of the urban landscape, intended as a key concept for the individuals' and society's wellbeing. An interesting example is the project of revaluation
78| of the historical High Line in New York, a 10 metres high suspended park that crosses Manhattan and, instead of destroying a piece of city history, has turned a disused railway line into a rather innovative place. Fully covering the old railroad, you can pass over taxis and absorbed passer-bys in the traffic, meet secret gardens, wooded areas, spontaneous proliferation of the wild green areas, handrails covered by ivy, art deco balusters and metropolitan graffiti: an urban revaluation to recover a disused infrastructure, a heap of iron and cement, and give it back to nature, planting trees and cultures to make the city a place more livable, green and relaxing. Since the Thirties, this steel and cement ribbon supplied the city with milk, meat and building materials, travelling among the two storey blocks. The last train has transited in 1980 and since that moment High Line has

78. High Line, James Corner, Diller Scofidio + Renfro, New York City, 2005

progressively fallen in disuse and even demolished in some parts. What remained, nature has taken it back again, covering platforms with grass, trees and spontaneous bushes. A suspended "greenway" that has been turned into a park similar to Promenade Plantée in Paris. thanks to the determination of the Big Apple's citizens.

Other meaningful examples are instead referable to that projects the revaluation will is really expressed in by the realization of new footbridges, exemplary urban architecture projects with the task to improve economic, social and cultural degrading conditions. In comparison to the car bridge, in truth, the pedestrian infrastructure presents some characteristics that make it more suitable to develop determined issues tied up to the landscape and its preservation in the planning stage. They are works that, unlike motorways, crossovers, bypass roads and viaducts, have demonstrated to be able to establish a more constructive relationship with places, go over the mere technical and functional issues. Certainly, the reduced territorial scale and dimensions favour them in this sense. Besides, other two basic aspects that give the correct value to this particular nature exist.

The first one is surely that of the loads these works are subjected to. In the projects for rubber tyred or railway transportation, considering the activity load entity, the structural typologies are usually chosen with relation to the light to exceed. In these years, the above mentioned principle has leaden to a preference for beam bridges for 100 metre high lights and the use of arches or reticular structures for 250 metre high lights. Over 300 metres high, cable stayed structures or suspended bridges were instead preferred to avoid instability problems in compressed elements.

For a long time, unfortunately, pedestrian bridges (considered as "minor" works) they have also been forced to this rigid classification. Being often their light limited, their form was hardly always reduced to a simple beam structure, so renouncing to that planning freedom that instead would be really offered by their being subjected to inferior service loads. Because of this attitude, in the past, many occasions to revaluate important parts of territory were lost in the past.

Furthermore, in the last years, thanks to the "recent" scientific discoveries, a new planning methodology develops: from a completely different starting point, not anymore that of light, but that of the structure optimization, independently its form. It is a process that looks with priority at the elimination of the superfluous to leave a space to transparency and lightness. Therefore, architectural quality isn't typically reflected not in the nineteenth-century monumentality, but in its *dissolution of matter*: at the same way as the full, the void turns into the protagonist in the work, while the structure becomes light and «*hacking with parsimonious points, keeps the eyes free to run across*». Behind this operation there is however the fundamental necessity to come to a synthesis between form and structure,

pursuing that perfect adherence concept between deep and apparent reality.

Applied to the theme of the pedestrian bridge, in the last years this vision has allowed to get solutions that, unlike the past, is countersigned for an unusual slenderness. As a matter of fact, the optimization to dissolve the mass up to reduce it to essential lines and endless structural hybrids takes shape. Going over standard classifications, they create dense meaning relationships with the context and emotions that give new life and value to the landscape they intervene in.

The second aspect that countersigns its exit is the reference to the type of users served by such works: the man and not the car.

As it is well known, the other speed blocks each relationship with the surrounding landscape. Dipped into the capsule of the inhabited area, our relationship with the external world is thus relegated just to the sense of sight, while the rest of the sensory apparatus results forced in a semi-sleeping condition: the body of the vehicle acts that is like a protective shield that protects and corporally alienate us from what happens outside. A perception of the immediate reality is derived, even if resulting really rather ephemeral. Moreover, inside the car, our attention focuses more on what our arrival point will be, while the surrounding turns into a sort of entity, indifferent to us. That is, the landscape we cross becomes for us something that both quickly slips away and attention isn't paid to or care isn't taken, because our mind is already beyond, busy in foreseeing the arrival destination. Drew Leder defines "dis-corporate" this way of living typical of the contemporary society, a way based on a substantial loosening between mind and body: the former projected forward, toward the future, and the latter almost entirely anesthetized because incapable to listen to it here and now.

This mechanism, rather natural for who races by car, takes also with itself some negative effects at the same way of conceiving the infrastructural work. The bridge, in fact, becomes only for us a means to reach a destination as soon as possible and in absolute safety. On a planning level, it derives the attention is exclusively (or almost) focused on issues tied up to the efficiency and safety of the road, so that the rest clearly is less important (or completely neglected) with not very pleasant consequences also for the person who doesn't use the bridge, but forced to suffer its presence every day.

Otherwise, in the footbridge, the man is "forced" to a slower walk slower that however allows him to look at what surrounds him with much more attention. Besides, the only filter that separates us from the external world is our skin which, contrarily to car bodies, acts as a sponge: it absorbs and gains our body crosses. This fact, at all negligible, baits a sort of process that wakes up again our senses and conduces the mind to the present time. Mind and body are both rejoined and our presence and awareness to live here and

now powerfully increase.

At the beginning of this century, Merleau-Ponty has already highlighted as human experience has the fundamental peculiarity to be incarnate, that is, an experience that embodies the information that it receives from the surrounding world through eyes, ears, hands, etc. As a result, living a multi-sensorial (not only visual) experience allows us to perceive the reality in different way, becoming meaningful because it keeps engraved in the memory.

Crossing a pedestrian bridge means then to wake up again our attention, bring it to the present time and, neither filters nor barriers, with extreme clear head, look at the world that we have built around us: "in slow motion" we give more value to our gestures, feeling and we are able to perceive that deep reality of things that, as Eugenio Turri remembers, just the silence practice is able to offer; "in slow motion" we physically perceive not to be an uprooted entity from the environment but, on the contrary, be a vital part of a more complex system called landscape.

In front of this truth, our way of comparing us to it also changes, understanding now the pain inflicted by contemporary civilization's carelessness and couldn't-care-less attitude. Every his aspect gains then a new value and becomes a motive for care and preservation for its being a fundamental element for our survival and comfort.

So the project acquires new finalities tied not only to the functionality, but the necessity to recreate that body-environment integration that is basic for the increasing request for landscape that for different years has directed public opinion's expectations. From this perspective, therefore, the footbridge takes the fundamental role of medium between the man and the landscape, while its form and structure become the vehicle to wake up again the body and the mind. The bridge as place of the landscape which the man will be reconnected through to the world by means of that serene clear head and critical judgment necessary to find the correct direction of the transformations he is promoting and observing.

It achieves a completely different planning in comparison to the traditional engineering rules, a planning careful to the mechanisms that dominate our sensory perception able to amplify our feelings. In order to act as an intermediary, the pedestrian bridge must be conceived as a stimulating and pleasant place to be lived, a place that encourages the man to open to the world, enjoy and rejoice of his being part of a system, a place that modelled on our feelings pushes him to establish new relationships with people and territory he lives in.

On this basis you can then attribute the right meaning to a small and thin pedestrian bridge that, through the rock and bypassing the river, connects the two shores of a narrow

valley. This is the Pùnt du Suransuns designed by Jürg Conzett, whose construction was
79| required to give new continuity to a pedestrian walk on the path of an old Roman mule track that crosses Viamala (Switzerland). For the design of this route, a competition for regional engineering studies was announced in the autumn of 1997. The result is an engineering work characterized by a remarkable architectural significance, an aspect that guided Conzett not only in the design of the bridge, but also in that of the path that leads to, crossing places that have been of touristic interest since the time of Grand Tour. It is to such places and path this refined suspension bridge must be connected to be really appreciated. As noticed by the competition organizers themselves, the bridge clearly reflects the idea of "an open-air museum", through the redesign both of the link and ancient pedestrian path. For this reason, the structure was not built where the valley is narrower and therefore the free light between the two supports would have been reduced. Chosen by its designers as an integrating part of the whole, the layout finds its different origins in the hiking tour architectural quality, preferring a less steep route with more panoramic points to tourists and with relation to the A13national road viaduct, the other larger and higher bridge. Compared to the latter, the pedestrian bridge really becomes a valley's architectural object, perceptible from the upper panoramic point. Therefore, it should have been near, but not exactly below, where it wouldn't have been visible. The final image is that of an inverted arch, slightly inclined and with an arrow not exceeding one metre.

Finally, the idea for an open-air museum is also marked by the choice of materials. The structure consists of four steel cables made integral with Anderer granite slabs, extracted in the surroundings and chosen because of its excellent physical characteristics. Some slabs, just 6 cm high, form the bridge deck whose construction has been mainly dry, anchoring the granite slabs directly to the steel bearing bands. In the intentions of the customer, the Pùnt du Suransuns had to appear perfectly integrated with local history and geography, light and strong at once. And it was exactly like that. A suspension bridge in stone and steel. Thin, ancient and modern at the same time. Perfect incarnation of a technological oxymoron: granitic lightness.

Unfortunately in Italy, in comparison to these positions and what happens in foreign countries, we are behind, and pedestrian bridges and gangways are to this day (and too often) considered order infrastructures both by employees and common people. With a certain carelessness with relation to the international production, our public administrations persist in fact in having a preference for the use of pre-packed structures – they are economical bridges constituted by stumpy lamellar wood beam or concrete - that nothing have to do or see with the site where they are inserted and that, consequently, they are very often ignored by the same communities.

79. Pùnt da Suransuns, Jürg Conzett, Viamala, Swiss, 1999

80. Pùnt da Suransuns, Jürg Conzett, Viamala, Swiss, 1999

The cause of this delay could be found in a general lack of culture on the theme that brings not rarely to meet a customer aware of potential, hidden behind these particular structures and, therefore, very careful to the economic side of the project, instead of the architecture and landscape. A scarce employees' competence, the lack of funds and ability to finance valid planning competitive examination can be also added. A limited interest also by the middle class citizen, more prejudiced on the utility of these works and therefore not very inclinable to renounce to the use of the car (at least on the small and middle journeys), can be noticed.

2.4. Infrastructures and landscape dimension

After explaining the footbridge design's real potential, it becomes now necessary to understand what really means talking about "*infrastructural project*" as "*project for landscape*". We want here to assess the methodologies and the architectural investigation process that are required to invest infrastructures with a landscape dimension, turning it into a metaphor of landscape that goes beyond the mere functional aspect. This operation, however, requires to reconsider, upstream in the matter, the concept of landscape, trying then to define its relationship with the bridge's form and architecture.

The concept of landscape has today at least two fundamental meanings: on one hand, it is identified, in ecological terms, as a physical-concrete reality; on the other hand, on a phenomenological basis, as a socio-cultural reality. In the first case, the territory is considered as a physical, dynamic, organic entity or a reality whose conditions derive from physical geography and natural sciences, i.e. from the ecological discipline. In the second case, instead, the landscape acquires a phenomenological dimension becoming expression of the man's living space, or expression of that empirical space where he searches for the representation of himself in his relationship with the territory. In this sense, the landscape will be reinterpreted by means of the phenomenological discipline, based on a return to the individual in his specific psycho-physical expression and offers the opportunity to reconsider man not as a primary and absolute being, detached from any relationship with the place where he lives in, but as an individual whose meaning and essence have to be searched in his living in a specific environment.

Phenomenology, which have therefore the merit to establish a dialectic relationship between man and landscape, is not a new discipline and finds its most meaningful expression in the speculation of the French philosopher Maurice Merleau-Ponty who, already in 1945, had explained we can understand the man and his world only on the basis

of their facticity[19]. Consequently the landscape becomes our being's reflection in nature in its phenomenological evidence and truly and fully reveals us, the sense of our existence on earth: as stressed in the European Landscape Convention, it affirms those perceptive relationships that link each individual to the territorial reality he belongs to.

At a practical level, this relationship between man and territory is created by the human body whose fundamental dimension comes from the perception of its existence as a body in a given time and space. In this perspective, the landscape turn into what we perceive through our body, while phenomenology is essentially the description of the modality of such a perception.

Thanks to this interpretation, it becomes therefore possible to overcome on an almost permanent basis the historical dualism between mankind and nature, which defined the landscape according to a purely aesthetic concept; the whole is now related to a dynamic and ever-changing system that includes everything. As Merleau-Ponty wrote: «*Man is inseparable from this body and from this world*»[20]. On this term revaluation, the basis also for an idea of architecture looking at the landscape beyond its purely physical-natural reality can therefore be set.

As a matter of fact, considering the landscape as an expression of the human perceptive experience means to see in it the material representation of the way, through our body, and therefore through our sensory perception, we interact with the territory we belong to: such a representation takes shape by means of the architecture, necessary instrument to build the landscape on the basis of human physical and emotional senses. In such a manner, it becomes therefore the material link between the man and the representation of himself in the territory, while the landscape turns into the basic concept for the architectural project: it regains its centrality reflecting on the architecture through the rediscovery of an environment characterized by an empirical concreteness (which

19 M. Merleau-Ponty, *Fenomenologia della percezione*, edited by A. Bonomi, Milan 1965. With the term phenomenology, we refer to the doctrine founded by H. Husserl and its subsequent developments. The centre of phenomenology is the return to the "things themselves", that is to the "phenomena" intended not as appearances opposing to hypothetical things in themselves, but as primal show of the reality in the concrete «lived experience» (Erlebnis) of consciousness. Developed in a new direction by Heidegger, the influence of phenomenology began to spread also in Europe, after the Conferences of Husserl in Paris in 1929, involving authors such as J. P. Sartre and M. Merleau-Ponty. In particular the latter defines the phenomenology as «the philosophy that places the essences in the existence and thinks that it is possible to understand the man and the world only on the basis of their facticity», and identifies the fundamental location of existence (being-in-the-world) in the lived experience of perception, where subject and object, consciousness and world are in a relationship of mutual implication, exchange and interaction that phenomenology has to return in its original ambiguity. Phenomenology acquires so the meaning of primary experience.

20 M. Merleau-Ponty, *Fenomenologia della percezione*, edited by A. Bonomi, Milan 1965, p 522

reaches our senses), essential for the project specificity[21].

As for the design of pedestrian infrastructures, many recent contemporary experiences seem to reaffirm the importance of the perceptive relationships that associate forms to landscape. This is the case of Limerick Living Bridge, opened in November 2007 by Wilkinson & Eyre Architects. Built in the University of Limerick in West of Ireland, this work is the paradigm of the inhabited bridge whose form is made up in the landscape producing unusual architectural figures.

The footbridge, placed in the central zone of the campus, has a leading role in the University expansion project from its historic location to the new settlement built on the opposite side of Shannon river. Feature of this place is the particular vulnerability of its landscape that is under protection and considered Special Area of Conservation (SAC). For this reason, the bridge appears as an example of modest invasiveness, developing a structure that keeps an organic and continuous relation with the surroundings. According to the designers, the particular nature of the place required indeed a bridge with a minimum visual impact, having to be the celebration of the "hidden World" of that river landscape, inviting passerbys to stop and enjoy the beauty of the view and becoming aware of it through their sensory perception. For this reason, the deck is divided into two delineated zones: on the outer edge of the deck, a perforated aluminum path makes a "fast lane" for transiting pedestrians; while in the remaining part, the deck, covered with a bonded aggregate finish, is provided with tree canopy seats, which offer students an off-campus location where to study and have informal meetings.

As there is no vantage point where a full view of the path is possible, the bridge is conceived as a series of independent structures supported by tetrahedral piers that evoke a stone skimming over the water. Below the deck level, its load-bearing structure, formed by a pair of cable trusses, seems to fade into the landscape wrapped in the natural aura of the river. Instead, in correspondence of the piers, the narrow passaged floor in the middle of each span widens into a large aggregation area. These heterogeneity of the deck creates a series of small recesses and natural pauses in the journey, gently distributed along the bridge. Here some wooden seats are placed, protected by glass shelters and creating secluded places to socialize and give small concerts. In this way, designers materialize the concept of "*Living Bridge*" from which it is possible to enjoy the exclusive environment offered by the river. The final image given by the bridge is that of an organic form that lives and pulses in the landscape reflecting in its architecture the fragility and gentleness

21 This thought is taken by Vittorio Gregotti, L'architettura dell'Ambiente, Casabella 482/1982, pages 10-11

81. Limerick Living Bridge, Wilkinson&Eyre, Limerik, 2007

82. Limerick Living Bridge by night

83. Limerick Living Bridge, Wilkinson&Eyre, Limerik, 2007

of this place.

It is thus clear how the construction of a landscape by means of architecture, in its investigation of possible forms, involves multiple dimensions of the being that only men's corporeity and sensory capacity can return. Through senses we perceive the space and the relationships in it; and an architecture conceived and perceived through senses creates existential, concrete and living metaphors which give consciousness and form to our being in the world. As Johani Pallasmaa writes: «Architecture is the art of reconciliation between ourselves and the world, and this mediation is carried out through the senses»[22]. At the same way, David Harvey says: «Architecture is particularly sensitive to the changeable experience of space and time, because [involves] the construction of representation and spatial products from the flowing of human experience»[23]. In this sense, it represents «the primary tool we relate to space and time with and give these dimensions a human scale. It tames the unlimited space and the endless time so that mankind tolerates, lives and understands them»[24]..

Also the Austrian architect Dietmar Feichtinger, who designed the new pedestrian
 bridge Valmy inaugurated in Paris in 2008, seems to agree on. With the consulting of Schlaich, Bergermann and Partner studio, this bridge, with its 90-metre-span, connects the financial district of La Defénse with Nanterre, within a tortuous and densely inhabited urban landscape.

Winding among the Parisian skyscrapers, the footbridge realizes a kind of contemporary urban promenade. It starts behind the Grande Arche and circumscribes (without touching) the Palace of Société Générale Bank giving shape to a curved path that becomes the distinctive feature of the project. It is also the bearing structure of the bridge that emphasizes this shape, being specially placed in the outer side of the curve, far from the skyscraper windows. Its architecture is then conceived to enhance the sense of lightness of this bridge which thus differs from the perceptively massive forms of the surrounding buildings. If the mighty stairs of Grande Arche impresses visitors, so Valmy footbridge draws up people, evoking the idea of a flexible and transitional space by its "minute" dimensions. Borrowed its own structure from the anatomical terminology of big animal vertebrae, it acts as a "spine", emphasizing even more the feeling of floating in space. The multisensory experience it reveals is therefore rather revealing, remaining engraved on the mind of those who cross it for a long time for the density of stimulations

22 Juhani Pallasmaa, *Gli occhi della pelle. L'architettura e i sensi*, Editoriale Jaka Book, Milan, p 89

23 David Harvey, La crisi della modernità, Il saggiatore, Milan, 1993, p 397

24 Juhani Pallasmaa, *Gli occhi della pelle. L'architettura e i sensi*, published by Jaka Book, Milan, p 26

caused.

Moreover, on this topic there is a conspicuous philosophical and scientific literature, aimed at the study of space perception through senses and effects that the consideration of visible forms produces in us. However, Johani Pallasmaa, in his famous essay "The eyes of the skin", reminds us of the trend of western culture that, since ancient times, has taken into account only the sense of sight, because it is considered to be the noblest sense, and has conceived even thoughts in visual terms[25]. That's why much of modern and contemporary architecture has kept searching for its founding rules in the epistemological primacy of sight. Just thinking to modernist architecture, conceived more as a visual plastic fact. That inspired in the last century the philosopher Martin Heidegger's illuminating words: «*The fundamental process of modern age is the conquest of the world as an image*»[26].

This way of conceiving perception has led, however, to an architecture, especially contemporary, largely thought and realized only according to the sense of sight, when our experience of the world is instead based on an integrated combination of senses. A purely visual design ends up flattening out the potential of the architectural product and the whole environment that, consequently, gets seriously impoverished. Pallasmaa explains: «[…] *I think we can gather many aspects of the daily architecture pathology through an analysis of the epistemology of senses and through a criticism of the proneness to the ocular centrism of our culture in general, and architecture in particular. The lack of humanity in the architecture and in the contemporary city can be intended as the negligence towards the body and the senses, as the result of an imbalance in our sensory system. The increasing experiences of alienation, loneliness and detachment of modern technology world, for example, could be linked to a certain pathology of the senses*»[27].

What we want here to make clear, it is not that the sense of sight should be subjected to the other senses (Pallasmaa himself acknowledges that sight remains the most developed and effective sense in transmitting information to the brain); on the contrary, we want to support the need for a multi-sensorial consideration of perception in architecture (and in infrastructural design), according to which all the sensory organs are involved at the same time in the perceptive process. Only some great architects have been able to use materials in architecture without forgetting the importance of perceptive plurality. Historical figures such as Luis Kahn or Frank Lloyd Wright managed to achieve a deep balance between their works and their sensory interaction with man and environment. By

25 *ibid*., 25

26 Martin Heiddeger, *Holzwege. Sentieri erranti nella selva*, Bompiani, Milan 2002, p 114

27 Juhani Pallasmaa, *Gli occhi della pelle. L'architettura e i sensi*, published by Jaka Book, Milan, p 27

84 - Valmy Footbridge, Dietmar Feichtinger, Paris, 2009

contrast, many buildings, especially contemporary, do not seem to minimally take account of this fundamental aspect for an art, like architecture, that by giving exclusive importance to the visual factor will inevitably keep producing alienating, lifeless works, as we can find many examples in our cities.

This is true also for structures such as bridges and footbridges whose design and construction have not been based, for a long time, on an architectural concept focused on man and his sensory dimension.

We could then assert the importance of developing, together with the visual interpretation of architecture, another sort of «unconscious» perception, achieved through those sense organs that are involved, like sight, in the perceptual processes but, unlike the visual system, are not usually considered in this process in their real sensory value. We are talking here of senses like hearing, smell, but especially touch, calling them unconscious because, despite being very important in determining the quality of the perceptual process of the subject (in many cases as important as sight), many times the latter is unaware of their activity because he mainly relies on his own visual stimuli. This phenomenon is normal for the individual who does not need to "know" or define precisely which sense organs are involved in his visual experience and will only judge it through a general assessment of its feelings, but it cannot escape the designer, and especially the architect, who needs to know and analyse with precision and in advance how his architecture can interact with the landscape, taking into account the dynamic interaction between the users and the work as well as their perceptual stimuli.

The landscape, therefore, in its phenomenological complexity as place of man's lived experience, lends itself to a dual interpretation: on one hand, an analysis carried out by visual perception, linked to our eye's ability to capture and organize, through its informative activities and in a precise and complex way, forms, colours and movements of objects in our life; on the other hand, an analysis focused on that sensory system, generally little considered, that makes architecture not a purely intellectual experience, but also, and above all, a living, real and present experience, pregnant with meanings intimately connected to our nature of human beings.

With this double reading, the landscape will produce in us a representation of itself linked not only to the mediation of our mind, but also our body. The landscape is so invested with more complex meanings derived from its being not only within sight, but also "*within reach of the body*". The phenomenological expression introduces then an idea of space as temporality of the being and flowing.

In this research, dedicated to the study of modern footbridges, what mentioned above makes it possible to return to a global design process, considering the bridge not

85. Jonas Salk Institute, Louis Kahn, 1965

86. Fallingwater, Frank Lloyd Wright, 1939

as a mere model of forms and functions, a primary and absolute event that determines its laws independently both from the context and the users, «but as a synecdoche, as a fragment that expresses the whole. The relations between the parts of the work, between the work and the users and between the work and the context, combine to define a totality of events that, merging intimately into each other, are reciprocally resolved»[28]. Miho Museum footbridge is a good example in this sense.

In the south-east of Kyoto, in Shiga Prefecture, one of the most famous architects
87| in the world, Ieoh Ming Pei (Louvre Pyramids' creator, at once), completed in 1997 the building of a fabulous art museum called Miho Museum. This museum is the fulfilment of Mihoko Koyama's dream (1910-2003), one of the richest women in Japan who founded in 1970 Shumei spiritual movement, focused on art and beauty and their power to nourish and refine the soul. A real temple for the cult of beauty, the museum displays Shumei Family's collection which includes masterpieces of the ancient age and is internationally recognized for its great aesthetic and historical value. Part of a magnificent context where natural and artificial beauty are in perfect harmony, Miho museum is presented as "the realization of Heaven on earth", a kind of labyrinth of courtyards and gardens, where marble and glass peep in the woods of the valley. This deep sense of meditation in the middle of untouched nature is emphasized by a slender steel bridge which realizes the main entrance to the museum, connecting the entrance tunnel with the exhibition area.

Located in a protected natural area, and therefore subject to strict regulation,

28 Paola Gregory, *La dimensione paesaggistica dell'architettura nel progetto contemporaneo: l'architettura come metafora del paesaggio*, Laterza, Rome 1998, p 25

the bridge develops an innovative structural system that, detaching itself from the rock, extends in the empty space covering a 120 metre long span without the use of intermediate supports. Visually light and minimal, the structure reduces its impact on the environment using a double suspension system. If on one side, towards the rocky slope, the deck is supported by a cable stayed system (anchored behind to the arch and then the walls of the Tunnel), on the other side, near the Museum, the structure acquires his rigidity thanks to a system of post-tensioned cables, forming a reversed truss, placed below the deck. The combination of these two different systems creates in this way a delicate effect of visual fade of the form that gradually develops from the rocky slope of the mountain to the big open and airy square in front of the exhibition spaces. As a natural extension of the members of the mountain and glorification of it, the plasticity of the red arch and the spatiality of cables gradually makes their presence milder leaving the inevitable primacy to the museum and its content.

The refinement of this work clearly reveals the particular attention paid by the designer to this unique and spectacular landscape. Before the supremacy of nature and its musicality, the Bridge acquires a perceptive dimension rich in transparencies cherished by the sweet melody of that harp with the red arch. This example expresses therefore the idea of the bridge as a metaphor of landscape which is realized through a «representation that becomes real coincidence and identification of architecture with landscape»[29]. That's the only way many territorial damages today caused by infrastructural works could be avoided at last.

2.5. The visual perception

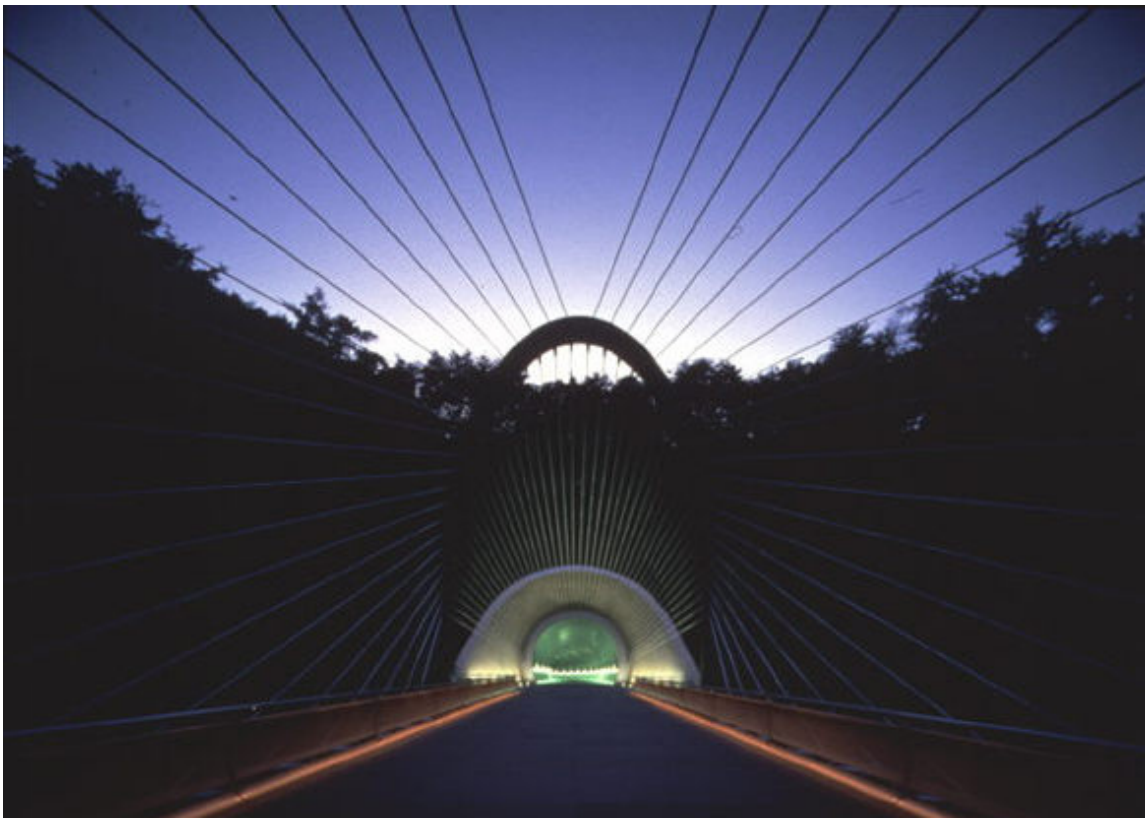
With regard to the function of visual perception in architectural design, a particular contribution comes from the studies on "The Dynamics of Architectural Form" written by the psychologist and art historian Rudolf Arnheim[30].

His considerations on the dynamics of perceptible forms are connected to Gestalt's theories and originate from the concept of *entirety*, emblematically resumed in the formula: «*The whole is greater than the sum of its single parts*» (position of epistemological holism). In opposition to the atomistic concept that considered man at a physiological level as

29 *ibid.,* p 26

30 Such considerations make reference to the main literary production of Rudolf Arnheim. Among the texts considered, the following are mentioned: *Arte e percezione visiva*, Feltrinelli, Milan, 1962; *La dinamica della forma architettonica*, Feltrinelli, Milan, 1981; *Il pensiero visivo*, Einaudi, Turin, 1964

87. Miho Museum Footbridge, Ieoh Ming Pei, Shigaraki, 1997



88. Miho Museum Footbridge, Ieoh Ming Pei, Shigaraki, 1997

being composed of countless tiny elements (atoms) and considered psychic processes according to a summation and aggregative concept, Arnheim supports the idea that human experience cannot be divided into its natural components, but we have to consider the whole as a super-ordinate phenomenon with respect to the sum of its components. On this basis, he **assigns eyes** a role and a function of supremacy because, compared to the other senses, the sight has the maximum capacity to organize with precision and complexity, in space and time, forms, colours and the movement of the objects that are part of our life. The sight does not just record the flow of sense data, but organizes and interprets them in three basic operations: the *selection*, which prevents the spirit from being submerged by a mass of information; *grasping the essential*, which allows to complete the object for the invisible parts and assigns the structure of the horizon both the ability to exclude exceeding elements from the visible and integrate them, so ensuring the visual exploration continuity**;** finally, the *putting in context*, which interprets every object in the light of its context and its horizon, a very important feature in the vision of the landscape that is, as always, an "overview" where many parameters are involved.

Thus, he asserts the importance of the study of perception as a process through which the man draws information on the world he lives in, giving this a meaning. Perception is not therefore a mechanism that exactly reproduces the reality from which it is stimulated, but it is a dynamic activity and complex interaction between the visual object and the perceiving subject: perception is an active recording of our visual sensations and building, through these, of our own understanding. What we see is not only what the eye physically reveals, but an elaboration our mind returns. You can say that, if the vision takes place in the eye, the visual perception comes from the combined action of eye and brain and it is what we actually believe to "see" with our eyes. Consequently, the resulting visual images are perceived not as the sum of individual parts, but as more complex global configurations.

In this sense, the definitions of George Kepes are also interesting, as perception is a creative act of integration, necessary for the orientation in space, in time and in social relationships: «*We live in the midst of a whirlwind of light qualities. From this whirlwind of confusion we build unified entities, those forms of experience called visual images. To perceive an image is to participate in a forming process; it is a creative act. […] every experiencing of visual image is a forming; a dynamic process of integration, a "plastic" experience. The word "plastic" therefore is here used to designate the formative quality, the shaping of sensory impressions into unified, organic wholes*»[31].

31 Gyorgy Kepes, *Language of Vision*, Courier Dover Publication, Minesota, N.Y., 1995, p 15 (originally

In this perspective, according to Arnheim, the concept of space finds new developments. From an elementary container of physical bodies whose shape and configuration are independent from the object in it, space becomes a field of vector forces where relations between things are ruled by reciprocity conditions. Consequently, the empty space that separates two objects is not empty but full of perceptive relations: these relations define the character of each visual image.

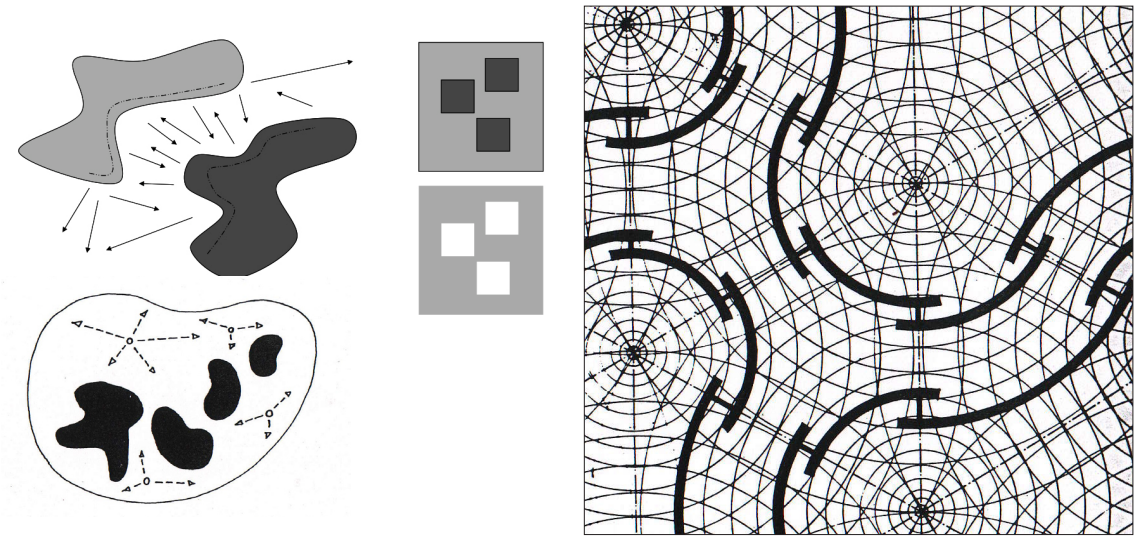
Agreeing to Arnheim, George Kepes adds: «*Every force exists in a field and this means that no subject present in the space has absolute qualities. Be it of size, shape or dimension, each visual unity acquires its single way of appearing through the dynamic interrelation with the optical environment that surrounds it*»[32]. For example, a slightly irregular figure will appear much more irregular in a scheme of perfectly geometric squares than with relation to very irregular elements.

Therefore, before you start using the visual language to communicate a concrete language, it would be good to know the great variety of possible spatial sensations connected with the relations between the forces acting on the visual perception level. Each particular relation produces a particular spatial feeling.

Consequently, the following analysis, applied to the specific topic of footbridges, will assess how the dynamic of visual perception can intervene in the field of infrastructural design. In particular, on the basis of the most important design experiences of the last 20 years, some initial indications will be here drawn for a project methodology interested in structural, functional and aesthetic-perceptive matters. Looking carefully at the forming activity of the eye can lead to substantial benefits both in formal and visual terms, especially when the bridge expresses the desire to penetrate the landscape and become an integral part of it. This means we must understand, by visual analysis, how the perceptive relations contribute to define the modality of interaction between the work and the context, and, consequently, the type of sensory experience resulting from it. In the subsequent paragraphs, six different main themes will be therefore discussed**:** *figure-ground relationship*, *reversibility or presence*, *a question of distances*, *belonging to the ground*, the *spatial tension*, *"iconemi" and permanencies*. For each of them, the key issues will be highlighted, searching for immediate comparisons in the recent bridge production. This study will be carried out abstracting the bridge (and its landscape) in a two-dimensional image according to a logic tending to conceive the work mainly as a plastic object placed in front of us and distant from our physical dimension.

published in 1944 by P. Theobald)

32 *ibid., p 35*



89. The empty space that separates two objects is not empty but full of perceptive relations

2.5.1. The figure-ground relationship

«*It is tempting deals with buildings as isolated objects as though they were paintings or sculptures. The human mind finds it easier to handle one thing at a time; this holds true for the architect conceives the building, as well as for the critic or theorist who describes it*»[33]. In reality, however, there are no objects characterized by visual qualities defined in a unique and isolated way: each architecture, be it a building or a bridge, exists in a given environment (field of reference) and each process inspired by this architecture has meaning only in reference to what surrounds it. The architectonic object and the environment establish a relation of reciprocity that transforms the landscape into a complex mesh, in a "place of relationships" in which each part is understandable only with relation to a higher whole. Rather than analyzing the individual elements, reconnecting so to an idea of entirety as the sum of individual parts, it seems therefore advisable to use parameters such as the figure-ground relationship, in order to read the landscape not only in its formal aspects but in its meaning of synecdoche, that is of fragment that expresses the whole.

Dealing with figure-ground relationship, it is meant here to refer to the specific perceptive phenomena identified by the psychology of Gestalt and in particular to the relations that Arnheim, in the representation of space, defines as: boundless ground, interaction of spaces, figure-ground reversal. «*With respect to the sketchiness of a simple dialectic binomial that opposes one configuration to the indefinite and potentially unlimited*

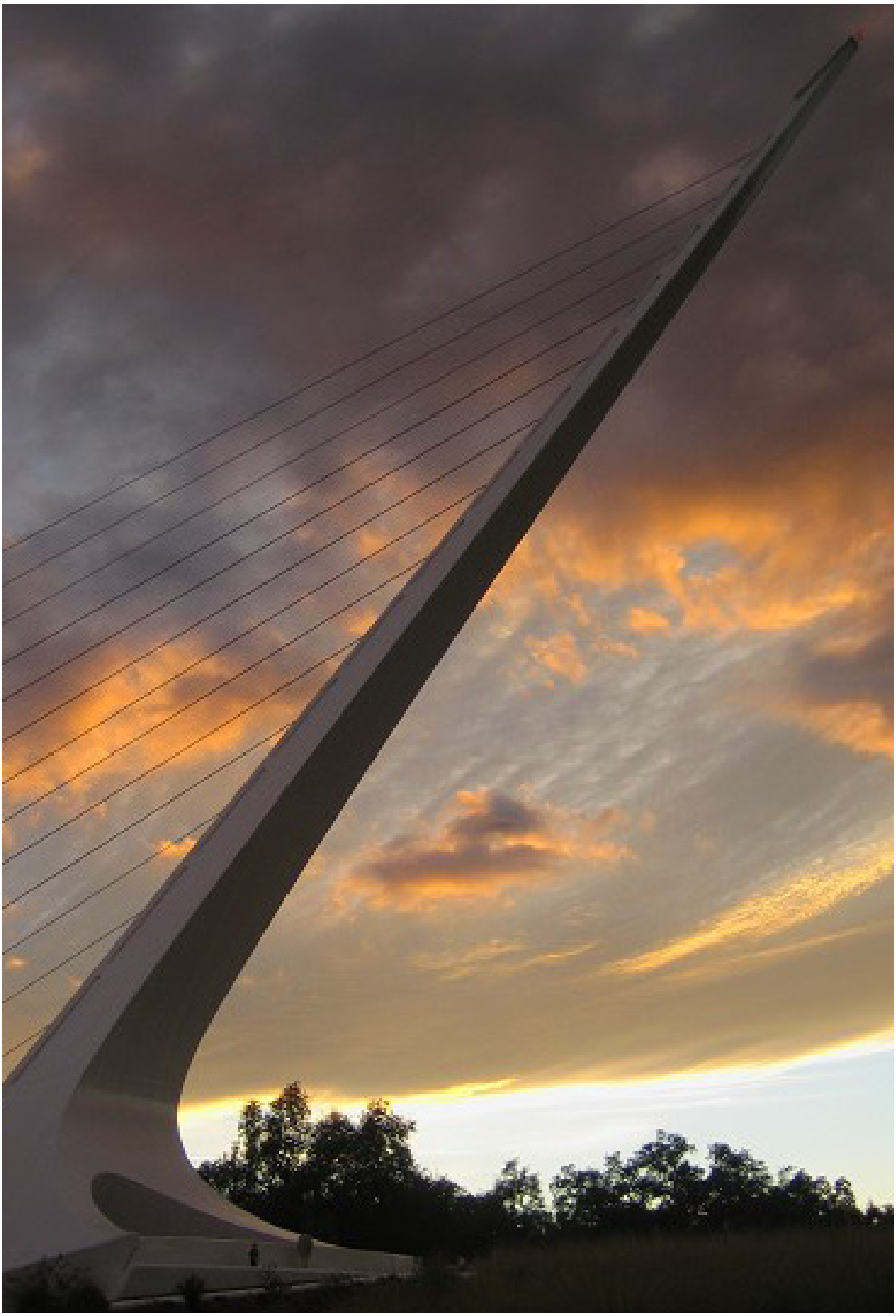
33 Rudolf Arnheim, *La dinamica della forma architettonica*, Feltrinelli, Milan, 1981, p 81

ground and that has often led to identify the landscape as a background on which the human work settles, more complex relationships come up, in which the empty space, from an undifferentiated container, becomes a visual and perceptive object, an active element of the total pattern, finally taking the role of figure. This is the case of the hollow space, typical of internal spaces or the "urban canyon" where the empty space becomes prevalent in the spatial experience and appears as the exciting human extension in the surrounding space»[34]. In this overturning of the figure-ground relationship «*emptiness, from unlimited, indifferent, inert, homogeneous, neutral area, acquires the meaning of temporal, concrete and vibrant substance in which presence and absence, proximity and remoteness, form and essence, being and becoming are well-balanced*»[35]. The purpose of the architecture is not appearing as a figure on a background, but turning the background into a figure, achieving the total symbiosis between nature and building, between the new and the pre-existing.

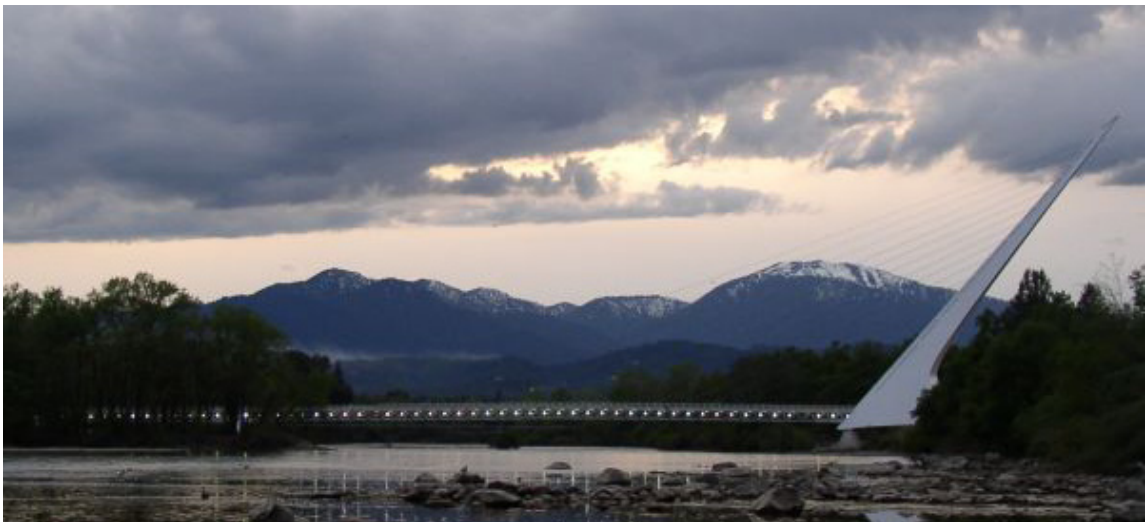
On the contrary, the work of the Spanish architect Santiago Calatrava seems to belong to an opposite vision. Either in urban context or natural context, his figures tend to have such an articulated and defined configuration (also highlighted by their typical colour white) that, most of the times, the background is overshadowed. This mechanism, according to which the figure gets ahead with respect to the background, as if they were almost two elements of a two-dimensional image, clearly emerges in the architecture of
 Sundial Bridge on the river Sacrament, completed in 2004 inside the Turtle Bay Exploration Park in California. Like the preceding Alamillo Bridge (Seville), this work is configured as a cable-stayed structure supporting a steel and glass deck, with a single 213-metre-long span. The configuration is characterized by the huge and mighty white steel pylon, 66 metres high. Skillfully modeled to realize the needle of the world's largest, sundial the pylon rises from the ground as a streamlined sabre, almost as if it wanted to cleave the sky above. The pylon, penetrating for its angular forms and clear cuts, remarked also by the reflection of the light on its translucent surface, is characterized by an aerial strong sculptural presence that makes it rise from the boundless background where it was laid down on. By contrast, the surrounding landscape is a very extensive natural reserve only marked by general spatial and structural properties, making it an endless and shapeless background of minor relevance. In this relationship, the pylon acquires a dominant role: with its form, it rules the whole image and conveys all the perceptive vectors to itself,

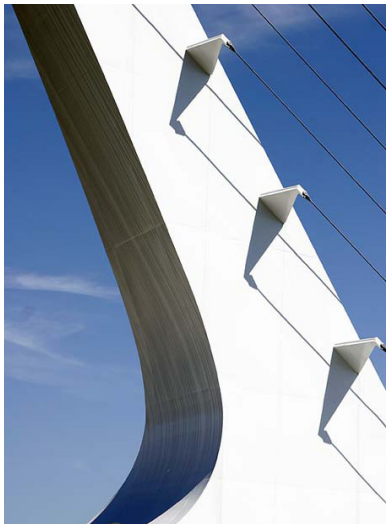
34 Paola Gregory, *La dimensione paesaggistica dell'architettura nel progetto contemporaneo: l'architettura come metafora del paesaggio*, Laterza, Rome 1998, p 243

35 *ibid.*, p 244



90. Sundial Bridge, Santiago Calatrava, Califormia, 2004





91. Sundial Bridge, Santiago Calatrava, California, 2004

92. Puente de la Mujer , Santiago Calatrava, Buenos Aires, 2001

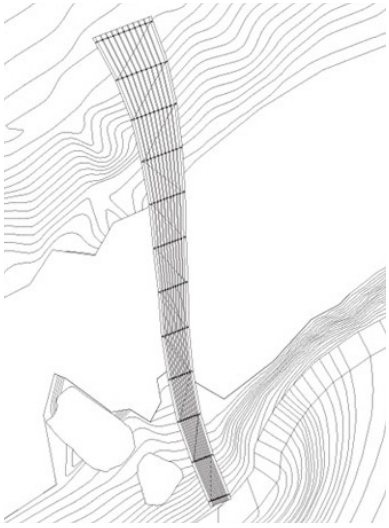
becoming the only decisive factor between the two partners in the relationship.

Because of this way of conceiving architecture, Calatrava's works seem to reflect the design approach of Le Corbusier, that is the modernist idea the soil is a neutral tray where regular volumes are laid down on. According to this vision, architecture is not supposed to be linked to the landscape, but set against it. Villa Savoye, for example, could have been placed anywhere, without being affected at all. At the same way and almost 80 years later, Sundial Bridge seems to repeat the same concept by creating plastic figures, formally complete in themselves (and not in the landscape) that could be easily moved to any other context still keeping faithful to their nature. To make another analogy, works like Sundial Bridge could be easily associated to Roman obelisks, whose declared symbolic
92| significance transcended any relational intention. Although built earlier, the similar Puente de la Mujer (2001), realized in the port of Buenos Aires in Argentina by Calatrava himself, represents another confirmation.

Considering the figure-ground relationship in terms of positive spaces (figure) and negative spaces (ground), very frequently we can find cases in which both terms are potentially able to assume the role of figure, without however having the same right. In this conditions, in a two-dimensional surface, the subordinate areas are not simply seen as background in the global context because they possess their own contours and forming powers. They have their own configuration that contributes to the total image, controlling and balancing the positive spaces; without the counter-force they produce, the positive spaces would be deprived of an essential means to keep them together. Therefore, as long as the background is shapeless and boundless, without its own structure, the contours of the total image are controlled only by the positive figures, but whenever the negative spaces acquire any power of figure, they end up affecting the total pattern. The perceptive stability is thus achieved through a balance between the pressures coming from positive and negative spaces, and the apparent stability of the forms is revealed to a sensitive eye as the result of pressures and counter-pressures.

In the three-dimensional space, this effect is mainly achieved when there is a concordance of lines, dimensions, materials, colours and emotions between object and context, figure and background. This principle of congruence is the basis of the project
93| of a footbridge on Areuse stream in the district of Boundry (Neuchatel) in Switzerland, designed in 2002 by Geninasca Delefortrie SA studio. Far from paved roads, this bridge is part of an uncontaminated and wild mountain landscape, characterized by rocky and steep slopes. In this place, silence reigns supreme and in front of it you can do nothing but listen and contemplate.

The constructive response to this particularly emotional need, has led to the



93. Areuse Footbridge , Geninasca Delefortrie, Swiss, 2002

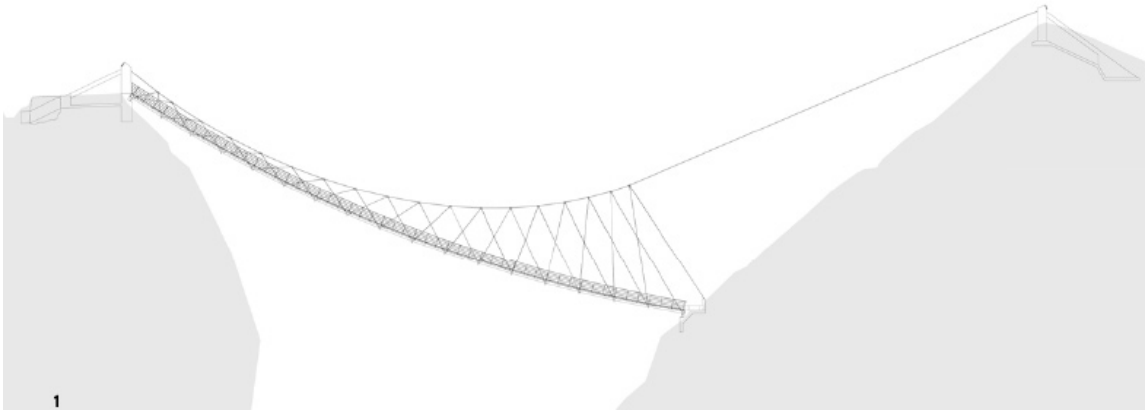
building of an organic and wavy sculpture in perfect harmony with the context and the river. Its dynamic and sinuous structure recalls a tree chopped down and falling to the ground. A slight S-shape emphasizes this analogy, also highlighted by a constriction of the deck (from 11,5 to 3,8 metres) that better suits the differences of the two banks: the path is narrow on the steeper side and then progressively widens to the other side where it opens in a generous airspace. Also its facade seems to emerge organically from the forest. Finely slotted with blades of pigmented fir, the sides of the bridge, as well as the upper covering, appear as transparent screens that, instead of hindering the light, let the sunbeams filter through and allow the landscape to penetrate the structure, becoming its setting element. This mesh of dark lines also allows the structure to breathe freely as if it were a living body, so that, by expanding and contracting, it interacts with the dynamic space of the place, while its beating echoes in the landscape.

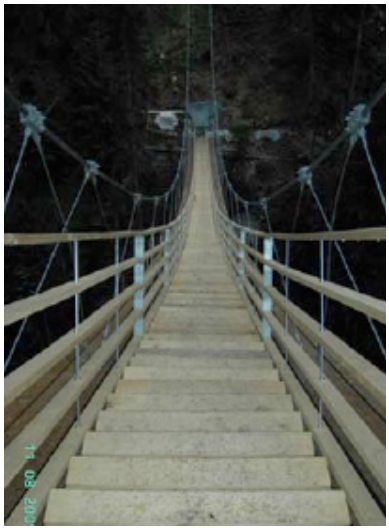
The same complicity seems to belong also to another footbridge designed in Switzerland, by the engineer Jürg Conzett in 2005. Included in the mule tracks of Viamala,
94| Zweiter Traversiner Steg replaces a previous structure designed by the same author but destroyed in 1999 by a landslide. The new bridge, slightly moved from the other and made in a safer place, is the modern and personal interpretation of a wooden suspension bridge whose configuration is the optimal answer to an obvious functional need. The bridge, as a matter of fact, is actually a 167 step large suspended staircase which is not only the shortest connection between the two sides of the valley, but it also appears particularly suitable for the mule-track route it belongs to, which goes from the north to the south.

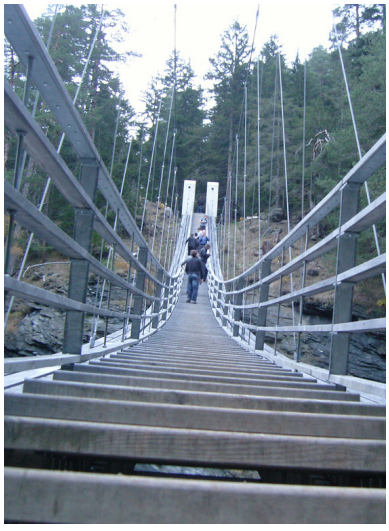
Visually, the structure draws in the landscape a marked parabolic curve that touches like a tangent the steep walls of this gorge, ideally extending into the mountain. The curve of the deck highlights so the profile of the valley, emphasizing the dynamic nature of its topography. Unlike the footbridge on Areuse stream, in which architecture and landscape contaminate together through a game of delicate textures, shapes, colours and sizes, Conzett prefers the clear cut of the deck that follows the contours of the space, as if it were the stroke of a pencil. Through its line, emphasized by the wood beams of the deck and the convergence of trajectories of the suspensions cables, the bridge enhances the emotional pathos of this uncontaminated environment.

Consequently, we can also find a similar example in the pedestrian bridge on São
95| Pedro river designed by the Portuguese architect Carrilho da Graça and António Adão da Fonseca, professor at the Faculty of Engineering at the University of Oporto. Completed in 2003, the bridge is placed inside the campus at the University of Aveiro in Portugal and connects two areas developed on different levels along both sides of São Pedro river.

Like in Conzett's work, the predominant character of this footbridge is the marked







94. Zweiter Traversiner Steg , Jürg Conzett, Swiss, 2005

95. Footbridge over São Pedro River, António Adão da Fonseca, Aveiro, 2003

96. An example of “urban canyon” in Hamburg

sharpness of the signs giving shape to its structure. In particular, the abstract reticular design and the strong minimalism of its almost skeletal forms, give this work a configuration that perfectly matches the desolate character of this arid river landscape crossed by the bridge. This formal homogeneity is also confirmed by the perfectly horizontal profile of the deck, parallel to the soil, as well as by the square and linear form of the two access ramps. Chromatic choices, finally, create a delicate balance of shades that from the dark blue of the structure shades off in the green and yellow colours of the nature behind. All this produces the visual effect of a bridge that, by interacting with the landscape, enhances those peculiarities that define its uniqueness.

On the contrary, the last category drawn up by Arnheim provides the visual and perceptive reserving of the figure-ground relationship. In such cases, we have an inversion through which emptiness is defined as a figure, giving this latter a positive value (concrete and factual) that, promoting it to an expressive synthesis, becomes a crucial and phenomenological moment of appropriation of space, as amplified reign of the presence of man. For many aspects, this matter seems mostly to be connected to the theme of the river
96| and its possibility to be crossed. The famous "*urban canyon*" mentioned by Arnheim and in which emptiness is perceived as a predominant element in the spatial experience, finds a better exemplification in the masonry curtain walls of the ancient port city of Hamburg in Germany. The structure of this particular Island consist of a dense orthogonal mesh of artificial channels that, similarly to the famous chessboard of Manhattan, divides the whole surface in rectangular lots from which the typical industrial red brick architecture of the late 1800s originates. Within this organizational scheme, the numerous bridges, also recently realized, have a predominant role and give the whole mesh a continuity of the flows. These bridges, however, do not only link the banks, but make them appear as such, becoming actually *places*: it is the bridge that opposes the one to the other and transforms them from undifferentiated borders of a land into a succession of spaces that become places. As Heidegger written: «*The bridge brings the river, the banks and the surrounding land mutually close [and] brings the land together as a region around the river*». Thanks to the bridge, the river (as emptiness), from a simple subordinate element belonging to the background, assumes the role of figure in the landscape conformation and becomes the amplified reign of the presence of man.

97| In this context, the Austrian architect Dietmar Feichtinger completed in 2007 a new pedestrian bridge that represents the main access to the new Naval Museum of Hamburg in the former warehouse "Kaispeicher B". The form of its deck was conceived as the extension of the pedestrian street of the new urban park realized to the north of the port zone, while in the middle it progressively enlarges until it forms a pleasant rest area from

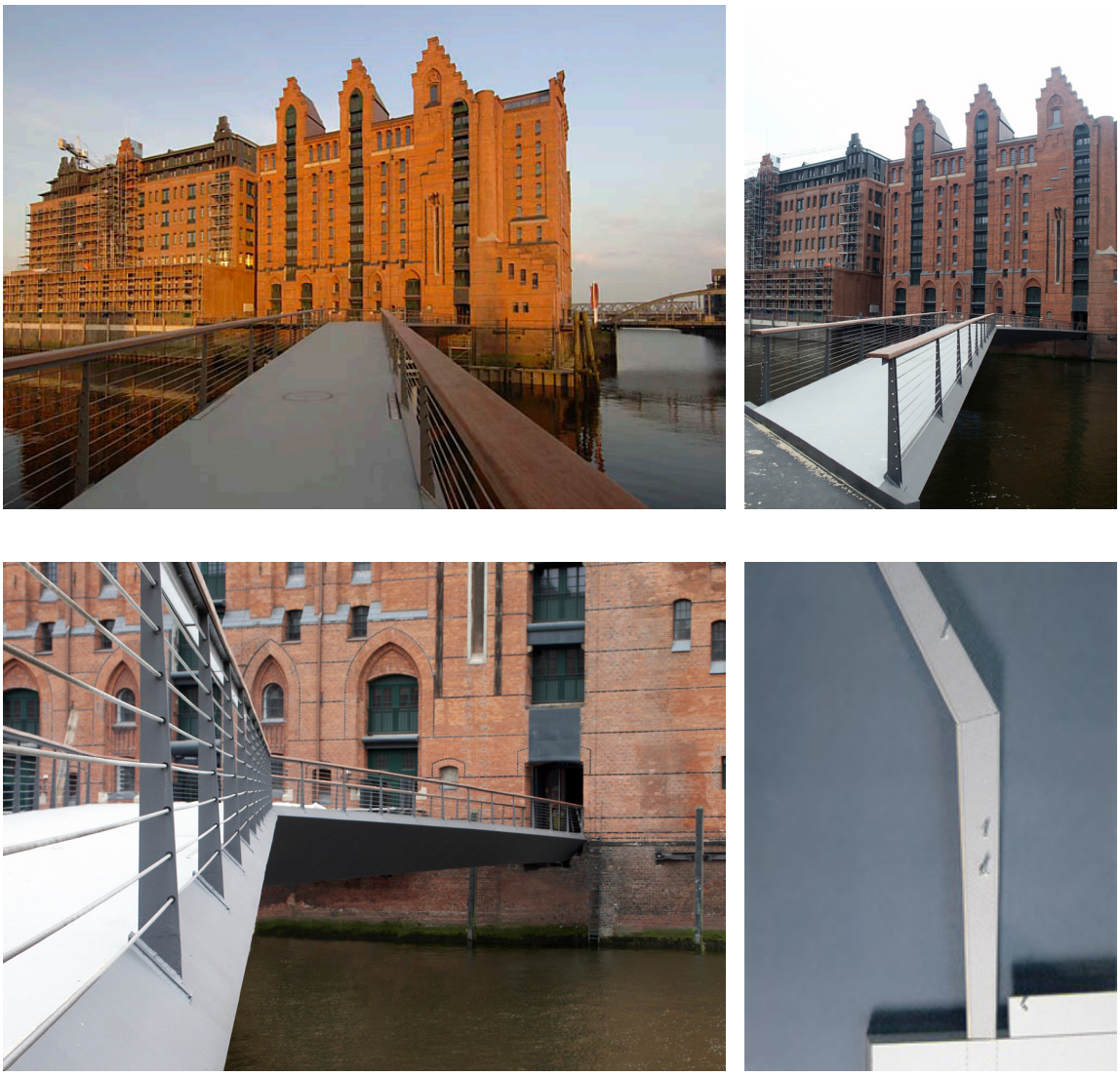
which it is possible to enjoy a panoramic view on the port. Its structure was designed as a steel box girder and it recalls a man, with stretched arms, trying to sustain himself by pushing with force against the two vertical sides of the river. Formally closed and compact, the deck gives indeed the impression of leaning on the abutment in order to stay above the water and not to invade its spatial dimension. This visual effect is also emphasized by the dark shades of the structure and the wooden handrail that make reference to the colours of the surrounding buildings as if the bridge preferred to be at the level of the architecture and not of the river: so, the river, the real indisputable protagonist of the scene, can flow undisturbed in its bed, without any form or colour to distract attention from it.

98| To the same logic belongs also another footbridge made up in Kelheim (Germany) in 1987 and designed by the German engineer Jörg schlaich. This is a suspended structure that crosses Rhine-Main-Danube canal with a curved reinforced concrete deck, supported by two inclined pylons placed in the banks of the river. With relation to the urban context, the work presents a really modest size, according more to a human scale rather than to that of the river it crosses. This creates a clear visual effect of physical and emotional detachment from the water below, also emphasized by the homogeneous and plastic surface of the deck (which contrasts with the fluidity of the river) and by its rising almost spontaneously from the shores of the canal. Through the bridge, the two banks rise from the ground to meet face to face above the river, hanging on the suspension catenary. The bridge becomes so a suspended platform above the water that, underlining its belonging to the built world (and not to the natural), allows you to contemplate the passage of the time from an observation point, outside and detached.

99| Always in Germany, in 1997, was instead realized a footbridge that, at a perceptual level, seems to deal with the topic of the reversal in a different but equally effective way. Designed also by Schlaich, the bridge is part of a large project called IBA Emscher Park to the north of the Ruhr and one of the main pieces of an articulated cycling path that develops along Rhein-Herne-Kanal and covers the whole region.

Ripshorst Bridge has a particularly innovative structural configuration: a steel arch supports oblique beams, variously tilted, which in turn support a reinforced concrete deck. The final result is a lightweight, transparent and dynamic structure that fits in with the landscape so delicately and sinuously as if it just wanted to touch it.

Unlike the previous examples, in which the sense of respect for the natural context is obtained by the creation of a state of tension between the two elements, the beauty of this work is given by its ability to show this feeling in a much more playful and funny way instead. This sensation is pointed out in all its elements: from the thin bearing arch that rises from the soil in few points to the pleasant curve of the deck that crosses the river



97. Kaiserpeicher B Footbridge, Dietmar Feichtinger, Hamburg, 2007

98. Bridge over Rhine Main Danube Canal, Jorg Schlaich, Kelheim, 1987

99. Ripshorst Bridge, Jorg Schlaich, Emscher Park (DE), 1997

100. Herrenkrugsteg, PPL, Magdeburg (DE), 1999

remaining as far as possible from its vital space to leave it almost intact, until the contrast between the rigorous trajectory of the first and the freedom of the second impressed on the vibrant and winding path. For many aspects, the bridge doesn't seem to simply cross the river, but to turn around it in order to observe its image from multiple points of view. Compared to the compactness and regularity of the landscape forms, this work resembles an insect that, wavering between the two sides, tries to place itself exactly above water to study its course. In this way, the river acquires the perceptive primacy in the visual conformation of the landscape, transforming it from an indefinite space to a unique and meaningful place.

100| By contrast, Herrenkrugsteg looks like a circus tightrope walker in balance on a rope. Designed by PPL studio of Hamburg in 1999 at Bungesgartenschau (Buga) in the north of Magdeburg (Germany), the bridge crosses one of the most important rivers of central Europe, Elba, with a total length of 615 metres. Its deck, narrow and long, moves freely above the water as a thin strip of satin. On the whole, the structure actually consists of a really simple system of suspension in steel and reinforced concrete whose simplicity of form gives the bridge a strong sense of humility with respect to the great river. The same principle also applies to the massive bases that support the pylons: as bearing walls, they are arranged on the edge of the river, without obstructing it but pointing out the borders of its bed.

101| Another example worth mentioning is York Millennium Bridge, completed in England in 2001. Designed by Whitby Birdlimited studio and repeatedly awarded for its technological innovations and construction qualities, the bridge crosses Ouse river in the small town of York, realizing a cycling path that allows students to reach the university campus from the South Bank avoiding the vehicular traffic of the near Skeldergate Bridge.

With its slender arch structure in stainless steel, the footbridge is considered today an important meeting place for the town: thanks to the particular conformation of the deck that facilitates the sitting, the platform is an ideal place to admire the beauty of the river. Making reference to Heiddeger's thought, this bridge has the peculiarity of taking back the stretches of land extending beyond the shores to the river, but it especially gathers the inhabitants of York around the main stream crossing their town. The bearing arch with its cables, converging in an imaginary point placed in the centre, directs the look to a precise place below the surface of waters. So, as an eye opening on the landscape, the bridge turns to the river which has all the looks focused on it and acquires the role of key point of the visual composition.

102| In a characteristic merchant village of the city of Manchester, instead, a thin white

101. York Millennium Bridge, Whiyby BirdLimited, York (UK), 2001

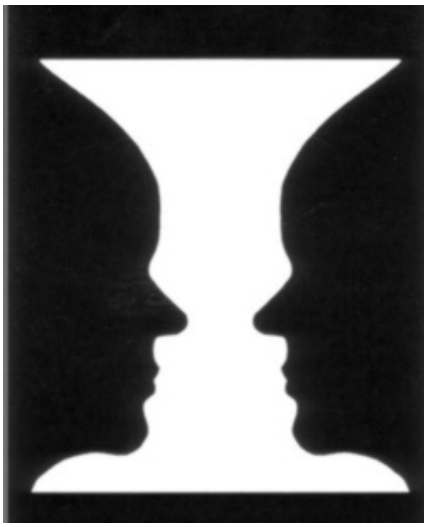
102. Merchant's Bridge, Whitby BirdLimited, Manchester, 1996

steel arch bridge links the Barça Cafe in Catalan square in Castlefield with the opposite side of Bridgewater Channel. Completed in 1996 following the designs of the engineering study Whitby Birdlimited and selected on the occasion of the Millennium Award for its strong formal and structural coherence, this bridge is the key element of a process of urban regeneration in this area so rich in history (the famous industrial revolution in the 18th and 19th century roughly began in these places), which offers the best of engineering design of the last century. In confirmation of that, the Municipality of Manchester indicated this area in 1979 as a space to preserve, turning it in 1982 into the first urban park of British heritage. Therefore, the rebirth of Castlefield revolves around the building of the new Merchant's Bridge, a 67 metre long footbridge, formed by a tilted arch that counterbalances a cantilever deck, up to 3 metres wide.

Thanks to its particular static conformation, the footbridge reduces its structural mass to the minimum and the perceived visual effect is that of a light and transparent architecture that introduces itself into the landscape leaving entirely to the latter (the empty space) the opportunity to become active element of the total pattern. The thin white structure creates a kind of mesh that structures the vision and organizes the landscape behind in a sequence of images that arise from the background acquiring the same dignity as the bridge. In a certain way, it is the same feeling that would be felt looking at an image with strong shades through the embroidery of a pierced, snow-white lace: the eye of the observer will be led to look beyond the embroidered mesh, and his attention won't be particularly focused on its design but on the bright colours that show through it. Then, through what Arnheim's defines as "*grasping the essential*", your eye will complete the invisible parts of the image ensuring this way the continuity of the visual exploration. Unlike the previous works, therefore, the concept of "urban canyon" is here extended to the whole landscape, which is perceived in its completeness: by means of the bridge, the river and the built space become prevailing in the visual and spatial experience offering themselves as an exciting extension of man in the surrounding space. This result is finally obtained thanks to the size and shape of the work that seem to reproduce, exactly, the human scale of the surrounding architecture and the dense and pregnant articulation of its urban design.

2.5.2. Reversibility or presence

When we deal with the psychology of perception and we wonder why objects appear, or why they are as they are, one of the first matter to face is precisely that of the figure-ground relationship. The first who described this phenomenon was the Danish



103. Rubin's vessel (1915)

104. Decorations of Ca' d'Oro

psychologist E. Rubin in 1921. He had the credit for observing and describing the qualitative differences that characterize those parts of field that appear in the image as figures and those that appear as background instead. The famous image of the cup/profiles duo is emblematic: in this figure, defined *reversible*, the appearance of an image implies the non presence of the other because the two figures will exclude each other. During this process, the portion of field that in a given moment appears as figure will acquire characteristics of bigger compactness and consistency placing itself ahead, towards the spectator. Vice-versa, the portion of field that appears as background will be less solid and will be placed on a rear, more distant plan.

This «*reversibility*»[36], typical of two-dimensional images, can be also found in architecture although it is not easy to identify: this difficulty depends on the large difference that exists, at a perceptive level, between a percept originated by a draw and the one resulting from an architecture. Architectural objects are made in a way that all their characteristics contribute to make them mostly as figures, giving them the aspect of very substantial perceptive places, emerging from their environment. This happens because, in the case of three-dimensional objects, the richness of perceptive stimulation is incomparably more complex: if in the two-dimensional figure the figure-ground relationship is regulated by rather simple relational parameters, in architecture what surrounds the three-dimensional object is not the simple background of the figures, but a more complex whole, usually described with the word *space*.

36 The issue has been investigated by Marco Sambin, Lucio Marcato, *Percezione e Architettura*, Collana di Psicologia, R. Cortina, Milan, 1999

The same concept could also be described in terms of *energy potential*: if we look at architecture, we realize how difficult it is to find situations where the «*amount of perceptive energy*»[37] of a building is equal to that of the surrounding environment. This is because the architectural object includes material, perceptive and cognitive features that keep its primacy well evident.

From this point of view, the only exception reported by Marco Sambin concerns the battlements of Ca' d'Oro in Venice: «*By putting the sky behind them as background, we can get close enough to a condition of reversibility. The lightness and the richness of the stone lace are so prominent that generate, precisely in that segment of the building, which is transition between full and empty spaces, an almost equivalent relationship between the surface occupied by the material and that occupied by the sky. This depends mainly on the jagged and complex conditions of the margin. You can get the impression that the sky can act as a figure and, indeed, you observe that the empty spaces are so enclosed by the stone to take considerable perceptive emphasis*»[38]. From this example we can therefore understand how a more reversible architecture is generally characterized by less consistency, less pronounced materiality, and a more delicate way of imposing itself; it gives in short the idea of being lighter. On the contrary, a little reversible architecture usually looks peremptory, massive, not open to other opportunities, and therefore permanent.

As for the bridge, the choice of either possibility will depend exclusively on the visual sensations that the designer want to produce with relation to the landscape he is called to deal with: if one structure stands out clearly and imperatively with relation to the background, it will inevitably tend to emerge and to advance with respect to the landscape; if, by contrast, relating to the background, it will be more aware of the context and of the possibility to be as it is but also otherwise, it will produce the diametrically opposite fading effect. In this latter case, the bridge should be designed to make its solid mass as intangible as possible. In general, the effect is achieved when attention and cares are equally focused on the material and on what's around. In some ways, the more an architecture refers to a two-dimensional vision (made of lines and not of masses whose roundness is marked by a powerful chiaroscuro), the more it will be possible to give rise to a reversibility of roles.

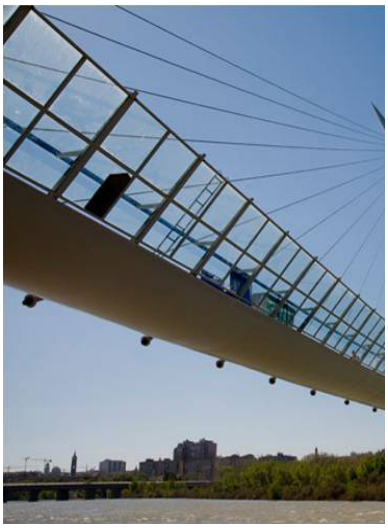
105 | Let's now compare two bridges recently completed: Chords Bridge[39] of Calatrava in

37 This expression indicates the degree of stimulation to which our eye is subject when perceiving a given object.

38 Marco Sambin, Lucio Marcato, *Percezione e Architettura*, Collana di Psicologia, R. Cortina, Milan, 1999, p 26

39 Chords bridge is not exactly a pedestrian bridge. It actually carries the new urban line of light

105. Chords Bridge, Santiago Calatrava, Jerusalem, 2009



106. Zaragoza Footbridge, Javier Materola, Zaragozza, 2008

106| Jerusalem and the new footbridge at Expo 2008 in Zaragoza designed by Spanish engineer Javier Manterola Armisén. In both cases, we have a cantilever cable stayed bridge with single pylon and curved deck. The contexts are however different: in the first situation the bridge crosses a densely busy city square, while the second one crosses Ebro river, one of the largest water courses in Spain. The project scale is also different: on one side we can observe a 118 metre high inclined tower supporting a 360 metre long and 14.82 metre wide deck; on the other side, the pylon is "just" 80 metres high, covering a length of 235 metres with a walkway 4.35 metres wide.

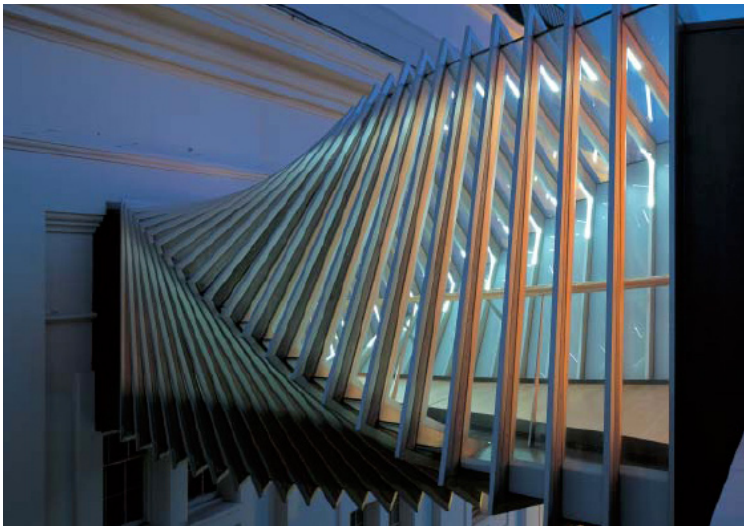
However, focusing the attention on the shaping of their decks, we can see that between the two structures exists a strong difference at a perceptive level. If Calatrava prefers a solution in which the structure of walkway and the parapet appear almost a compact whole, thanks to the predominant use of polished steel surfaces and massive concrete walls, Manterola opts for a less dense and lighter visually effect. He realizes indeed a structure that, although it presents a certain formal continuity (the parapet opens to the outside as a natural extension of the profile of the deck), it tends to dissolve itself in the sky: this effect is achieved on the railing by combining limited steel surfaces with wider transparent areas that seem to vanish in the sky. Between these two examples, therefore, the diversity lies in the different treatment of their surfaces. While the first architecture is less reversible because of the compactness of its forms, the Spanish parapet could be ideally compared to the parapet of Ca' d'Oro: the lightness and the richness of the balustrade «*are so prominent that they generate, precisely in that segment of the building, which is transition between full and empty spaces, an almost equivalent relationship between the surface occupied by the material and that occupied by the sky*»[40].

Let's now consider two more examples belonging this time to the designers of the same studio. These are two urban pedestrian bridges that meet the same functional need
107| with visually different targets and solutions. The two works in question are Flora Street
108| Bridge and Paradise Street Bridge designed by the Londoner Wilkinson & Eyre studio.

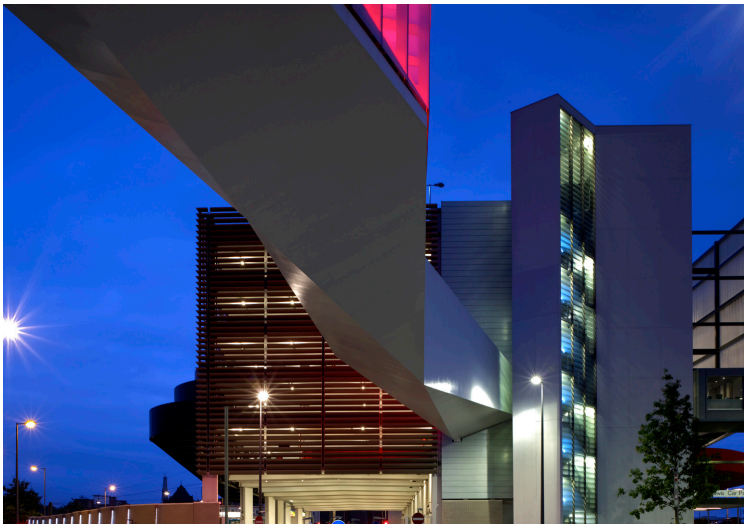
The first bridge is part of the urban context of Covent Garden in the heart of London and was built in 2002 to connect the Royal Opera House with the Royal Ballet School, two historic buildings in Neo-Renaissance style. This link was realized to allow the dancers to move quickly from the school classrooms to the stage of the Theatre without having to

train, allowing pedestrians at the same time to cross the flows of traffic in this congested road node. However, at the end of this study, it has been included among pedestrian bridges because of its interesting features in terms of visual perception.

40 Marco Sambin, Lucio Marcato, *Percezione e Architettura*, Collana di Psicologia, R. Cortina, Milan, 1999



107. Flora Street Bridge, Wilkinson&Eyre, Londra, 2002



108. Paradise Street Bridge, Wilkinson&Eyre, Liverpool, 2008

cross the street in the rain. The conceived structure, which presents small dimensions due to the short distance between the two buildings, looks like a beam made by a combination of bearing aluminum frames progressively turning on themselves, with glazed inclined portal frames. Its outer surface is consequently very jagged, almost like a papier-mâché accordion: this feature allows the footbridge to get into the two majestic buildings in a very delicate and little invasive way. The visual effect perceived from the road suggests the idea of a vibrant and elegant object moving in the air sinuous and light like a dancer. At night, instead, the bridge stands out in the bluish sky of London as an illuminated crystal.

The second bridge is part of a project of development of Paradise Street in Liverpool, an urban multi-purpose complex in the heart of the city. In this case the intention was to create a work with a strong visual impact and in contemporary style, immediately recognizable as an integral part of the new district. From a functional point of view, the realization of this bridge was made necessary by the urgency of providing a direct link between a big shopping centre and its opposite parking area, in order to offer the customers a shelter from the rain and the strong winds that frequently blow from the South-East.

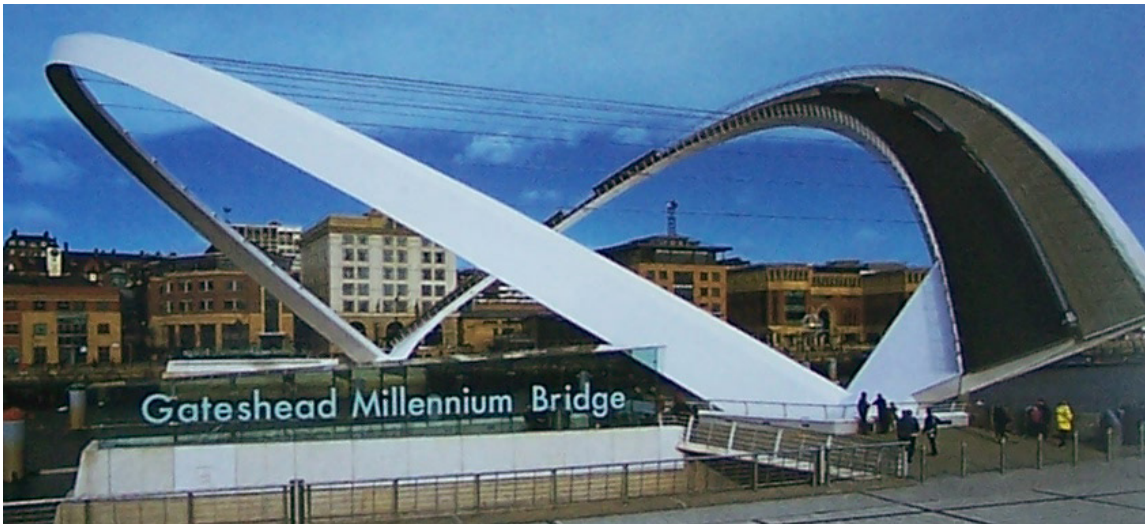
With its 58-metre-long span, the footbridge was designed both to evoke in the customers an experience different from usual and to create a peculiar architectural diversion for the passer-bys on the road below. While its geometry is generated by the symmetry already present in the place and by the conditions dictated by the non-aligned shutters, its distinctive form is obtained by the combination of many faceted surfaces that develop around the deck in order to wrap and protect the pedestrians.

Some of these faces are effectively structural elements realized with steel plates, some others are instead simple structures in glass. Therefore, the alternation of full or empty surfaces, symmetrically developed around the deck, models the view and the sculptural identity of the bridge so as to transcend its mere function of medium between buildings.

Unlike Flora Street bridge that, both day and night, tends to dissolve itself in the sky almost like a temporary structure, Liverpool pedestrian bridge actually bases its relation with the surroundings on its essence of work dense of perceptive presence.

That makes us understand that the theme of reversibility corresponds, therefore, to the way through which architecture decides to relate to landscape. In this sense, the way of dealing with its surfaces and outer margins becomes decisive. The more compact these will be, the more the work will tend to be massive, present and full of meaning; by contrast, the less consistency these will have, the greater will be its ability to appear as it is but also otherwise and, therefore, to fit in with the landscape without compromising its

109. Footbridge on the River Neckar, Jorg Schlaich, Stuttgart, 1988



110. Gateshead Millennium Bridge, Wilkinson&Eyre, Gateshead (UK), 2001

integrity. In confirmation of that, we will now compare the suspension footbridge on the
109| river Neckar in Stuttgart designed by Prof. Schlaich (1988) and Gateshead Millennium
110| Bridge by Wilkinson & Eyre Architects (2001).

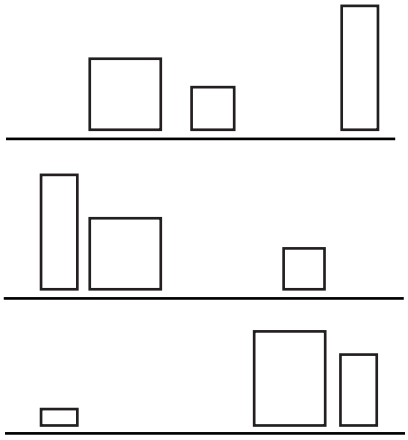
The first project is about a pedestrian bridge made up of a suspended structure, elegantly designed, which fits in with the suggestive natural context of Max Eyth Lake. The landscape that surrounds this lake presents a really complex topography, characterized by continuous ups and downs among wide green plains and terraced hills. In this big park, which in some ways recalls an English Garden, we find this small footbridge that, because of its small size and its simple and almost imperceptible forms, crosses the river without making itself noticed. The beauty of this bridge lies in fact in the extreme subtlety of its white concrete deck which, with just 30 centimetres of thickness, goes across a 114 metre long span thanks to an ingenious solution of cross hangers that give more rigidity to the structure. The path of the bridge also reflects the topographical peculiarities of the place: instead of imposing to the structure its own rigid and symmetrical scheme of access, the two ramps are designed to adapt to the movements of the land giving shape to forms that seem real extensions of land above the river. This visual effect is also confirmed by the finish of the bridge surfaces (homogeneous with respect to that of the paths inside the park), by the details of the suspension system and cable parapet (which remember the temporary and genuine nature of bridges made up by lianas) and the linearity of the intrados of deck on whose surface, smooth and white, the flow of water is reflected.

On the contrary, the forms of Gateshead Millennium Bridge are diametrically opposite. With its two white arches, deliberately plastic, the bridge appears as a strong and incisive sign in Tyne landscape. Unlike Schlaich's footbridge, which prefers the fading rather than the pregnancy, what really matters in the British project is the strong and symbolic presence of the architectural object, as requested by the competition notice itself. If in the first case, therefore, it is the architecture that yields to the landscape becoming completely wrapped by it, in the second case, it is the landscape that reorganizes around the architecture which becomes the unmistakable symbol of its rebirth.

2.5.3. A matter of distances

In his study on the possible relations between the vision and cognitive activity, Rudolf Arnheim gives particular importance to the concept of space. Starting from the idea that the whole is not the sum of individual parts, he gives a definition that moves away from that elementary vision according to which space is a simple container of physical bodies whose shape and configuration are independent of the objects present in it. According to this idea, the spaces between things appear visibly empty. On the contrary,

111. Canary Wharf



112. Mutual repulsion

Arnheim, insists on stating that space is originally a relationship among objects and in particular he explains: «*In the presence of perceivable things, like two objects placed near one another, between them linear connections will be established, which constitute the axis of reference for the environment configuration, giving in this way presence to space*»[41]. These relations, which make therefore appear the space between material things not as a simple empty space, persist daily in the human perceptive experience, even though we are not aware of it.

Arnheim also says: «*Let's take, for example, two buildings, one big and one small, standing at a moderate distance from each other. A global view perceives the two buildings as an image that produces an eminently dynamic experience, in which the space between the buildings is an inseparable part of the image. Far from being empty, that interstitial space is pervaded by gradients. […] If the width of the interval were to change, i.e., if the buildings were closer or farther apart, the slope of the gradients would change concomitantly*»[42], modifying the perception of space and objects that make it up.

This distance, which cannot be really measured, influences the perception of the architectural environment creating between the buildings conditions of their mutual dependence or independence. In terms of the dynamics of perception, Arnheim talks about forces of attraction and repulsion: if two buildings are, for example, too close to each other, a condition of "*mutual repulsion*" is very likely to arise between them. At the opposite extreme, an enormous distance would end up cancelling almost all the relationship until you

41 Rudolf Arnheim, *La dinamica della forma architettonica*, Feltrinelli, Milan, 1981, p 28
42 *ibid.,* p 29

reach the condition of absolute vacuum, which occurs when there is no more relationship of attraction between two objects. The perceptual emptiness should then be defined as the quality of an area whose characteristics are controlled by the surrounding objects. In this sense, the interspace becomes an inseparable part of the global vision because, with its width, it helps to define the general nature of the place, producing feelings of both submission and spatial disorientation.

Two Bridges, built at the end of the 1990s within the same project for urban
113| regeneration, can easily make this concept clear: these are South Quay Footbridge
114| (Wilkinson & Eyre, 1997) and Floating Bridge (Future System, 1994) in the area of Londoner Docks of Canary Wharf.

The first example is a cable stayed bridge that won a design competition aimed at improving pedestrian connection in the Dock: 180 metres long, it connects the area of Canary Wharf with South Quay. The competition notice, however, had a peculiarity: it required a structure that had to consist of two parts, a temporary one (and possibly mobile) and a permanent one. Wilkinson & Eyre studio presented therefore a combined system of two cable stayed bridges, independent and with the identical span and section, which in their original configuration formed a S-shaped path articulated between two sloping pylons. One of the two separate elements was fixed to the bank, while the other one was designed to open up on itself and, subsequently, to be transported to another place.

However, at the time of the competition, the area of the project gave an image of itself very different from the current one and, above all, was not so densely built as it is today. Over a dozen years the area was indeed greatly enlarged to give space to new skyscrapers of the financial district of Canary Wharf. The same channel, crossed by South Quay Footbridge, suffered a strong reduction in width to allow the construction of new buildings and, what remains today of the two structures of the bridge, is only the fixed part. Hence, if initially the bridge seemed to adjust appropriately and harmoniously to the scale of the place, today the remaining part is completely subject to the new skyscrapers. Initially, the bridge was indeed acting within an area much wider and the distance that existed between the structure and the surrounding skyscrapers was sufficient to harmonize the different heights of the project. The verticality of its pylons, 32 metres high, and the formal complexity of the deck gave the footbridge its own dimension that equalled that of the nearby buildings: at a perceptual level, the bridge filled therefore the gap between the two sides of the channel. Today, by contrast, the remaining part ends up just close to the skyscrapers behind and the effect is a total constriction of the work. As Arnheim would say, if the interspace between two objects is eliminated, the smaller object is reduced to simple appendix of the bigger one. If the bridge had maintained a certain distance from the

113. South Quay Bridge, Wilkinson&Eyre, London, 1997

114. Floating Bidge, Future System, London, 1994

new constructions (or vice versa), this condition of submission would not probably have occurred, as in the original condition.

This effect is made even more evident if you get to South Quay Footbridge passing by the near Floating Bridge, whose relation with the dominant verticality of Canary Wharf has been wisely resolved with the design of a horizontal structure, simple and linear, which lies down on water as if it were a coloured insect. With its contained and minimalist form, parallel to the line of the channel, this footbridge totally departs from the impressiveness of the new commercial buildings without creating any condition of friction.

So, the concept of distance is also linked to the concept of size of the architectural object and, by combining these two terms, you will inevitably face a matter of proportions.

Finding the "right" proportion between the work and its landscape means to identify in the architectural object those sizes that, better than others, will manage to go well with those of the place, without thereby creating feelings of space disorientation or submission, which can arise, for example, when having a small object in a large space (and vice versa). A proportionate image will be therefore given by the right combination of the sizes of volumes and distances, or of the sizes of what is perceived and what is not perceptible. Generally, for each spatial relationship between objects, there is always an ideal proportion established intuitively by the human eye.

We have just stated that a small object in a large area will almost certainly express
115| a condition of spatial disorientation. This is the case of Tiergarten Footbridge built in 2001 in the German town of Dessau and designed by Kister Scheithauer Gross architectural practice. The elegant white arch that crosses Mulde river, looks more like an isolated sculpture than a real architecture of landscape. This happens because, in terms of perceptive forces, of attraction and repulsion, between the bridge and the surroundings there is, as a matter of fact, no relationships so that the structural characteristics of the perceptive vacuum around the arch are not framed in order to define a space that will give the bridge a real formal justification.

116| The feeling that arises when watching the above mentioned Chords Bridge designed by Calatrava in Jerusalem is completely different. This project is the way the Catalan architect meets the local inhabitants' need of a structure that had to provide a new entrance to the city, redefining so the skyline, and to become a symbol of reconciliation. Hence, the bridge is made by a cable stayed structure with a 118 metre high pylon that bends forward to reproduce the King David's Harp. From here, 66 steel cables support a 14 metre wide curvilinear and cantilever deck that, instead of crossing water, runs on a river of traffic at the entrance of the city. However, since its very first months of construction, this work has

115. Tiergarten Footbridge, Kister Scheithauer Gross, Dessau, 2001

116. Chords Bridge, Santiago Calatrava, Jerusalem, 2009

117. La Rosa Footbridge,Antonio González Serrano, La Coruña, 2003

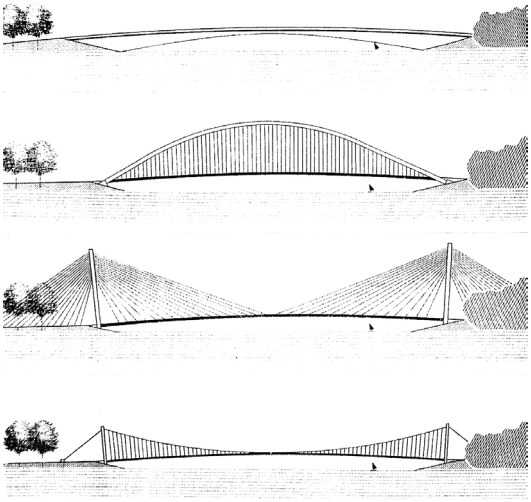
raised protests among the inhabitants of the city. As reported also by the international press in the days prior to the inauguration, the huge size of the bridge and its predominating on the whole urban fabric of the city (with a pylon visible from any perspective) have made it, in a short time, more comparable to a monster than to a symbol of reconciliation. The chosen area, one of the busiest and most degraded of the city, is dimensionally inadequate to accept the structure because it is too small: the result is that the huge band of the deck (which runs very close to the roofs of the cars) and the high pylon (with the top bended forward), instead of interacting with the environment, completely dominate it, imposing their presence. «*That place is too crowded with houses, persons, cars – the poet Haim Gouri says in New York Times – and the aesthetic value of the bridge has been completely lost, it would need more space. It has been put in the most inappropriate area*».

117| Even if in a more subtle way, the Spanish footbridge "La Rosa" created in La Coruña in 2003 and designed by the architect Antonio González Serrano seems to get to the same result. The size of its pylons and their plastic design totally dominate on everything around them. Too close to the buildings around and too large for the road below, the pylons of this bridge seem to crush with their big mass the immediate surroundings.

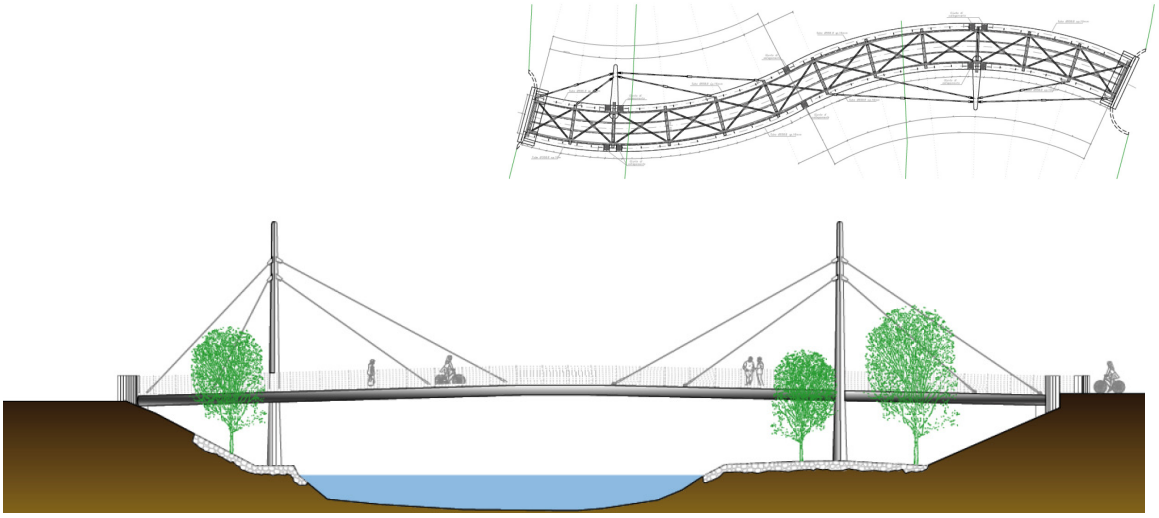
As shown by Tiergarten Footbridge, a question of proportions in architecture has a relevant weight in the visual perception of the bridge, not only in densely built urban areas, such as London or Jerusalem, but also in natural landscapes such as that of Vranov

118| Lake in the Czech Republic. Close to the banks, Swiss Bay Footbridge was built in 1993 by the Czech engineer Jiri Strasky.

This bridge is situated in a natural area with high landscape value both for the presence of its big artificial lake and for the beauty of the castle that dominates the landscape from a natural hill. The area, today one of the main tourist destinations of the Czech Republic, required however a direct link between the public beach, placed on the shores of a inlet, and the hotels located on the opposite side of the lake. Considering the beauty of the place, the study of the bridge began from the search of the "exact" relationship between size of the structure and scale of the landscape that would have allowed the work to establish an harmonious relation with the environment. According to a matter of sizes, four different structural types were studied, focusing on their visual impact on the context. The idea of placing the pylons in the water was immediately rejected both for aesthetic and technical reasons, and the problem was considered of building a structure with a main span of at least 250 metres. Moreover, in order not to hinder the navigation along the river, the deck was conceived with an arch profile, raised in the middle. On the basis of these considerations, the first two proposals envisaged, respectively, a bridge with cantilever beams, however considered visually too heavy, and an arch bridge, rejected



118. Swiss Bay Footbridge, Jiri Strasky, Lago di Vranov, 1993



119. Ponte ciclopedonale Pelosa, Progeest, Padova (IT), 2008

too because of the excessive dimensions necessary to cover such a span, which damaged the environment. A cable stayed solution was left, considered even cheaper, whose static functioning implied however the construction of two huge towers that would have overlapped the skyline of the landscape with an unacceptable effect. Starting from this latter alternative, and with some changes made to the project, the solution was chosen that was realized afterwards: a suspension bridge with parabolic cables that were jointed in the middle to a reinforced concrete deck and diverted to the ground by means of two A-shaped pylons. Compared to the cable stayed bridge, this structural type allowed the use of pylons with small height, visually much lighter and more transparent. The introduction then of a post tension technology also permitted to set the walkway on a very thin and elegant concrete strip, which crosses the lake suggesting a deep sense of respect for the landscape. Unlike the first cases, the designer managed so to give the bridge a more suitable size for the landscape, choosing soft and sinuous lines able to emphasize its natural forms.

The same care for the landscape can be observed in the project for Pelosa
119| Footbridge, a work inaugurated in Padua by Progeest company in 2008. This small white bridge is part of an urban renewal project of the ancient Via Pelosa whose continuity was interrupted in the XII century with the construction of the artificial Brentella canal. The design concept of this bridge has to be found in the particular nature of the site and in the beauty of its banks, which allowed to create an original and overall light work, a strong sign able to interact with the surrounding environment without damaging it. In this sense, the footbridge is conceived as a zoomorph structure, which draws from the surrounding elements as starting points for a union between nature and the structural element, and looks at the winding path of the river to give shape to the deck. Anyway, the beauty of this work is especially visible in the special features of its scale: like a small toy, or an elegant garden piece of furniture, it perfectly inserts between the banks of the channel characterized by the same measures. The pylons, like any other element of the bridge, fit in with the landscape, establishing a dialogue on an equal level with it and giving life to a new area for rest and contemplation in the city of Padua.

2.5.4. Belonging to the ground

A further aspect which affects the perception of the bridge is the way the structure relates to the ground. We are here making reference to two main themes: the first concerns the morphology of the internal components of the bridge (abutments, intermediate support and main structure), the second refers to a matter of verticality and horizontality.

In the first case, abutments and support are the elements through which the bridge

materializes its real contact with the landscape, both at a static and perceptual level. Apart from bringing loads to the ground, they tell us through their form about the type of dialogue that the bridge has decided to develop with the environment that surrounds it. Together with the rest of the structure, they contribute so to determine the final image of the work. Their finish, their plastic configuration, and their colour help to enhance the purposes of the project.

In general, the bridge can define its contact with the ground in two main ways: the rooted or the timely one. In one case, the structure will tend to emerge from the soil and to claim its presence; in the other case, it will prefer a gentle placement in order to detach itself more easily and as fast as possible from the ground. The choice of one or the other solution will depend essentially on three factors: the position of the perceptive potential inside the work, the relationship between the parts and the choice of the colour.

120| The first type certainly includes Devesa Footbridge, built in 1991 in Ripoll (Spain) and designed by Santiago Calatrava. You only have to observe the solution of the abutment on the left side to understand the designer's declared purpose of realizing a work firmly anchored to the ground. As a sort of V-shaped sculpture, in raw concrete, the abutment rises from the ground in a plastic way, supporting a straight and sharp deck that, by directional contrast, reaffirms its massive nature. This effect is also given by the colour and the roughness of the surfaces that match the visual characteristics of the river shores, making the bridge and the ground one entity.

121| The intermediate supports of London Millennium Bridge are also as vigorously shaped. Opened in 2001 and designed by the English architect Norman Foster, the piers of this particular suspended structure emerge from the water like sea animals. They extend upwards until their heads meet the truss cables supporting the deck. The plasticity and majesty of their figure reveal the strength of their act, which consists in tightening a mesh of cables on which laying the slender path afterwards.

For these reasons, the two works share the same way of dealing with the "*potential perceptive energy*". This term refers to that perceptive energy that each object naturally possesses and that is defined according to those material and formal features that maintain its priority well evident. In both cases, this potential is located in correspondence of the junctions with the ground. At a perceptual level, this means that the weight of the work falls completely on the piers, while the rest of the structure becomes light and slender so that it can vanish in the empty space.

122| The case of Pedro and Inês Footbridge by Antonio Adão da Fonseca, whose arches hardly seem to touch the water surface, is completely different. In this example, in fact, the structure progressively reduces its mass going down from the deck to the lower part

120. La Devesa Footbridge, Santiago Calatrava, Ripoll (E), 1991

121. Millennium Bridge, Norman Foster, London, 2001

122. Pedro e Inês Footbridge, Antonio Adão Fonseca, Coibra, 2007

123. Liberty Bridge, Schlaich Bergermann&Partner, Greenwill, Califormia, 2004

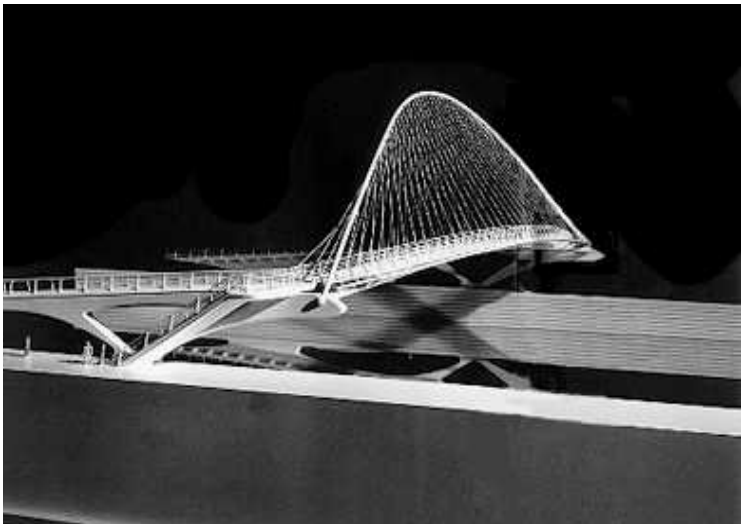
(and not vice versa). This aspect produces a diametrically opposite visual experience with respect to the previous one, although we are still talking about a bridge with intermediate and punctual support. This happens because the potential perceptive energy is in this case concentrated not in correspondence of the support but of the deck. Moreover, taking into account that the energy potential of an object varies according to its distance from the ground, and that it decreases as the height increases (because of the lower gravitational force that would bring it to the ground), the footbridge of Coimbra appears visually detached from the ground, as if it were simply resting on a surface. If the millennium bridge seems therefore to be rising from the water to claim its presence, on the contrary, Fonseca creates a work deliberately detached from the ground in order to keep a respectful distance from it.

123| This second modality finds another expression in Liberty Footbridge designed by Jörg Schlaich and built in Greenwill (South Carolina - USA). It is a suspension bridge inside an urban park, which shows its essence in the material fading of its supporting structure. The empty space, as well as the mass, acquires the leading role within the work, which becomes this way perceptively light, hardly visible. This is a clear example of reversibility in architecture and the same philosophy also applies to the two antennas that, with a simple and linear design, leave your eye free to go through them and enjoy the natural beauty of the landscape. The task of establishing the union with nature is entrusted to two minute steel balls, which help to define the whole image of a dancer dancing on the grass on tiptoe.

Two more factors have to be added to the question of the perceptive potential: the relation between the parts and the theme of the colour. Let's consider two examples: a
124| footbridge in Saint Denis by Marc Mimram (1998) and Campo Volantin Bridge, a work
125| by Calatrava completed in 1997 in Bilbao.

A quick analysis highlights that both works have a central steel structure based on two sculptural concrete abutments. The latter are also characterized by a configuration that makes them strongly rooted in the ground. Despite this, from a perceptive point of view, the two final images differ substantially. In the first case, the steel structure realizes, without interruption, the right and harmonious link between the two lateral abutments: in correspondence of the river, they seem indeed to rise temporarily from the ground and to descend immediately after on the other side, continuing their journey undisturbed. In the second case, the effect of rooting of the abutments is completely eliminated because of the evident formal and material diversity between the internal parts of the bridge. While Mimram creates a structural whole fixed to the ground, Calatrava's footbridge does not seem to have any relation with the ground, i.e. with the context. Thus, we have the

124. Passerella a Sant Denis, Marc Mimram, Sant Denise (FR), 1993



125. Campo Volantin Footbridge, Santiago Calatrava, Bilbao, 1997

impression that the metal part (the actual bridge) really detaches itself from the abutments to float in the empty space like a balloon. It's no accident that the head of the abutments recalls a kind of hook whose purpose is not to support the bridge, but to hold it fixed to the ground. Therefore, the final image is that of a work characterized by a deep internal contradiction, certainly wanted by its designer, which creates a kind of disorientation and discomfort in the observer. This happens when between the abutments and the rest of the structure there is no principle of continuity: while the first tell something, the second talk about something completely different.

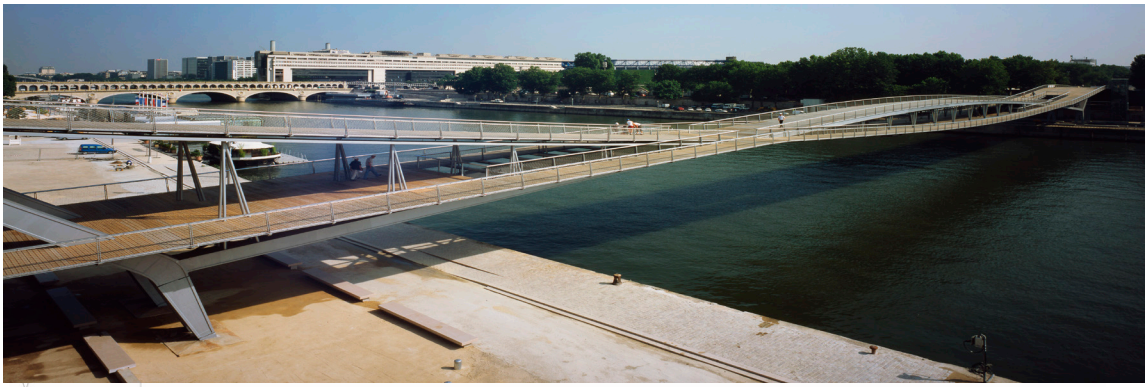
This different visual effect is also obtained thanks to the diversity of colour of their structures. The more its colour will tend to white the lighter and more vibrant the bridge will be. On the contrary, it will be more stable in its fixity linked to the ground with predominant dark shades. Thereby, Campo Volantin Footbridge does not seem to be willing to establish any relationship with the landscape around it: light and vibrant, it is completely detached from it, just because there are no elements that, perceptually, give the idea of a kind of continuity with the ground, while its potential perceptive energy keeps completely focused on the metal structure.

The second issue refers to verticality and horizontality. As Arnheim writes: «*the dominant axis of a prevalently vertical building meets the ground at right angles, and since linear shapes have the dynamic propriety of extending visually unless they are stopped, such a building will seem to continue into the ground*»[43]. A similar effect can be found in nature: a tree trunk, for example, does not stand on a base but emerges from the ground, and what is visible of it looks incomplete since a plant has its base in the root system underneath. The opposite problem arises for buildings that mainly develop along the horizontal plane: «*Here, the condition of "belonging to the ground" comes about not through penetration at right angles but through parallelism, which creates an easy harmony. The building remains attached to the ground and fits in easily with the landscape. At the same time, it is rootless like a boat, it tends to float on the surface of the ground because parallels do not interlock. The contact is gentle because the shape of such a building undercuts the vertical dimension of gravitational pull. So the building has a light weight; it does not apply pressure downwards*»[44].

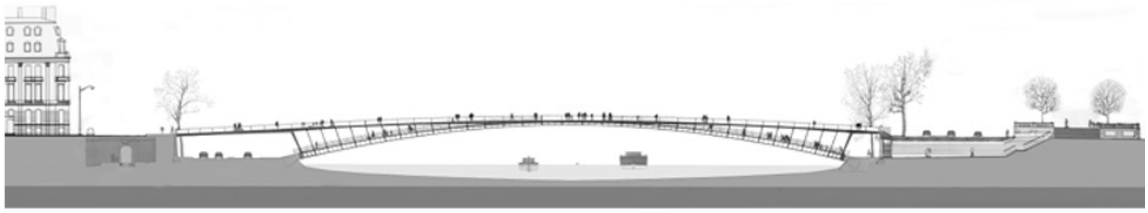
This dynamic generally includes stress ribbon bridges that, thanks to their flexible structure, lies down on the ground following in their horizontality the topography of the place. An example is North Bridge, one of the five bridges made for IGA Park 2003 in

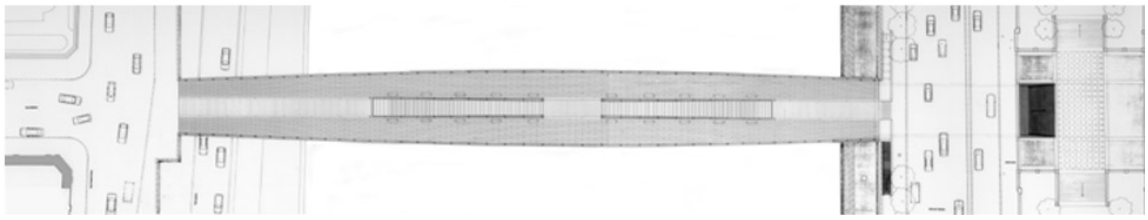
43 Rudolf Arnheim, *La dinamica della forma architettonica*, Feltrinelli, Milan, 1981, p 51
44 *ibid., 56*

126. North Bridhe, Schlaich Bergermann&Partner, Rostock (DE), 2003



127. Simone de Beauvoir Footbridge, Dietmar Feichitinger, Paris, 2006





128. Solferino Bridge Drawings, Marc Mimram, Parigi, 1999

129. Rogue River Bridge, Jiri Strasky, Oregon , 2000

Rostock (DE) by Schlaich Bergermann & Partners practice. Until today, this work is one of the few stress-ribbon bridges on multiple spans. With lights of less than 40 metres, the bridge crosses the bed of a small river that flows inside the botanical park of IGA. The advantage of this structural type is the realization of an extraordinarily transparent object. The deck is just 15 centimetres thick, which lets the eye roam free beyond the footbridge. Similar to a flying carpet, it runs very close to the water without ever touching it and its wavy profile creates a light and elegant solution that introduces itself in the surrounding environment in a harmonious way.

This feeling of floating on the water acquires then greater strength in Simone de
127| Beauvoir Footbridge (2006). Designed by the Austrian architect Dietmar Feichtinger along Seine river, this work is the physical materialization of a floating square above water. Its truss bands, which intersect in the middle of the river forming an open eye on the landscape, are placed parallel to the water course without touching it. The result is therefore a structure that combines with the skyline with a certain elegance.

This characteristic is made even more evident if we compare this bridge to the near
128| Solferino Bridge by Mimram, whose double system of arches indefinitely extends in the ground according to the trajectory of their tangent. The result is a figure that detaches itself from the ground and rises then above Seine river; a diametrically opposite image with respect to that of Simone de Beauvoir Footbridge, despite the same design premises.

2.5.5. Dynamics

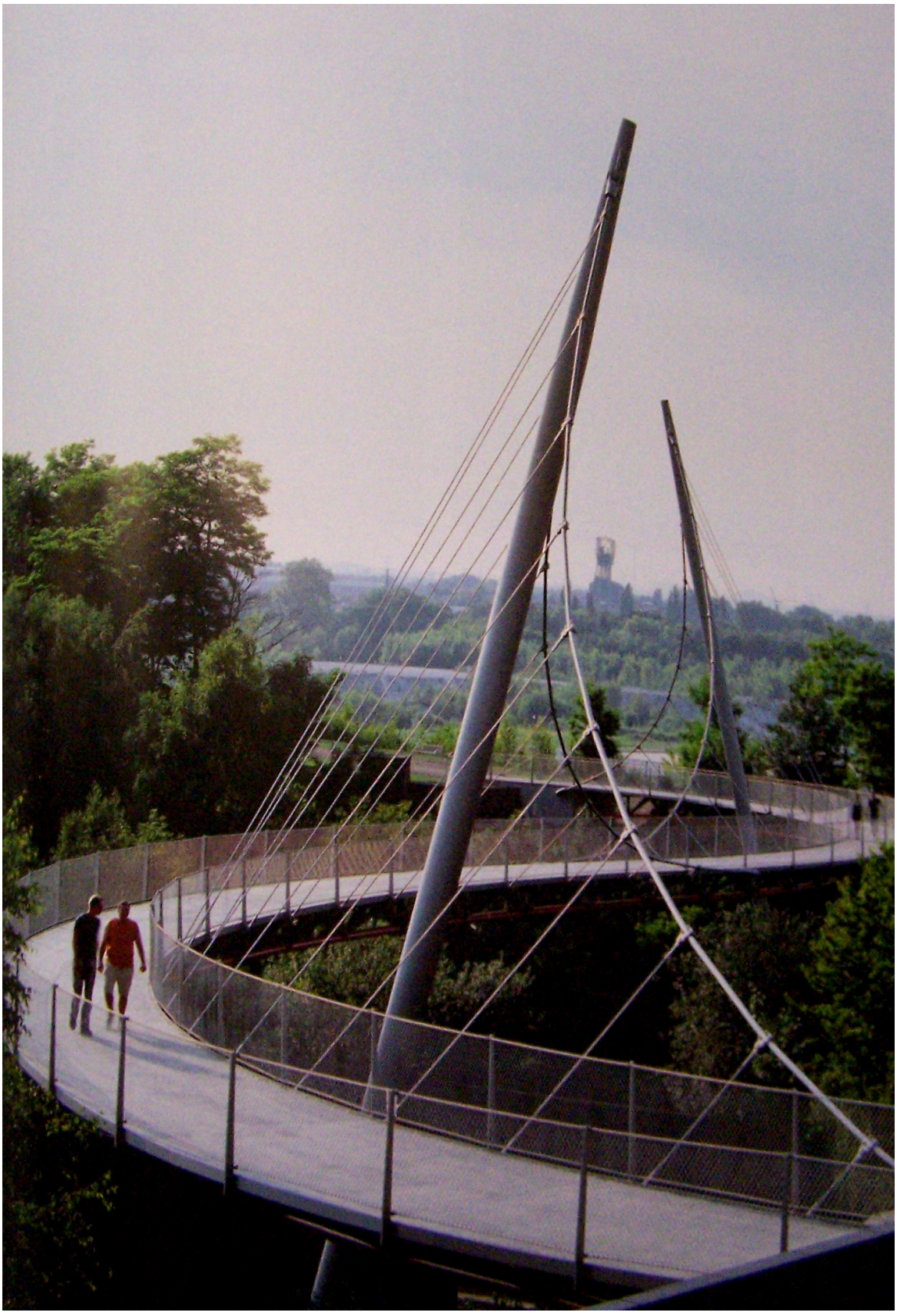
«*If the movement is absent, the work is dead*»[45]. As Arnheim explains, an object without any articulation is an inert object, without vital quality. Only through an articulation of form and the presence of internal spatial forces, which generate tension, you can make a work alive.

To obtain this tension it is necessary however to imprint a deformation in the form: this could be a change of proportions, a distortion of the figure, a deformation of intervals between two objects, or an oblique orientation spontaneously perceived as a deviation from the basic spatial framework of the vertical and the horizontal, these instruments suggest the idea of a potential movement that can produce tensions and interactions that give vitality to the object. Anyway, «*this effect is only visible when the starting basis is implicitly present, i.e. when the scheme of reference is clear, just as any force can occur only through the resistance to the opposite force*»[46].

In the specific case of the architectural object, Arnheim defines the movement developed in architecture as a continuous oscillation between two points. This principle, which he calls «*directed tension*»[47], is a property intrinsic in each visual object, for which the forms don't mutually stabilize their position, but seem to be moved by the desire to find a more convenient location. This tension produces so a latent movement that is taken in the act of its forming and is fixed in a shape that preserves the traces of the physical forces that have generated it, reflecting so its entire forming process. «*To obtain so the movement of a form, it is necessary that the designer conceives each object as an event, rather than as a static fragment of theory, and he thinks of the relationship between objects not as a geometric configuration but as a mutual interaction*»[48].

Considering the main contemporary design experience of pedestrian bridges, the principle of directed tension seems to have become a well established fact. The use of deformed structures and the preference for an oblique orientation actually distinguish the contemporary footbridges. This type of design, developed at the end of 1980s by the first experimentation within the German school of Jörg Schlaich and the Spanish school of Leonardo Fernández Troyano, makes the coincidence between form and structure its cultural foundation. On the basis of that perfect adhesion between deep reality and

45 Rudolf Arnheim, *Arte e percezione visiva*, Feltrinelli, Milan, 1962, p 346
46 *ibid.,* pp 342-344
47 *ibid.,* pp 327-332
48 *ibid.,* p 332



130 . Footbridge across the Gahlesche Strasse, Jorg Schlaich, Bochum, 2003

131. Peace Bridge, Wilkinson&Eyre, Londonderry (EI), under costruction, 2009 - Rendering

132. Castleford Bridge, McDowell+Benedetti, Castleford (UK), 2008

appearance, which finds its origin in Eduardo Torroja's teachings, the principle of the directed tension finds today, in the design of pedestrian bridges, a wide range of applications. Curvilinear decks, inclined pylons, deformation of arches along their axis (as well as in their transversal plan), are only some of the main examples.

130| In this sense, the footbridge in Bochum on Gahlesche Strasse, completed in 2003 by Prof. Schalich is memorable. It is a bridge that, with its S-shaped deck, 66 metres long and supported by two inclined masts, linked the two parts of a re-naturalized park in the centre of the city. The structure appears visually light and dynamic, also thanks to the use of the post tension technology in the deck, which dissolves the mass acquiring greater transparency. According to this, that double curve of the deck, reiterated by the different inclination of the masts, seems just to represent that idea of «*latent movement that is taken in the act of its forming and is fixed in a shape that preserve the traces of the physical forces that have generated it*»[49].

The same author has also worked out other solutions, always characterized by a curvilinear deck, which have become today a valid reference for most of the designers. Even if structural functioning is different, the same aesthetic principle of Bochum can often be found in the works by authors such as Chris Wilkinson and Jim Eyre, who have presented this scheme again in the Londoner South Quay Footbridge and in the recent

131| project for Peace Bridge in Northern Ireland. The latter is a pedestrian and cyclist bridge, 235 metres long, which crosses Foyle river in Londonderry County. Financed by EU PACE III funds, the work diagonally connects the old military stations at Ebrington with the historical centre of the town. In the inclination of this axis, a S-shaped deck takes form that, starting from the abutments, moves away from its scheme of reference to open up to the river and offer original views of it.

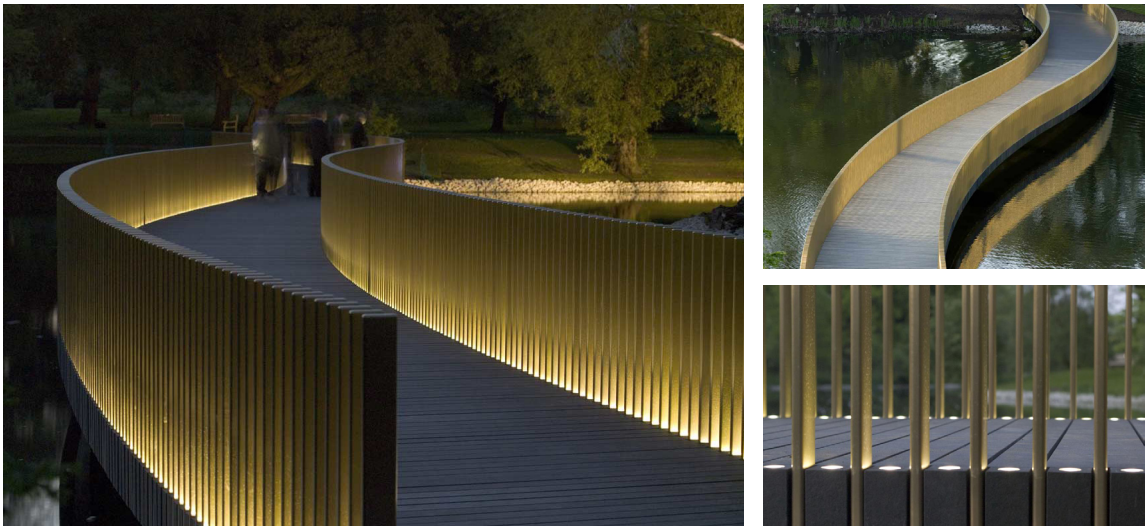
A deformation less bound to a static scheme is instead that of the new footbridge

132| at Castleford (UK), designed by Mcdowell+Benedetti. Inaugurated in 2008, this simple beam structure offers a mostly fluid and dynamic spatial experience. Its vigorous curves cross Aire river creating a sinuous path that wraps up its waters. A variety of images and visual angles, as a continuous tendency of the deck to extend towards some points of the river, moving then even more suddenly to other parts, are specific characteristics that impress such movement and tensions in the project that the bridge acquires a marked vital quality

133| The perception of the event intrinsic in the structure is also typical of Manzanares River Bridge designed by Javier Manterola and inaugurated in Madrid in 2003. This is a

49 *ibid.,* pp 347

133. Footbridge on the River Manzanares, Jever Manterola, Madrid, 2003



134. Sackler Crossing, Buro Happold&John Pawson, London, 2005

135. Brother and Sister Bridges, West8, Amsterdam - Borneo, 2000

cable stayed bridge that crosses the river and the adjoining urban roads with a 85 metre long span. From the deck two circular routes take shape, which are one the reflection of the other and that in the whole are equivalent to two specular S, crossed in the middle. The visual effect that emerges is equal to the collision, in altitude, of two opposite flows. This feeling is further strengthened by the different plans in which the cables are placed.

In conclusion, Sackler Crossing designed by Buro Happold and the architect John
134| Pawson in 2005 is worth mentioning. The aim of this project was to introduce in the system of internal paths of the Royal Botanic Gardens of London a work visually contemporary but also characterized by a relation of harmonious continuity with the historical and natural beauties of the surrounding. The result is a footbridge with an elegant curved deck whose pace is accentuated by an interesting alternation of empty and full spaces. While full spaces are made by horizontal strips of dark granite, empty spaces give form to vertical strips of bronze, slightly spaced between them, will create a delicate balustrade by vanishing contours. The close proximity of the vertical elements produces parapets whose shape are perceived in the whole as a compact entity but in fact spongy and permeable to the landscape. This feeling is also re-marked by the absence of horizontal lines of closure, like those of the handrail. A lighting positioned in the interstitial spaces of the balustrade also contributes to make the dynamism of the route even more vibrant .

135| On the contrary, a vertical deformation is typical of works like Brother and Sister Bridges (2000). Designed by West8 Architects, these bridges are an integral part of a plan for the regeneration of Borneo and Sporenbug peninsulas, in the centre of Amsterdam, now used as residential areas. They represent some of the key elements of the city planning on which their particular sculptural and expressive form depends. For an analysis that takes account of what Arnheim stated, the two bridges have to be regarded as the two elements of a single project. If Sister bridge represent in fact the initial scheme, Brother Bridge moves away from it through a deformation of the structure imprinted in its vertical plan. Between the two works is thus created a continuous oscillation between two points that produces then a mutual interaction. Furthermore, unlike the traditional arch bridges whose curvature mostly denotes a state of calm, the asymmetrical curve of Brother Bridge gives the structure a further formal tension so that the emotional impact is made even more intense.

A combined game of deformations on different plans gave life instead to the
136| project of the two bridges in front of the new Museum of Modern and Contemporary Art in Bolzano (2008). Designed by a Berliner architecture practice, KSV, as part of the Museum, these two works are at the same time twin and different. Crossing Talvera river, they create a kind of artificial mountain landscape, which is reflected in the continuous ups

136. Museum of Modern and Contemporary Art , Bridge over the Talvera, KSV, Bolzano, 2008

137. Rari Nantes Footbridge, Progeest, Padova, 2009

138. Aagade Footbridge, Dissing+Weitling, Copenhagen, 2008

and downs and in the marked plan distortions of their routes. This emotional chaos is also given by the particular conformation of their sculptural deck. These works, which look different from each side you are looking, derive their vital quality from the apparent calm of the river, suggesting so the idea of a potential movement able to produce an intense game of tensions and interactions.

137| Rari Nantes Footbridge belongs to another kind of directed tension, and its vitality is impressed in a double inclined arch. Designed by Progeest and inaugurated last June 2009, the structure crosses Bacchiglione river in the south-west of the city of Padua, with a 75 metre long span. The project draws its inspiration from the analysis and the formal synthesis of one of the most numerous "inhabitants" of this river landscape, namely Gallinula Chloropus, an aquatic bird similar to galliformes. The whole design of the work originated from the study of this animal and the observation of its movements (while hunting the insects it eats). At a geometric level, the bridge is characterized by the presence of an asymmetrical arch, inclined 22° to the vertical and crowned above by a curvilinear band (further inclined) in the shape of the beak of a bird, which acts as an element of counter-balance. From this system, a cantilever deck, up to 4 metres wide, develops along an axis almost perpendicular to the river, while that broken line that links across the various oriented plans, imprints the physical tension of the animal taking off in the form.

138| The use of inclined arches to give force to the work is made even more extreme in the pedestrian bridge of Via Aagade by Dissing+Weitling. Inaugurated in Copenhagen in the summer of 2008, the position of the arch is subject here to an even greater rotation that brings it to an inclination of even 45°. This Arch, characterized by a strongly lowered profile, is linked to a curvilinear deck suspended by means of equally oblique truss. A cold night lighting complete this image full of tension.

139| One of the last construction by the engineer Massimo Majowiecki is also based on the dynamism of the diagonal. Similar to a swan that extends on the water, Canonica Footbridge (2009) crosses Rhine river in correspondence of the town of Casalecchio di Reno in Italy with an approximately 75 metre central span. Its profile is made up by a cable stayed structure with a single asymmetrical pylon, and with a Y-shaped pedestrian entrance. The inclination of the pylon, strongly inclined forward, produces a strong perceptive tension that it is reflected in the system of cables that support it. The visual impression is that the latter, in the act of extending above the river, suffers a sudden arrest because of a bundle of cables that impedes its movement from behind.

140| Deformation of surfaces and obliquity of lines finally reach a perfect harmony in Knokke Footbridge, built in Belgium and inaugurated in 2007 by Ney & Partners. This

139. Canonica Footbridge, Massimo Majowiecki, Casalecchio di Reno (IT), 2009

140. Knokke Footbridge, Ney&Partners, Belgium, 2007

is a hybrid bridge, both cable stayed and suspended, characterized by an extraordinary aesthetic. As the initial design sketches show, the basic idea was to imprint in the form the diagram of the moment of bending of a three-span beam by means of a steel sheet, specially shaped, 12 mm thick. Similar to a membrane, the skeleton of the footbridge behaves like a fabric whose weave is stretched and deformed thanks to Y-shaped masts that support its mass determining the final configuration. The straight and oblique lines of support are opposed to the harmonics forms of the membrane. The expressive intensity derived from the opposition of these elements is then accentuated by the use of the white colour that dissolves the structure making the game of tensions readable. As Arnheim would say, this powerful expressive quality is full of "*spontaneous symbolism*" [50]. In order to be seen as expressive, «*the shape of an object must be seen as dynamic. There is nothing expressive, and therefore nothing symbolic, in a series of stair-steps or in a staircase, as long as it is seen as a mere geometric configuration. Only when one perceives the gradual rising of the steps from the ground as a dynamic crescendo, the configuration shows an expressive quality, which carries a self-evident symbolism*»[51].

Considering again the principles of the doctrine of Lips, these works give life to *Einfühlung*, i.e. to the projection act through which a subject, through the imitation of the physiological behaviours of another, recreates in himself the feelings that had caused those behaviours in the other. In aesthetics, this happens when an object is being visually perceived as if its behaviours were those of human emotional states. This creates a kind of transposition of the sensory data into the art work so that they are made vital by the feeling. Thus, it becomes impossible to describe the dynamic quality of a form without evoking their spontaneous symbolism at the same time; «*the matter is that the form is not just the physical facilitation of the function; it rather translates the functions of an object in the language of perceptive expression. This mechanism introduces the living presence of man in the form*»[52].

141 | Let's observe for example Dreiländerbrücke designed by Dietmar Feichtinger. Inaugurated in 2007, this bridge symbolizes the idea of creating a link between two nations on the Franco-German border near Switzerland. The wish to join with a unique gesture the two countries is impressed in the thin and nervous form of its double arch. As a cut when everything is calm, the disposition and the configuration of its elements (for example, the arrow of the arch was reduced to the minimum as well as the section of the structure to

50 Rudolf Arnheim, *La dinamica della forma architettonica*, Feltrinelli, Milan, 1981, p 290
51 *ibid.,* p 290
52 *ibid.,* p 290

141. Dreiländerbrücke, Dietmar Feichtinger, Weil an Rhein, 2007

142. Forthside Footbridge, Wilkinson&Eyre, Stirling (UK), 2004

obtain the maximum transparency) fully comply with the requirements of physical statics, but also reflect the game of the forces in a visual pattern that interprets the dynamic theme for the eyes of the observer.

142| Forthside Footbridge is also characterised by high expressive quality, a recent work designed by Wilkinson & Eyre and finished in April 2004 in the ancient Scottish City of Stirling. This structure is now one of the main pedestrian links between the constrained urban centre and the new development area on the banks of the River Forth, across the main railway line. The City of Stirling, ancient capital of Scotland, is placed in the geographical, historical and emotional centre of the nation. The skyline is dominated by the 15th century Stirling Castle and the famous Wallace Monument, an imposing Victorian Gothic tower that stands out among other spires and pinnacles of the city and of the surrounding landscape. In specific terms, the competition required the building of a footbridge that should refer to a contemporary style of high quality and make a lasting contribution to Starling's architectural and cultural heritage: in particular, the competition aimed at promoting the development of the site with a construction that could enhance the presence of the river and symbolize the regeneration of Stirling.

The bridge by Wilkinson & Eyre adopts an extremely unusual structure. According to the principle of an inverted "fink" truss, it detaches itself from the original concept so as to be completely unique. Two tapered and inclined truss planes are arranged to create a twisting form: i.e. they turn on their axis creating a geometry that traces an imaginary line across the bridge that differs from its real axis for strategic planning and contextual reasons. The distinctive feature of the bridge is therefore given by this couple of truss that rise up at the two sides of the deck and are made up by a sequence of steel masts with cable cross bracing. Their form derives from "Fink truss", named after the German Architect and Civil Engineer Albert Fink, who developed the type commonly adopted on the 19th century American railroad bridges. At Forthside, the truss is "inverted" to suspend the deck, which is a contemporary but uncommon use of the system. Traditionally, a fink truss is symmetrical but in this case the trusses are asymmetric and increasingly change across their length in a manner that sufficiently distances the structure from its generic root, to be entirely unique. An interlocking originates from their overlapping, which looks like a "handshake". Those who cross the bridge will feel as if they were gradually 'released' by one side and 'received' by the other, an experience that is also emphasized by the feeling of progressively sliding along its length, both visually and spatially.

2.5.6. Iconemi and permanencies

According to Eugenio Turri, between *territory* and *landscape* there is a substantial difference. While the first refers to human anthropological space, i.e. the result of the physical work of more individuals, the second is its subjective projection worked out «*on the basis of our feeling, suffering, remembering and planning*»[53].

This vision, which is based in fact on a clear distinction between making and perceiving, defines the landscape as a «*product of looking, following the action time*», or as an essential tool so that man can understand whether his actions are going in the wanted direction, and not otherwise: «*looking at and admiring the effect of his own actions man becomes aware of himself, of his place in nature, of his misery and greatness*»[54]. If in the territory man turns into the actor, in the landscape he becomes so spectator of his own actions: from the observation of the latter, he will get that whole of images, lights, sounds and smells that will shape a physical representation of the environment in which he lives.

In order to produce a realistic representation, the visual investigation of the landscape should be exhaustive and not limited to a superficial perception of reality, inadequate to enter that spirit that makes each landscape unique. To gather the real soul of a place, without dealing only with its outer look, it is required to search for the *Genius Loci* that identifies it. That means we have to find those «*elements that rule the whole and that set themselves up as pars costruens of that landscape, i.e. as elements that give it character*»[55]. Turri defines these parts that help us to enter the context or soul of a landscape as *iconemi*, «*i.e. the elementary parts of the landscape, which are like words of a speech or pieces of a music inserted in the whole, forming the overall image of a country*»[56]. Like an image, *iconemi* offer information on the structuring of the territory, its functional contents and the ways the local society has organized its living space. They are similar to many photographs that if put together give form to the landscape and to its history. The *iconemi* can therefore allow to achieve a deep reading of the landscape, when *reading* means to give meanings to *icomeni*, metaphorically qualified as parts of a

53 Eugenio Turri, *Il paesaggio degli uomini: la natura, la cultura, la storia,* Zanichelli, Bologna, 2003, p 23

54 *ibid*, p 23

55 *ibid*, p 23

56 *ibid*, p 23 *Iconema* is a term coined by Turri and is the crucial element of his way of reading the complexity of the landscape. *Iconemi* are the «basic units of perception that, combined with the others, form the global image of a town. The landscape is the summation synthesis of several units, of several *iconemi*, elements full of peculiar, artistic, historical etc. meanings».

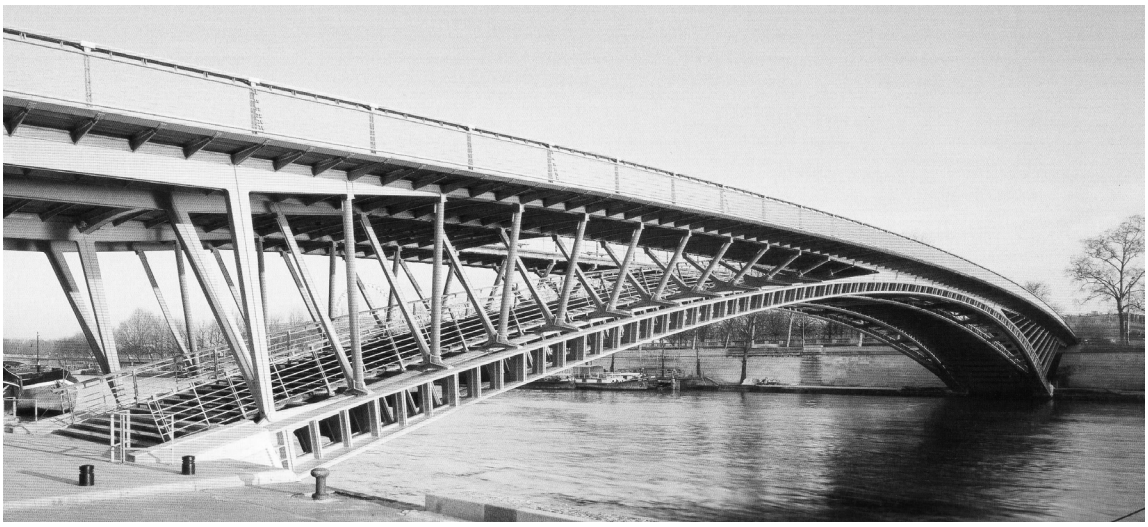
speech or, from a semiological point of view, as signifiers of a sign system. The landscape is indeed an organization of signifiers, a set of interconnected signs that correspond to the concrete links on the territory: «*The landscape is just a glance or a set of glances that refer to the territory, to the concreteness of territorial facts*»[57].

Returning the matter to the design sphere, thanks to an analysis carried out through a reading of *iconemi* we are able to intervene in a given territory preserving not only its historical pre-existence (monuments), but also that *Genius* that makes it unique. In specific terms, this approach deals with the problem starting from the *visual investigation* of those social, cultural, architectural, language and custom features that determine the identity and character of each environment, as well as of the Community that lives in it, to translate them into contemporary forms able to improve and fix them both in the present and in the future. From this point of view, Solferino Bridge, a work by Marc Mimram inaugurated along Seine river in 1999 is particularly emblematic.

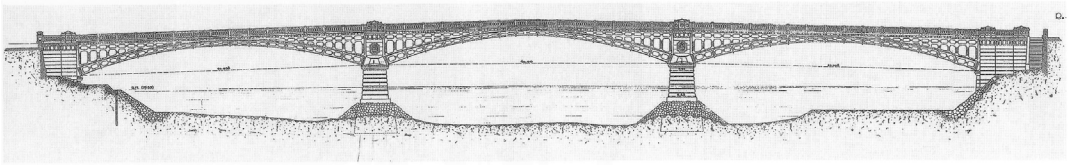
The history of this project dates back to the ancient Ponte Solferino, a cast-iron structure with three spans realized in 1859 during the empire of Napoleon III. Built by the engineers Paul-Martin Gallocher de Lagalisserie and Jules Savarin, who also created the Pont des Invalides, it was named like that after the French victory in the Solferino battle. In the course of its life, however, its piers were often subject to collision by barges sailing along the river that led to a gradual weakening of the work and to its demolition in 1961. In its place a temporary footbridge was then built, made up by quite unpleasing metal beams, which remained opened until 1992 when the notice for the reconstruction of the ancient and important link between the Museum d'Orsay and the Tuileries Gardens was published. Inaugurated in 2000, the winning project realizes a crosswalk of Seine river recreating that visual and spatial continuity that was typical of Paris urban paths in the late 19th century. Mimram achieves this aim designing a metallic structure made of lowered parabolic arches that in correspondence of their ends undergoes a kind of "structural splitting". This effect is obtained by means of a bridge made up by two major elements joined in the middle, which turn gradually away from each other approaching the shores of the river. More specifically, a first lowered arch links the two banks of Seine river to the street level overcoming a 140 metre long span, while the second one, supporting the first, joins the lower quay of the left bank with the underground passage on the Rive Droite allowing a direct access to Louvre gardens.

In addition to these evident urban opportunities, this system offers interesting benefits even from a static point of view, despite the strongly lowered profile of the two

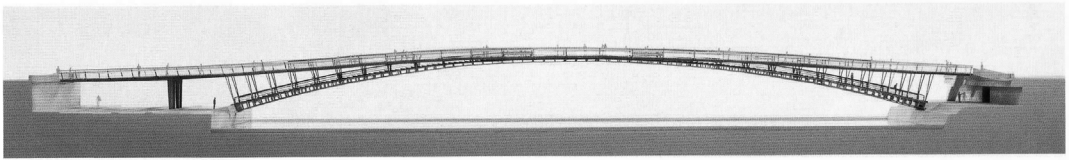
57 *ibid,* p 23



143. Solferino Bridge, Marc Mimram, Paris, 1999



144. Pont de Solférino, Paul-Martin Gallocher de Lagalisserie and Jules Savarin, 1859



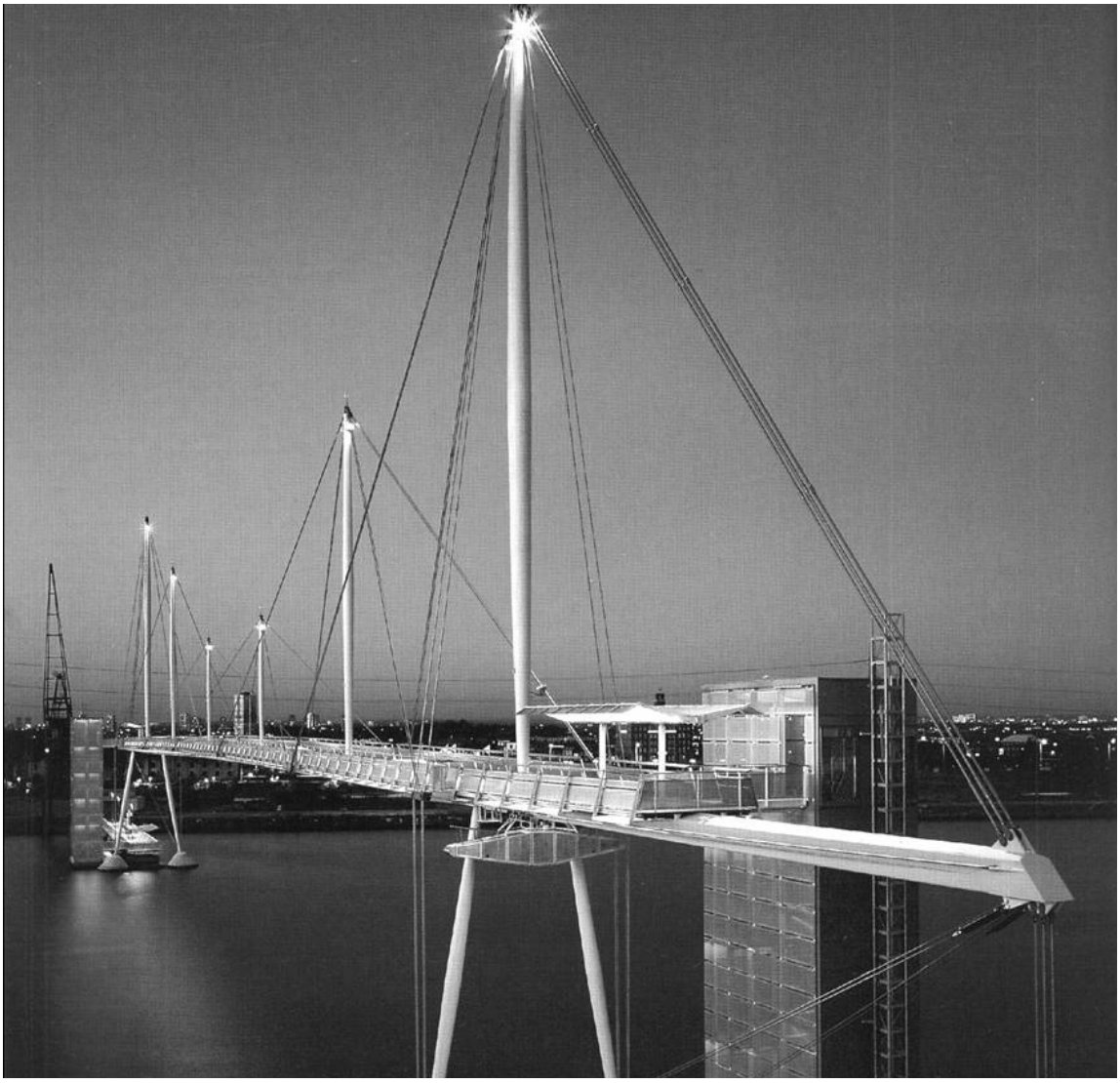
145. Solferino Bridge, Marc Mimram, 1999

parabolic arches. This latter aspect usually involves obvious problems in terms of stability of the building, problems that in this case were resolved just thanks to the structural splitting of the bridge: the two arches work as two large Vierendeel beams, hinged at the edge, which, apart from making the system more resistant, give the bridge a marked degree of transparency, allowing so the passage inside it. Like a kind of promenade on the Seine, the latter rises from the quays below to join a superior platform placed in the middle of the river from which you can enjoy the view of Paris.

As Mimram recalls, mindful of the historical tradition of the bridges of Seine river, this project aims at maintaining a formal coherence with the past, turning however the classical structure of arch bridge to an innovative system of double arch[58]. With Solferino Bridge, he realizes so a bridge between tradition and modernity, both in structural terms and from an architectural point of view. In addition to this, the design of every single metallic element refers, in a contemporary language, to the typical forms of Liberty style, admirably expressed by the near d'Orsay Museum. The *iconema* of a long engineering tradition is therefore associated to the image of a cultural period that defined the contours and the social life of the city of Paris. The type of deck surfacing used, as well as the choice of the benches and the particular design of the parapet unconsciously recall the comfort of the 19th century Parisian salons, while the internal promenade refers to the urban atmosphere of Haussmann's time.

146| From the same perspective, Royal Victoria Dock Bridge of Lifschutz Davidson Sandilands, inaugurated in London in 1998, is the subjective projection of the deck of a sailing boat: from its wooden floor, a sequence of mainmasts rises in support of "invisible"

58 Francoise Fromonot, *Marm Mimram. Passerelle Solferino*, Birkhaeuser, Basel, 2001



146. Royal Victoria Dock Bridge, Lifschtuz Davidson Sandilands, London, 1998

147. Royal Victoria Dock Bridge, Lifschtuz Davidson Sandilands, London, 1998

sails, whose seams along the margins (i.e. the wire ropes) are the only visible elements. Parts of white steel hull emerge here and there from the floor, which offer unusual seats but actually recall the typical images of the naval architecture. The whole belongs to the area of the Docklands, the term that indicates today the historic port of London, once considered one of the biggest in the world.

2.5.6.1. Functional adaptation of existing bridges

In this context, we can also find the topic of the functional adaptation of existing bridges and viaducts, which offers the opportunity to investigate new exploratory and research factors. This branch of research includes a fundamental part of the planning and research activity and that has been carried out by now for almost twenty years by Prof. Enzo Siviero.

Italy has a very long tradition as regards bridges. Considering the particular urban development of our territory, the many roads and canals that run through it have always played a fundamental role in the civilization of this country. For this reason, our system of spatial connections has today such a complex structure, especially because of the continuous economic, social and urban planning variability of that myriad of small urban centres that makes necessary a constant adaptation of existing infrastructures to ever-changing requirements. Today, for example, new vehicles and new security requirements for users have to coexist with works designed to meet obsolete functional needs.

According to these premises, functional adaptation currently represents a theme of strong interest that involves a great responsibility for the designer that will be called to face

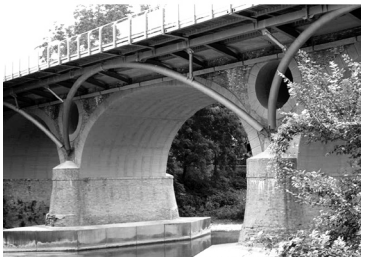
the pre-existing context, especially when the latter is ancient. One of the more relevant aspects of the design procedure is the relationship that the "new" work has to establish with the "old" one. In these cases it is desirable that the designer, with an attitude similar to that of a restorer, investigates the comparison with existing work giving it the historical validity that actually makes it an important witness "document". Being then the bridge structure also "naked", he won't avoid in any way producing a bearing system that is first of all wise, as well as good and beautiful. To this end, according to a coherent approach with the restoration tradition, the interventions of functional adaptation should always start from the knowledge of the assumptions that have generated the original artefact. By contrast, the case of interventions on recent works could be different, especially on those characterized by a poor architectural quality as a result of design attitudes that prefer standardization and prefabrication rather than searching for a sensible relationship with the landscape. In such situations, almost certainly, the intervention of adaptation will take the connotation of visual filter, of work of camouflage. On the contrary, with a diametrically opposite attitude, the intervention on ancient works will involve a series of reflections that focus on the question of the maintenance of the existing context. For example, in those cases where additions are required, these should be always distinguishable from the original, while the old part will continue to remain visible. Vice versa, there could be the risk of replacing the image of the old bridge with something different, consequently changing the landscape setting and its cultural dimension[59].

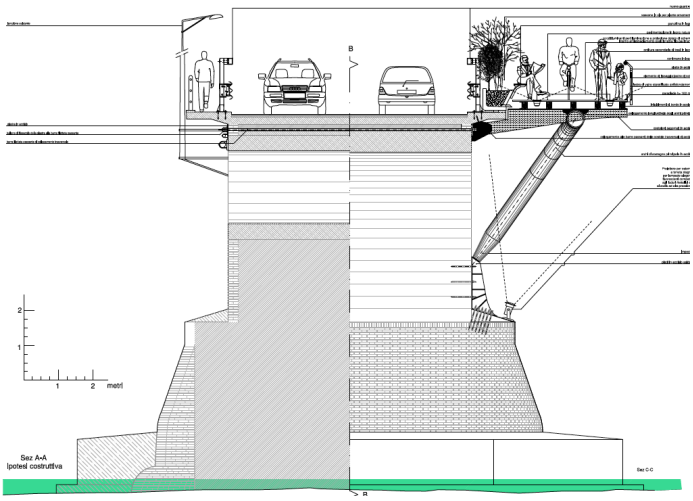
In this sense, Borgo Tossignano Footbridge (2005) proposes an example of functional adaptation of a historical road bridge of 1945 through the building of a new cycle-pedestrian structure designed alongside it. Inserted within a large regional planning characterized by a multitude of small towns, spread on the plain and hilly land, the old bridge, built on the banks of Salterno River, is today a crucial point in the provincial and regional links, as well as for the local links in the town. Consequently, given the heavy vehicle and cycle-pedestrian traffic, the previous structure was inadequate both in static-functional and road safety terms, as the current physical limitations of the construction could not guarantee the safety of any of the users. Therefore, in order to solve this problem, a cycle-pedestrian bridge, supported by the existing bridge, was designed to remove that sort of traffic from the main bridge where it was dangerously exposed to the intersection of the vehicles.

Furthermore, considering the historic and architectural value of the original

59 Michele Culatti, *L'adeguamento funzionale di ponti e viadotti*, Strade&Autostrade, n°1 – 2006, pp 161-176

148. Borgo Tossignano Footbridge, Progeest, Borgo Tossignano (IT), 2005





149. Borgo Tossignano Footbridge, Progeest, Borgo Tossignano (IT), 2005

construction, it was decided to implement a planning solution that respected the old bridge and enhanced the architectural, environmental and landscape features that distinguish the bridge. By changing some of the original transversal geometries to adapt them to the current vehicle and cycle-pedestrian traffic, the project actually restores value to the historic construction in its natural context through a static awareness and a discreet work that guarantees the necessary upgrading without damaging the original image of the bridge, which is impressed in local people's historical memories.

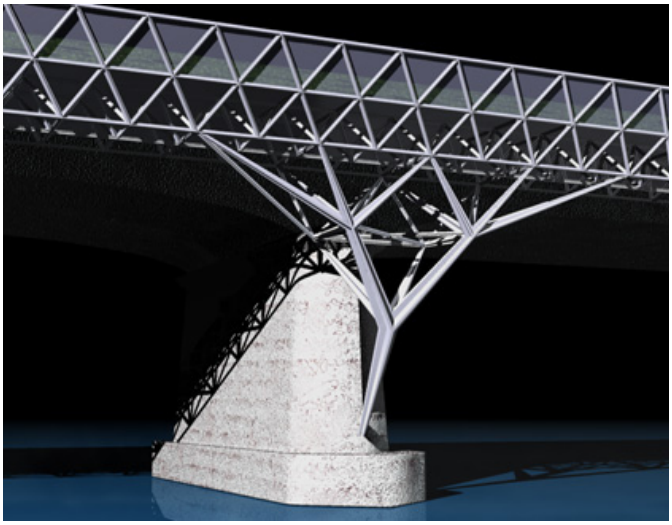
In this sense, a consecutive arch steel structure recalls the appearance of the original view, hinging to the previous brick walls and supporting a wood walkway that acts as the cycle-pedestrian track alongside the pre-existing bridge.

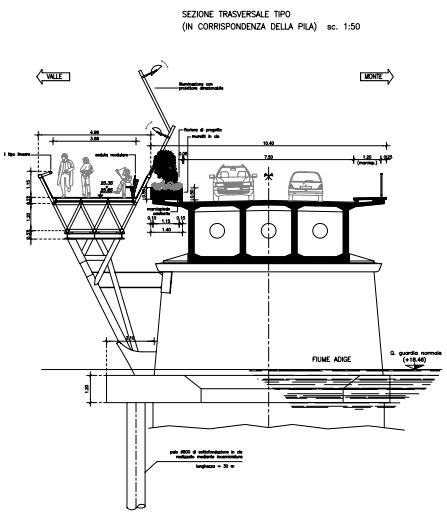
150|

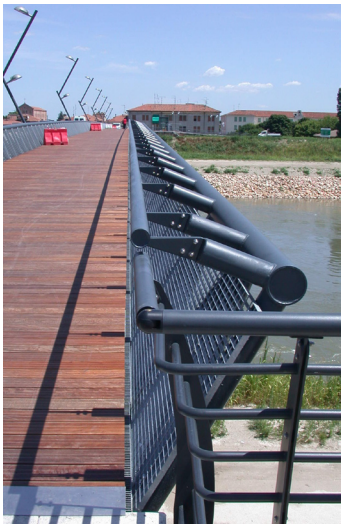
Also in the cycle-pedestrian bridge alongside Principe Umberto Bridge, the design process was characterized by a careful analysis of the reference location, both at a historical and urban level.

The settlement of Legnago, developed on the banks of Adige river, has very ancient origins documented by the discovery, at the beginning of the 1900, of remains of pile-dwellers settlements, as well as of Longobards and medieval objects. In this context, the intervention aimed at creating a pedestrian connection between the urban centre of the town and Porto (a district on the opposite side of the river) in order to improve the accessibility to the shopping areas of the latter, made problematic by the width of the existing bridge. This infrastructure also serves one of the main local traffic routes, an aspect that made its functional inadequacy even more evident with respect to the current traffic volumes and the safety conditions for cyclists and pedestrians.

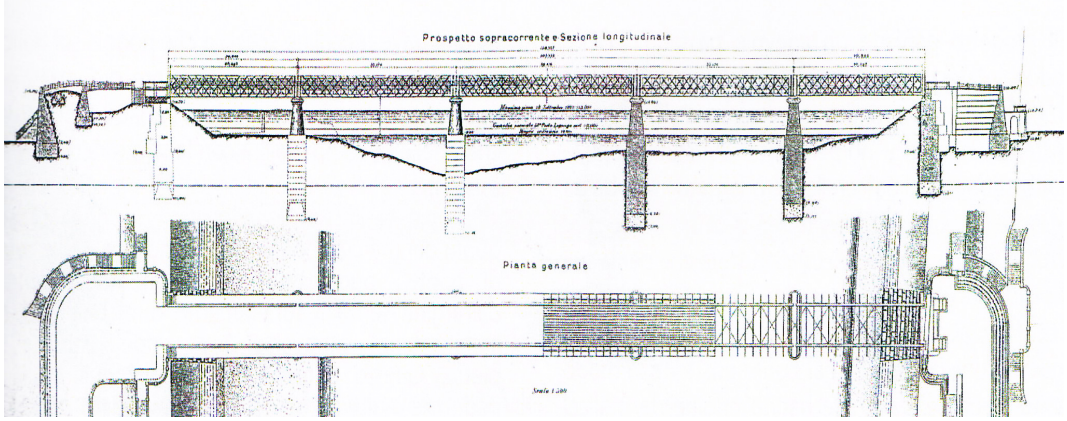
From a historical point of view, the existing bridge dates back to 1946. It is a normal box girder structure in reinforced concrete, which was built in replacement of a nineteenth-century bridge destroyed during the second world war and made up by a harmonious composition of longitudinal elements of steel (deck), wisely assembled, and vertical elements (piers), of local stone and brick. The historic project was therefore regulated by the association of these two materials, which has allowed in the new project to resume the use of steel with maximum freedom of thought and functional flexibility. A new and elegant reticular metallic structure, which recalls the original project, was so built alongside the existing bridge for its entire length by means of a separate cycle-pedestrian path, 4 metres wide. Pylons that recall the characteristic shrubs form originate from the piers. These branch off upwards to support a spatial reticular beam that creates the support to a walking surface and, at the same time, the lateral parapets. Placed then at the level of the route on the banks, the new bridge can be easily reached through two ramps paved with stone, or using two panoramic lifts on both sides of the river, which depart from







150. “Principe Uberto” Footbridge, Progeest, Legnago (IT), 2004



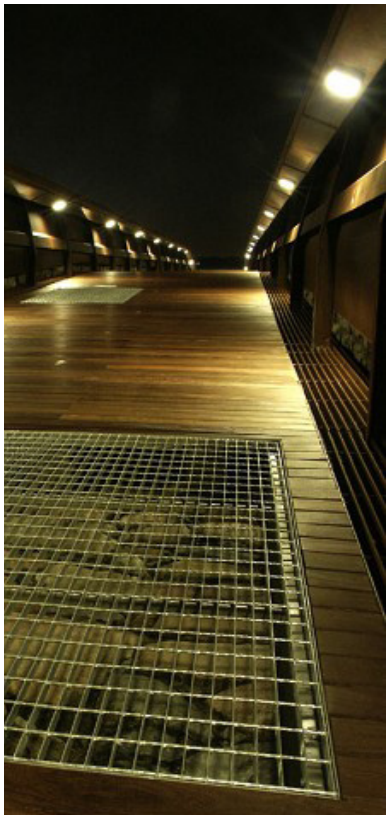
151. The Ancient "Principe Umberto" Bridge

the road, i.e. about 9 metres lower than the height of the bridge. As for the latter, the geometric morphology that concerns in specific terms the tower lift towards Legnago, has been designed on the ancient "castrum" track. As a matter of fact, what is particularly evident is the "cut" made on the embankment body by two brick walls that contain the bright tower lift of steel and glass.

This work was also given an award in 2005 on the occasion of the "Urbanistica e pianificazione territoriale Luigi Piccinato" (urban design and planning Luigi Piccinato) prize promoted by Veneto region.

Integration between what is new and what is old finally finds a valid expression
152| also in the project of reconstruction of Pont Trencat, completed in 2004 by the engineer Xavier Font Solà.

Belonging to Roman epoch, the original bridge was part of the ancient Via Augusta. In 1811, however, during the Napoleonic wars, its main arch was destroyed and never repaired for nearly two centuries until 1996, when the inhabitants of the two neighbouring villages, Sant Celoni and Santa Maria de Palautordera, decided to restructure it. From here, the design process was characterized by two distinct steps: the first, aimed at a cognitive analysis of the original work, the second, instead, at the choice of the kind of relationships that the new part would establish with the ancient one. Therefore, according to the ideas expressed in the past by some famous restoration theorists, such as the Austrian Alois Riegel and the Italian Camillo Boito, its designer decided to rebuild the missing part creating a modern structure that formally highlighted the distinction between the "old" and the "new". The contrast between the two parts was thus obtained by means of a steel box girder structure that develops on two spans and is centrally supported by a 24 metre long metal span arch. Instead of a mimetic reproduction, he therefore opted for a work that



152. Pont Trencat, Xavier Font Solà, Barcelona, 2004

underlined the main events of the history of the original bridge. The designer took then the noteworthy decision to harmonize the two parts by extending the new deck on the entire length of the bridge and highlighting, in correspondence of the pre-existing work, the old path through some openings made on the new flooring.

2.6. Unconscious Perception

In the phenomenology of artistic techniques, the architecture is traditionally defined as the *art of space*. This means we are in presence of an architecture or, better still, in presence of a "unit of architecture" [60], only when we see a space: this latter shouldn't be however whatever space, but an "internal" space.

As Carlo De Carli explains too, one architectural space becomes such when it is not indefinite: a space «*is given by its margins, its (peripheral) elements of edge and of (internal) polarization, namely its stones and its equipment (the building and the natural margins that delimit an urban space or a room, the equipment given by the plant installation and objects of use)*»[61]. Materials represent therefore the physical means of architecture and as such have their own spatiality that deprives the space and fills that "emptiness" in which man's life can exist and circulate. In architecture, therefore, there isn't any space without physically defined margins.

However, that doesn't mean space is something "closed". As Gianni Ottolini underlines, «*it may be physically open, in various directions, for example towards the sky*»[62], such as the urban interiors whose margins are evident: «*the raw material, and the origin of architecture, is not [therefore] the column, or any other constructive element that occupies the space, but a limited-open one that originally, after the mother's womb, could have been a natural cave, [as well as] a suitable clearing for human settlement*»[63]. *An architectural space is so «a practicable space, practicable by foot (and with the mind) and not only through the ocular vision: it is dimensioned in order to receive man's body, his actions (practical and ritual), his things*»[64].

In view of that, even the footbridge, in its contemporary meaning, can be legitimately

60 The idea of «unit of architecture» is suggested by Carlo de Carli, *Architettura spazio primario*, Hoepli, Milan, 1983, p 364

61 Gianni Ottolini, *Il linguaggio delle pietre*, in *Metafora, mimesi, morfogenesi, progetto: un dialogo tra filosofi e architetti*, edited by E. D'Alfonso ed E. Franzini, Guerini studio, Milan, 1991, pp 110-111

62 *ibid.*, p 111

63 *ibid.*, p 112

64 *ibid.*, p 112

considered today an example of architecture on an urban scale. As shown by the examples mentioned so far, it has those particular characteristics that allow it to create an open space within the city, but at the same time limited by its own material.

Such identification, however, implies a vision of the bridge that goes beyond the simplistic idea of crossing, making it, by contrast, a space whose being liveable becomes its raison d'être. With reference to the project, the designer shouldn't restrict himself to a merely visual and external analysis of the work, but he should deeply investigate its internal space, through the senses such as touch, hearing and smell. Considering our physical and bodily perception as an instrument of investigation creates the necessary conditions to turn a bridge from a "crossing structure" into a "space to live", that is, the expression of man's living space. Through our body we mould the architecture, which becomes the connection between us and the territory, and consequently the physical representation of the relationships that shape the landscape. Moulding the interior space of a bridge on the basis of our senses give the latter a deep meaning, which lies in its being a metaphor of that empirical space (i.e. the Landscape) through which man searches for the representation of the self in his relating to the territory. «*At any moment –David the Breton explains –through his body, the individual interprets the surrounding environment. […] Sensation is immediately immersed in perception. Between sensation and perception there is the cognitive faculty, to remind you that man is not a biological body but a creature of sense. Seeing, hearing, tasting, touching or feeling the world means to think of it always through the prism of a sensory organ*»[65].

So, what results from that is a completely new design attention to the quality of the material used in the flooring, to the form of the benches, to the design of the parapet, as well as to the type of lighting, from the perspective that the more the choice of materials and the conformation of the space will be able to stimulate our "unconscious" perception, the more our desire to live that place will be perceived as such, and the more the bridge will be considered as an integral part of its landscape and not a mere element inserted in it.

Together with the sight, one of the privileged senses in architecture is certainly the touch. As Juhanny Pallasmaa remembers, «*The sight reveals to us what the touch already knows. We might think of the sense of touch as the subconscious of the sight. Our eyes caress distant surfaces, contours, corners and the unconscious sensation of touch determines the pleasure or discomfort of the experience. These feelings have been used well by Frank Lloyd Wright in Fallingwater House. The dynamic meeting with this work interwoven the*

65 David Le Breton, *Il sapore del mondo*, Raffaello Cortina Editore, Milano, 2007, p 5

surrounding forests, the volumes, the surfaces, the texture and the colours of the house, and even the smells of the forest and the sounds of the river, in an unrepeatable experience of fullness. This is a physically and spiritually present work and the visual frontality of its architectural design gets lost in the real experience of architecture»[66].

Another important sense is hearing. According to Pallasmaa, it organizes and divides the experience and understanding of the space; while the sight is directional, the sound is omnidirectional: «*The sense of sight implies externals, while the sound creates an inner experience. I look at an object, but it is its sound that comes close to me; the eye reaches, while the ear receives*»[67].

In this regard, Pallasmaa makes some good examples. When a film is deprived of the soundtrack, the scene irremediably loses plasticity, sense of continuity and life. That's why the silent films needed to offset the lack of sound loading the gestures in a demo mode. At the same way, the acoustic hardness of an uninhabited and empty house contrasts with the welcoming sounds of a lived one. Here the sound is refracted and muffled by the many surfaces of the present objects. Finally, the echo of the steps on a paved street has an emotional influence because the sound that reverberates from the surrounding walls makes us directly interact with the space.

Returning to the theme of pedestrian bridges, we can therefore understand how these senses, although traditionally little-regarded at a project level, may actually «*help to enrich our experience and our understanding of the world*»[68].

153| Let's consider, for example, Castleford Bridge by McDowell+Benedetti. The "interiors" of this structure are characterized by a massive use of wood, a material usually used to create welcoming, comfortable and pleasant spaces. Also the presence of comfortable benches, as well as the close attention paid to the design of the metal parts, carefully integrated into the overall design of the work, contribute to further enhance this feeling that makes you want to relax, stop and contemplate. The image that emerges is that of a liveable and familiar place that catch the attention especially for its built-in sense of home. This footbridge acquires therefore, in the mind of those who cross it, an intimate value that produces, at a sensory level, an enlarged perception of the environment: man feels here an integral part of a space whose physical essence gives him back the value of an existential experience. This result is especially given by the quality of the wood used and the way it was employed and modeled. Its particular porosity and the delicacy of its

66 Juhani Pallasmaa, *Gli occhi della pelle. L'architettura e i sensi*, Jaka Book, Milano 2007, p 63
67 *ibid.*, p 65
68 *ibid.*, p 67

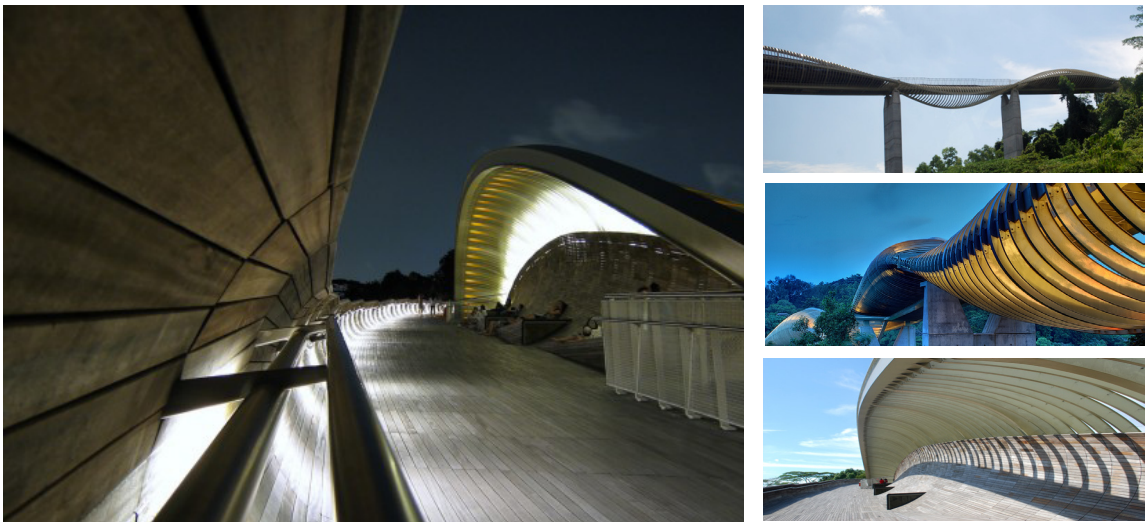
153. Castleford Bridge, McDowell+Benedetti, Castleford (UK), 2008

forms encourage dialogue and contacts with the other, induce you to feel the handrail under your hands and to slow down to pay new attention to the surrounding landscape. This makes the resulting tactile experience vivid and real. At the same way, also the sense of hearing finds significant stimulation. If the sound produced by the heel of a shoe on a surface as dense and compact as marble tends to be sharp and harsh, a porous floor produces more subtle vibrations instead, and therefore more similar to those perceived in a furnished room. Taking these issues into account has allowed to give the bridge a more human dimension, i.e. close to man's scale and to his sensory world.

154| A similar example in that sense is also the Henderson Waves inside the natural park Telok Blangah, completed in 2008 by the architects IJP and the RSP practice of Singapore. This particular pedestrian bridge allows to enjoy the wonders of the natural landscape through an unconventional walkway. With a length of 250 metres, the bridge is suspended at a height of 36 metres, where the visitors of the Park can overlook the forests of Mangrove, Sugei river and physically cross the huge forest of trees using an eco-friendly structure. The feeling we can perceive when crossing it is a pleasant sense of alienation produced both by the high altitude of the path and by the particular conformation of its internal space. With its wavy form and covering, this elegant organic, iconic and sculptural architecture creates a fluid space that through the wood and the steel wraps the visitor up stimulating his senses both visually and physically. The seats themselves, organically integrated into the structure, extend man's tactile perception to all the body. He consequently obtains a completely new understanding of the landscape he crosses.

155| The tactile perception also finds particular stimulation in the work of Jörg Schlaich in Bad Homburg von der Höhe (2002). Within a marble flooring a mast is placed whose plastic conformation is strongly exalted by the use of a material, the rough stone, which gives the object the typical materiality and presence of Greek architecture. As a sculpture in the round, the mast is the fulcrum of the perceptive experience of this bridge: its presence induces to stop unexpectedly during the journey for the unconscious desire to feel its rough surface.

156| In the project of Dreiländerbrücke by Feichtinger, the leading role is taken by the surface in honed and polished concrete that characterizes the deck floor. Unlike rough concrete, this kind of surface finish makes the material soft to the touch and to the sight. From a certain point of view, it arouses a feeling similar to that of the porous wood: we are therefore encouraged to stop to touch the surface and admire its smoothness. This particular attention to the material has so allowed to make the symbolic experience of the union between Germany and France more intense and meaningful. Despite its pre-eminent longitudinal extent, the pedestrian path presents a nobility worthy of the purposes and an



154. Henderson Waves, IJP&RSP, Singapore, 2008

155. Marble footbridge, Jorg Schlaich, Bad Homburg von der Höhe (DE), 2002

156. Dreiländerbrücke, Dietmar Feichtinger, Weil an Rhein, 2007

internal spatial dimension (typical of the particular texture of the floor) that turn this work into a sort of boulevard suspended above the water: perceptively, as if the section of the deck were bigger as the real one and presented those spaces needed to host every kind of events.

The materials normally used for the flooring of a bridge include then the asphalt. If on one hand it facilitates the crossing by bicycle, on the other hand its grained surface reminds the pedestrian of the image of a path that, rising from the height of the street,
157| realizes its natural extension above the river. This is the case of Herrenkrugsteg in Magdeburg which, thanks to this material, acquires the value of a walk across the river Elba, marked by slow movements and brief moments of rest and contemplation. In this case, therefore, the work becomes the materialization of the famous definition given by Leonardo Fernandez Troyano, who identifies the bridge as "Tierra sobre el agua".
158| Such perceptive experiences are also typical of the footbridge on the river Neckar by Jörg Schlaich (1988), also reinforced by the particular system of parapets (a wire fence attached to the oblique cables of the bridge) which enhances the idea of a path suspended in the vegetation, i.e. of the architecture of the original bridges made with lianas.

The following examples privilege the sensory experience of sight instead. Unlike the previous examples, works as Campo Volantin Footbridge or Millennium Bridge are mainly designed according to their visibility from the outside and to a use aimed at a view on the outside. For this purpose, the materials used are glass, steel and aluminum, which make these bridges *objects to be observed* from the quays and *points of observation* from which to admire the landscape.

The brightness and the lack of roughness that characterize these materials subordinates the tactile experience to the aesthetic and visual experience. Cold and distant from human sensory dimension, they generally produce angular and intangible architectures. The glass, in particular, offers sensory experiences that especially involve the sight, but its more or less pronounced transparency "dissolves" the surface to the extent of interposing no visual obstacles between the observer and the object of his observation. It
159| takes just one look at Campo Volantin Footbridge by Calatrava to understand this dynamic. Inaugurated in Bilbao in 1997, this bridge is part of that strategy of urban regeneration that finds in the ephemeral architecture of Guggenheim Museum of Gehry its most emblematic representation. According to the same logic, Calatrava realizes a thin parabolic arch from which, through a spectacular composition of cables, a deck covered with semi-transparent glass plates is suspended. Similar to ice, this material turn the footbridge into a place to admire visually, a sort of image that impresses more for the dynamic of its vibrant structure than for its being a dense and pregnant figure. White as the majority of the

157. Herrenkrugsteg, PPL, Magdeburg (DE), 1999

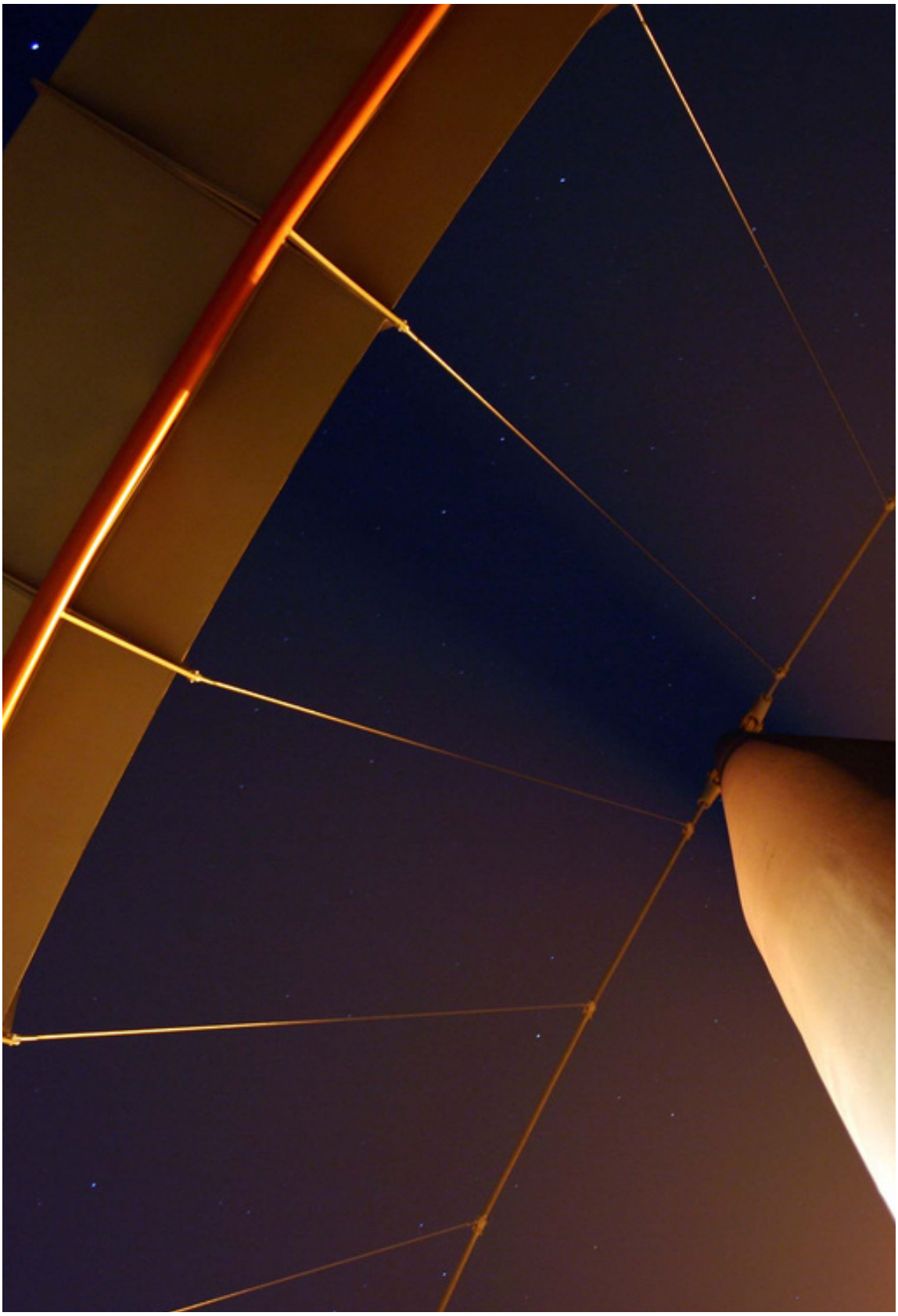
158. Footbridge on the River Neckar, Jorg Schlaich, Stuttgart, 1988

159. Campo Volantine Footbridge, Sabtiago Calatrava, Bilbao, 1997

160. Millennium Bridge, Norman Foster, London, 2001

Spanish architect's works, by day and by night, this bridge becomes tangible expression of an immaterial architecture, made to be observed and not lived. Even walking on it produces sounds that recall such images, especially when in case of frost it gets hard to cross it.

160| Finally, the same dynamic can be also found in Millennium Bridge by Norman Foster in London. This bridge originates from the combination of steel (for the bearing structure) and aluminum (used on the floor and the handrails). Both to the touch and to the hearing, these materials offer mainly aseptic sensations and distant from human warmth, which make this bridge a model of technological and objective architecture, conceived to be observed from the banks of the River Thames and to admire its audacious structural functioning.



161. Sassnitz Bridge, Schlaich Bergermann und Partner, Sassnitz, 2007

The footbridge
in its revisited meaning

3.1. The semantics of the bridge: part 1

According to Umberto Eco, «*If semiology is not only the science of the systems of signs recognized as such, but the science that studies all culture phenomena as if they were systems of signs – based upon the assumption that all culture phenomena are effectively systems of signs, namely that culture is essentially communication – one of the fields in which semiology is more challenged […] is that of architecture*»[1], because architectural objects do not apparently communicate, but they effectively *function*. Asserting that an architectural work functions means to underline how it, through its configuration, is able to communicate a certain function to carry out[2]. The instrument that makes possible this communication is the type (model or structure) which is something that do not actually exist, but which refers to a certain context of phenomena. Man knows that this model may take various appearances, but they would always be a single application of an abstract model, recognized as such because already encoded by a certain society on the basis of a system of acquired expectations and habits[3]. The vision of the single application will therefore communicate its possible function to man, even if it won't be carried out.

1 Umberto Eco, *La struttura assente*, Bompiani, Milan, 1968, p 191

2 In that sense, Umberto Eco adds: «Using a spoon to bring food to the mouth is still the fulfilment of a function through the use of a product that allows and promotes it: but still saying that the product "promotes" the function means that the product fulfils a communicative function too, it *communicates* the function to fulfil […]. The spoon promotes a certain way of eating and means that way of eating, while the cave promotes the act of shelter and notifies the existence of a possible function; both objects will communicate even though they are not used», *La struttura assente*, Bompiani, Milan, 1968, p 194. In the same way, Giovanni Klaus Koenig adds: «The architecture is composed of signs that promote behaviours, [thereby] the architectural object […] is only and definitely a stimulating object», *Analisi del linguaggio architettonico*, Libreria Ed. Fiorentina, Florence, 1964

3 Roland Barthes, *Elementi di semiologia*, Ed. Einaudi, Turin, 1966, p 39

According to this logic, architecture becomes then «*a system of signs able to transmit a message and, for this purpose, it consists of forms (signs) which represent the signifier of the exactly and conventionally denoted meaning that is its function*»[4].

As Roland Barthes also explains, the signifier and the signified are the two components of the same sign: the first corresponds to the plan of expression, the second to the plan of content[5]. The signifier is therefore the material mediator, or the form through which an object acquires a particular meaning, while the latter «*is not "a thing", but the mental representation of "the thing"*» [6]. Sharing the same thought, Ferdinand de Saussure had previously identified the psychic nature of meaning with "*concept*". As for the signification, instead, he stated: «*it can be conceived as a process; it is the act that binds the signifier and the meaning, an act whose product is the sign*»[7]. Going back over the bridge, if the structure acquires the value of signifier, its signified (the function made possible) will then be its being a tool able to overcome an obstacle, i.e. a tool necessary to connect two separated parts. The design process has to be identified rather with its process of signification.

Thinking however that the architecture of the bridge does nothing but give us information on how to use the object would be a serious mistake. «*The architecture [as Luigi Prestinenza Pugliesi explains] speaks to us of so many things – forms, harmonies and dissonances, conceptions of the world – and if we reduce all its language to a functional question it would be like thinking that in the human being the mouth indicates the possibility of introducing food, the hands the ability to write and to handle objects, and the heart serves to pump blood, forgetting higher and more complex meanings*»[8]. Each object communicates therefore on two different levels: on one hand, it denotes a *primary function* that the architecture fulfils; on the other hand, it connotes some *secondary functions* that have symbolic character and communicate extra-functional values. The first takes the name of "*denotation*", while the second of "*connotation*".

Starting from this distinction we can therefore understand the other side of the process of renewal that at the end of the twentieth century led to reconsider the theme of footbridges at the root. When the bridge has abandoned its status of "infrastructural project" to become an "urban project", its meaning (as well as the form) has undergone a radical

4 Umberto Eco, *La struttura assente*, Bompiani, Milan, 1968, p 192

5 Roland Barthes, *Elementi di semiologia*, Ed. Einaudi, Turin, 1966

6 *ibid*., p 40

7 Roland Barthes, *Elementi di semiologia*, Ed. Einaudi, Turin, 1966, p 45

8 Luigi Prestinenza Pugliesi, *L'architettura parla?*, article taken from the digital magazine of architecture *Arch'it*, 6 january 2001

change: becoming a place for urban living (public space), it has acquired new significances that allowed to reconsider its semantic value, enriching it with new connotations. Apart from denoting indeed the primary utilitas of crossing, as a result, it connotes today a new and deeper meaning that increases its functional qualification communicating its "social value". Product of the contemporary urban *ideology*[9], this value takes inspiration from this model of urban living that looks at the open and public space as a crucial element for the image of the city, both on a social and physical level. This way, the bridge reaches the value of *place*, giving back to the city its original meaning of intersection and exchange point. Consequently it acquires a key role in the preservation and improvement of those values that make the public space a proximity place, aimed at the construction of a collective identity and an easily accessible environment where getting lost is almost impossible.

In confirmation of that, those who had the opportunity to visit the Gateshead Millennium Bridge or the Pedro and Ines Footbridge, just to mention two examples, would hardly consider these works as devices merely able to overcome an obstacle. Conceived as a sculpture on an urban scale, the bridge of Wilkinson & Eyre is especially a physical space around which the lives of thousands of people revolve daily: in recent years, they have committed themselves to building the economic and social renewal of their city focusing precisely on those values that give a sense to their being a community. At the same way, the bridge of Fonseca in Coimbra is first of all the performing of a history that has its roots in the folk tradition and that is remembered not through words, but through the physical and emotional reunification of the two banks of the river. The whole is obtained by means of a dual system of arches that metaphorically gives form to the ideology of people that feel like a Community because they are linked to the cultural and historical background of their city.

These cases, as in many others, show therefore how the functional question is by now often outclassed by the connotative value of the work itself: as a matter of fact, the conventional signified of the term "bridge" (structure that allows the passage from one bank to the other one of a river or the crossing of a depression of the soil) is often exceeded

9 «When I look at a window on the facade of a house, I do not mainly think of its function; I think of a meaning-window that is based on the function but in which the function is absorbed so that I can also forget it and see the Window with relation to other windows as elements of an architectural rhythm; as you read a poem, without neglecting the meanings of the individual words, you can also leave them in the shadow putting in the foreground a certain formal game of contextual combination of signifiers. [This happens because] the form of these windows, their number, their disposition on the facade [...] do not denote only a function; it refers to a certain concept of living and using; it connotes a global ideology, which lay at the basis of the architect's work. Round arched, ogival arch, *en accolade* arch work in a bearing sense and denote this function, but connote different ways of conceiving the function. They start to take a symbolic role», *La struttura assente*, Bompiani, Milan, 1968, pp 202-203

by new connotations that heavily change the basic meaning of the structure.

However, what remains still obscure is how this process of connotation can be realized in practice. In this sense, the theories developed by Italian Giovanni Klaus Koenig in his essay "Architettura e Comunicazione" of 1970 are very helpful. Based on the idea that the main characteristic of architecture has always been «*offering itself as the creator of a given space suitable to carry out a precise function*»[10], he gathers that architecture realizes its process of communication through the creation of spaces that influence man's sensory experience, thus controlling his acts.

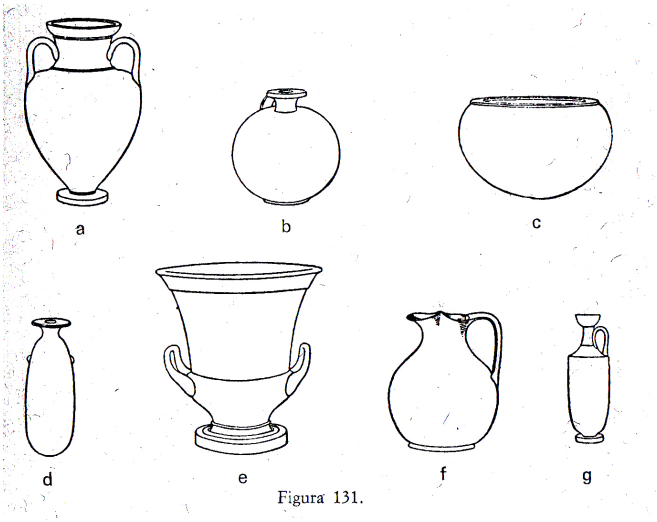
The same concept may be applied to the bridge which, becoming an open and circumscribed space, influences the user's perception so as to promote a certain type of behaviour and arouse certain feelings. As also highlighted by proxemics[11], in this game of relations between man and work, our way of being is strongly influenced by our perception of space. If the wooden floor of a bridge induces us to stop, an asphalt floor leads us to quicken our pace, or even to run; equally, if a long and narrow path leads to walk quickly, a wide, circular space with benches all over is generally perceived as a place where you can stop and relax. It follows that forms and materials can influence our perception of the bridge (and therefore the value and meaning we will give to the work) as they are endowed with intrinsic qualities that influence our way of acting.

While the implications derived from the use of different materials have been previously discussed, it is now useful to delve deeper into the reasons that connect a given form with a specific signified.

In the course of the centuries many authors have dealt with this topic. Among these we find again also Rudolf Arnheim, who, opposing to the rationalist vision of «*form follows function*», shows how between form and signified there is a deep relationship that goes beyond the pure function. He asserts that the function do not possess its own form and that one function can be actually fulfilled by many forms. Therefore, to answer the question of "what determines the meaning of a form", in the final pages of his book on the dynamics of the architectural form, Arnheim introduces the concept of symbolic interpretation of the function, i.e. a conceptual element of mediation between form and function (an element of passage) with which he associates by spontaneous analogy the dynamics of forms with the fundamental human experiences (of bodies and bodily events) that we all know, and

10 Giovanni Klaus Koenig, *Architettura e Comunicazione*, Lef, Firenze, 1970 p 22

11 Proxemics is the discipline that studies space and distances inside a communication, either verbal or non-verbal. The term was introduced and coined by the anthropologist Edward T. Hall in 1963 to indicate the study of the relationships of proximity in the communication. With relation to it: Edward T. Hall, *La dimensione nascosta*, Bompiani, Milan, 1968.



162. Arnheim's jars

on which all other experiences depend. As Gianni Ottolini explains, this is: «*a specific projecting and identifying process, which is realized by the translation of the self on things with mind-blowing effects compared with interpretative and figurative conventions*»[12]. This analogy, which allows the process of metaphoric *transfer*, subordinates the process design to the consideration of feelings, thoughts and emotions that define the essence of our spirit, i.e. to the consideration of what really inspires our body and our gestures[13].

According to this logic, architecture would therefore communicate with us on the basis of our mental and sentimental, and not physical, needs. This principle is confirmed in psychology where it was noted how human physical needs effectively arise from mental needs and that the same needs that architecture must satisfy have consequently the same origin: «*The needs of our body become such when our mind feels them as discomfort*»[14].

In this respect, the famous example of Arnheim about the profile of some Greek jars is emblematic[15]. They were made to contain wine, water or oil, and they all fulfil the three basic functions of receiving, containing and pouring. As he underlines, a common aesthetic analysis of these items would examine their conformation "in itself" (proportion,

12 Gianni Ottolini, *Il linguaggio delle pietre*, in *Metafora, mimesi, morfogenesi, progetto: un dialogo tra filosofi e architetti*, edited by E. D'Alfonso ed E. Franzini, Guerini Studio, Milan, 991, p 116

13 According to Etienne-Louis Boullée, in the opening of his essay about architecture, the buildings should be in a certain way poems: «the images they offer our senses should arouse sentiments analogous to the use those buildings are designed for», in *Architettura. Saggio sull'arte*, Marsilio, Padova, 1967, p 47

14 See Rudolf Arnheim, *La dinamica della forma architettonica*, Feltrinelli, Milan, 1981, pp 275-280

15 Rudolf Arnheim, *La dinamica della forma architettonica*, Feltrinelli, Milan, 1981, pp 285, fig 131

harmony, curvatures, etc.) coming so to certain formal considerations that, however, have nothing to do with their function or its visual expression.

What would indeed lack it would be the understanding of the actual relations existing between the structural property of the object and our way of acting in front of it as a result of our perceptual experience. By contrast, this aspect is decisive when we want to assess the quality of a form in its embodiment of a certain function[16]. With the term "embodiment" Arnheim doesn't mean simply the fact that the shape of the jar is physically suited to meet these requests (a necessary, but not sufficient, condition), but that its shape present that dynamic quality suitable to express the idea of that function.

The spherical *aryballos* (Fig. 131b), for example, is an oil bottle intended to contain a good deal of liquid and to dispense it little by little. This concept of containing is visually expressed by means of a pronounced roundness of its profile. In the *lebs* (Fig. 131c), instead, the theme of receiving and dispensing has the priority. For this reason, the conformation of its profile starts at the bottom with a rather large radius, «but it intensifies its curvature towards the top, as if it suddenly became aware of the approaching obstacle to its closing»[17]. Finally, in the *calyx-crater* (Fig. e), used to mix wine, «the contour totally subordinates the large upper part of the container to the function of receiving and pouring with a crescendo towards the opening as the principal theme and by replacing convexity with concavity»[18]. Here, the action interrupted by the rim is not closing, but further expanding.

163| Like jars, footbridges also follow these perceptive dynamics. Their spatial conformation, together with the choice of materials, has therefore an essential role in achieving that connotation process that makes the bridge a place able to express an embodied example of proximity, identity and continuity concepts, peculiar of each urban space. The *Passerelle des Arts* in Paris, for example, despite belongs to a precedent era is one of the most faithful representations of that Parisian lifestyle, described in the novels by Baudelaire, Balzac and Walter Benjamin, and that still today characterizes the soul of the city. This bridge isn't indeed a simple link between the two banks of the river, but the material embodiment of the atmosphere typical of Haussmann's boulevards. It is constantly lived by a great number of people who go there to meet other people, to make new friends, but also simply to relax in the sun, read a book and contemplate the

16 In Arnheim's opinion, «the specific dynamics of each configuration and of each relationship between configurations is however influenced by that function. The perceptive appearance varies consequently», p 286

17 *ibid.*, p 287

18 *ibid.*, p 287

163. Passerelle des Arts, Paris

beauty of the city. Its nineteenth century-like architecture, delicate and comfortable, not invasive, creates an ideal environment for a pause or a meeting: as a sort of magnet, its benches are crowded all day and when there is no place left to sit down, the floor itself turns into a comfortable seat, decorated by drawings on the balustrade. In addition to this, the footbridge is also an important factor of definition of the urban settlement. Thanks to its forms and to its strategic position, it gives continuity and vitality to the paths along the river Seine and transforms this piece of river near the Louvre into a urban space, full of significations and symbolic values.

However, as we can well imagine, there isn't a unique way to embody the ideology of which the footbridge is today representative. This is because such ideology reflects a multifaceted urban lifestyle. As a matter of fact, if in the Passerelle des Arts certainly prevails an idea of bridge as meeting place (proximity), many other works give priority to those meanings that are more linked to the concepts of continuity or identity: an example, Gateshead Millennium Bridge. The choice depends therefore on the foundations that the conditions of the surroundings lay at the basis of the project. All of it is then translated by means of a certain conformation of the interior space of the bridge, which will be thus associated with a kind of "programme of use". The latter corresponds to the range of possible human behaviours that the bridge will be able to promote. Added to the basic function, it gives the work a precise value within the urban context, so defining its peculiar character. According to this programme, the user will assign the bridge a particular signified and will associate a precise image with it.

From an analysis carried out among the main projects that have been realized since the end of the 1980s, in my opinion, six main categories of images (connotations) can be identified, arising from changeable combinations of factors such as the physical and socio-cultural landscape, the architecture of the bridge and the functions favoured in it. The pedestrian bridge should be therefore identified as a *tool for spatial understanding*, *place of contemplation and cognitive activities*, *cultural connection*, *social catalyst*, *symbol and icon*, and *instrument able to activate the imagination*. In my opinion, what is however particularly important to be underlined is that inside each project there is always a co-presence resulting from the significantly multivalent urban space, that is, its being a collective and connective space at once. It will be therefore the prevalence of one figure on the other that will define the pre-eminent character of the footbridge. In this sense, descriptions will be so organized on the basis of that particular sign that will contribute, more markedly, to define the final meaning of the work.

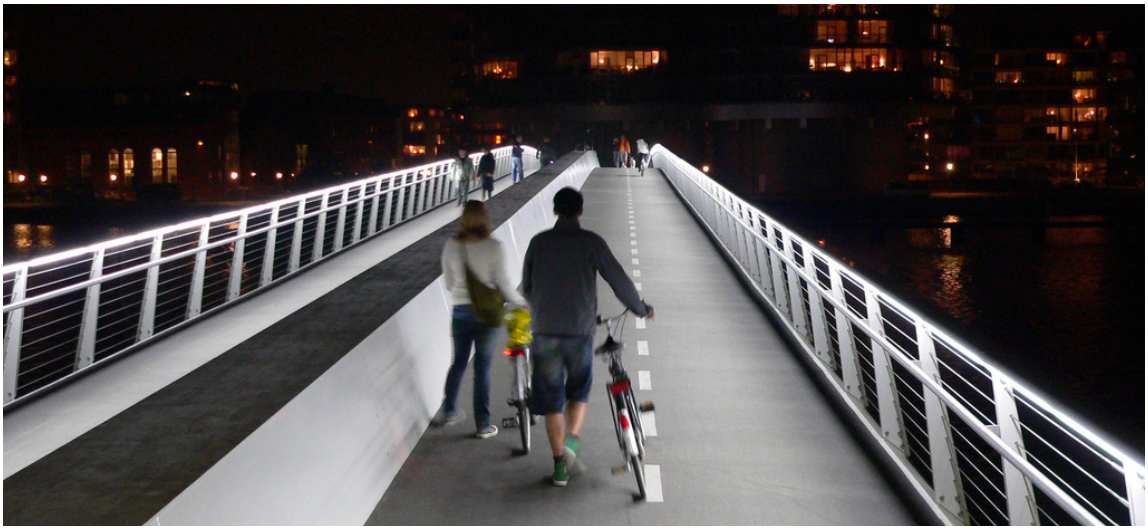
3.1.1. Tool for spatial understanding

A footbridge becomes a tool for spatial understanding when the important task of restoring continuity to the fragmented contemporary city is given, bringing it back to the model of Haussmann's city, conceived in fictional terms and told by its routes and infrastructures which allow its united perception. This logic turns the bridge into a crucial point within a mesh of connections necessary to give a new structure and meaning to the scattered and isolated places of the urban fabric.

164| The Bryggebroen of Copenhagen, designed by the Danish Dissing+Weitling practice in 2006, connects two parts of the city that had always been separated, Vesterbro and Islands Brygge, allowing the students who live in the central zone to reach, more quickly and safely, the classrooms of the University located in the south within the modern district of Ørestad. Its simple and clean architecture creates a linear space where crossing is the primary function. This is confirmed by the evident separation between the pedestrian and cyclist path. Moreover, its bright colour, visible both by day and by night, makes this work a distinctive sign in the urban landscape of the Danish capital. As a white line that connects two points, the bridge crosses the gate channel of the port becoming an essential element of spatial connection and offering the passer-by the perception of understanding clearly the urban fabric of the city. It is true that, if you walk on the bridge looking towards the mouth of the channel, you'll see a huge expanse of water with the main institutional buildings of the city overlooking it. You can also see, on the left, the oldest urban area with the monarchic residences and, on the right, the new residential areas with the modern architecture of the University campus. Those looking at the bridge from the banks and in the opposite direction will see its white, thin and elongated form, which marks the border between the urban centre and the port area that extends beyond the bridge.

165| Built on the Kanaal Rijn, the Nescio Bridge by Wilkinson & Eyre represents instead a vital link for the inhabitants of the Ijburg district and the centre of Amsterdam, and allows those living in the city to gain access to the wide green spaces of Diemenpark. This role of connecting element finds its expression in the linearity of its figure that elegantly lies down in the landscape giving new order to it. Its delicate and sinuous forms reflect the direction that mainly corresponds to the ideal journey of those who daily move by bike to the centre, developping a feeling of continuity and fluidity. Just a picture of the footbridge from the banks has to be taken to understand its aptitude for the water suspended bike path, a place conceived to connect two parts and wrap up the surrounding space.

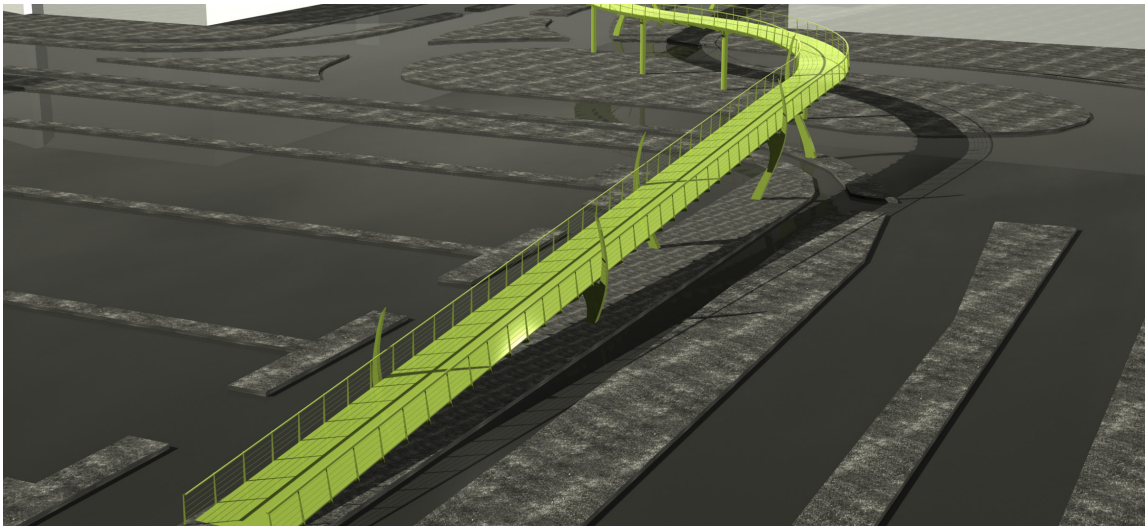
166| In 2004 the French architect Dominique Perrault designed instead a group of new footbridges (not built) in Palermo. Conceived to connect places divided by the transit of

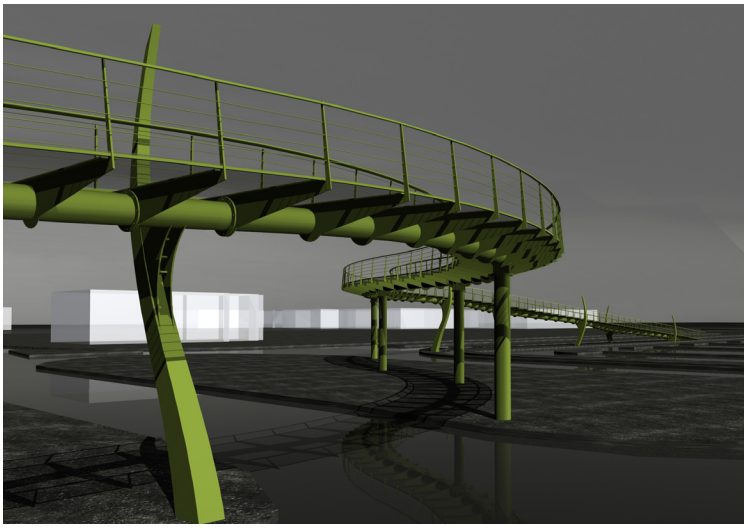


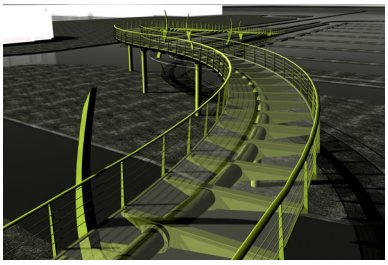
164. Bryggebroen, Dissing+Weitling, Copenhagen, 2006

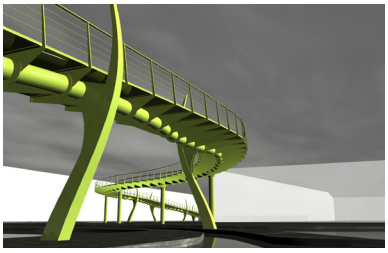
165. Nescio Bridge, Wilkinson&Eyre, Amsterdam, 2006

166. Footbridges, Dominique Perrault, Palermo, 2004









167. Footbridge in Castelfranco Veneto, Paolo Consolo, Simone Zecchin, 2004/2005

cars, they have the task of reshaping the urban fabric of an outlying district that is today particularly fragmented. Thus, pedestrians and cyclists become here the necessary figures to "sew up" this large urban area, focusing on the movement in the daily life of pedestrians. Four footbridges whose length varies from 150 to 500 metres. They are so conceived to eliminate pedestrian lights and make people movement more fluent. Furthermore, being developed with relation to different radius circumference arches, paths creates joints and small rest areas where it is possible to observe the city from through divorced eyes. As Perrault explains, in this project «*the focus is on the movement of the pedestrian, his way of seeing and enjoying urban spaces*».

167| Finally, within Prof. Siviero's school of bridges, the draft of a pedestrian bridge in Castelfranco Veneto (IT), thesis by the students Paolo Consolo and Simone Zecchin (2004/2005), can be considered particularly interesting. This study intends to solve the problem of the pedestrian and cycle priority within the system of urban roundabouts (today more and more widespread and chaotic), in order to give back continuity to the mesh of the slow routes inside the town. The project aims at linking the historic avenues of Castelfranco, by realizing a path that would be first of all an extension of the latter, above the traffic chaos. In this sense, the winding paths and the tree shape of the piers intend to give the bridge the aspect of a blade suspended among the trees. Thus, it is possible to achieve a suspended green walk that offers the possibility of quickly overcoming the bustle of the cars to rediscover, when descending, the naturalness of lines and forms typical of the city.

3.1.2. Place of contemplation and cognitive activities

This category includes those footbridges whose primary task is to create new observation points and panoramic platforms from which to explore and contemplate the landscape from new and unusual perspectives. Equivalent therefore to instruments of cognitive investigation, they allow to visually accede to places not usually "accessible" and know new aspects of the landscape we live in.

168| In this sense, a good example is given by the new Footbridge of Saanitz, designed by Schlaich Bergermann and Partner practice and completed in 2007. Built on the island of Ruegen to the north of Germany, the work is part of a programme of urban regeneration aimed at physically reconnecting the old town centre with its port area, abruptly separated during the Cold War. However, it represents much more than a simple reconnection between places: apart from making the city more accessible to visitors (Sassnitz today is a popular holiday resort), the particular conformation of its path turns this bridge into an

168. Sassnitz Bridge, Schlaich Bergermann und Partner, Sassnitz, 2007

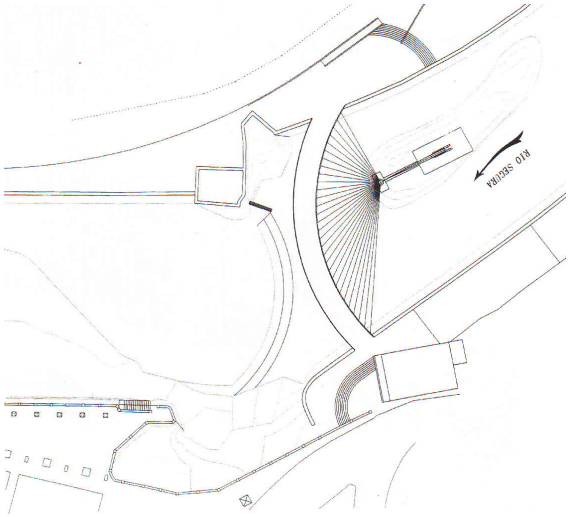
exciting "Balcony to the sea". Its curvilinear shape, supported by a sequence of inclined cables attached on the inside edge of the deck, **turns indeed the work into** an ideal terrace from which to admire the panorama, with original views both on the city and on the port. We are here facing that process of visual reversal that is typical of the figure-ground relationship and that, according to Arnheim, arises when a combination of two terms (bridge and landscape) leads to define the empty space (landscape) as a figure. So, the concept of *promenade architecturale* reappears, i.e. of that place of physical and symbolic passage between the framed image of the landscape (which acts as background) and its updating as a figure in the space of Le Corbusier's roof-garden. In a similar way, the linear and smooth path of the Sassnitz Bridge comes out from the frame of Ruegen town to open up completely towards the sea, the real protagonist of the scene.

169| McDowell+Benedetti practice completed in 2008 the construction of a bridge on the river Aire in Castleford (Yorkshire, United Kingdom). The work is part of a programme of urban regeneration aimed at promoting the economic recovery of the city after a period of severe crisis due to the closing down in the 1980s of many local mining industries. Within this project, the new pedestrian bridge is one of the most ambitious work and today the main point of reference for the city and the river landscape of Aire. This success is mainly based on the quality of the relationship between the work has been able to set with the place's nature and history. Castleford rises in fact on the site of a Roman camp and just near the bridge we can still see the signs of an ancient ford and the remains of a ruined old barge. With relation to these aspects, the bridge is therefore similar to an ideal path where exploring the city secrets from and think on what has before happened. Here is its path characterized by a fluid form which gives these signs a great symbolic value, freely moving over the river. For certain aspects, the aim of this work is similar to suspension paths inside the archaeological parks, making the close contemplation of those symbols and images belonged to preceding eras possible. As a result, its structure is reduced to a pure white sign held up by occasional supports in the river bed, while the interiors, similar to those of a ship, recreate the experience of a path in the history also thanks to the longitudinal disposition of the slats of the floor that recall the flow of events.

170| The Pasarela del Malecón in Murcia is designed by the Spanish engineer Javier Manterola. Inaugurated in 1996, this work crosses the river Segura by means of a cable-stayed structure with curvilinear deck. Made up by a single pylon placed in the river bed, the bridge realizes a path that becomes a real panoramic terrace overlooking the river. Thanks to the arched form of its deck and vertical aerial, it embodies therefore the leaning forward of a person kept busy to look at what is hidden below.

171| Another emblematic example is the "Bridge of Memory", a footbridge placed on

169. Castleford Bridge, McDowell+Benedetti, Castleford (UK), 2008



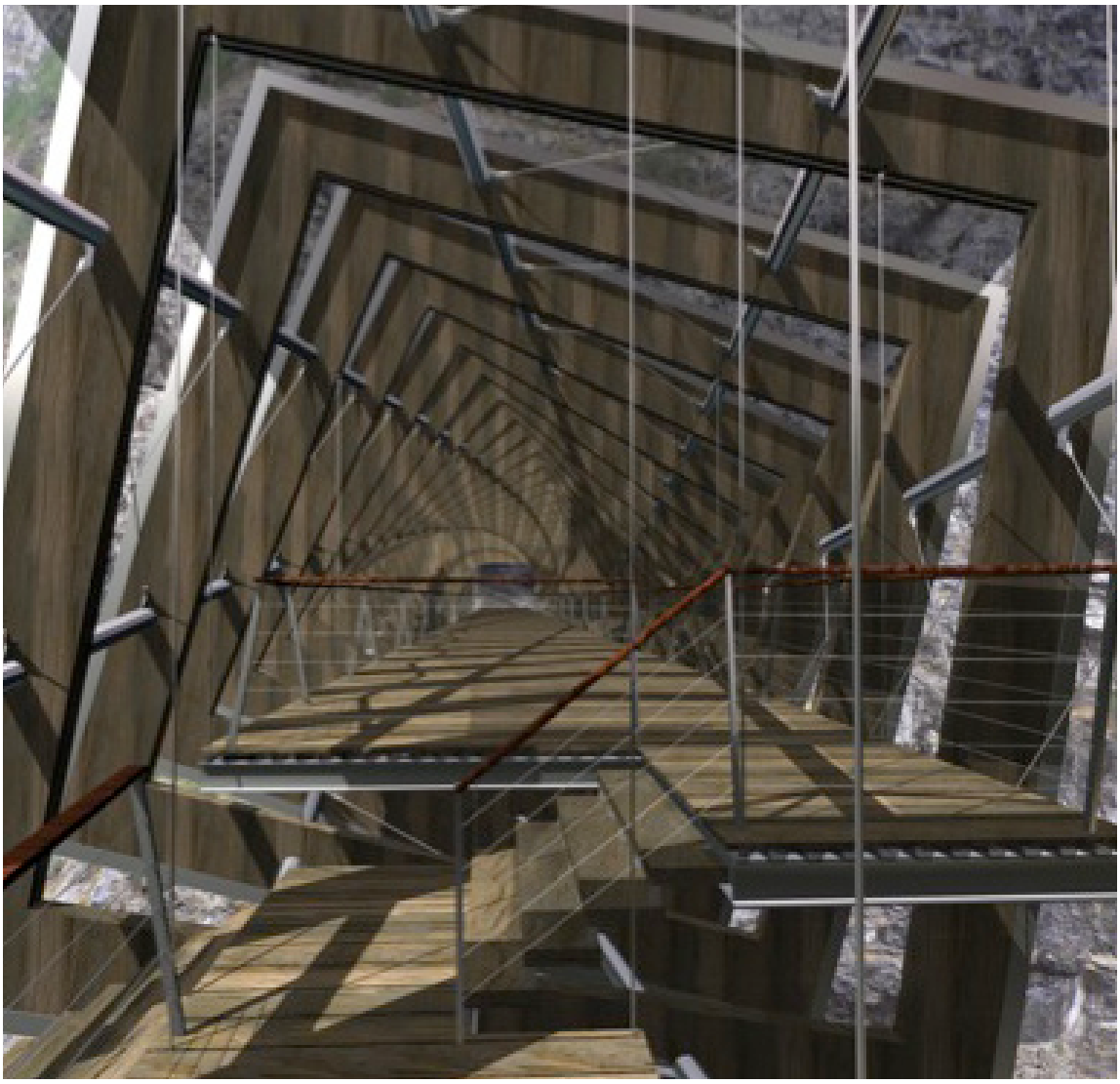
170. Paserela del Malecon, Javier Manterola, Murcia, 1996

the background of the Vajont dam in Italy. This is a graduation thesis elaborated by some students of Professor Siviero and characterized by a special setting that dates back to 9 November 1963. That night, the landslide of a mountain close behind the artificial lake provoked a huge wave that, in few seconds, erased the history of a territory and the life of almost 2,000 people. The event completely disrupted the morphology of the place with incalculable material and moral damage whose signs are still evident today. This damage represents the starting point of the project by Marco Barreca and Paolo Piccin, whose main purpose was to create a route that, step by step, could explain the terrible dynamic of what happened. According to this logic, the form of the bridge was carefully studied so that the architecture was not purely functional, but could convey to the people crossing the bridge the idea of being in a place full of sadness and tension. Used as an exhibition gallery, the project thus creates a sort of "Museum of Memory" whose predominant theme is that of the wave that, like a whirlpool, shapes the architecture giving it a strong dynamism and expressiveness. It follows a rather unusual structure and formed by square portals which, turning 180°, make the observer feel as if he had been there when the disaster occurred. Outside, the bridge appears instead as a spiral that recalls the image of how the bridge would have appeared if the night of the tragedy had been swept away and deformed by the wave. The result is a project that, full of symbolic and emotional implications, allows to retrace with the mind, as well as the body, what really happened that night and to meditate on the fact that, perhaps, this disaster could have been avoided.

3.1.3. Cultural connection

The pedestrian bridge can be considered also as an instrument of cultural connection when it expresses, physically and symbolically, the desire to create a symbolic and ideological link between countries and cultures, as well as between past stories and future stories. The bridge reaches its own identity when it becomes a mending factor between ancient and modern fractures, both on a social and cultural level.

Overlooking the Adriatic Sea, Pescara is the city of contrasts: the sea and the mainland oppose each other, while the homonym river divides the urban fabric into two distinct districts. The "Ponte del Mare" was designed by Walter Pichler of Bolzano to bridge this original interruption of the Pescara seaside promenade, creating a sort of ideal completion of its waterfront and the ideal conditions to turn the contrast between the two districts, physically separated, into a reason of dialogue between two different realities. The bridge becomes so a meeting place and a place of human reconciliation, i.e. a tool of social cohesion, even before a tool of spatial and urban fusion. However, "Ponte del



171. Ponte della Memoria, Marco Barreca, Paolo Piccin, Longarone, 2004/2005

Mare" is also more than that: this elegant suspended bridge wants to be, first, an object that represents the Community in its dimension of entity open to relations and to dialogue and, at the same time, a monument of peace and gateway to new cultural exchanges, such as those recently developed with the declaration for the Euroregione Adriatica. Its double deck, planned separately for cyclists and pedestrians, creates indeed a design of linear elements suspended in the empty space, which become reunited only at the two ends to symbolize the ideological and cultural relationships that connect the two sides of the Adriatic Sea.

173| Dreiländerbrücke, designed by Dietmar Feichtinger and inaugurated in 2007, is an arch bridge with a span of almost 230 metres, which crosses the Franco-German border near Switzerland (that's where its name, the "Bridge of the Three Countries", comes from), connecting the two towns of Weil am Rhein and Huningue. As recalled by its designer, the choice of the arch structure was greatly influenced by the strong symbolic dimension implied in the idea of creating a bridge between these two nations. The arch symbolizes therefore the wish to combine the two countries in a single gesture and this idea finds further confirmation in the choice of minimizing its arrow so to give the bridge a greater visual power and much more expressiveness. The whole is completed by a tiny deck, a thin strip of concrete finely treated, that unites the two countries with a clear, limpid and unequivocal sign, giving as a result the path the nobility of a gesture (see p).

174| The same logic also belongs to Passerelle de Deux Rives, conceived by Marc Mimram in 2004 as a symbol of European unification. Conceived to symbolize the links between France and Germany, this cycle and pedestrian bridge crosses the Rhine connecting the German town of Kehl with the city of the European Parliament, Strasbourg. In the specific, this work is part of an overall project aimed at realizing a public garden to improve the two banks of the river and create, in this border area, a highly symbolic place. The footbridge, key element of the project, is a cable stayed structure 400 meters long and formed by two steel towers and by a pedestrian path (rectilinear in plant and arched in front elevation), as well as by a separate cycle track (shaping in plan an arc of a circle). These three distinct elements become reunited only in the middle where they give form to an island suspended on the river that symbolically represents the reunification of the two banks. Thanks to this peculiarity Passerelle de Deux Rives became in April 2009 the ideal place to host one of the main celebrations of NATO Summit. This suspended island has been the scenario for the ritual photo of the world leaders. It is also interesting to underline that some elements of this bridge have been introduced in the official logo of the event: the symbol has the number 60 in the middle, which reminds us that this summit is the 60th anniversary of the Atlantic Alliance, while a number of lines representing the

172. Ponte del Mare, Walter Pichler, Pescara, 2009

173. Dreilaenderbruecke, Dietmar Feichtinger, Weil am Rhein, 2007

174. Passerelle de Deux Rives, Marc Mimram, Strasburgo, 2004

175. Drawings of the bridge

176. Celebrations of Nato Summit

inclined cables of the bridge radiate from the centre towards the outside cutting the shapes of its two particular ramps.

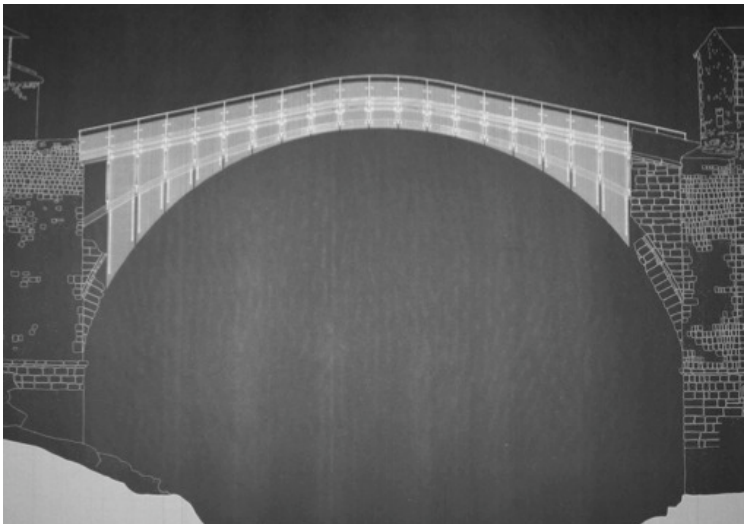
177| A further example is situated in the spectacular scenario offered by the many bridges that characterize the urban panorama of Oporto. Built from 19th century by designers as Gustave Eiffel, who created the iron railway bridge Maria Pia (1877), or the Portuguese engineer Antonio Adão da Fonseca, designer of the recent Ponte do Infante Dome Henrique (2003), these works perfectly suit the idea of infrastructure as a connective material in the narrative fabric of the city. As a matter of fact, both in the historic district of Ribeira, along the northern banks of the river, and in the Village of Gaia, developed on the southern banks, the bridges of Douro contribute to give a meaning to the urban structure of Oporto. Through their axes and their architecture, they reveal those indispensable rules for the human understanding of the city and, at the same time, offer themselves as symbolic places of its urban fabric. The same logics have been also applied to the study of a new footbridge designed by Adão da Fonseca and commissioned by the municipality of Oporto (today UNESCO World Heritage Site) and Gaia. The project, still in the process of completion, aims at building a bridge suspended on the Douro, not far from the 19 th-century bridge Dom Luis I, which will connect the two medieval centres of Ribeira and Gaia. A curvilinear deck "will descend" from the winding stairs of Oporto to gently lie down on the banks of Gaia and so bring together, in a single gesture, the two villages around the river. This symbolic embrace will give life to one big district, called "Ribeiras", which will make the Douro its fundamental element.

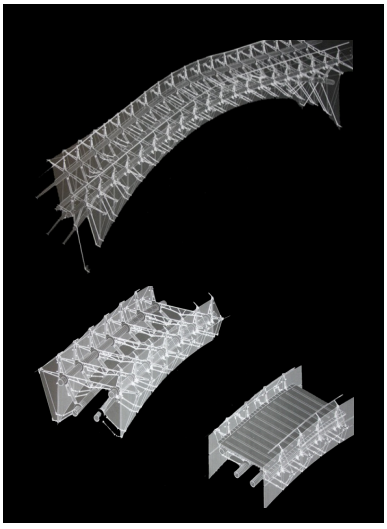
178| A warning symbol, as well as physical connection, can instead be found in the new cycle and pedestrian footbridge designed by Massimo Majowiecki and inaugurated in 2008. This work aims at stitching up a territorial wound within the inhabited centre of Dozza and caused by the recent realization of A13 motorway (Padua-Bologna). Therefore the bridge has been built to give back physical and social continuity to those two parts of the city that has been forcibly divided by the expressway system. This reconnection is carried out by means of a work that, in its essentiality and lightness, becomes a symbolic warning facing those events that have undermined the history and evolution of this small town. Composed by two A-shaped trestles, inclined and contrasting in the middle, it catches the attention of passer-bys, forcing them to remember what happened. Its expressive form, and dramatic at once, stands out above the motorway, inducing the observer to deeply meditate.

179| The following project does not aim at simply rebuilding the physical unit of a settlement and the continuity of the urban fabric, but rather at creating a symbolic meeting point between the past, present and the future of a city that, in the 1990s of the last century, suffered the severe consequences of the war in Bosnia. This is the reconstruction

177. Ponte pedonale Ribeiras, Antonio Adao da Fonseca, Oporto

178. Footbridge, Massimo Majowiecki, Dozza (IT), 2008





179. Bridge of Mostar, Marina Susa, Marco Rocca, Mostar, 1993

of the sixteenth-century Bridge of Mostar, destroyed by the Croatian-Bosnian artillery in November 1993 and subject of the graduation thesis by Marina Susa and Marco Rocca (1998/1999), Prof. Siviero's students. The solution proposed was the realization of a structure of steel and glass that, following the original form of the bridge, recalls, in the immateriality and changeableness of the surface, the fragility of every possible intervention in this place. Furthermore, its intended discontinuity with respect to the stone of the Balkan constructive tradition, does not express the intention to mask the signs of the tragedy but give shape to a light and aerial image, referring to the theme of journey between past and future.

3.1.4. Social catalyst

The footbridge acquires instead the role of social catalyst when it is transformed into a place of proximity and relationships, i.e. in a real place of community aggregation, able to encourage the dialogue in respect of the integrity of values typical of the collectivity. Under this cloth, the pedestrian bridge becomes, in this case, the ideal tool to recreate that synergy that makes each space a place for life.

Like the near Passerelle des Arts, the Simone de Beauvoir Footbridge symbolizes this idea by creating a public square suspended on the water. Its 12 metres of width, the indisputable lightness of its slender curves that make a counterpoint to the verticality of the Mitterrand library, the multiplicity of its spaces and the fluidity of its paths make this work an exhilarating example of contemporary urban space, ideal to take shelter from the city chaos. Inaugurated on 16 July 2006 and designed by Dietmar Feichtinger, the footbridge is placed in the framework of the great upheavals that, since the 1920s, have focused on the eastern borders of the French capital city. Moreover, it represents the 37th crossing work over the Seine, and the fourth exclusively reserved to pedestrians and cyclists. With its 190-metre central span without support, it connects thus on two levels the square of the Grande Bibliothèque François Mitterrand with the terrace of the Park of Bercy.

Morphologically asymmetrical, it consists of up of two crossed bands, with different width and characterized by sinuous curves, in which the pedestrian flow coincides with the force flow inside the structure. Combined together, they give shape to a complex structure made up of two elements that balance out and complete each other: an arch overlapping a tense structure, with opposite curvature, which represents its chain. Where the two join, in the centre of the bridge, a suspended piazza on two floors creates a place of meeting and relationships, but also an area to host activities and temporary exhibitions. As its author then noted, the project has a built-in desire to create a new urban space within the city,

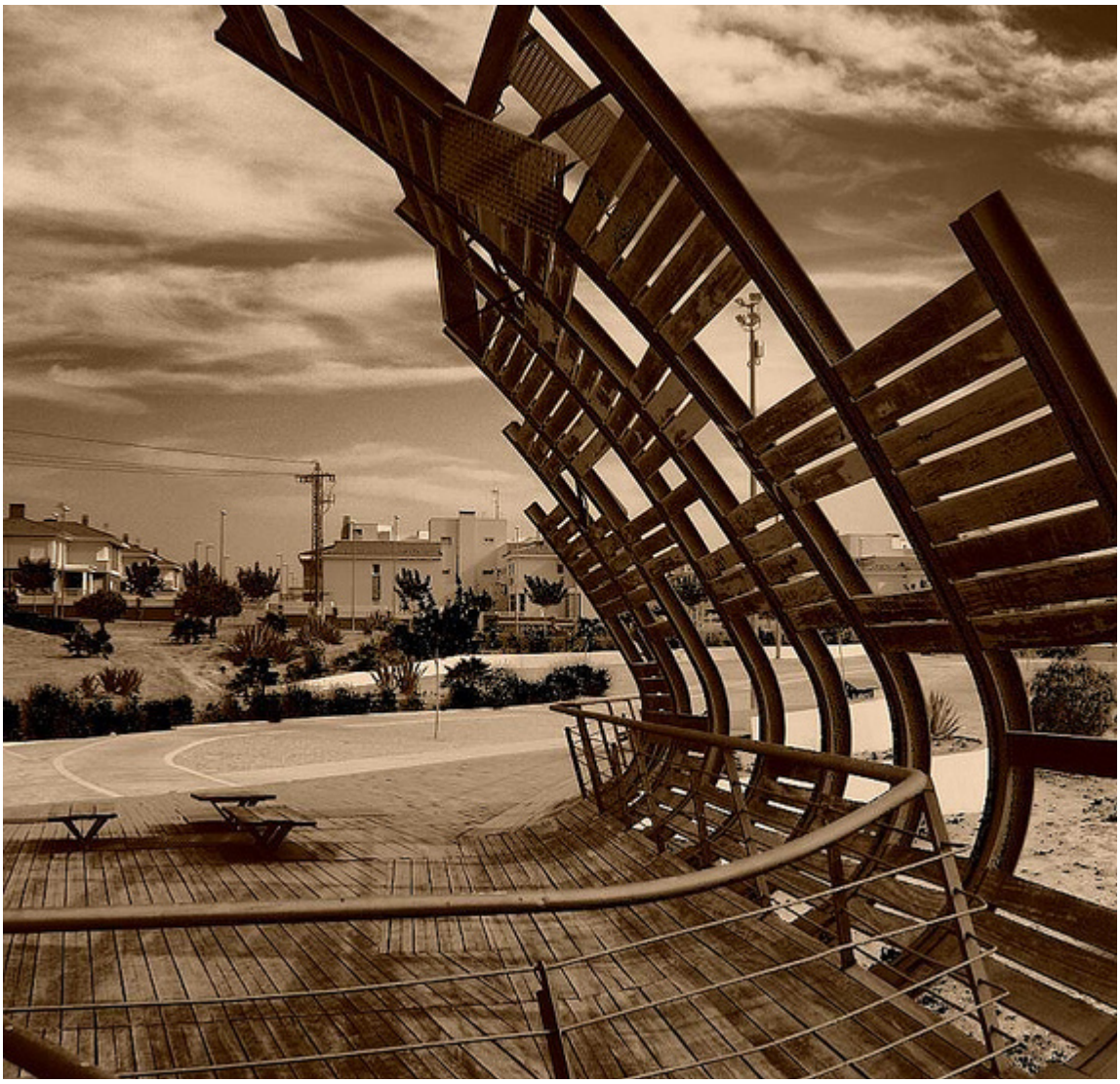
180. Simone de Beauvoir Footbridge, Dietmar Feichtinger, Paris, 2006

181. The life on Simone de Beauvoir Footbridge

a place to contemplate Seine river and fully live the atmosphere of Paris: «I wanted to produce points of rest and reflection in these 300 metres of walk across the river, places from which to observe the panorama, breathe the morning fresh air, appreciate the light and admire Paris». The upper path thus reveals the view on Nôtre Dame and the historic Paris; the arch and the catenaries, instead, crossing each other in the central section of the structure, which takes shape from, create a unique area to enjoy the events organized on the water; in the lower part of the "lens", a square with benches induces the passer-by to take a break halfway and enter into relations with other people. For those coming from Bercy, the vision is to say the least exciting: a majestic and, at the same time, light public space that delicately pushes its way through the towering skyscrapers of Perrault and offers an evocative image of Paris.

182| Also the footbridge of Carme Pinós in Petrer (1991), a key element of a small urban centre near Alicante, belongs to the same category. Designed to connect the two banks of a dry river, the author transforms the reticular path of the bridge in a suspended square, an elegant artificial soil that brilliantly allows the passage between the town centre and the degraded outskirts in the north of Petrer. The objective of the project was to make the footbridge a public space in which the suburbs could identify. This desire is reflected in the project both in the architecture of the space and in the surface of the floor. The path of the bridge initially develops along a narrow passage that becomes a wide level ground covered with lists of wood positioned with a different orientation with respect to the initial part. The irregular perimeter of the place identifies then different rest areas organically arranged on the wooden platform, while the strips of sand that surround it often replace the bridge floor. In this way the elements that mark the bridge get confused and mingle with those existing, making the place-bridge and the surrounding urban landscape a single entity. Along one of the sides delimiting the suspended piazza, a series of steel beams, on which the lists of the floor lie, bow upwards forming a sun breakers structure. This last element, occasionally buffered with wood, acts as a support for the artificial lighting components.

183| Finally, in 2009, in the district of Qingpu in Shanghai, the inauguration of an elegant footbridge designed by the Japanese Ca-Design studio was celebrated. For designers, the bridge had not to be only an element of engineering that would solve a problem of communication, but had to provide a dedicated space on the river, a room, an overlook, a window on the water. As a matter of fact, both by day and night, the bridge hosts everyday several social and entertaining activities, also thanks to a lighting system that allows to extend the use of the structure at all hours of the day. In specific terms, the bridge crosses the river with a span of 50 metres, realizing a curved path whose inclined axis is with



182. Footbridge, Carme Pinos, Petrer, Barcelona, 1991

183. Footbridge, CA-DESIGN, Shangai, 2009

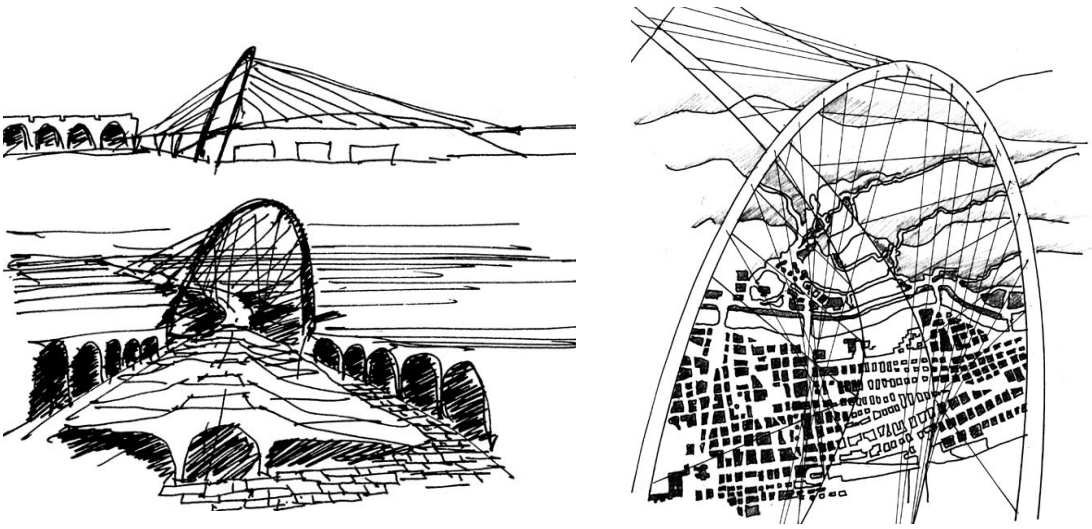
relation to the different morphological conditions of access and with the different views of the surrounding landscape. Finally the flooring, like the inclined ceiling, is covered with wooden boards. In particular, this last element acts as a big spotlight for artificial lighting, incorporated in the handrail, while during the day it catches the sparkling reflection of the sun on the water.

3.1.5. Symbols and icons

A modern footbridge is often given a strong symbolic and iconographic value. These dynamics occur above all in those projects that, designed as works of Landmark, become part of territorial marketing operations designed to promote processes of urban regeneration. For example, we have already discussed about the facts that characterize the project of the Gateshead Millennium Bridge and how this work, mainly thanks to its spectacular architecture, managed to promote the economic and cultural regeneration of cities like Gateshead and Newcastle, focusing on the so-called *Bilbao Effect*.

Built for the 2006 Winter Olympics, the Olympic footbridge of Turin, designed by Hugh Dutton, is an integral part of the plan for the new Olympic Village of the city. This is a project that included among its main interventions the reconstruction of the historic Magazzini Generali (conceived by Umberto Cuzzi in 1934) and the realization of a pedestrian link with the former building Lingotto, placed in front of the Village and beyond the railway line. The most important element of this connection is certainly the great red arch from which an original composition of inclined cables originates, supporting a long and narrow path that leads from the Olympic area to the current commercial centre "Ling8". The choice of the colour as well as the arch form, which for certain aspects recalls the arch of St. Luis (Missouri) by E. Saarinen of 1947, especially **reflects** the purpose to create a strong signal in the landscape and the urban skyline, a sign that was supposed to be visible from far and to become in a short time both a symbol for the Olympics and for the Turin of the future. To this end, its essential form, but full of symbolic force, has been properly chosen to make this work an ideal icon of strength and powerful lightness. Its vertical profile and its slender figure also recall the elegant sequence of parabolic arches that characterizes the architecture of MOI (Olympic Village) which has further contributed to transform this bridge in the real symbol of the Olympics as stated also by the main advertising slogans of that period.

As in Turin, also in many other European cities, the arrival of important sporting or cultural events often provides the decisive factor for the launching of interesting urban renewal policies. Among these it should certainly be recalled the case of Zaragoza, the



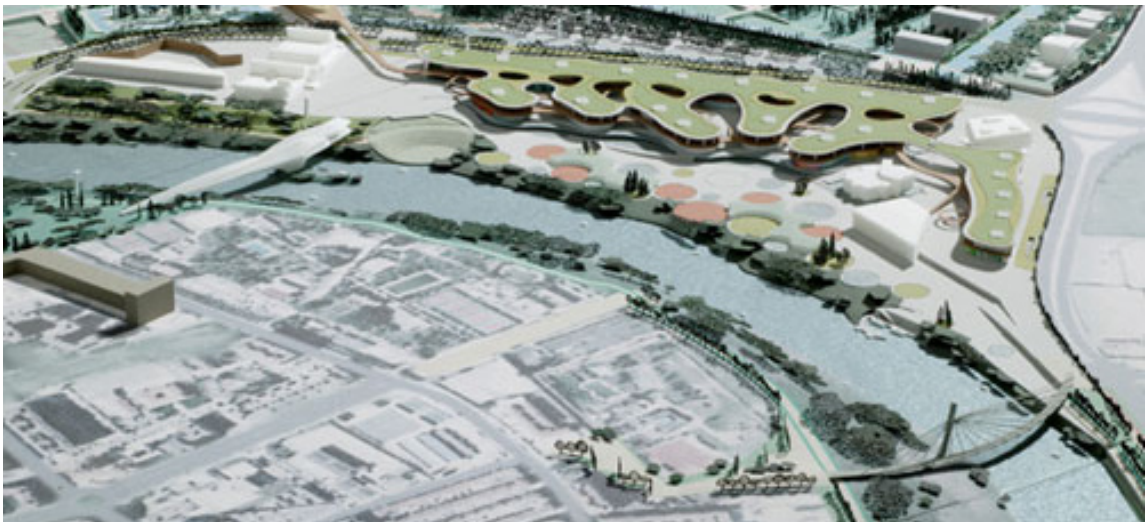
184. Ponte Olimpico, Hugh Dutton, Torino, 2006

city chosen to host in 2008 a great international exhibition about the theme "Water and Sustainable Development". Thus, water as the central topic and Ebro river as an element of the urban development, represent the two successful aspects that guided such decision. For this purpose, the nomination of the city was accompanied from the beginning by a plan of urban development that had as principal objective revitalizing the expansion of the city through a regeneration of Ebro in its emblematic stretch of Meandro de Renillas, an area of 150 hectares and 2 km far from the centre and not far from the new high-speed station. In this way, the project proposed a process of restructuring of the city principally focused on the theme of water as an element that at Roman times determined the settlement foundation and the need to overcome the physical barrier condition, typical of the river, through the construction of new bridges and the transformation of its banks (14 km long) in spaces for landscape enjoyment and new urban activities. In this scenario the new
185| pedestrian bridge designed by the Spanish engineer Javier Manterola finds its place, work constituting one of the main elements of this revaluated iconographic landscape. With a cable-stayed structure in support of a curved deck, the bridge crosses with a bold gesture (and without intermediate supports) the River Ebro on a span of about 235 metres. The dynamism impressed in its forms (an inclined pylon, a plan deck "almost" skimming over the water surface and a transparent parapet that tenaciously opens up to the outside) gives thus the work a vitality to be nowadays regarded as one of the main access gates to the city. Together with the museum-bridge by Zaha Hadid and the Puente del Tercer Milenio by Juan José Arenas, it helps therefore to build the new identity of Ebro river, the real main street in 21st century Zaragoza.

189| The same iconographic logic belongs also to another bridge recently inaugurated and designed by the Expedition Engineering practice. In the English city of Stockton, the Infinity Bridge crosses the river Tees putting itself as focal point of a project entitled "Teest Valley Regeneration". With its elegant and fluent double Arch, placed on a total span of 180 metres, connects the two banks of the bay giving so life to a distinctive sign which remains imprinted in the skyline of this landscape. Its wavy white line becomes then the unique answer to the cultural requirements of its community, also thanks to the great interest shown by the community itself in the project phase.

190| Finally, the Memorial Bridge, designed by the Croatian practice 3LHD and completed in 2001 is emblematic for its symbolic value. However, unlike the previous examples, the formal qualities of this work have here a commemorative function in order to give the bridge the fundamental role of monument. After the violent conflict in Balkans region, the city of Rijeka announced a competition for the realization of a pedestrian bridge that had not only to be an efficient place of passage, but also, and above all, the

185. Expo Footbridge, Javier Manterola, Zaragoza, 2008



186. Masterplan EXPO 2008, Zaragoza

187. Zaragoza Bridge Pavillion, Zaha Hadid, Zaragoza, 2008

188. Puente del Tercer Milenio, Juan José Arenas, Zaragoza, 2008

189. Infinity Bridge, Expedition Engineering, Stockton (UK), 2009

190. Memorial Bridge, 3LHD, Rijeka, 2001

commemorative monument to the Croatian defenders died during the war. With its abstract L shape, the footbridge creates therefore an important contemplative space that is mainly characterized by the presence of a great vertical wall, marked by a central opening, whose form recalls the image of a tombstone and leads to a deep reflection on the nature of this place psychologically upset. Completely covered in marble, the high wall then projects its mass to the ground creating an elegant platform suspended above the water and a rear piazza with some benches that induce to admire the work from many points of view. A reddish incision on the ground, which from the opening extends on the floor, symbolizes the blood shed by Croatia on the wet ground.

3.1.6. Instruments able to activate the imagination

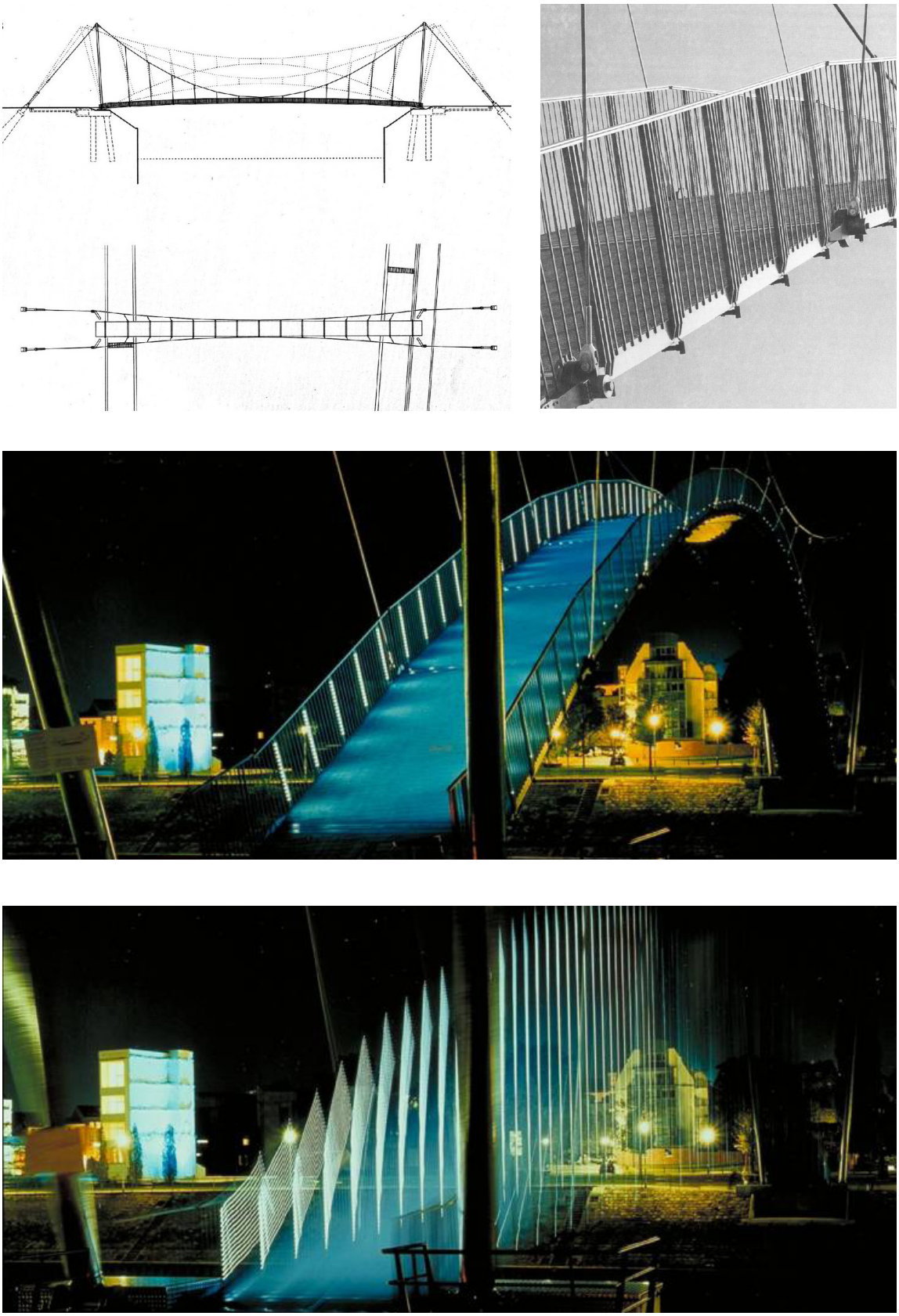
This last image concerns those bridges that relate to the careful observer involving him in a process of emotional and rational identification, based on the visual capability
191| stimulation. Faltbridge, for example, is a work whose main characteristic is precisely its intrinsic ability to stimulate curiosity and interest in those people that focus their attention on its functional logic. Designed by Jörg Schlaich and Volkwin Marg, it is pedestrian bridge made in 1997 in the German city of Kiel-Hörn, near its port area. In this sense, the design of the bridge well reflects the features of the surrounding zone, characterized by industries, ships and cranes. Its main peculiarity can be found in its peculiar structural articulation of forms. If in an operation stage, the static scheme is comparable to that of a cable-stayed bridge, it is only during its closing the work shows completely its exceptional nature: moreover with its closing deck, the building bents on itself, deviding into three sections 25 metres long each one. Such a movement is allowed by advanced studies of kinetic engineering, and in the district of Qingpu in Shanghai, This whirl is put in action thanks to two hydraulic motors, while the general system is driven by a single cable formed by a couple of cables the deck hangs from, divided into three parts by cylindrical pivots. The operation of opening lasts just 2’30’’ and occurs on average more than 12 times a day. The care put into the modelling of the joints of the bridge makes the latter a giant Meccano, a high moving sculpture. This aspect is also accentuated by the use of brilliant colours that, precisely in correspondence of the joints, attract the attention of the careful observer both during the opening and the closing.

192| The jointed structure is also similar in another footbridge designed by Schlaich. This is the Katzbuckel Bridge situated in the Inner Harbour of Duisburg in Germany and completed in 1999. Graceful as a cat arching its back, the feature of this movable bridge mainly lies in its opening dynamics. Facing the need to occasionally allow the passage

191. Faltbridge, Jorg Schlaich, Kiel, 1997

of large ships, the lateral pylons, supporting the deck, are rotated backwards (by means of hydraulic jacks) so to tighten the central rope and to consequently lift the deck in few minutes. The latter, specially designed to support in a natural way the variation of the main cable, progressively bends upwards thanks to a particular system that transforms the deck from a single rigid element into a sequence of rectangular prefabricated concrete slabs placed in steel frame hinged together, and therefore highly jointed. This effect is more attractive especially in the night when the bridge becomes a kind of light structure characterized by a particular similarity to a string of pearls. The designer has reached this effect welding 16 LEDs on a metal plate that was set in the internal part of each pillar of the parapet. Approaching the bridge from the water, it looks like a single line that bending upwards breaks itself in so many points of light. The result is an excellent and elegant aesthetic solution and, at the same time, so functional and efficient to deserve the Annual International Design Award in 2001.

193| The Rolling Bridge, designed by Heatherwick Studio, is an innovative movable bridge situated in the new residential and administrative complex at Paddington Basin in London. Just 12 metres long, this small footbridge of steel and wood is composed of eight sections hinged at the walkway which, when the bridge gets closed, curl up until its two ends join to form an octagonal disk. While it looks like a normal, little flashy timber bridge when open, it takes a totally new form when closed. As therefore in the previous examples, the peculiarity of this bridge consists in its ability to activate the imagination in the incredulous observer that looks careful at its design and moving. The form of the structure, both in the details and in the whole, becomes so a vehicle of communication between the architectural object and the intuitive faculty of the user, acting as a channel information flows through, on which the understanding of the object depends and in order to which the latter assumes a meaning. At the basis of this, as in the other projects, there is indeed the conviction that man has the faculty to recognize a sense in the object, regardless of his degree of preparation and his ability to analytically understand the function of every single piece. This is because he doesn't realize a purely visual reading, but a kind of feeling of agreement on the way this interaction of elements is supposed to be obtained. It is not only about observing and perhaps understanding from the outside, but also about feeling involved in a process in which the object is used as something that touches the sphere of the reason and that can enrich or arouse interest, activate the imagination, or even arouse emotions.



192. Katzbuckelbridge, Jorg Schlaich, Duisburg, 1999

193. Rolling Bridge, Heatherwick Studio, London, 2007

3.2. The semantics of the bridge: conclusions

As shown by the previous examples, the footbridge can have today different meanings. They are grouped in six main semantic categories, identified both on the basis of spatial and material evaluations and socio-cultural considerations. A certain range of secondary functions (connotations) corresponds to each of them with relation to a specific meaning acquired by the bridge and expressed through that particular configuration that allows such a function.

For this reason, within each connotative class, some constants in the way of conceiving the interior space of the bridge can be conceived. These are precisely *structural analogies* that make the definition of a kind of architectural *type*[19] possible, referring not to structural and static aspects, but the way the bridge embodies a given connotation, that is, how the bridge architecture reveals its essential content.

Let's consider, for example, Bryggebroen and Nescio Bridge, previously identified as spatial connection instruments. In both cases, what prevails in the whole image is especially the longitudinal dimension of the deck, while the rest of the structure tends to dissolve almost completely. Equivalent to space suspended lines, these bridges give the illusion to be unbound from the ground and freely move in the space creating an articulated mesh of relationships, revaluating the form and structure to the city system: as signs of an artificial map, as a result, they draw the paths where we normally move along and we are able to have a full vision of the urban settlement and organization.

Even if with a different purpose (of contemplative kind), such a longitudinal extension is also present in works as Sassnitz Bridge or Castleford Bridge. They express a concept very close to that of flow: namely, they are the metaphorical representation of

19 Quatremère de Quincy in his Historical Dictionary of Architecture gives a very precise definition of type in architecture: «*The word "type" doesn't represent the image of something to perfectly copy or imitate, but the idea of an element that must itself serve as a rule for the model.*[...] Everything is precise and given in the model; everything is more or less vague in the type». This definition is also confirmed by Carlos Martì Arìs who affirms: «[...] the type should not be conceived as a simple mechanism of reproduction, but as a structure of the form capable of numerous developments». Therefore, the type is conceived as a structural similarity between different architectural works and as such it faces the problem of the form at a level of maximum abstraction. Arìs also specifies: «The architectural type is defined by the presence of a formal invariant that manifests itself in different examples and takes place at the level of deep structure of the form. [It results that] the type is a statement that describes a formal structure». Moreover, «the type is synonymous with class, family, genus, etc., i.e. it is a category that results from the application of a classification process on a set of objects. [...] The creation of the types depends, in large part, on the criterion according to which the classification is carried out», *Le variazioni dell'identità: il tipo in architettura*, Carlos Martì Arìs, edited by Marta de Benedetti, CittàStudi, Milan, 1990, pp 11-16

a space-time guide, that is, a path where a given event (la promenade architecturale, for example) gradually develops starting from an initial A condition and concluding in the final B condition. In the middle, infinite points connect the two ends, building up the endless stages of such an evolution. Be it therefore one or the other category, bridges by similar connotations make reference to an architectural type that finds its existential foundation in being, first of all, a route to walk, that is, a *path* aimed at achieving a destination and whose inner space gets properties similar to those of a canal.

Considering instead examples such as Passerelle Simone de Beauvoir Footbridge, the design of the work tends to draw towards a defined and limited entity. From a line, the bridge becomes a focal point where various events are collected and placed in. Conceptually similar to a place, the project by Feichtinger may be compared to a kind of container that incorporates every occurrence. For this reason, it mainly works as a social catalyst, stimulating the meeting and exchange among people.

Even the "Ponte del Mare" belongs to the same category: as an instrument of cultural connection, it has a nature similar to the Parisian footbridge and mainly derives from its promoting relationship forms between different and distant cultures. In this sense, it is the conceptual representation of two different situations that, meeting in an equidistant point, give life to a third dimension which is the product of the first two and not the simple summation. In both cases, we have therefore works that refer to the concept of *node* and are characterized by a spatial interaction where the horizontal dimension, real or potential, is equivalent (if not more) to the longitudinal one. This is also valid for Mostar Bridge: symbol of a reunion between past and future, the marked transparency of this structure induces the careful observer to slow down his pace as far as he stops and admire the bridge from the inside, scrutinizing every detail from multiple lateral and frontal points of view. Also in this case, we have a reference to the architectural type of the place, crucial point (where to move from and to) whose importance is gained by its becoming the concentrated combination of functions and meanings.

By contrast, Olympic Bridge in Turin belongs to another category. In this project, as a result, we have the reversal of the concept of node which, from a spatial entity to live, now becomes an object to see and observe from the outside. In these works, sculptural and symbolic dimensions of architecture prevails, creating a mainly emotive relationship with the observer: in this relationship, eye system has a pivotal role as main link intermediary between the man and the work. putting itself not only within sight, but also "*within reach of the body*". Therefore, it serves as visual reference value (landmark) in the urban skyline that will remain imprinted in the audience memory.

At the same genre, examples as Rolling Bridge or Faltbridge belong: works

characterized by a predominant visual value able to stimulate the intuitive and reaction faculty of those observing them.

At this point, it seems clear how the six connotative properties, previously quoted, may actually be reduced to three architectural types, each of them refers to a precise function and a particular signified at once. Identified starting from formal analogies with relation to human behaviour gamut the bridge can promote, they respectively are *path*, *node* and *landmark*.

The path embodies the image of the line linking two points where it is possible to move along. It identifies the archetype of the real crossing and the physical union of separated parts, so the space finds again its *continuity*. Instead, the dimension of a space tending to the extreme figure of the circle or the place finds its expression in the node, that is, tending to those geometric conformation characterized by a prevailing internal space and limited by perimeter margins circumscribing it. Conceptually similar to a place, the node embodies the concept of *proximity*, that is, quality typical of a urban space that wants to be first of all collective place. Finally, the landmark is the materialization of a plastic object that places in front of us as a statue in the round, a statue to admire from each side. Equipped with a marked symbolic dimension, it becomes builder of a collectively and objectively shared *identity*.

As written in the previous chapters, each footbridge, intended to become urban space, acquire contemporarily the double valence of collective and connective space. Just in this way, it is able to set an instrument ideal to rebuild the city in a more human direction, that is, turning it from a non places nebula into a morphologically structured environment, organized according to coherent scheme of spaces provided *continuity*, *proximity* and *identity*. By the product of these last concepts, as a result, the today's meaning of modern conception footbridge was born, simultaneously becoming *path*, *node* and *landmark*. Then, the prevailing of one of these concepts will determine the predominant character of the work itself. As Kevin Lynch noted, in his famous book *The image of the city*[20], path, node

20 Kevin Lynch, *The image of the city*, MIT Press, Cambridge, Mass, 1960. In the book, the author realizes a description of the main elements that help to define the image of the city. Among these there are *paths*, nodes and landmark. The first are described as the channels through which the observer moves habitually, occasionally or potentially. They may be roads, pedestrian streets, channels or railway lines. For many people these paths are the elements of their predominant image and their understanding of the city goes through these pathways. On the contrary, *nodes* are similar to points, to strategic places in the city, in which an observer may enter. They represent intensive focal points from which and to which to move and can be primarily junctions, places of break in transportation, crossings or convergences of paths, moments of shift from one structure to another. Nodes may also be simple concentrations that derive their importance from being the condensation of some use or physical character, as a street-corner hangout or a square. Finally, *landmarks* are another type of

and landmarks are included in the list of those elements that, in a more significant way, help defining the form of the city landscape. Consequently, giving the pedestrian bridge this threefold value means to give it a privileged role in promoting the urban environment restructuring, starting from its own founding elements. Therefore, the very process of morphological redefinition at the end of the last century can be also read as functional to the concept of *legibility*[21] developed by Lynch.

At this point, the images of the ancient *inhabited bridges* come back, handmade works that for centuries have represented one of the principal places of public life in the cities. A famous example is that of Ponte di Rialto bridge, a "public building" that in the past has been an important commercial exchange and social aggregation point, an extraordinarily important work not only on the functional and dimensional level: it represented the principal economic, juridical, fiscal, social and symbolic fulcrum of the settlement.

Aimed above all at the *connection* between two settlements on the opposite shores, the inhabited bridges identified a crossing, sometimes an interference possibility or a contact opportunity between the pedestrian and water traffic. Their *place* represented then an important city market: activities of every kind took a sure advantage of its passing position, above all when the proximity with the principal poles of the public life was assured. They possessed therefore an important role in the life and imagination of those people who saw, and used it, and were involved for different reasons. As Antonella Calabi remembers, «*They were structures that obviously had a symbolic and strategic meaning, but their symbolic importance was greater. In other words, they constituted the material sign of the city, an entrepreneurship demonstration and civic pride, often built thanks to contributions of citizens and serviced by their care and commitment. They were able to draw attention of foreigners and all those people that came from the outside and often became one of the most known images of the city itself, landmark, place for ceremonies, illustrious sovereigns' triumphal entry, but also processions, public entertainments or*

point-reference, but in this case the observer does not enter them, they are external. They are usually a rather simply defined physical object. Some landmarks are distant, usually visible from many angles and distances, beyond smaller elements, and used as radial elements. In summary, see pp 47-48

21 The *legibility* is described by Lynch as that «quality in the physical object that gives it a high possibility of evoking a strong image in any given observer. It is that shape, colour or arrangement that facilitates the making of vividly identified, potentially structured, highly useful mental images of the environment. It might also be called *imageability* or perhaps *visibility* in a wider sense, where objects can be seen but also sharply and intensely offered to the senses», *The image of the city*, MIT Press, Cambridge, Mass, 1960, pp 9-10

194. Stockholm Slussen Masterplan, Foster+Partners, Stockholm, 2008

exemplary punishment»[22].

It is no accidental if in the last years, and especially in the context of great urban revaluation plans, *living bridge* theme has bossily returned in fashion as maximum exemplification of that semantic triad that considers the footbridge contemporarily as node, path and landmark. Today, in fact, more and more studies and competitive examinations tackle this theme in the attempt to remould broad parts of the city giving back to them the *anthropological place* prerogative, that is of places, as Marcs Augé states, that set as identity, relational and historical spaces.

At this purpose, the four noteworthy projects of 2009 by Marc Mimram for New York, Shangai, Moscow and La Courneuve, but also Passerelle Simone De Beauvoir by Dietmar Feichtinger of 2006 and the most recent Limerick Living Bridge by Wilkinson&Eyre. We can also add many other projects as, just to quote some example, the proposal by Norman
194| Foster for Stockholm (2008), Marina Bay Bridge by Cox Architects (2010) and the famous
195| competition by RIBA in 2009 for the reconstruction, in an updated key, of the historical London Bridge, one of the most important places in London: «*Daily visited and dense of traffic at every time, it had for a long time the great political and symbolic importance that usually have got the central city places in the collective imaginary: the grisly custom to set out the traitors' head, as told by the ancient chronicles, is not but the most resounding demonstration of a habit to use the place as urban node for news communication*»[23].

22 *ibid.*, p 78.

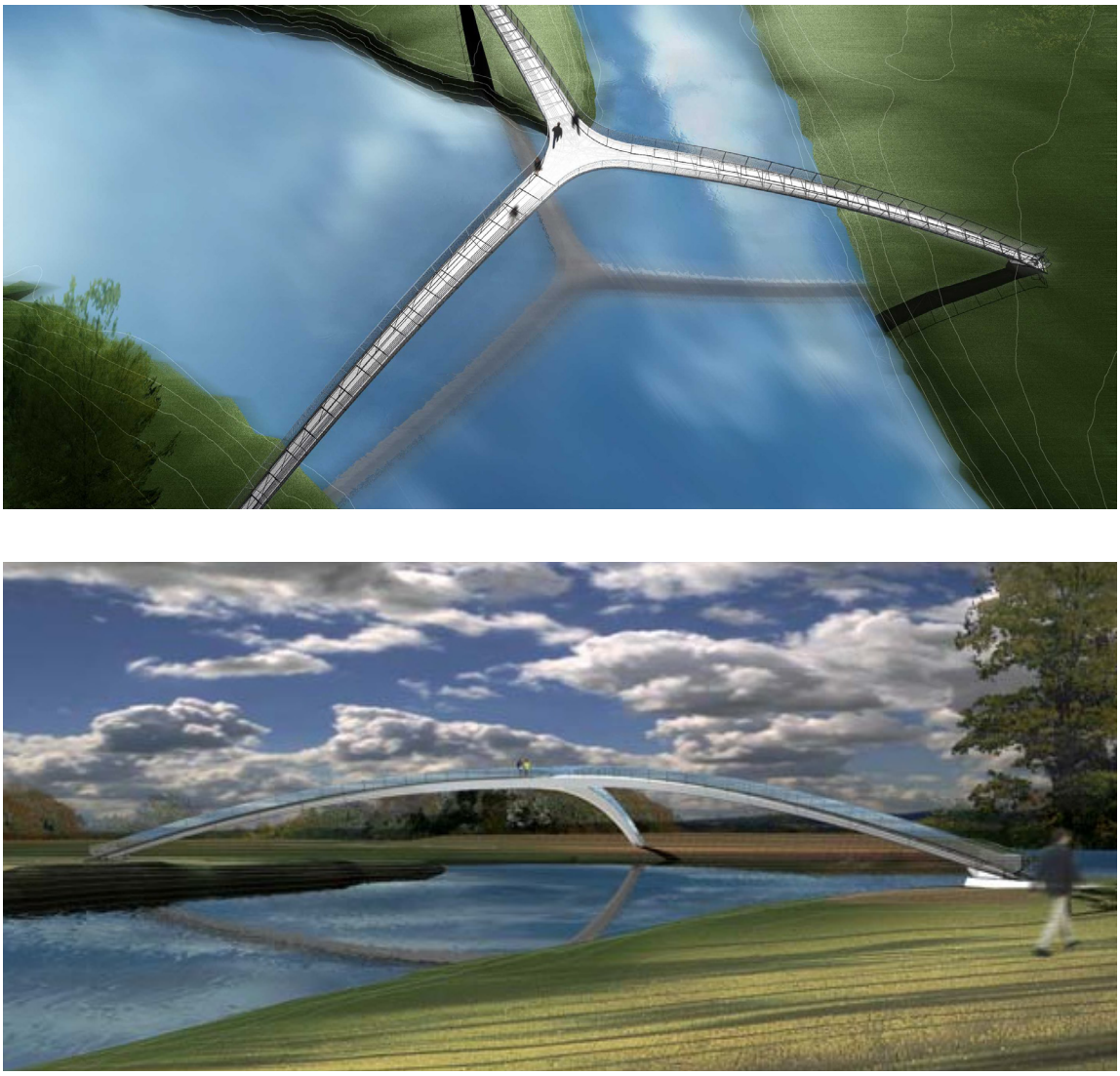
23 Donatella Calabi, *Il ponte e la città europea in età moderna*,in *De Pontibus. Un manuale per la costruzione di ponti*, (by Sasa Dobric, Enzo Siviero), Il Sole 24 Ore, Milano, 2008, p 80

195. London Bridge, Laurie Chetwood, RIBA Competition Winner, 2009

196. Marina Bay Bridge, Cox Architects, Singapore, 2010

197| Last of all, Hacking Ferry Bridge project becomes then emblematic, a project that clearly illustrates the semantic triad of modern pedestrian bridges in its highest degree of abstraction. Designed in 2000 by Wilkninson & Eyre Architects and Ian Firth, it is about a bridge (never built) which had to be a crossing in the confluence point of two rivers so as to give continuity to the three banks by a single architectural gesture.

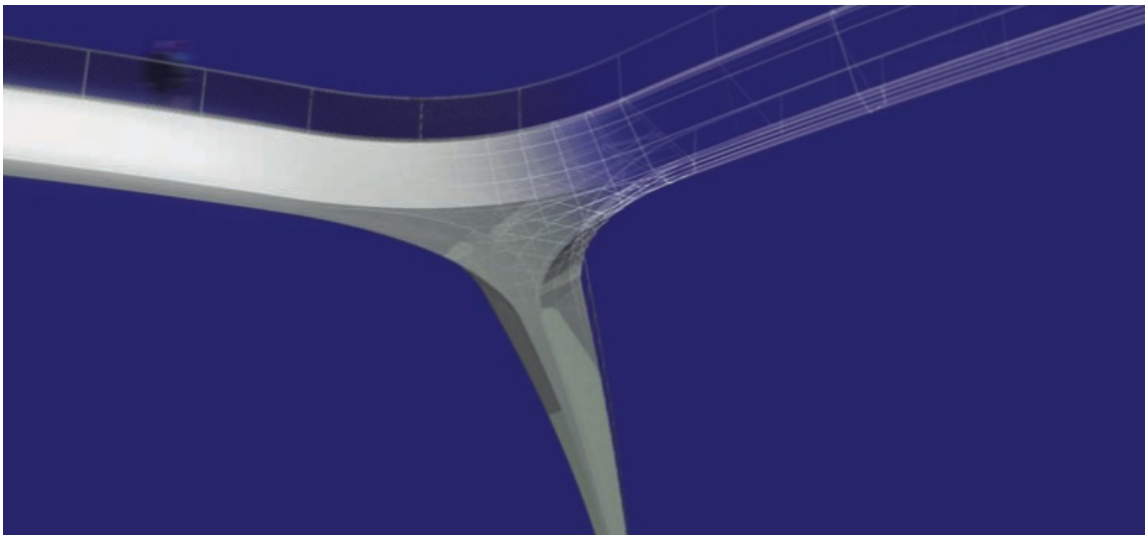
To this end, its designers conceived an interesting arch structure, consisting of three paths that, rising up all together from the ground, meet in an equidistant point suspended above the river. In this place, undisputed focus of the composition, the incredible possibility to admire the force of nature from above: river stream are here stronger and create whirlpools, showing the beauty and rush of its flowing. As a sort of tripod, whose top clearly indicates where the water flow is stronger, this bridge tells the story of, from



197. Hacking Ferry Bridge, Flint&Neil, Wilkinson&Eyre, Lancashire (UK), 2000

which everything starts and everything comes. With its threefold arch, the bridge thus makes an architecture that appears as a landmark of the event and uncover that magic, making it a unique place. At this purpose, we can thence affirm Hacking Ferry Bridge is a work that, before every other thing, gives dignity back to this part of territory: a dignity that springs from a deep feeling of respect and pride towards that landscape that lives and transforms out and inside of itself.

As Eugene Turri states, giving dignity back to the landscape means to appreciate the beauty and the importance of its existence. Be it Natural or artificial, the landscape isn't a simple inactive container, but a depositary of our history, a deposit for discards and debris, designed for become significant forms of the events that have produced them: a cultural patrimony, therefore, whose enjoyment all we have the right to, because it is one



198. Hacking Ferry Bridge, Flint&Neil, Wilkinson&Eyre, Lancashire (UK), 2000

of the basic elements that concur in defining our individual and social comfort. Giving dignity back to the landscape means to understand his real importance and put a stance on in front of its today's state of decline: as a result, it is a form of pride that can come just from ourselves, insofar as the fault of what happened is ours.

Consequently, besides that its primary function, the footbridge turns into an useful instrument to materialize this feeling. So it becomes a *project for landscape*, a transformation that has widened its finalities, including not only technical questions, but looks at the landscape in its full meaning of tangible representation of the relationships that bind the man to the territory where he lives in. As we have seen, these relationships are a product the man daily builds through his body and on the base of his way of perceiving reality through senses. Planning the bridge in consideration of this truth means to create therefore a work that becomes a true connection intermediary between the landscape and us.

On urban level, this perspective change has allowed to make in the last years interventions that have given back its original vitality to the urban space. A planning that focuses attention on the human sensory perception allows in fact to create places where he doesn't feel anymore as a context extraneous and uprooted body (typical of those cities conceived for moving by auto), on the contrary as integral part of the image and meaning of the city. He is a basic and irreplaceable element of the city. Without the man, the cities would lose their original meaning of meeting and exchange point.

As Fusco Girard explains, «*Since its birth the city has been the fruit of a complex project for life that daily is built together with the other. Consequently, it represents «the*

physical, concrete and spatial expression of the idea of person that reports to others»[24], that is the physical expression of the man in his relational dimension of a subject endowed with a natural predisposition toward the exchange, relationship and comparison with other people. The city is therefore the socialization place par excellence, the place where the individual, through his relationships, takes conscience of himself, his nature to be social and his being class, community and society. In consequence, the city is a synonymous of society and as such it is the mirror of the manners, forms and relationships the society represents itself by. Without the man, the city becomes a *non place*.

Producing therefore pleasant places where the man feels alive and stimulated allows to create an environment for the openness and freedom to set up new contacts with the outside. It means to grant the opportunity to identify himself in the landscape where he lives in and finds joy and love in and for it. Just in this way that feeling of pride can express, feeling from which the attention and the necessary care will spring to preserve what belongs to him. For all purposes, the renewal process that at the end of last century has given birth to the modern footbridges is a way to rediscover ourselves, reawaken our mind from that state of doziness and ignorance that in not too very distant epochs brought us to ruin what we hold dearer in the world, that is the landscape.

In one of his famous writings, Luis Kahn explains the way school institution should be conceived and his places organized to best stimulate the learning process. To do this he advances an excuse of a story and writes: «*Schools began when a man under a tree, unaware of being a teacher, started discussing consciousness raisings with few others that didn't know to be students. The students thought about that topics and the beauty to be with that man. They craved that also their children could listen to that man's words. The birth of the school was inevitable: it belonged to the man's aspiration*»[25]. In my opinions, that tree can be compared to the footbridge where at its base we can see us, careful and desirous students, greedy for re-knowing that deep reality of things that only the landscape, as a teacher, is able to disclose us.

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24 Luigi Fusco Girard, *La città, tra conflitto, contraddizioni e progetto*, Rivista ACE Architecture, City and Environment n°1/2006, Barcellona.

25 Maria Bonaiti (by), Architettura è. Louis I. Kahn, gli scritti, Electa, Milano, 2002

199. York Millennium Bridge, Whiyby Bird Limited, York (UK), 2001

APPENDIX
Palestro Ciclabile
A project of urban regeneration in Padua

Arch. Fabrizia Zorzenon - Arch. Elisabetta Carattin - Arch. Mattia Gatto

Summary

Between the 1960s and 1980s of the last century, the poetic atmosphere of many Italian cities was severely undermined because of the rapid increase in the car traffic within the urban areas. A more and more intense air pollution and an infrastructural production more and more inclined to speculate on landscape, rather than to preserve it, are some of the factors that led in a short time to a substantial damage of many urban centres and outskirts of our country. Like many other cities, also Padua has faced these problems such as the dramatic increase in the number of road accidents which in recent years have involved a growing number of cyclists and pedestrians, especially because of the lack of a protection plan for those living in the city.

In this respect, some years ago, the Municipality has decided to allocate special funds to the development of a safety programme for pedestrians and cyclists. With the above mentioned Padova ciclabile project, the city has so aligned itself with the main European initiatives aimed at developing new infrastructural systems based both on a logic hierarchization of the users (for example by separating the vehicular traffic from the pedestrian one) and on an idea of integration between infrastructure and landscape aimed overall at the regeneration of the urban scenario.

What follows below is therefore a project on an urban scale that is in line with the recent management policies of the territory and promotes the restructuring of a historic residential area of Padua, developed outside the historic centre along a fragment of the ancient Roman street of via Palestro. In specific terms, it is a strategic programme of regeneration of the urban environment in which the system of infrastructure is given a leading role: the construction of a new footbridge is indeed assigned the privileged task of giving this part of city a renewed quality by means of an intervention of morphological and social redefinition of the district itself.

Padua, city of water

1. General overview

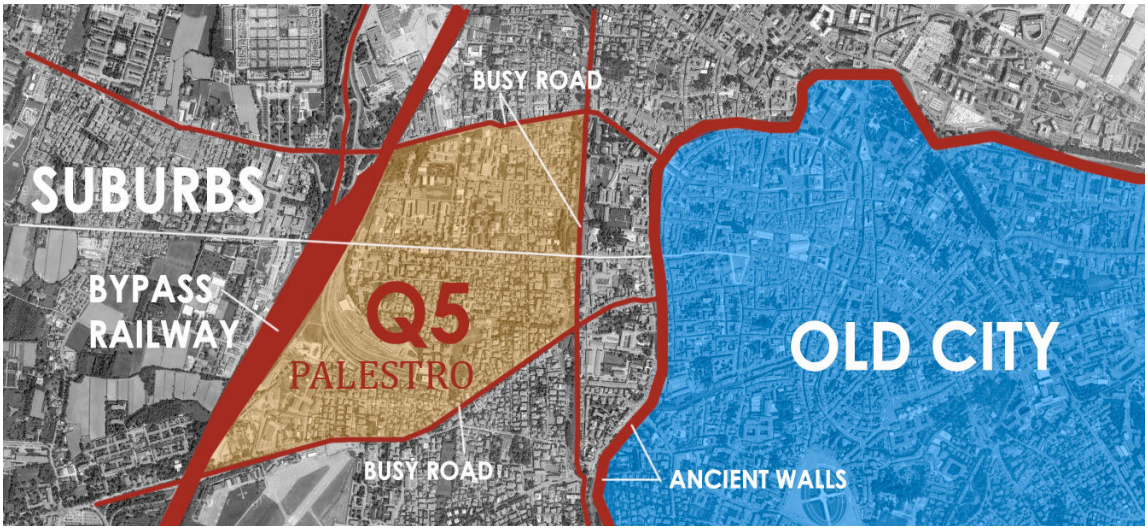
Padua, traditionally known as the "city of water", has always had a large number of bridges and footbridges that has allowed it to overcome the numerous rivers and channels that surround it and come out in the past of the isolation caused by the ring of water. Unfortunately, many of these works, also of Roman origin, don't exist today any more and numerous water courses have been gradually silted up to solve the problems that the continuous increase in vehicular traffic had raised.

Moreover, in the 1950s, the expansion of the city outside the fortified walls has required the construction of new infrastructural arterial roads that have quickly redefined the borders of the city. Like real physical and social barriers, they have led to an inexorable marginalization of some peripheral districts around the historic centre from the rest of the city, consequently reducing them to a ghetto.

These include the vicissitudes of the District n°5, to the south-west of Padua, whose settlement conformation is mainly affected by the presence of some important architectural barriers: in addition to the ancient Venetian walls of the city that delimit the space to the east and the river Bacchiglione that penetrates it horizontally to the south, the District is today surrounded (or better torn) by two major infrastructural arterial roads, the outside bypass of Padua and the railway Padova-Bologna, which hamper its connection with the neighbouring areas outside the city. In addition to these, there are also other very busy roads, which pass through the neighbourhood shattering it in several and detached small suburbs: these include the residential area of Via Palestro that is in a state of urban and social isolation with respect to the historical centre of the city and the other peripheral areas. Due to the numerous traffic

Ancient Venetian Walls (1500)

Expansion of Padua outside the fortified walls



Neighbourhood of Via Palestro and the topographic barriers

Neighbourhood of Via Palestro

Old and new topographic barriers

routes that surround it, this place carries the signs of a deterioration that for years has made life difficult there, both at an urban and social level. Unsuitable housing standards, an offer of public services not corresponding to urban rates, the massive presence of traffic and cars parked on both sides of the roads (also where the width of the streets wouldn't allow it) and the lack of sufficient space for pedestrians and cyclists to move in compliance with safety requirements, are the main factors that defines the image of a district reduced to the mere function of dormitory (despite being next to the historic centre) and marked by a social life, also because of the lack of commercial activities.

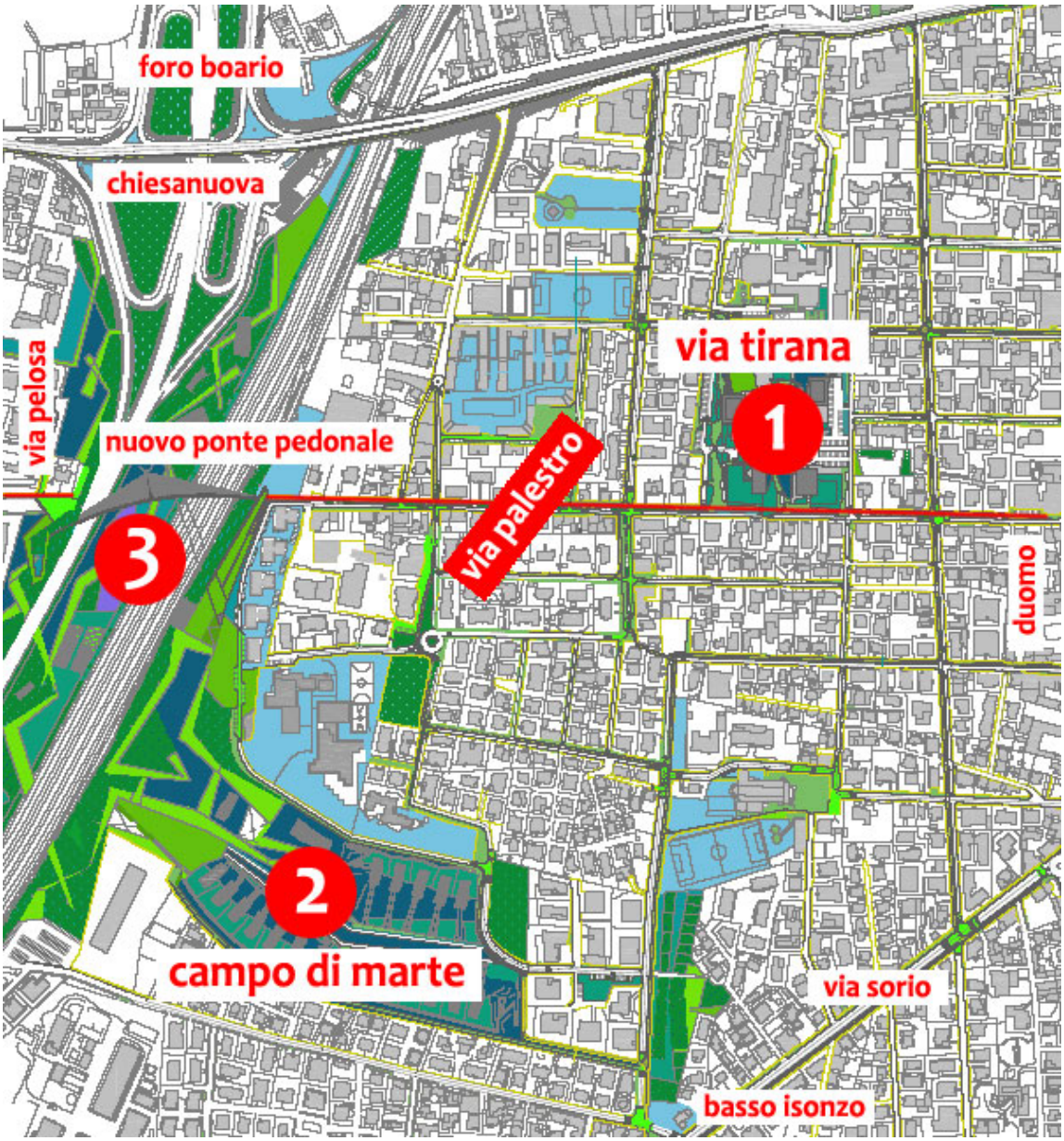
Fortunately, in the recent years, the District Council n°5 has highlighted, through the PATI (inter-municipal territory planning programme), the need to start a process of regeneration of this area, in order to increase the quality of housing standards for residents. As emerges from the documentation of the plan, the urban regeneration of this part of Padua is entrusted primarily to the implementation of new infrastructure works (essential to reconnect the district with the rest of the city) and wide interventions of improvement of public space and public green areas. In particular, the key element of this project is the construction of a new cycle and pedestrian bridge between Via Palestro and Via Pelosa, a project that is in line with the recent territorial policies promoted by the Municipality of Padua in favour of a sustainable urban development. For many years, the Municipality has been sponsoring the above mentioned Padova Ciclabile project, whose aim is to create a structured network of cycle tracks that from the centre of the city reaches the surrounding areas, in order to offer its citizens a healthier, clean and safe environment, able to dissuade them from the indiscriminate use of cars.

Brochure of Padova Ciclabile






Some views of the neighbourhood of Via Palestro as we can see it today



Masterplan of Via Palestro with its nodes (the new footbridge, via Tirana, Ex Campo di Marte)

2. Palestro Ciclabile: the urban project and the new footbridge in Via Palestro

According to these premises, the main objectives that guide the project of "Palestro Cicilabile" have been identified, an urban project that proposes a substantial redefinition of the physical and social structure of the area of Via Palestro dealing in detail with the concept of node, path and landmark to make them the key elements of the intervention.

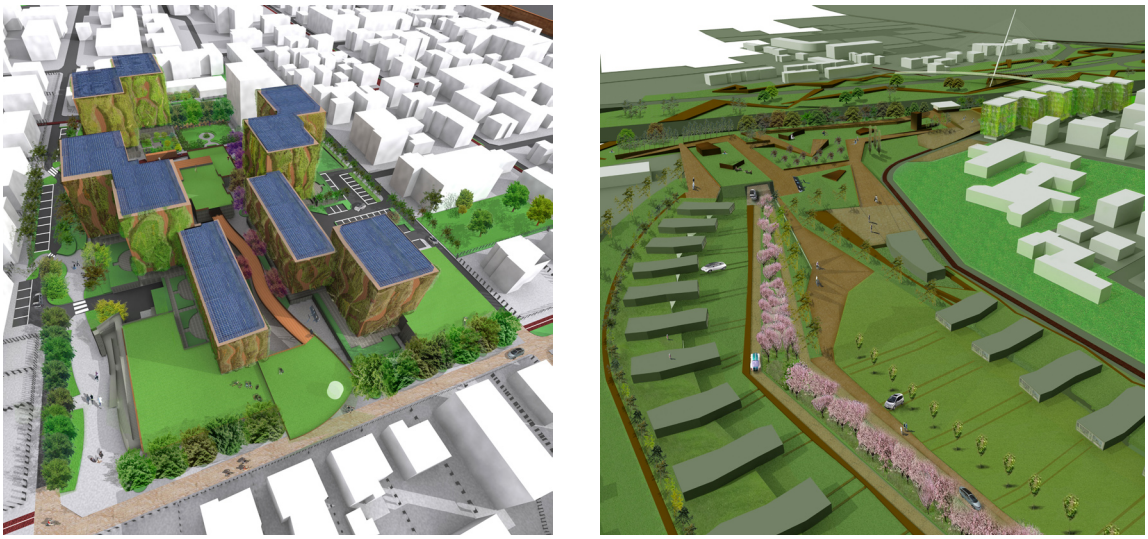
Phase 1 (SEE DRAFT 1/2/3)

Investigating the possible causes of the social degradation that is now concerning the district of Via Palestro represents the starting point of this urban study.

A decisive factor is in this sense the lack of what Fusco Girard calls "spaces of proximity and centrality", i.e. those places that make the city pleasantly liveable. In the face of this lack, those spaces have been identified that, once they are regenerated, would have possessed the ideal characteristics to become "incubators of relational values". The attention had been so focused on the decaying residential complex of Via Tirana (a group of buildings of 1960s directly overlooking Via Palestro) and on the former "Campo di Marte" (a property of the Italian Railways no longer being used), which are involved in a significant project for urban regeneration by means of physical redefining of their public spaces. The conviction is that by improving the quality of Architecture of these spaces it is possible to recreate that attractiveness and contagious energy that is typical of each place of life, i.e. have a positive influence on the social life of this district and promote a greater perception of well-being and a renewed feeling of belonging and social cohesion. As already pointed out, an environment with a certain aesthetic quality is able to act as a magnet attracting to it not only persons but also those small businesses that contribute to the livelihood of the district.

In this perspective, therefore, the project of via Tirana aims at turning the complex into the new social and economic node of this district. Taking account of its central position with regard to Via Palestro, the concentration of new businesses, as well as the restructuring of buildings with the creation inside of it of a structured system of public spaces and green areas, represent the necessary ingredients to turn this micro and decadent reality into a large urban square, crucial node of the Palestro district.

The former "Campo di Marte", which appears complementary to all that, will be transformed in an urban park for cultural and recreational activities. The key elements of such plan are: the creation of pedestrian paths, forested areas, urban gardens, areas of phytopurification and some interventions of residential building

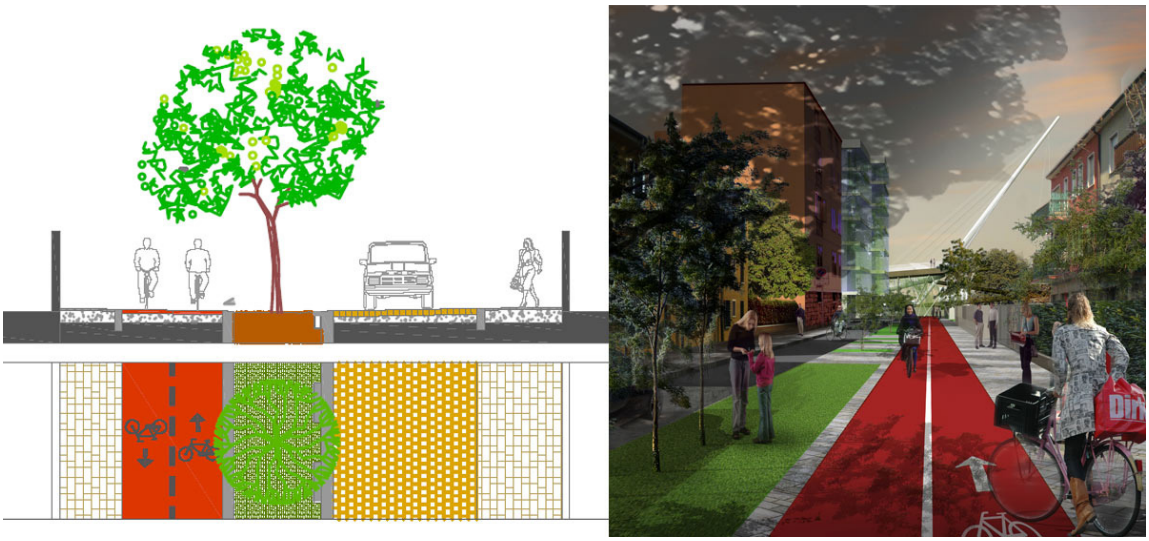


Views of Via Tirana's Project (Node 1) and Ex Campo di Marte Area (Node 2)

characterized by low housing standards, which have been designed as areas of filter between the park and the densely built surroundings. The area will then include the new underground station of Padua and its public services. On an urban scale, this park is also an important strategic node of connection between the future Park of Basso Isonzo, in the south of Padua, and the scheduled cultural centre in the former area of Foro Boario. To this end, a new pedestrian and cyclist path will cross the park diagonally acting as a link between the two poles.

Phase 2 (SEE DRAFT 4/5)

After identifying the potential intensive nodes of the social life within the district of via Palestro, the second phase of this study is focused on the regeneration of the urban spaces necessary for their connection. The central element of this operation has been the planning of an articulated system of pedestrian and cyclist paths, alternative to those for cars, with the fundamental task of creating a fast, safe and pleasant connection between the different nodes individualized inside the area. These nodes also include schools, churches, sporting areas and town parks. The final objective is to reduce the flow of the vehicles for the circulation inside and towards the district so as to realize a real restructuring of the urban spaces and to give them a renewed architectural quality. A not fragmented and well designed district allows its residents to have a great freedom and variety of daily movements without necessarily using the car. To such purpose, on the wake of the Danish example of a sociality widespread in an urban context with an elevated architectural quality, different typologies of intervention have been identified that should be evenly extended to the whole district. These typologies include: pedestrian areas as "woonerf" and interventions



Details of Via Palestro after the project of regeneration.

of improvement of the multitude of green spaces in the district, affected today by a state of semi-abandonment.

In this sense, the area more subject to that kind of intervention is via Palestro, which has been involved in an important project of redevelopment aimed at restoring the density of meanings that belongs to the idea of street in its original value. Thus, like Haussmann's boulevards, a conversion plan has been developed to transform this space, mostly used today by cars, in an area of meeting and socializing. The street has been so reduced to a one-way road, with enlargements of the pavements on both sides (also including trees and a new lighting system with low energy consumption) and a long cycle track that creates a link between the district and the historical centre of Padova, through the rubble of San Prosdocimo.

Phase 3 (SEE DRAFT 6)

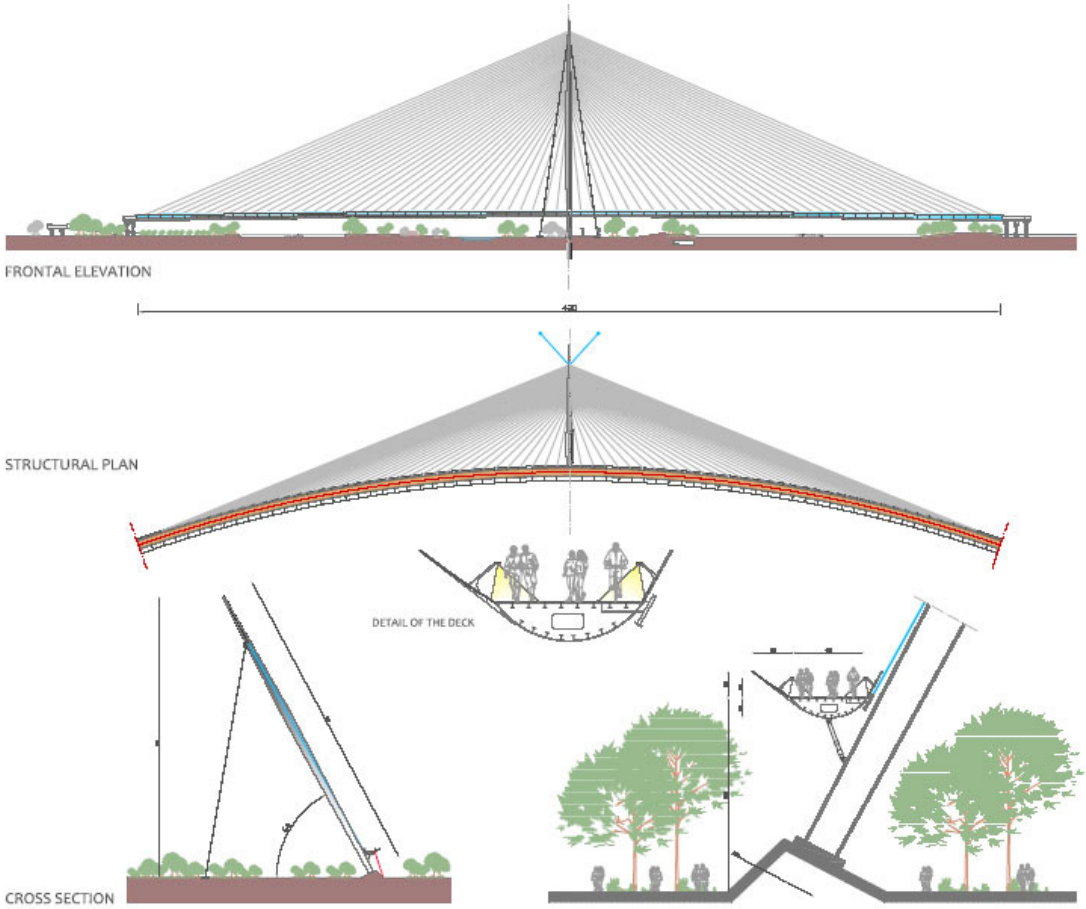
Once the urban and social structure of the district has been recreated, the next stage of this work has dealt with the topic of reconnection of this urban fragment with the rest of the city. We have so identified the necessary conditions to exit from a status of ghetto of the area and transform it into a place physically and culturally permeable both for those who live there and for those who will come from the outside. This operation is focused on the realization of a new cyclist and pedestrian bridge across the large physical barrier created by the railway line to Bologna and the lanes of the outside bypass of Padua. In specific terms, this project deals with three main topics.

Path

The first topic is the creation of a raised path that gives continuity to the system of the cyclist and pedestrian urban tracks and recreates that leading thread that historically led from the Duomo of Padua directly to the heart of the city of Vicenza. Together with the new Pelosa Footbridge (Progeest, 2008), it is meant to underline the need to reconnect the ancient Roman street of via Pelosa with its urban stretch of Via Palestro.

From the functional point of view, the new bridge is also a good alternative to the crucial flyover of Chiesanuova that in recent years has caused several accidents: the new bridge is, in this sense, an effective solution to the problem of road safety. The use of the new structure allows the residents (young people and older people) of suburbs as Rubano, Caselle and Brentelle di Sopra to reach in a short time (and in full serenity and security) the historical centre of Padua through the rubble of S. Prosdocimo.

The crossing of the barrier is created by means of a cable stayed structure that extends above the rail and the bypass with a span of 210 metres. With its curved



The new footbridge of Via Palestro

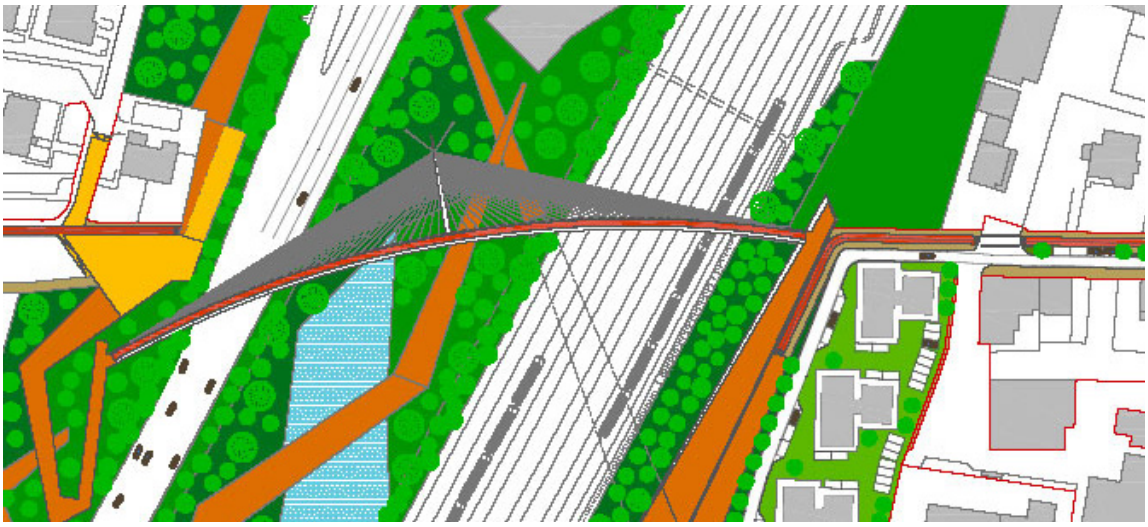
deck, supported by external edge, it creates a kind of curvilinear connection between the straight lines of Via Palestro and Via Pelosa. In the plan, the concept of connection is visually expressed by a combination of lines that refers to the design of the spring. The curve of the deck is followed, at both sides, by a sequence of zigzag lines that corresponds to the tracks of the ramps and the cycle paths.

Node

The second issue deals instead with the virtual demolition of the virtual "border" and its reconversion in an urban place. Like a sort of a no men's land, this barrier (now property of Italian Railways, it will be soon put on sale for residential use) is morphologically made up by a long and slender space, confined between the tracks of the railroad and the anti-noise barrier of the bypass. Once this area, renamed "limbo", is improved, it could be used to build an interesting urban space used as green area necessary to recreate that visual, as well as physical, continuity between the urban fabric of Via Palestro and that of the nearby District n°6 along Via Pelosa. The physical and formal redefinition of the "limbo" and the architecture of the new footbridge of Via Palestro is functional in this sense. In particular, the conformation of the latter establishes the guidelines for the architectural redesign of the green areas that surrounds it. From its abutment, as from its deck, the lines start around which the spaces of the urban park within former Campo di Marte, of the green areas of limbo and of those located beyond the bypass take form. With its curvilinear path, which almost embodies the feeling of an embrace, it takes back to itself the different areas, giving shape to a single large urban space, third key node of the whole project of urban renewal in the district of Via Palestro. Also the structure of its internal spaces follow this objective: turning to the park, the bridge leaves the bearing structure behind while the parapet, opening up to the outside, induces the pedestrian to live the bridge obliquely. In this way, he can enjoy the beauty of the park and perceive the intrinsic nature of this connecting place. Through this operation it becomes therefore possible to transform an environment physically torn in a unique place, organized on two levels (the one of the deck and the one of the ground below) and with its own specific identity that is strengthened by the bridge.

Landmark

A white and 130 metres high pylon supporting the deck is finally the conceptual



When the bridge becames an urban place

focus of the third theme faced by the bridge: the memory made possible by means of a work of landmark. With its slender shape, placed within the limbo, the pylon stands out from the ground vigorously and rises up above the city becoming an icon of the demolished border and the symbol of the rebirth of this land. Thanks to its height, it provides an interesting visual relationship with the dome of the Duomo of Padua. In this sense, its position was conceived by the desire to put the pylon in the centre of the visual cone of those who are moving from the centre towards the structure, while the spatial conformation of the deck allows, for those who cross it, a privileged view of the architecture of the Duomo. Those who, finally, will turn their look from the top of the near overpass of Chiesanuova in the direction of the bridge will perceive its value of organizing element within the urban skyline.

In conclusion, the new footbridge of Via Palestro appears at the same time as a path, node and landmark. With its architecture it expressly embodies these three functions. Originating almost naturally from the interference between the ancient road and the new infrastructural system, the bridge acts as the binding agent keeping together the various parts of the city, that is the invisible material that connects and reduces remote fractures. At the same time, however, it becomes an opportunity for the recognition of the specificity and the identity of the place. It represents the node, the focal point of the place, to which the eye unintentionally turns and that produces the contagious energy that will make this space a place of life. By conveying to itself the perceptual vectors that rule the urban image, it becomes therefore the main point of visual reference. Unlike Calatrava's works, its "reversible" architecture achieves a real visual "inversion" of the figure-ground relationship, thanks to which the background, from empty, inert, neutral and indifferent surface, takes the meaning of real and vibrant substance. That is, the bridge does not appear as a figure in the background, but turns the background into a figure, generating so a complete symbiosis between infrastructure and landscape, a symbiosis that makes the latter the prevalent element in the spatial experience. In this way, a new urban space will originate from the bridge, with a recognizable and meaningful image. This result is given then by the state of visual tension impressed in the curve of the deck (which underlines the reunification of the different strips of land) and in the inclination of the pylon, the concordance of lines between the geometry of the bridge and that of the parks below, and the large dimensions of the structure necessary to arrange the great perceptive emptiness between the urban fabrics of District n°5 and n°6.
It turns out to be a work that becomes itself a metaphor of a redeveloped landscape.

Bibliography

Main Literature about Bridges and their Architecture

- M. Arici, E. Siviero, *Nuovi orientamenti per la progettazione di ponti e viadotti*, D. Flaccovio Editore, Palermo, 2005
- U. Baus, M. Schlaich, *Footbridges: costruction, design, history*, Birkhauser, Basel, 2008
- D. Bennett, *The creation of bridges: from vision to reality, the ultimate challenge of architecture, design and distance*, Aurum, London, 1999
- L. Blakstad, *Bridge: the architecture of connection*, Birkhauser, Basel, 2002
- A. Boegle, *Leicht Weit: Jörg Schlaich, Rudolf Bergermann,* Prestel , Monaco 2003
- Fib Bulletin 9, *Guidance for good bridge design*, Link International Federation for Structural Concrete, Lausanne, 2000
- J. Conzett, *Architettura nelle opera d'ingegneria*, edited by M. A. Chiorino, Allemandi, Turin, 2007
- S. Dobric, E. Siviero, *De Pontibus. Manuale per la costruzione di ponti*, Il Sole 24 ore, Milan, 2008
- K. Frampton, *Calatrava Bridges*, Birkhaeuser, 1996, Muenchen
- F. Fromonot, Marc Mimra. *Passerelle Solferino*, Birkhauser, Basel, 2001
- L. Fernanedz Troyano, *Terra sull'acqua: atlante storico universale dei ponti*, edited by M. Arici, D. Flaccovio, Palermo, 2006
- F. Gottemoeller, *Bridgescape: the art of designing bridges*, Wiley, New York, 1998
- F. Leonhardt, *Zu den Grundfragen der Ästhetik bei Bauwerken*, Springer, Berlin, 1984
- I. Margolius, *Architects + Engineers = Structures*, Academy Editions, New York
- Otua, *Footbridge 2002*, Paris, 2002
- University IUAV of Venice/Otua, *Footbridge 2005, 2nd International Conference*, Venice, 2005
- Faculdade de Engenharia da Univesidade de Porto/Otua, *Footbridge 2008. Urban Renewal*, 3th International Conference, Oporto, 2008
- A. Pauser, *Massivbrucken - ganzhettlich Betrachten*, Bau und Technik, Duesseldorf, 2002
- A. Picon, *L'art de l'ingénieur*, Editions du Centre Pompidou, Paris, 1997
- M. Poetzl, *Grundlagen fuer den Entwurf der Bruecken*, Berlin, 1996
- J. Schlaich, K. Gabriel, *Seiltragwerk - Vorlesungsunterlagen*, Fachgebiet Massivbau - Technische Universitaet Berlin, Berlin, 2002
- J. Schlaich, A. Pauser, *Beton Calender 2004 - Brucken und Parkhaeuser*, Ernst&Sohn, Berlin 2004
- M. Schlaich, *Guidelines for the design of footbridges*, Fib Bulletin 32, Lausanne, 2005
- E. Siviero, *Il tema del ponte*, Catalogue of the exhibition about Enzo Siviero's works and his students' projects held in Venice in 1999, Editrice Compositori, Bologna, 1999

- E. Siviero, S. Casucci, A. Cecchi, *Il ponte e l'architettura*, Città Studi, Milan, 1995
- E. Siviero, L. Ceriolo, *Il mondo dei ponti - The world of Bridges*, Editrice Compositori, Bologna, 2003
- E. Siviero, S. Casucci e A. Cecchi, *Il progetto del ponte*, Biblioteca Galileo, 1994, Padova
- E. Siviero, A. Benedetti, *La concezione strutturale nel progetto di architettura*, Compositori, Bologna, 2002
- E. Siviero, *Ponteggiando - Bridging*, Catalogue of the exhibition about Enzo Siviero's works and his students' projects held in Padova in 2009, Il patro, Padova, 2009
- Jiri Strasky, *Stress Ribbon and Cable Supported Pedestrian Bridges*, Thomas Telford ltd, London, 2005
- M. Torres Arcilia, *Ponti*, Atrium Group, Barcelona, 2003
- E. Torroja, *La concezione strutturale*, CittaStudi, Milan, 1995
Bridge Construction, Detail 8, 1999
- M. Wells, *Bridges*, Laurence King Publishing Ltd, London, 2000
- Wilkinson&Eyre, *Bridging art& science*, Booth-Clibborn Editions, London, 2001

Landscape

- F. Alberti, I. Pizzetti (a cura di), *Architetture del Paesaggio*, Allinea, Florence, 2000
- A. Clementi, *Interpretazioni di Paesaggio: Convenzione europea e innovazioni normative*, F.lli Palombi, Rome, 1986
- L. Caravaggi, *Paesaggi di paesaggi*, Meltemi, Rome, 2002
- L. Caravaggi, R. Pavia, S. Menichini, *Stradepaesaggi,* Meltemi, Rome, 2004
- F. Mazzino, *Paesaggio & architettura: atti della giornata di studio, Genova 23.03.2000*, Allinea, Florence, 2001
- C. Muscarà, *Piani parchi paesaggi* (inside: Eugenio Turri, *Il paesaggio oltre la geografia*, p 126 – Jean Paul Guerin, *Il grande ritorno del paesaggio*, p 121 – Umberto
- Vascelli, *Nuove dimensioni culturali di paesaggio*, p 140)
- V. Romani, *Il Paesaggio. Percorsi di studio*, Franco Angeli, Milan, 2008
- C. Norberg-Schulz, *Genius loci : paesaggio, ambiente, architettura*, Electa, Milan, 1998
- E. Scandurra, *Città del terzo millennio*, Edizioni La Meridiana, Molfetta, 1997
- C. Tosco, *Il paesaggio come storia*, Il Mulino, Bologna, 2007
- E. Turri, *Antropologia del paesaggio*, Ed. di Comunità, Milan, 1974
- E. Turri, *Il paesaggio e il silenzio*, Venice, Edizioni Marsilio, 2004
- Eugenio Turri, *Il Paesaggio degli uomini: la natura, la cultura, la storia*, Edizioni Zanichelli, Bologna, 2003

Perceptive analysis

- R. Arnheim, *La dinamica della forma architettonica*, Feltrinelli, Milan, 1985
- R. Arnheim, *Arte e percezione visiva*, Feltrinelli, Milan, 1988
- R. Arnheim, *Il pensiero visivo*, Einaudi, Turin, 1974
- M. De Rubertis, M. Clemente, *Percezione e comunicazione visiva dell'architettura*,

Officina, Rome, 2001
- P. Gregory, *La dimensione paesaggistica dell'architettura nel progetto contemporaneo: l'architettura come metafora del paesaggio*, Laterza, Rome, 1998
- M. Hachen, *Scienza della visione: spazio e Gestalt, design e comunicazione*, Apogeo, Milan, 2007
- E. T. Hall, *Il linguaggio silenzioso*, Bompiani, Milan, 1969
- E. T. Hall, *La dimensione nascosta: il significato delle distanze tra i soggetti umani*, Bompiani, Milan, 1988
- D. Harvey, *La crisi della modernità*, Il Saggiatore, Milan, 1993
- M. Heidegger, *Saggi e discorsi*, (a cura di) G. Vattimo, Mursia, Milan, 1991
- M. Henle, *Documenti sulla psicologia della forma*, Bompiani, Milan, 1970
- D. Le Breton, *Il sapore del mondo*, Raffaello Cortina Editore, Milan, 2007
- R. L. Gregory, *Occhio e Cervello: la psicologia del vedere,* Il saggiatore, Milan, 1966
- D. Katz, *La psicologia della forma*, Boringhieri, Turin, 1961
- G. Kepes, *Il linguaggio della visione*, Dedalo, Bari, 1971
- K. Koffka, *Principi di psicologia della forma*, Boringhieri, Turin, 1970
- M. Sambin, L. Marcato, *Percezione e Architettura*, R. Cortina, Milan, 1999
- D. M. Levin, *Modernity and the Hegemony of Vision*, University of Califormia Press, - Berkeley-Los Angeles, 1993
- M. Merleau-Ponty, Fenomenologia della percezione, edited by A. Bonomi, Milan, 1965.
- J. Pallasmaa, *Gli occhi della pelle. L'architettura e i sensi*, Jaka Book, Milan, 2007
- F. L. Wright, *Writings and Buildings*, a cura di Edgar Kaufman e Ben Raeburn, Horizon Press, New York, 1960

Urban Spaces and semantic matters

- *Aalborg Charter Conference on Sustainable Cities&Towns*, 27 May 1994
- F. Alberti, *Progettare la Mobilità*, Edifir, Florence, 2008
- J.F. Augoyard, *Passo passo : il percorso quotidiano in ambiente urbano*, Lavoro, Roma, 1989
- M. Augé, *Nonluoghi: introduzione a una antropologia della surmodernità*, Elèuthera, Milan, 1993
- A. Bagnasco (edited by), La città dopo Ford, Bollati Boringhieri, Turin, 1990
- R. Barthes, *Elementi di Semiologia*, Einaudi. Turin, 1966
- M. Berman, *L'esperienza della modernità*, Il Mulino, Bologna, 1985
- O. Bohigas, Contro l'incontinenza urbana: riconsiderazione morale sull'architettura e la città, Cangemi, Rome, 2008
- D. Calabi, *Storia della città: l'età contemporanea*, Marsilio, Venezia, V. Calabrese, *Atopie : non luoghi, spazi quasi pubblici, quasi spazi pubblici*, DAU, Università degli Studi g. D'Annunzio, Pescara, 1995
- P. Caputo (edited by), *Le architetture dello spazio pubblico: forme del passato forme del presente*, Electa, Milan, 1997
- F. Choay, *L'orizzonte del posturbano*, Ernersto d'Alfonso, Officina, Rome, 1992A.
- F. Choay, *Del destino della città*, a cura di Alberto Magnaghi, Alinea, Florence, 2008

- F. Choay, *Espacements: figure di spazi urbani nel tempo: l'evoluzione dello spazio urbano in Francia*, cura di Ernesto d'Alfonso, Skira, Milan, 2003
- A. Clementi, F. Perego, *Europolis: la riqualificazione delle città in Europa*, Laterza, Rome, 1990
- A. Clementi, R. Pavia, *Territori e spazi delle infrastrutture*, Transeuropea, Ancona, 1998
- Roberta Comunian, Pier Luigi Sacco, *NewcastleGateshead: riqualificazione urbana e limiti della città creativa*, DADI Dipartimento delle Arti e del Disegno Industriale, Università IUAV di Venezia, Juny 2006
- A. De Cesaris, *Infrastrutture e paesaggio urbano*, Rome, Edilstampa, 2004
- P. Desideri, M. Ilardi, *Attraversamenti: i nuovi territori dello spazio pubblico*, Costa&Nolan, Genova, 1997
- S. D'Urso, *Barcellona, lo spazio pubblico tra infrastrutture e paesaggio*, CLUP, Milan, 2005
- U. Eco, *La struttura assente*, Bompiani, Milan, 1968
- M. Foucault, Eterotopia: luoghi e non-luoghi metropolitani, Mimesis, Milan, 1994
- L. Fusco Girard, *La città, tra conflitto, contraddizioni e progetto*, Rivista ACE Architecture, City and Environment n°1/2006, Barcelona
- L. Fusco Girard, Nicholas You (a cura di), *Città Attrattori di Speranza. Dalle buone pratiche alle buone politiche*, Franco Angeli, Milan, 2006
- V. Gangemi, *Cultura e impegno progettuale : orientamenti e strategie oltre gli anni '90*, F. Angeli, Milan, 1992
- J. Gehl, *Vita in città: spazio urbano e relazioni sociali*, Maggioli edizioni, Rimini, 1991
- U. Hannerz, Esplorare la città: antropologia della vita urbana, Il mulino, Bologna, 1992
- G.K. Koenig, *Architettura e Comunicazione*, Lef, Firenze, 1970 K. Lynch, *L'immagine della città*, Marsilio, Padova, 1964
- Greater London Authority, *The London Plan, Spatial Development Strategy for Greater London,* February 2004
- *Making London a walkable city, The Walking Plan for London*,Transport for London, February 2004
- K. Lynch, *The image of the city*, MIT Press, Cambrige, Mass, 1960.
- A. Manfredini, G. Manfredini, *La progettazione architettonica nella riqualificazione urbana*, Allinea, Florence, 2006
- G. Marinoni, *Metamorfosi del progetto urbano*, F. Angeli, Milan (2005)
- G. Marinoni, *Infrastrutture nel progetto urbano*, F. Angeli, Milan (2006)
- C. Martì Aris, *Le variazioni dell'identità: il tipo in architettura*, edited by Marta de Benedetti, Città Studi, Milan, 1990
- L. Mumford, *La città nella storia*, Edizioni Bompiani, 2002 (original edition, *The city in History*, Harcourt,1961)
- Municipality of Copenhagen, *Urban Place Action Plan 2006*
- Nazioni Unite, *Habitat agenda, agenda habitat: verso la sostenibilità urbana e territoriale*, Franco Angeli, Milan, 2002, p 102

- A. Orlandi, *Il paesaggio della città : spazi aperti, giardini, parchi e struttura urbana*, Gangemi, Rome, 1994
- G. Ottolini, *Il linguaggio delle pietre*, Guerini Studio, Milan, 1981
- M. Torres, *Luoghi Magnetici. Spazi pubblici nella città moderna e contemporanea*, Franco Angeli, Milan, 2000
- Fabrizio Zanni (edited by), *Architettura, progetto, reti*, Libreria Clup, Milan, 2000

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