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12





ficha técnica

Título | Serial title

A OBRA NASCE
revista de Arquitetura e Urbanismo
da Universidade Fernando Pessoa
nº12, dezembro de 2017

Edição | Publisher

edições Universidade Fernando Pessoa
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edicoes@ufp.pt | www.ufp.pt

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Oficina Gráfica da Universidade Fernando Pessoa

ISSN

2183-427X

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Green + grey: eco-oriented redevelopment of urban contexts

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ABSTRACT

Urban regeneration aims to pursue an upgraded level of sustainability each time with a new experience creating a positive competition between nations, trying to differentiate their works with innovative technologies. The purpose is to develop areas to create sustainable, multi-functional, totally accessible public spaces characterized by two components: the green component (vegetation) and the grey one (built environment), which will become the main elements to achieve a new eco-oriented reticular redevelopment. The case study of Hudson Yards set an example of how sustainable technologies can be used to create a mixed-use real estate with office, residential and retail space, integrated with a central green public square. The new structure of urban context is itself becoming a new platform for sharing: the collection of data through IT tools such as GIS (Geographic Information System) allows to keep every aspect under control and to make it understandable to everyone.

Keywords

Cyber-mapping, Environmental design, Innovative technologies, Reticular connection, Web-cartography.

1. THE ENVIRONMENTAL REBALANCING

[ROSSELLA FRANCHINO]

The forecasted growth of urbanization that will take place in the coming years should also consider the quality of urban areas in relation to the use of natural resources. In order to take action on urban land development, to find an alternative approach to the model that prevailed throughout the last century, the rebalancing interventions should be addressed focusing on, among other things, improving environmental quality.

Anthropic activity, with interrelated complex structures and relationships, determines its own footprint in the environment, with it being a sign of decay and eventually left as a burden on future generations. In order to limit the anthropic footprint, it is necessary that any redevelopment interventions have the goal of changing the environment in which they will be carried out in a sustainable way. It is therefore a priority to orient any redevelopment intervention so that the unavoidable footprint is contained as much as possible, with this being achieved by increasing the ability to absorb and control the anthropization phenomena with a sustainable impact on the ecosystem.

The study of the conditions of the environmental water, air and soil matrices is one of the preliminary stages in redevelopment interventions of the areas that have been affected by past anthropic activities.

These human activities that have happened over time and that can be of various types, in many cases have affected substantially the environmental quality of the area.

The reuse mode, reconfiguration, natural landscape and usability are all closely related aspects in order to achieve a renewed quality of the environmental conditions of the area as a whole.

The redevelopment of the areas previously used for human activities is often approached from two perspectives, which are independent of each other: a technical viewpoint and from the perception of the landscape. The first deals with the technical design of the processing operations, not par-

ticularly linking it to the next intended use and merely focusing on checking the quality of the environmental matrices. The second concerns itself with the final configuration and the new use of the site, often underestimating the need for the technical intervention so as to remove the causes of the deterioration of environmental quality. The final result is that of obtaining, except in some particularly interesting cases, either a global control of environmental quality, which is often not in synergy with the reuse intervention of the site or a superficial arrangement without any control of the affected environmental subsystems.

It is therefore essential to identify the technical assistance required to monitor the environmental matrices in each case, but it is also highly significant that the intervention is structured in close synergy with the site's environmental transformation. The outcomes that may occur are varied and depend on both the previous use of the site as well as the new reconfiguration, ranging from just a functional disposal to move the activities to another place up to a decommission with ecological and environmental implications due to the previous use.

It is, therefore, highly important to customize the environmental control intervention by identifying the technological systems necessary, case by case, favouring the application of natural ones or that make the intervention even more environmentally effective.

In integrated rehabilitation interventions, which include the redevelopment of the area for an appropriate re-use, even the network infrastructures that provide environmental services should be properly planned. It is of fundamental importance to identify the links of the networks with the environmental base upon which to apply the service and, therefore, with the needs of the water, air and soil matrices in order to optimize the configurations for which the networks take the environmental status in relation to the various types of local contexts that may arise.

In order to appropriately structure the environmental re-balancing interventions of urban contexts in an eco-oriented perspective, the contribution made by natural water and green resources is particularly important, so as to use the

principles of nature as a model of sustainable management by stimulating their inherent natural potential.

In this context, the control of rainwater flows to the ground is significant to correctly and sustainably structure assumptions of urban transformation and rebalancing since the natural hydrological cycle of water at a local level is strongly affected by urbanization. In an urban context, the continuing increase in impervious surfaces often causes considerable problems of erosion and flooding, thus disrupting the balance between the precipitation, evaporation and supply of groundwater and surface runoff. A change in the management of water resources in urbanized areas is therefore necessary, with it having to follow the natural cycle. The actions to establish a sustainable management include re-waterproofing the ground, as well as to allow for the infiltration of rainwater so as to recover and reuse it.

The traditional water cycle in rural areas, with extensive permeable surfaces and the presence of vegetation and surface watercourses is characterized by high evaporation and infiltration as well as low runoff.

However, the water cycle in urban environments is defined by lower evaporation and reduced infiltration, which leads to the reduction of groundwater, as well as a considerable increase in the surface runoff due to the impervious surfaces. This means that the water must be quickly collected and channelled into the sewage system and does not supply the underground aquifers.

Natural systems can be used to check the water collection process, thus allowing for a management at a territorial level through a waste collection effected through the implementation of a self-regulating urban micro-basin that is managed according to the principles of "design for water conservation".

These natural systems are even more effective if, in addition to controlling the problems related to water management in anthropized areas, they also control the green aspect. This interconnection makes it possible to realize blue + green corridors that pass through the urban environment, help to connect the existing natural systems as

well as contribute to the improvement of the environmental characteristics of the area as a whole. The infrastructure systems that make it possible to reach these objectives can guarantee a sustainable future for urban areas and generate multiple ecological–environmental, social, cultural and even economic benefits.

The use of technologies that employ green + blue resources is proposed for the environmental rebalancing of urban open spaces, with the goal of using the principles of nature as a model of sustainable management by stimulating the inherent natural potential of these resources, which have remained undeveloped due to mass anthropization.

2. A RETICULAR MODEL {CATERINA FRETTOLOSO}

The controlling of the urban environmental quality is the result of a series of strategies aimed mainly at improving the thermal and hydrological balance of that part of the territory upon which to intervene, through the conscious use of both the materials of which the space is made of and the vegetation system. This balance will have positive effects in terms of the environmental quality and the quality of life, involving the city as a whole. It will additionally have a greater chance of success after having repaired the spatial and ecological–environmental fragmentation that characterizes, in general, anthropized contexts. In this sense, work on the realisation of open spaces according to a reticular model offers interesting opportunities to optimize the systemic dimension of cities. It will be strategically important, in fact, to reason on the functional fruition and eco–environmental connection of open spaces with other strategic points (public/private), exploiting the potential offered: sustainable mobility, user's comfort, awareness management of natural resources.

Slow mobility, in particular, should be promoted through a dual strategy that regards, on the one hand, the physical and infrastructure component of the road system, while on the other, the socio–cultural dimension. The first case deals with issues related to the differentiation of user flows and means of transport, the use of natural systems for the protection of the environment and the rational management of

resources [such as the insertion of shady paths to reduce the island warmth effect and achieve a more comfortable movement, control of the hydric balance]; the second case works on the motivations, in an effort to raise awareness and educate users towards a more responsible behaviour, therefore modifying their movement routines.

The idea of working on a systemic approach to open spaces comes from the sharing of a concept that is

Wider and all-encompassing of [open space], (intended as) a continuous network throughout the un-built territory in urban areas: public parks, but also private gardens, urban streets and squares. In this way, the network acts both as a link between individual spaces as well as an engine between buildings and structures, forming the context and frame of each of them and linking the centre with the surrounding landscape. (Stiles, 2011, p.5)

Thus, regarding the connection as a sequence of environmental and spatial units characterized by different functional, ecological–environmental, fruition levels, the ways of connecting can be oriented, depending on the specific conditions of the intervention context, to mitigate situations of discomfort, to strengthen areas of the territory characterized by a good level of quality, but also to indicate innovative ways of growth and development on an urban scale in an attempt to systematize the many aspects involved in defining the quality of life.

The way the open spaces are planned in the redevelopment interventions must meet specific functional requirements, dictated by the collective way of life, which is increasingly oriented towards a growing flexibility that does not mean, as often occurs, a lack of a design choice. On the contrary, it means work on the recognition of surfaces and the comfort of spatial elements, in an integrated approach to the project in which the technical and functional aspects are interwoven with social and environmental issues.

The construction of a network means, from a methodological point of view, the identification of the system of relationships between the different nodes of the system. This approach, with a technological matrix, consists of an

analysis of the urban context object of the intervention that is then divided into two successive levels: the first, highlights the eco-systemic aspects, while the second, the technological/environmental ones (study applied to areas with a high ecological quality, identified in the previous analysis). Starting from the identification of the redevelopment goals, it will be possible to define the framework of the needs which will be fulfilled through the identification of a requirements system which is a pre-requisite for the definition of the meta-design measures necessary to ensure an adequate quality to the network elements and, more generally, the quality of life in the urban context. Thinking at the macro level, from a performance point of view, the areas characterized by a high environmental quality should ensure the permeability of the soil, contribute to a rational management of rainwater and, in general, mitigate the environmental impact of human activities. A significant aspect is that the maintenance of high standards of environmental quality will have positive effect on the quality of urban life, creating, first of all, more comfortable conditions for outdoor life, secondly, providing an opportunity for people to be close to 'nature', with the associated positive impact that this can bring in terms of mental health and the simple pleasure of experiencing *green*, in an urban contest.

3. DATA MANAGEMENT AND SHARING INFORMATION TO REPRESENT URBAN MODIFICATION [NICOLA PISACANE]

The attempt to draw the hierarchical structure of both with graphic descriptions and through levels of study is analogous to the development of human action in relation to a phenomenon: the center of the map represents the theme and branches the detailed information. Each element of the map is therefore a concept and its central location more or less reflects the degree of generality or detail with respect to the fundamental theme of the map. This mode facilitates the collection of information, the development of ideas, enabling creative and collaborative processes and owes its great effectiveness to the fact that the structure and the use of images and colours stimulate the natural associative processes of the human brain. One example is given by the neurologist Antonio Damasio in an essay devoted to the workings of the mind where he employs an analytical mode

and exhibition, which is also based on a cartographic approach by stating in several parts of his essay this analogy:

Each of these regions (of the brain) is a collection of various areas and in each of these regions there is a busy crossing of signals between areas. I will say later that in my opinion these interconnected areas are the basis of the representations organized topographically, the source of mental images. Some of the patterns in the cerebral cortices are topographically organized, others are less so, and are not found in a map. (Damasio, 1995, p. 225)

This type of diagrammatic structure, introduced in the late sixties by the cognitive Tony Buzan, has created a map with more expressiveness and has been described as a 'mental map' as a form of graphical representation of thought.

This technique relies mainly on the creative capacities of individuals and groups, the unconscious mental resources, on synaesthesia created through pictures and diagrams, the processes that spontaneously restructure the information and that every time leave open more than an interpretive key. The reference model for the realization of a mental map is associationist: its construction proceeds with the free mental association, starting from a central, engaging progressively new element to the outside of the structure or dynamically regenerating those already present.

Setting radial geometry of mental maps is another significant feature that is associated to its logical-cognitive: the centre is always the main element that, at the same time, acts as a hub and by reference to the entire structure. The reading, in some cases, takes place along the hierarchical lines, in accordance with other ideals concentric levels, referring to the entire map, or locally at a certain branch. Due to the approach that requires the elaboration of such a representation, Buzan has always recommended the creation of mind maps on paper, because the senses and dexterity of hand painted stimulate the right brain, responsible for creativity, imagination, intuition, drawing on both what is in the sphere of consciousness, is what is outside of it. Recently, however, many digital systems have introduced ways to a graphic mental map through software with results similar to those introduced by its creator.

The image of the Earth as it is shown on Google Earth, the main portal web-cartography, cannot send us back to the image of twenty-five centuries ago when Plato describes it as a perfect glossy sphere and "wonderful in its beauty," the sphere itself the subject of many debates, many arguments and many different views on the basis of culture, technological innovations, instrumental limits that have contributed in so many centuries to its description and representation. The object of the representation is always the same: the Earth represented in its complexity. An image then, and as such filtered by the culture that produced it, created and designed. The image of the earth in all its complexity is what we perceive on the homepage of Google Earth geospatial application introduced in 2005 and still today one of the leading web portals of multimedia cartography. A positive example of what is referred to as Web 2.0 cultural evolution rather than technological knowledge and the dissemination of knowledge through the Internet. A participatory model that through the contributions of users increases its content, integrates them with other, creating a complex and multidimensional knowledge of the territory through which the contents are shared with other users by ensuring, albeit still with some limitations, the dissemination of knowledge through a more direct and collaborative relationship among the users so that they are all more actively and directly participate in decisions and choices through a platform of information and communication technology easily accessible from all over the web. Being members of a community in the information society is not only able to access services in a more efficient administration capable of designing their own services on the needs of users (e-government), but also to be able to participate in an innovative way in the life of the institutions policies (e-democracy), taking into account the modifications and the changes taking place in the relationship between public and private actors (governance). The participation must take place at three levels: information, consultation and active participation; only a dynamic involvement will enable and facilitate the deepening of the knowledge of any territory. Through the network, and telecommunications can ensure widespread dissemination of information by offering greater efficiency and effectiveness of engagement strategies as a force for economy of the territory. The knowledge and participation

thus become strategic moments and founding partners of the projects and the processes of economic and cultural change that animate a territory. Communication becomes a time of evolution of the relationship between citizens and institutions for information on the ground, articulating content and messages, defining actions, declining tools in the search for coherence and effectiveness.

You switch to a modern concept of belonging to a territory in need of knowledge and transparency and thus communication, aimed at an overall strategy of reorganization. The process needs to re-establish a bidirectional communication system with all the stakeholders in a continuous feedback of information that flow together in a single integrated system.

Some systems are constantly undergoing technological change, and it is already past the classification, made just in 2001 by Menno-Jan Kraak, according to which the maps available on the web can be distinguished between "static and dynamic", each category is then subdivided into interactive maps or read-only, with no animations. Today the situation is certainly more complex, articulated and structured to the point that a proper classification of the maps available on the Web could be misleading, since some span multiple categories. Surely the intuitiveness of navigation is an advantage that continues through the years and versions that have occurred; what surely has been implemented is the amount of data loaded but especially stratified and integrated through which users can zoom and query through miles and miles away, or navigate in urban areas with a likelihood more thrust. But the use of these platforms cannot fail to mention what is perhaps the most significant social aspect connected, for example in environmental campaigns, natural or social, conveyed through the communication tool of the web through virtual layers that reaches every point of the real surface Earth. The map thus becomes an instrument of democratic knowledge, but above all participatory. The intuition to tie together two different coordinate systems has produced a system with considerable potential. Associate, in fact, the geographical coordinate of an element according to the WGS84 coordinate a computer that uniquely distinguished them information via the URL is the foundation cornerstone of web cartography.

The representation of the territory, created with the purpose-oriented policies to control by the monarch dominated territory in order to be able to know and then administer and defend against attacks, offering the same also a powerful system of protection and management of their wealth. The old maps precisely because of this purpose were enriched with coats of arms and heralds that testify the economic and political power of the ruler. Today in drawing maps, while maintaining their multidimensional economic, demographic, technological or geographical purpose, as well as those that are technical methods of acquisition and restitution of spatial data, is mainly characterized by the computerization of the product. In the current historical moment, marked by the social diffusion of the Internet and all the possible forms that have derived from the interaction and dynamic, continuous and multi-sensory with the data-base, there has been the greatest advancement of the discipline. Modified and accelerated the process of production and the mode of use, cartography, while maintaining its traditional definition, (i.e.) the meaning of the symbolic representation of data related to geographical places, entered fully into the field of instruments intended to act as a support to the type of information disseminated and accessible to all. In this new sense, the user is free to choose from time to time the information to display, download or develop, to play an active and leading role, so as to orient also the technological advancements in the research. The dissemination of maps through the internet and especially the ease of access and selection of spatial information, while it has innovated the mode of acquisition of geographic data, from another point of view did not change the behaviour, as suggested by D.R. Fraser Taylor, director in Canada of the "Geomatics and cartographic research centre" and around the world disseminator of the power of cyber-cartography.

Under this trend, the urban and large-scale modification could be completely influenced by information and data shared by people who live in that place. Individual citizens take part in a decisional project expressing their interest and their idea. Government and specialists have to interpret people's necessities and desires with the aim to improve the quality of life and to satisfy citizens' needs. In this regard, Hudson Yards' program has been an experimentation field for applied urban data science and smart city development model.

4. THE CASE STUDY OF HUDSON YARDS: A PROJECT ABOVE THE RAILWAYS (BARBARA DI VICO)

To set an example of a large-scale redevelopment program, Hudson Yards would be the right one to understand how much a city can change its aesthetic, livability and connection between its neighbourhoods by creating a new residential, commercial, entertainment space revolving around a sustainable public garden. Hudson Yards is a redevelopment project planned, funded and constructed by the City of New York, the State of New York and the Metropolitan Transportation Authority, in order to create a connection between the Midtown Manhattan Business District and the Hudson River. The railyard project broke ground on the 4th of December 2012, it is still under construction and the estimated completion will be in 2024. It was designed to become the new core between Chelsea, Hell's Kitchen, Midtown and the Hudson River Park, following the input given by the requalification of the near High Line, which transformed a former elevated rail line used for freight service into a "Park on the sky". Hudson Yards can be considered as the winner of a series of proposals to develop air rights (fig.1). Actually, the West Side Yard was designed since the beginning with space left between the tracks to install columns that would support a possible future development above the tracks.

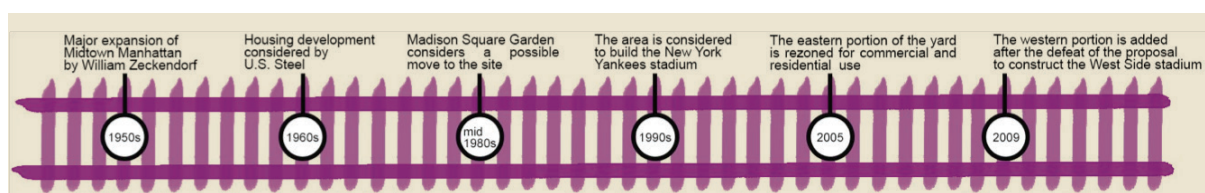


Fig.1: List of the proposals for the development of air rights on the West Side Yard. Source: scheme by Barbara di Vico.

The winning proposal aims to be far more than a series of tall buildings and open spaces. It will be a model for the future urban experiences perfectly combining buildings, streets, parks, utilities and public spaces.

Hudson Yards, like the near High Line, has a strong relation with rail tracks. In fact, it sits on a rail yard, known as the West Side Yard, used to store commuter rail trains owned by the Metropolitan Transportation Authority (fig.2–3). To minimize construction impact on the Long Island Rail Road commuter system's ability to store trains during midday and peak hours, caissons were drilled into bedrock throughout much of the site, over which the platform was to be built. However, only 38% of the ground level was needed to be filled in with caissons to support the new platform, which was built with a Manitowoc 18000 crane.

The redevelopment project is split into two phases because of the 11th Avenue that runs through the site. The Eastern Rail Yard Platform is a 10-acre deck that will support more than five acres of open space, four towers, a culture centre – The Shed – and one million square feet of shops and restaurants. The eastern platform was built using 300 caissons, placed in the space left between tracks, of 4 to 5 feet in diameter and 20 to 80 feet in depth, drilled deep into the bedrock, which allowed the trains to remain operational. Columns and other support structures land between the rail lines and are placed to avoid underground utilities. Tall trusses support hung sections of the podium, which connects 10 Hudson Yards and 30 Hudson Yards, and will house a collection of shops and restaurants on multiple floors. Other smaller trusses must bridge over a narrow portion of the rail yard to connect the drilled caissons to the columns.

Sustainability is the main key for the redevelopment of the site, making Hudson Yards one of the greatest projects to collect information about the quality of life and to be innovative with a series of technologies used into every aspect. Hudson Yards will use big data to change the way of thinking about work places, residential spaces and visitor experience. In fact, thanks to the advanced technology platform, operations managers will be able to monitor and react to traffic patterns, air quality, power demands, temperature and pedestrian flow to create the most environmentally

friendly neighbourhood in New York with ongoing optimization for safety and comfort.



Fig.2: Commuter rail trains below the platform and view of the construction site for Hudson Yards. Source: photo by Nicola Pisacane.



Fig.3: View of the construction site from the High Line. Source: photo by Nicola Pisacane.

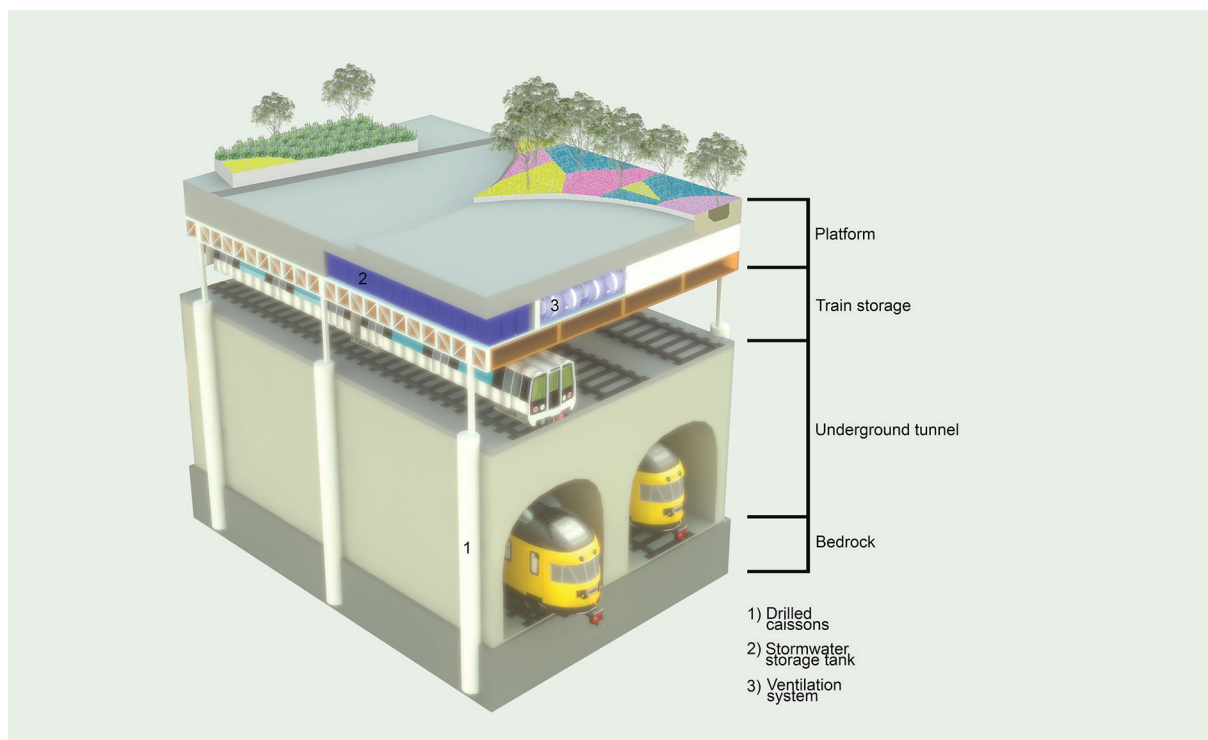


Fig.4: Platform below Hudson Yards. Source: scheme by Barbara di Vico.

Alongside the High Line, another park is under construction between the tall towers, that can be also considered an elevated park due to its position over rail tracks, and where technology will allow to create a space suitable for the growth of 28,000 herbaceous plants and more than 200 trees (fig.4). The Public Square and Gardens is a five-acre space of lush greenery and cultural expression, designed by the firm of Nelson Byrd Woltz. The problem caused by the heat generated by train represented a challenge to create a system for the growth of plants. A ventilation system powered by 15 fans commonly found in jet engines will supply fresh air to the track level. Besides, due to the presence of rail tracks, there is a minimum soil depth of 4 feet for trees and 18 inches for other plants, that would keep them from growing well. To protect plants' roots, a layered soil, presented to the community as "the smartest soil in town", made of sand and gravel between two concrete slabs, will provide for soil aeration, irrigation, drainage and ongoing control of nutrients, allowing roots to run wide if not deep. Moreover, the heat from the train yard below can reach up to 150 degrees; therefore, a network of tubing is being embedded within the concrete slab to circulate cooling liquids

that create a healthy environment for the plant's roots, protecting them also from the summer heat above.

Besides the fans, a huge stormwater storage tank has been placed to collect every drop of rainwater that falls onto Hudson Yards from building roofs and public plazas. This tank has a 60,000-gallon capacity: the collected water will be filtered and reused for irrigation, lessening the burden on New York City's infrastructure by saving space in its sewer system, and helping to keep the Hudson River clean. Lastly, Hudson Yards makes organic waste collection convenient and space efficient by utilizing grinders and dehydrators to reduce food-service waste to 20% of its initial weight and volume. The Public Square and Gardens goes beyond the simple idea of a park like Central Park in New York, elevating it to a place where people meet, attracted to what surrounds the area and not just to the area itself. Thomas Woltz, the owner of Nelson Byrd Woltz Landscape Architects, called the Public Square and Gardens the "living room of the West Side" – a crossroads where three of the city's most dynamic parks coalesce into an important community space. In an interview, he even compared this

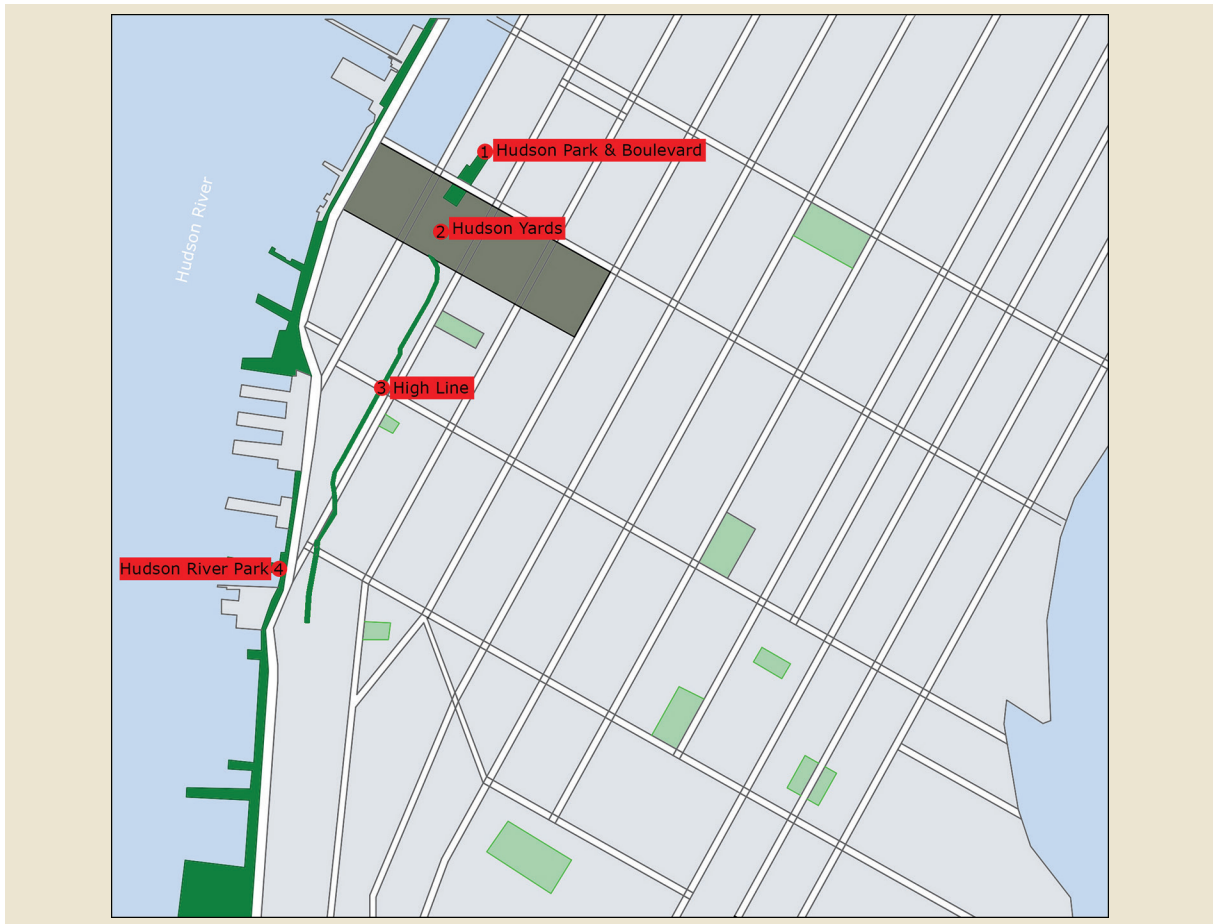


Fig.5. Map of New York City with Hudson Yards as the converging point of the three parks. Source: scheme by Barbara di Vico.

innovative space to Piazza San Marco in Venice or Piazza San Pietro in Rome. These squares have both entered the collective imagination for their architecture and a greater symbolism with incomparable characteristics to others and making them unique in their genres. Likewise, the Hudson Public Square and Gardens want to become the representative of, and the driving force for the new century in the requalification of spaces with a great potential to connect to the urban pattern in a sustainable key.¹

Hudson Yards' Public and Square Gardens represents the converging point of three of New York's dynamic parks: the High Line, Hudson River Park, and the new Hudson

Park & Boulevard (fig.5). The High Line is a public park built on an abandoned elevated freight line above the city streets, strongly desired by the association Friends of the High Line founded in 1999 by Joshua David and Robert Hammond, residents of the High Line neighbourhood, to advocate for the High Line's preservation and reuse as public open space. After analysing the economic rationality of the recovery project, the association worked with the City of New York to select a design team to start a revolutionary project that would lead to the rebirth of a potential neighbourhood. The project started in 2009 and ended in 2014 with its latest section, the third one, which embraces Hudson Yards giving different points of view of the site. The second park adjacent to Hudson Yards is the Hudson River Park that provides a lively space for outdoor recreation with its direct contact to the formerly inaccessible riverbanks. At last, the Hudson Park & Boulevard

¹ Information about Hudson Yards can be found at <http://www.hudsonyardsnewyork.com/> [accessed on 30/09/2017]

with its 4-acre of tree-lined parks and open space will serve as pedestrian connection between Clinton, Hudson Yards and West Chelsea, and as a central park area for the district. The aim is to develop this part of the city with new parks, cultural and recreational facilities that brings to enhance the public transportation. In fact, an extension of the underground will connect Hudson Yards' district to Times Square; the Moynihan Station will be renovated and it is planned the construction of a new railway station that will extend Penn Station to the west with the purpose to relieve pedestrian congestion at Penn Station.

5. CONCLUSIONS *(BARBARA DI VICO)*

The case study of Hudson Yards explains and helps to understand how non-functional areas full of potential could be used to combine both buildings and greeneries to get the highest results. In fact, designing a new redevelopment plan does not mean that one must either choose between grey, representing the concrete of which buildings are usually made of, or green, as trees and other natural elements.

As for this feature, New York City has always been a leader for integrating the highly densified urban area with parks distributed throughout the entire metropolitan territory. What is being done with Hudson Yards is to concentrate on a relatively narrow area a variety of functions, that goes from residential to commercial, from workplace to leisure area; a technological marvel that combines style with sustainability; a convergence of parks and public space.

Differently from cases in which the redevelopment faces technological and landscape aspects independently of one another, in this particular case the two aspects has been thought, studied, organized and designed at the same time from the start to achieve a global control of the environmental system.

The intervention has been specifically customized by identifying the technological systems necessary to achieve a balanced use of resources, such as water and soil, in order to optimize the environmental re-balance of the urban contexts in an eco-oriented perspective.

Not only buildings but also green areas become the representative to connect the urban pattern in a sustainable key. This balance becomes even more equal when the fragmentation of a highly anthropized context is overcome thanks to a reticular connection between different green areas, which see the Hudson Yards as the strategic converging point exploiting the potential offered: sustainable mobility, user's comfort, awareness management of natural resources.

To create a network means to identify the system of relationships between the different nodes of the area. The West side of Manhattan represented a context characterized in the latest years by the will to give citizens a different way to approach nature in the city, different from the famous Central Park. The Hudson River Park allowed citizens to live the river and to give it the importance that it deserved, while the High Line allowed them to have a different point of view on the city walking through nature while watching a landscape made of skyscrapers and busy streets. In this context, the Hudson Yards wants to be a new neighbourhood where all these new green platforms converge, the fulcrum of this new way of connecting different points of the city.

Hudson Yards also places itself into a future platform where the use of urban data is a fundamental resource to create the most environmentally friendly neighbourhood, thanks to the continuous monitoring of traffic patterns, air quality, power demands, temperature and pedestrian flow.

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