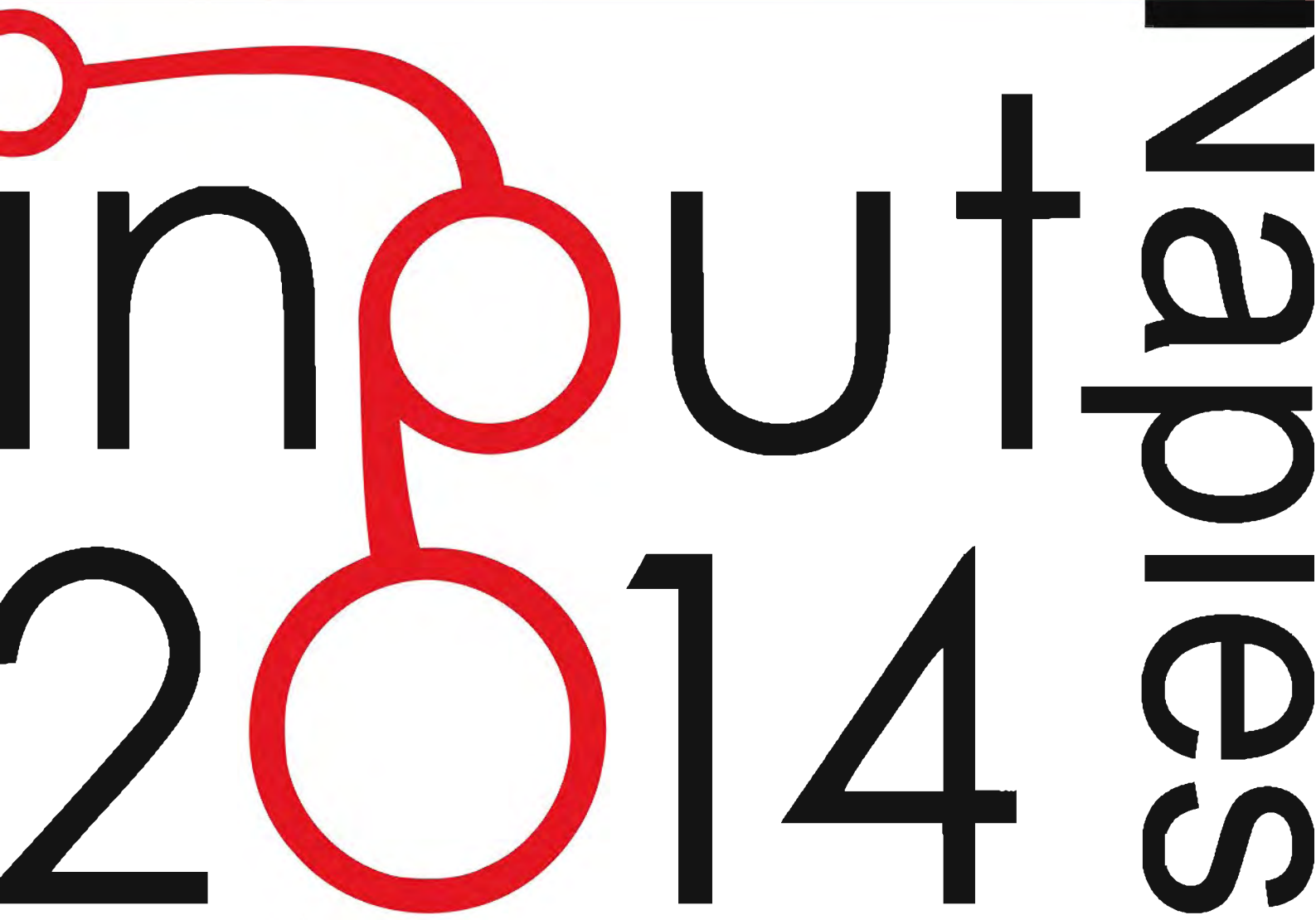
TeMA

Journal of
Land Use, Mobility and Environment

This special issue collects a selection of peer-review papers presented at the 8th International Conference INPUT 2014 titled "Smart City: planning for energy, transportation and sustainability of urban systems", held on 4-6 June in Naples, Italy. The issue includes recent developments on the theme of relationship between innovation and city management and planning.

Tema is the Journal of Land use, Mobility and Environment and offers papers with a unified approach to planning and mobility. TeMA Journal has also received the Sparc Europe Seal of Open Access Journals released by Scholarly Publishing and Academic Resources Coalition (SPARC Europe) and the Directory of Open Access Journals (DOAJ).



Smart City

planning for energy, transportation and sustainability of the urban system

Special issue, June 2014

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SMART CITY

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TeMA Journal of Land Use, Mobility and Environment

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This special issue of TeMA collects the papers presented at the 8th International Conference INPUT 2014 which will take place in Naples from 4th to 6th June. The Conference focuses on one of the central topics within the urban studies debate and combines, in a new perspective, researches concerning the relationship between innovation and management of city changing.

TeMA Journal of Land Use, Mobility and Environment

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EIGHTH INTERNATIONAL CONFERENCE INPUT 2014

SMART CITY. PLANNING FOR ENERGY, TRANSPORTATION AND SUSTAINABILITY OF THE URBAN SYSTEM

This special issue of TeMA collects the papers presented at the Eighth International Conference INPUT, 2014, titled "Smart City. Planning for energy, transportation and sustainability of the urban system" that takes place in Naples from 4 to 6 of June 2014.

INPUT (Innovation in Urban Planning and Territorial) consists of an informal group/network of academic researchers Italians and foreigners working in several areas related to urban and territorial planning. Starting from the first conference, held in Venice in 1999, INPUT has represented an opportunity to reflect on the use of Information and Communication Technologies (ICTs) as key planning support tools. The theme of the eighth conference focuses on one of the most topical debate of urban studies that combines , in a new perspective, researches concerning the relationship between innovation (technological, methodological, of process etc..) and the management of the changes of the city. The Smart City is also currently the most investigated subject by TeMA that with this number is intended to provide a broad overview of the research activities currently in place in Italy and a number of European countries. Naples, with its tradition of studies in this particular research field, represents the best place to review progress on what is being done and try to identify some structural elements of a planning approach.

Furthermore the conference has represented the ideal space of mind comparison and ideas exchanging about a number of topics like: planning support systems, models to geo-design, qualitative cognitive models and formal ontologies, smart mobility and urban transport, Visualization and spatial perception in urban planning innovative processes for urban regeneration, smart city and smart citizen, the Smart Energy Master project, urban entropy and evaluation in urban planning, etc..

The conference INPUT Naples 2014 were sent 84 papers, through a computerized procedure using the website www.input2014.it . The papers were subjected to a series of monitoring and control operations. The first fundamental phase saw the submission of the papers to reviewers. To enable a blind procedure the papers have been checked in advance, in order to eliminate any reference to the authors. The review was carried out on a form set up by the local scientific committee. The review forms received were sent to the authors who have adapted the papers, in a more or less extensive way, on the base of the received comments. At this point (third stage), the new version of the paper was subjected to control for to standardize the content to the layout required for the publication within TeMA. In parallel, the Local Scientific Committee, along with the Editorial Board of the magazine, has provided to the technical operation on the site TeMA (insertion of data for the indexing and insertion of pdf version of the papers). In the light of the time's shortness and of the high number of contributions the Local Scientific Committee decided to publish the papers by applying some simplifies compared with the normal procedures used by TeMA. Specifically:

- Each paper was equipped with cover, TeMA Editorial Advisory Board, INPUT Scientific Committee, introductory page of INPUT 2014 and summary;
- Summary and sorting of the papers are in alphabetical order, based on the surname of the first author;
- Each paper is indexed with own DOI codex which can be found in the electronic version on TeMA website (www.tema.unina.it). The codex is not present on the pdf version of the papers.

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SPECIAL ISSUE

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Smart City - Planning for Energy, Transportation and Sustainability of the Urban System

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SOCIAL HOUSING IN URBAN REGENERATION

REGENERATION HERITAGE EXISTING BUILDING: METHODS AND STRATEGIES

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ABSTRACT

The theme of *urban regeneration* has played a strategic role during the last two decades in European and national urban building policies. Current addresses, also defined in *Leipzig Charter on Sustainable European Cities* in 2007, indentify the necessity to invest in requalification of degraded residential assets and not in new developments, individuating in urban regeneration the main tool for development of contemporary city.

Public neighborhoods have developed, historically, a wide set of common problems. They are not only due to wrong planning but also to the concept of “housing for masses”.

The original ambition of modern settlment, developed from German*Siedlung*, was to be an autonomous part, on the point of view of morphology, in urban expansion. Joined by new developments, a lot of neighborhoods became benchmarks for suburban areas and now we can define themas “new urban centralities”. So theirrole in urbandynamics has changed and they can be individuate dasprecious reserves of public spaces and potential incubators for regeneration of larger areas.

Analyzing some Italian and European case studies, themostinnovative relate to the *densification* of open spaces, inserting new services in a general redesign of green areas; concentration of built surfaces, in order to reduce land consumption and introduction of different residential types in order to improve *mischbebauung.* The reasons for an active recovery are motivated by the criteria of environmental sustainability and saving land, have relaunched compact projects with medium to highdensity.

KEYWORDS

Regeneration, Densification, Development, Recycling

1 DESIGN-RELATED AND FACT-FINDING ASPECTS FOR URBAN REGENERATION

The biggest problem with which our society must confront is the deep crisis of the concept of the distinction between city and country and the problem of redevelopment of public housing neighborhoods. The expansion of the built environment and urban fabric in farm and rural areas has led to a patchwork of hybrid spaces organized according to an alternation of full and empty spaces, cities and countryside, without any apparent connection. The complexity of the areas is formed by the overlapping of different layers sedimented in time according to a mysterious logic of cancellations and permanences that a cursory glance can not classify that as chaotic and incoherent. The gradual domination of the environmental characteristics of the area from the settlements built and networks, which began with the industrial city to another of the eighteenth century, in recent years has reached a high degree of irreversibility.

The address of the research project is measured by the substantial processing activities built that is taking place for several years in Europe, involving many parts of buildings, both old and new. Especially in the context of the progressive tradition has developed a sensitivity to the positive role that public spaces natural parks, gardens, green cities, agricultural areas, gardens metropolitan have in rebalancing the extreme artificiality of urban life by answering logical health benefits and recreation but also as places of practices and mobility alternatives and natural reserve. Similarly the processes of regeneration of the *housing* concern both the adaptation of existing buildings, both new functions and the redesign of open spaces and common areas. All work on the built becoming increasingly expanded and diversified: additions, overlays, *infilling*, inserts, new coatings, *surefit*, remodeling of land.

In particular, the traditional affection of italian culture to the conservation and protection has producedanalysis on public housing and interesting contributions to recovery. The original idea of the modern district, which born from *Siedlung* German, is a morphologically independent part in the expansion of the city.

Fig. 1 Hufeisensiedlung, Berlino

Achieved by the new expansions, many neighborhoods have become points of reference for decisive and peripheral areas that were once considered today as "new urban centers." The quality of the relationship between full and empty, evident within parties often saturated and congested, resulted in a gradual change of their role in the dynamics of urban identifying them as reserves of precious public spaces to redevelop larger areas.

It is necessary to change some of our assumptions, to make a shift of our look on the territories of the urban landscape to identify new ways in making and dealing.

1.1 URBAN PLANNING IN A “SITE SPECIFIC”

The analysis of the materials from which the city inevitably lead to recognize the uniqueness of each urban situation contingent and the specificity of each territory. The historical sequence of topography, river networks, infrastructure networks and agricultural land fragmentation, the morphology of the built and vegetation, has been a progressive sedimentation of materials that are stratified according to temporal logics very slow, unknown to the acceleration of the phenomena of the contemporary . Renew the look of the city means, then, refuse the apology to the city "generic" and get rid of that *habitus* of surface observations that the contemporary city is not understandable if you do not like chaos, homogenization, randomness. Urban problems that confront us today are, of course, essential to this situation. It is the responsibility of the project to recognize the specificity and adapt its operating modes to the complexity of contemporary space refusing to formulate formal models. The project is common ground in many disciplines but it is precisely the disciplines of architecture to give it a result of spatial as well as linguistic.
So the disciplinary specificity of urban design is to be found in the relevance to run in the space of the city, in the "care of form." In particular we want to use here the term "urban design" in the sense of "*projeturbain*" French as a tool that is able to articulate the different scales and in different times both the spatial aspects, figurative and formal and the social intervention planning by means of a "morphological axis" and a "axis of the process", the first reported to the organization of the space, the second to the processing capacity along the time. In this sense, it is then possible to speak, especially in the French tradition of a "culture of urban design" in which some aspects are clear: attention to the context and history of the places the consideration of the temporal component in the process of building the city, the belief in the proposal of a *mixitè* uses with particular attention to social complexity, typological and landscaping. It is interesting to note that in order to address an area suspended between town and country the best ideas come from their own disciplinary fields on the boundary between architecture and landscape, as if the morphological complexity should be reflected in a complex thought and analog.

1.2 THE CITY IN THE LANDSCAPE

Now seems inevitable reversal of perspective that is turning his attention to empty rather than full, open spaces and landscape rather than those built, to the relations between the parties rather than to objects.
The various research methodologies may have a number of basic assumptions and common lines:

- The design as a tool capable of articulating the different scales and in different times both the spatial and the social aspects of the intervention on the landscape.
- The territorial scale in relation to the concept of landscape and its implications in the field of design in its various forms (architectural, urban, ecological, artistic).
- The discourse on the form and, in particular, on the morphology of the territory.
- The emptiness, the open space as the beginning of the project reflection operand fact a reversal on the usual relationship between design and object.

2 RE - CYCLE AND URBAN REGENERATION IN EUROPE

This contribution is about public initiative developments realized in Europe from second post-war period to Eighties. There are many international examples on the topics of recycling, efficiency and sustainability. These include the recent interventions of MVRDV in Rotterdam and Berlin model in the recycling of buildings. The recent proposal for urban regeneration of Robin Hood Gardens (RHG) complex in London, advanced by Sarah Wigglesworth Architects (SWA), can be taken as a best practice in the field of urban regeneration policies for degraded situations in planned developments.

2.1 STRATEGIES FOR URBAN REDEVELOPMENT

French *grand ensambles*, German *siedlungen* and many works by IACP (Autonomous Institute for Public Housing) in Italy (INA casa e 167 plans) are characterized by big extension and their value is more evident in urban structure than in individual buildings. Hypotheses of discontinuity and big dimension of the buildings, taken as urban principles, involve the concentration of built surfaces in few volumes and the presence of big open spaces that stand as green stocks in deregulated and extensive development of contemporary European city. Concentration, as typical character of modern development, can be pursued, considered actual problems connected with land consumption, as sustainable and desirable hypothesis for new urban policies.

We have to overcome the prejudice about big dimension of modern developments, because this feature is not a cause of the decay of this areas. Big dimension must be considered not only as a condition for a sustainable urban project, but also as the representation of a collective idea about housing, that for the second part of Twentieth Century had inspired social housing experiences in the whole Europe.

Intervention in modern neighborhoods should be respectful of developments' specific features and should propose adjustments and improvements adding new contents to existing elements we consider as values, first of all the presence of big open spaces.

Collective buildings are often missing in modern development or their realization is incomplete. First category is about interventions that introduce collective uses and improve conditions of existing services. This kind of buildings, as interaction elements with open spaces, produce new ways of using open spaces, improving safety and social dynamics.

Contemporary regeneration interventions should realize conditions for coexistence, in a common urban context, of different kind of inhabitants. In this way, social dynamics and phenomena connected with control and appropriation of collective places could develop. Coexistence of different house types (simplex and duplexes houses in multifamily buildings, single-family houses, terrace houses and patio houses, ...), that modern architects called mischbebauung, represents the condition for the presence of different typologies of inhabitants.

We can talk about some urban project realized in Italy between 1940 and 1960, built on the hypothesis of typological mix. Between them the most interesting are Tuscolano development in Rome by Adalberto Libera and Via Dessiè development in Milan by Piero Bottoni, Giò Ponti, Luigi Figini and Gino Pollini.

2.1.1 SARAH WIGGLESWORTH ARCHITECTS: ROBIN HOOD GARDEN PROJECT

The demolition of this residential development seems almost certain. It is supported by predisposition of design proposals that are about the realization of 1700 accommodations in substitution of 214 existing duplexes. They have generated a big discussion about second post-war period architecture in UK.

Many urban transformations, changing completely urban fabric of Tower Hamlets, have produced new high density areas (Canary Wharf, Docklands, ...) and RHG looks like out of scale. For public and private actors is better to demolish existing buildings to realize new development quintupling inhabitants, than do complicated and expensive regeneration interventions.

Fig. 2 View of Robin Hood Garden

In these context Sarah Wigglesworth Architects (SWA) has proposed a regeneration project for RHC and it provides different levels of intervention oriented towards improvement of technological performances of the building and increasing of number of inhabitants:

- Re-configuration of existing accommodations
- Introduction of new accommodations
- Improvement of energy performance

The proposal individuates in coverings and perimeter areas the most suitable sites for new accommodations. In this way there are no problems for nucleus of original design, the big central park, that represents a strongly characterized common place. Perimeter blocks host garages and they should be converted into houses obtaining brand-new 33 duplexes. Existing stairs reach cover level and so it could be possible to realize duplex houses with wooden structure at last level of the building, obtaining other 38 houses. Overall RHG would have 71 brand-new houses.

On the technological performance point of view, SWA says that substitution of actual windows with new ones characterized by high thermal performance and inserting of suitable panels for external walls could induce a halving of current costs for air conditioning and heating.

2.3 ROTTERDAM: RESILIENT CITY

The port city of Rotterdam, situated on the banks of the Maas River, with a total population of 615,000 inhabitants, is home to the largest international port in Europe. 90% of the city is built below sea level and then to flood risk. Through various programs, including the Rotterdam Climate Initiative, the city aims to become more and more smart, setting ambitious goals, adopting a program to become the capital of the world with the lowest level of CO2 emissions. Currently the city has one of the highest rates of emissions in the world, approximately 29.8 tons. The RCI provides that, through the collaboration of government, organizations, businesses, knowledge institutions and citizens by 2025 will be reduced by 50% the emissions of pollutants. The central point for achieving these goals is to make sure you adapt cities to climate change in place, so as to also create a new boost to the economy of the city.

Fig. 3 View Port of Rotterdam

There are five major initiatives to achieve these goals, all centered on the concept of resilience:

- houseboats;
- squares of water;
- enhanced water collection systems;
- green roofs;
- sustainable port.

The houseboats. To cope with rising sea levels, Rotterdam plans to build floating urban neighborhoods. To show how this might work, the Rotterdam Climate Initiative has commissioned the "floating pavilion". The three interconnected transparent domes are easily positioned, made with a special plastic 100 times lighter than glass, are energy self-sufficient thanks to solar energy used for heating and cooling.

The squares of water. The water in the city Rotterdam is a ubiquitous element, has certainly contributed to its prosperity but the same can be a threat, especially in view of the projected increases in rainfall due to climate change.

For this urban planning has studied the realization of a system of "squares of water" as a solution to retain excess water and decrease the pressure on the sewage system. After the emergency, the excess rainwater can be channeled towards the sea.

Enhanced water collection systems. The change of the intensity of the rains brings with it consequences on the level of drought. For this reason, the challenge is to know how to avoid problems due to the phenomena of flooding and those of prolonged periods of drought. To do this in Rotterdam are studying a holistic system of collection and storage of rainwater through the roofs and other impervious surfaces, which are then cleaned and stored according to requirements, so as to have a ready supply in the event of long periods without rain.

Green roofs. Rotterdam currently has approximately 100,000 square feet of green roofs, the city plans to cover 160,000 square meters by the end of 2014. The system of green roofs, in addition to increasing the absorption of CO2 is also important for the absorption of rainwater in excess. Many public buildings in the city have already green roof including the Municipal Archives, the Central Library, the headquarters of Unilever Nederland, Maasstad Hospital, Children's Hospital of Sophia.

Sustainable port. To achieve the goal of reducing carbon emissions by half compared to 1990 levels by 2025, the city plans to allocate 80 hectares of land around the harbor for companies that produce energy through renewable sources. Currently, only 10 companies in the port using renewable energy in the face of 45 chemical companies, oil refineries and five different power plants. Another proposal involves the use of new containers for shipping, making it possible to maximize space and therefore reduce the number of trips.

2.4 RE-CYCLE IN AMSTERDAM -SILODAM MVRDV-

The Housing Silo is situated on the IJ River, at the tip of the pier, next to two former grain warehouses (silos) that have been converted.

Fig. 4 Silodam, MVRDV, Amsterdam

The IJ River served as Amsterdam's harbor in the golden age. Then, when the harbor fell into a decline, the buildings, warehouses, and shipyards were left unused. In the 1980s, when Amsterdam had a housing shortage, the city regained interest in the river's potentials and a variety of restructuring projects, where the designers tried to fuse the remaining structure and character of the harbor with new architecture, followed.

The building's public spaces are open to the natural elements, roof gardens, viewing balconies, and also a space under the building where home owners at Silodam can moor their personal boats. To address the

issue of the views of the water from the pier being blocked by the building, the designers penetrated the base of the building with a wide passageway that leads to a pubicly accessible balcony.
MVRDV have explained that the building holds in it neighborhoods. This is clear to see when looking at the diversity of the elements that put together the building. The architects of the building have, in fact, folded and stacked into the building different neighborhoods of Amsterdam. It is important to note that a usual neighborhood holds in it different programs as does the Silodam.

2.5 MODEL RECYCLING OF BUILDINGS IN BERLIN

If there is a city which has made the redevelopment of the buildings its flag, this is Berlin. For historical reasons, certainly, but also a socio-cultural issue, after the fall of the Berlin Wall in a few years has become the laboratory-largest shipyard in the world, beaten only later, in 2000, from Shanghai. The Sauerbruch Hutton was one of the first to innovate on the existing in Berlin, after winning the competition in 1993 to design dell' Headquarter GSW, an example of advanced surgery building. Sauerbruch Hutton designed the 1999 extension and renovation of the GSW headquarters complex in Berlin. The original high rise is remembered as one of the great rebuilding projects after World War 2. The new GSW tower brings a gentle curve and colorful flavor into the downtown. Circulation through the urban corridor easily introduces the visitor to a program of different scales. The building elements tie together the city scale with the pedestrian and individual visitor. Sauerbruch employed the Natural Colour Theory for this project.
Sauerbruch's modern environmental systems use passive means that use less energy and are healthier. Louvre systems and a double-skin facade effectively shape sunlight usage and add interesting complexity to the outside appearance. The entire block was destroyed and the old building stood a few steps away from the middle ground between the two walls. At the old volume, a tower of 16 floors, was juxtaposed with a knife glazed slightly curved shape, the existing building connected via a function block, which is also glazed.
The ventilation system and the outer sheet, corrugated colorful and bright tones, make energy savings of around 40% and the control of natural light input. "I think Italy is open to the architectural theme of sustainability, much more than they are in France or England." Is convinced of their Matthias Sauerbruch, the father of the Berlin studio. The urban and architectural energy of the German capital in recent years has been gradually declining, but anyone wanting to begin today in the re-building must be measured against the Berlin experience.

3 SOCIAL HOUSING: ASPECTS FOR PLANNING

The return of the themes of regeneration and recovery to establish a meter capable of building control to ensure the best levels of living but also techniques and tools to combat sprawl, is the basis of the new model of urban and social development that is characterizing the recent decisions of the metropolis degrees.
The theme of urban renewal and regeneration of tissue, in which the unit of "neighborhood" is established as a physical place and community, is part of a more general process of review and prevention of diseases of metropolitan and regional contemporary art.
In Italy, municipalities and governments, on different scales, they are faced with a choice: to let go forward spontaneous evolution, sometimes wild, employment, land use and the distribution of the different components of urban complexes, or prevent the proliferation of city and plan development.
The theme of social housing is one of the ones that most trigger tensions and interests disparate and conflicting. The regeneration of social housing has been addressed in many cases in recent years through strategies that provide various levels of demolition of the existing, based on a rethinking of the very large

size of the district, criticized the excessive concentration of population, to the poor quality and lack of recognition of places.

The practices of redevelopment are also a symptom of the gradual transformation of urban residence, which act on impulses from various sources: the demographic situation, the housing market prompted by innovations introduced by House Plan which intervenes on procedures and public-private relationships in 'social housing, the search for a Community dimension and sustainable settlement, the change of the idea of living and intervention strategies for the new residence. In this framework, new models and protocols for studies of the transformation.

3.2 INTERVENTION STRATEGIES

Through detailed analysis, elaborating a multidimensional representation of the urban fabric is possible to identify the potential and manage resources such as games of a profit and loss account to be used for the sustainable development of natural and built.

The process of redevelopment and regeneration of housing includes both the adaptation of existing buildings, both new functions and the redesign of open spaces and common areas. The main theme concerns the "densification" of open spaces, adding new equipment and services to both the local level (kindergarten, sports and leisure, business and craft) and the urban scale (community center) within a general redesign of the green and parking.

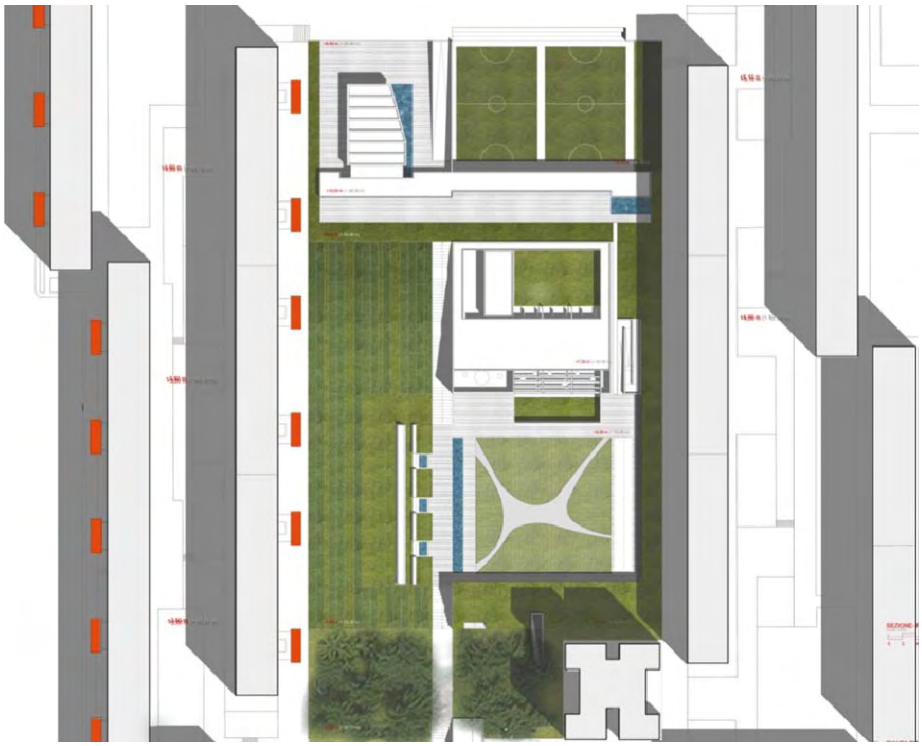

Fig. 5 Design intervention and recovery existing buildings, Neighborhood Vanvitelli, Caserta, Maria Antonia Giannino

The objective is to guide new interventions to revitalize the conditions of use of the large courtyard garden without contradicting the original architectural character of the grand unified space for collective use: the architecture to be included are objects of small size and organically linked to the design of the spaces external to the steps, to the trees. A significant point of the intervention strategy is the location on the south side of a covered market that assumes the role of "front door" in the neighborhood. For the redevelopment of the ground floor, the densification involves the insertion of small volumes to social rooms or shops. The

new volumes and open spaces are inserted in a general remodeling of the ground that, by compatible activities in partially underground structures, reduces employment gaps and increase the green surfaces.
A first objective, therefore, is the constant dialogue of the neighborhood with the city, the presence of green areas of relevance that promote livability for different user groups, from infancy to old age; building density contains a balanced land use and effectively draws the spaces between the houses attributing meanings to these precise and consistent with the characteristics of the users.
The formulation of a program of intervention should therefore be focused on a few principles: reuse and optimization of soils already cemented; redesign of the areas pursuing the functional mix, and quality of settlements
So while it is necessary laws regulating the use of land and funds for the maintenance of public administrations, on the other hand you should also upgrade the compact city and make it livable and functional needs of the population.

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