



COST Action TU0701

# Improving the Quality of Suburban Building Stock



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## PRESS RELEASE

# Improving The Quality Of Building Stock And The Built Environment

Members of the academic staff of the Faculty for the Built Environment were recently invited for the Final Conference of the European Science Foundation COST Action TU0701 held in Ferrara Italy and hosted by the Department of Architecture of the University of Ferrara. Perit Ruben Paul Borg, Dr Vince Buhagiar and Dr Paul Gauci, of the Faculty for the Built Environment have been participating in the research group within the European Science Foundation - COST Action: Improving the Quality of Suburban Building Stock, for the past 4 years. The group addressed in particular building refurbishment strategies, quality assessment methodologies and quality standards in suburban housing.

Suburban building estates make up a large part of the European Urban heritage. Most of the buildings generally consist of multi-family housing blocks consisting of small apartments, which were completed after 1950 using low-cost technologies. Consequently they are characterised by poor quality and building defects. The aim of the research group was to investigate methods and technologies used in the rehabilitation and renovation of suburban housing settlements, intended to increase their value, and to improve safety and the quality of life of the inhabitants.

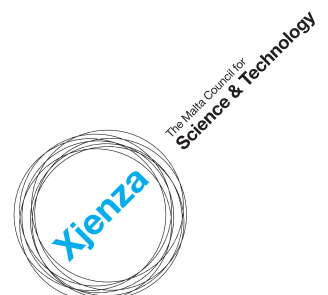
Perit Ruben Paul Borg is the Vice Chairman of the research group's Work Group 2 and is in charge of coordinating the scientific activities concerning strategies for the assessment of quality and refurbishment and quality standards in the building stock and the built environment.

A number of reviewed scientific reports and books concerning the Quality of Building Stock and the Built Environment were published and edited by the research group and presented at the conference. The main research publications include the book "Suburbanscapes" (Published by Alinea Italy, 2012) and the second volume in a two volume series "Improving the Quality of Suburban Building Stock" (Published by UnifePress Italy, 2012), of which Perit Borg and Dr Gauci were co-editors and responsible for the scientific coordination. The first volume in the series had been coordinated and published in Malta by the Department of Civil and Structural Engineering of the University of Malta, on the occasion of the international conference in Valletta in 2010. Both volumes include a comprehensive collection of the most recent developments in research on quality assessment methods and refurbishment strategies covering the suburban building stock and housing, with contributions from the foremost European experts.

Perit Joseph Galea, of the Faculty for the Built Environment was appointed by COST European Science Foundation, in Brussels as an Evaluator of the COST Action and the research work conducted during the past 4 years of activity. COST in Malta is coordinated by the Malta Council for Science and Technology.

For more information on this conference please contact Ruben Paul Borg, Department of Civil & Structural Engineering, University of Malta. [ruben.p.borg@um.edu.mt](mailto:ruben.p.borg@um.edu.mt)

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# PALERMO, ZEN DISTRICT. AN OCCASION OF URBAN RE-QUALIFYING

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**ABSTRACT:** Among the changes made to the original scheme proposed by Amoroso Group, were some that showed the willingness to accommodate the constraints established by the local council and were designed primarily to protect certain pre-existing historical sites in the area. Consequently, the gridded, dense neighbourhood Zen 2 had to be opened in certain parts. Thereupon on the South-East quarter the "OD" *insula*, the citrus grove, the historical outskirts and the school in Trapani Pescia Street detect an emblematic fragment, useful to understand the contradictions that exist in this district, where heterogeneous elements form self and distinct parts. The design of new residences in this area is an occasion of urban re-qualifying and comprehension of this neighbourhood. Using the existing knowledge about the location, a system of urban relations has been proposed, that through a housing, aims to confront with the surrounding and, on a larger scale, with the city. Particular attention has turned towards the environmental conditions and therefore, sustainable energy of the construction.

## *Premise*

During the research Miur Prin 2007 “Re-qualification and updating social housing. Guidelines for interventions in the innovative IACP districts in central and Southern Italy”, coordinated by Prof. Benedetto Todaro (Università La Sapienza - Valle Giulia di Roma), the research group of the University of Palermo, led by Prof. Andrea Sciascia, studied the social housing in Palermo’s districts Borgo Ulivia and Zen – San Filippo Neri.

This case-study is a to be considered as element of the project-reflections regarding the Zen neighbourhood<sup>i</sup>.

## *ZEN district*

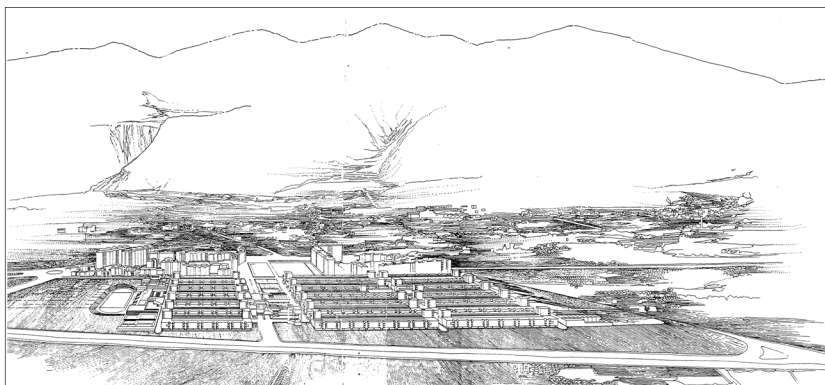


Figure 1. F. Amoroso, S. Bisogni, V. Gregotti, F. Purini e H. Matsui, Zen 2 neighbourhood from Mount Pellegrino.

The Zen-San Filippo Neri district is located in the Northern part of Palermo, in the middle of a valley, surrounded by the Pellegrino Mountains, Gallo and the Billiemi Mountains. Famous through the media, as stereotypic example of an ill-famed Southern Italian district, it is today the center of a particularly interesting transformation. The district, isolated by a speedway that surrounds it, has always been encircled along its margins by the gentrification coming from Palermo and Mondello and by the building of recreation centers and shopping malls, which draw a large number of visitors.

The social housing of Zen 2 is a concentrated, densely populated council housing area surrounded by private sprawl properties.

The original idea of F. Amoroso (head of the work-group), S. Bisogni, V. Gregotti, H. Matsui and F. Purini was based on a Hippodamus grid system in contrast to its variegated surrounding; the new neighbourhood had to be as “a meteor coming off from the constellation town” (TAFURI 1982), like an artificial core encircled by fields.

Today this intention of the designers can be understood by looking at the district from up above, from Mount Pellegrino: even when focussing the attention on the margins of the ZEN district, some dissonance become more apparent when the site is seen at close range.

#### *Between plan and construction*

Among the changes made to the general scheme proposed for the bid in 1970 by Amoroso Group, some of these showed the willingness to accommodate the constraints established by the local council and designed primarily to protect certain pre-existing historical sites in the area. In particular, the legislation of 1980 which dictated that Cortile Gnazziddi (on the Southeast margin of Zen 2), Fondo Trapani (between Borgo Pallavicino and Zen 2), Villa Mercadante (between Zen 1 and Zen 2), on Pensabene house (South of Zen 2) and Buffa houses (North of Zen 2) all had to be safeguarded. On this occasion local government legislation commanded the boundaries of the district, expanding to the North and South and the rows of *insulae* expand from three to four.

The dense, gridded neighbourhood Zen 2 was bound to modification due to pre-existing historical features thus had to be opened in some parts. The remaining *insulae* "scrap" was compensated by an additional row which produced the coexistence of two logics that appear irreconcilable: namely housing and the settlement of pre-existing history. Schools were to be placed at the two bands of productive activities (North) and sports (South), consequently they have suffered a decline, followed by the subsequent election of an additional school complex between Zen 2 and Borgo Pallavicino<sup>ii</sup>.

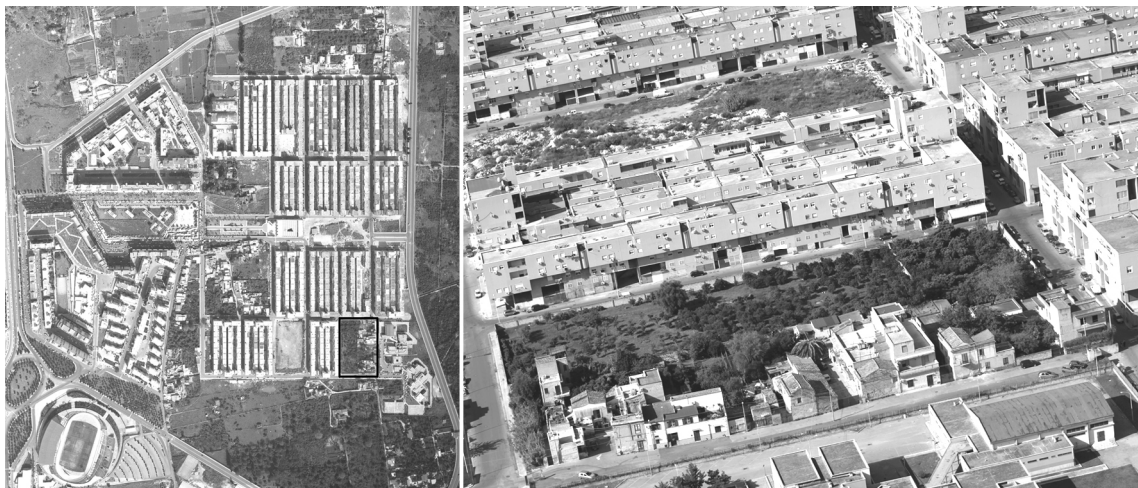


Figure 2. Aerial photo of Zen 2 neighbourhood and location of Cortile Gnazziddi (ph. Katsireas D. 2000 - Assessorato all'Urbanistica del Comune di Palermo).

### *Housing and safeguard of pre-existing site*

On the South-East quarter of Zen, the insula "0D", the citrus grove, the historical outskirts and the school in Trapani Pesca Street detect an emblematic fragment to understand the contradictions that exist in this part of the district, where heterogeneous elements form self and distinct parts.

The project site is encompassed by existing, listed buildings as well as contemporary architecture, it is located where the grid lacks one of the corners due to the enduring historical buildings which are protected by the Superintendence of Cultural Heritage and Environment.

The site is defined, in the North-East, from Trapani Pesca Street, a slight and flexuous route which linked Pallavicino suburb to the Fondo Trapani and then continued to Partanna Mondello. Beyond this location, facing the wall of the Cortile Gnazziddi houses, the school has access to a share of about 1,50 metres lower than the old level that coincide which citrus grove and the old houses. This height difference is currently denying the relationship between the parties, as well as the fence of the site through the curtain of houses and a stone wall. To the south-west limit is sharp and designed from the "0D" insula.

### *New houses as an opportunity for civic design*

Using the existing knowledge about the location we propose a new system of urban relations through a new residential complex that aims to confront with the immediate surrounding and, on a larger scale, with the city. Particular attention has turned towards the environmental conditions and therefore, sustainable energy of the same construction.

Investigating the relationship between architecture and towns, new and existing, now includes a reflection on technological innovation and the limitation of energy consumption, requirements that must fall within a single disciplinary thinking. Besides, the concept of sustainability as a foundational principle has the durability to clarify how attention to the climate and *oikonomia* of manufacture has deep roots and is fully part of the statutes of Architectural Design.

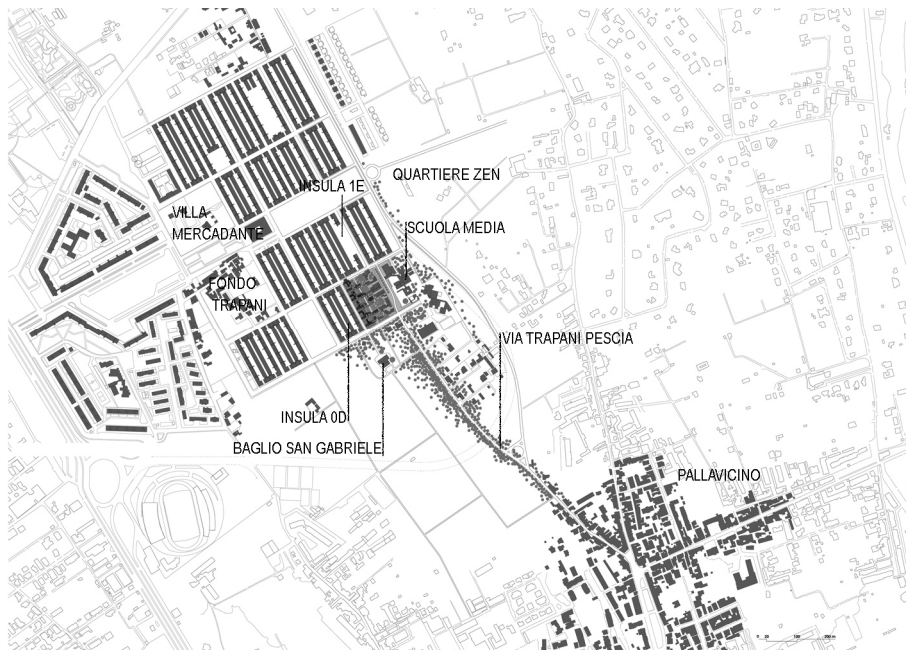


Figure 3. Between ZEN neighbourhood and Pallavicino suburb, new residential complex link pre-existing buildings and contemporary housing, from several points of view

The completion of the Cortile Gnazziddi block tries to provide a hint for thought on trying to combine different variables. Imagining new residences was an opportunity to integrate some data: pre-existing historical (the hamlet of Pallavicino, Cortile Gnazziddi and Trapani Pesca street), contemporary architecture (ZEN 2), orientation (to protect from the sun on the south-

west side), number of housing (40), typological diversity (5 types of residences), public gardens (designed in compliance with existing plantings) and energy requirements (90% of the requirement is satisfied thanks to the systems chosen, the shape of the building and the project of the wall).

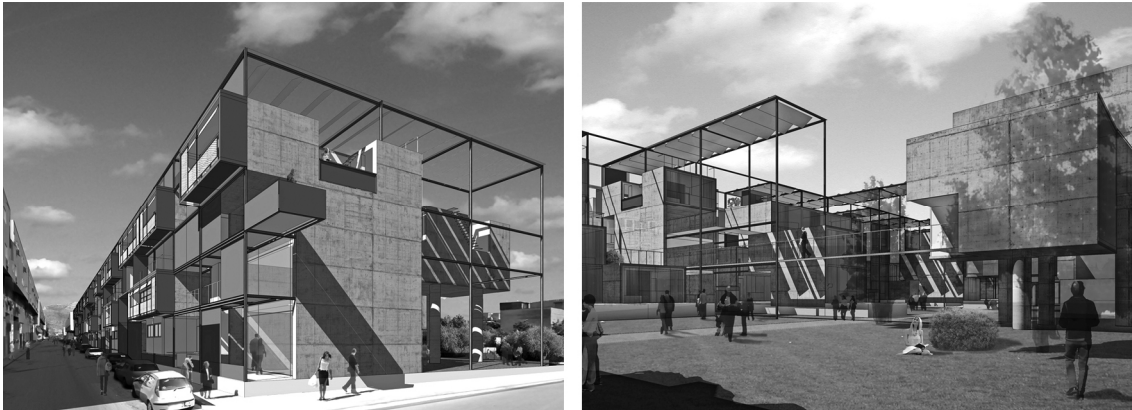


Figure 4. New houses between ZEN 2 and cortile Gnazziddi. On the left: Via Learco Guerra, on the right: the garden.

The main settlement whereby the new complex, of which the project has been presented, derived from the reading of the place with both natural and existing features taken into account. To the south-west *rue corridor* which was not built as proposed in the original design of ZEN 2 (F. Amoroso, S. Bisogni, V. Gregotti, H. Matsui and F. Purini). It is however, now being proposed through the choice of a front-permeable, but which is mainly compact. To the east, the citrus grove is the protagonist and the dispersed front interacts with pre-existing Cortile Gnazziddi. The desire to reduce the building density toward the garden is the basis of the combination of the elements. Mirrored with respect to longitudinal axis of the block the cluster of the suburb that grows from street frontage, giving rise to a system of short green semi accessible via pedestrian walkways.

At the urban level the idea of the project is linked to the desire to mend the fabric of the city with the green town, through the extension of existing paths. It is believed that open spaces should be taken advantage of and used effectively in order to exploit the current inaccessible spaces. It is essential to give new meaning to the action of the same protection.

The pedestrian paths that cross the new block intercept the peculiar permeability of the Zen 2 and convey the movements southwards towards the villa Pensabene, which could be utilised as the entrance to a park, with a view to capitalising on the existing vegetation.

The central street of the “1E” *insula* is in continuity with the principal pedestrian crossing inside the new block which is configured itself like a garden deriving from the requalification of an antic citrus grove.

This intervention obviously interferes with the positioning of the blocks of housing that assure the possibility to remove only a minimum of the existing groves and conserve definitely the trees of a higher stocks. Finally, the Via Pescia is joined to the right angled pattern of the ZEN 2 through the inflection of a service road that goes up to a unique base, planned to connect the internal garden with the adjacent school.

The identity of the road Via Trapani Pescia with the urban connecting artery between the historic areas (Partanna - Pallavicino) induces to reflect on how this street could become a connection between the ZEN and the city. The road Via Trapani Pescia could configure close to the Cortile Gnazziddi according to this proposal, like a servicing street to the houses that joins the height difference between ZEN 2 and the grove. The project of the soil has the objective to facilitate the street crossing and to delimit the usage exclusively of the school on a slightly deeper soil.

Hence Via Pescia becomes a visible and physical connection between the ZEN 2 and the Cortile Gnazziddi. Moreover, through the core of the “1E” *insula* this route could lead to the

service center of the district (the spinal tap of the ZEN 2 as planned in the winning project of the competition in 1970). The general hypothesis of Andrea Sciascia (SCIASCIA 2003) discusses the presence of the ring road around the Zen and takes into account that already road infrastructures exist that connect quickly the district with the highway and the ring road. Bearing that in mind, here it has been proposed to reduce the ring road of the Zen and reconnect it to the Via Pescia in proximity to the main square of the suburb of Pallavicino.

The said road intended for the traffic of the district would not be a barrier between the Zen and the new sprawl that has covered almost all the former green areas of the Zen and neighbouring suburbs. In this area free spaces can still be found, they are at present protected and have been envisaged as ecological corridors that connect the green areas.

*Climatic comfort, energetic sustainability and the form of the building*

The shape of the residential complex, dictated by site conditions, is consistent with the geography and exposure to the sun. In fact, open houses with terraces to the north-east offer in every case an amazing, panoramic view of Mount Pellegrino and a good exposure to sun light, without having to endure disadvantageous solar radiation. The lighting and climatic characteristics of the environments appropriately calculated in collaboration with the architect Alessandra Galatioto allow the original idea, that responded to the morphology of the context, to be reinforced. The longitudinal front facing "OD" *insula* was envisaged, therefore, with a facade that takes into account the height of Zen 2, covered by a "skin" that configures lodges and sunshades, and thus protects the housing from sunlight from the south-west.

Considering that the well-being in Palermo is determined primarily by staying cool during the summer months these housing conditions respond well to the climatic needs. In addition, with regards to global warming and the current economic crisis, a passive solution has been proposed. Intended on being based on a reasonable shape of the building relating to the area. The structure of this double outer skin (which is shaped, laminated, coloured, wood to have a strong thermal inertia) creates membranes as a buffer, corresponding to the coverage where it becomes support for some solar panels. The design of the PV system is integrated into the design of the building and the panels hung as curtains, moreover, producing energy, shaded terraces and courtyards.



Figure 6. Solar panels shade terraces and courtyards

The simulation was made for a top floor apartment type in the critical date of June 21. The diagram allows you to read the contributions in Watts of solar radiation incidenting on the window throughout the year.

The conformation of the residential complex, which offers the advantages described, presented – in amore specifically architectural scale - some problems with heat dissipation of individual housing. The apartments are organized according to a regular grid (spacing 5.30 m) that supports free aggregation of juxtaposed or isolated volumes. The rarity of the volumes

implies a loss of energy. To resolve this problem a suitable package wall which isolates the interior as necessary was studied.

### *Conclusions*

The goal was to bring together the technological solution to the logical unit of the project.

In fact, through this volumetric composition, which in terms of climate ensures cross ventilation in all cases, you can also get a hybrid typology - storey home + banisters house + detached - to offer, in all cases, a glimpse into the garden, a terrace and heterogeneous houses, as specified in the required program.

The project proposes five types of apartments (two types of three rooms and three of two rooms) of which the majority are duplex. This feature may appear in contradiction with the vocation of "cheap and council housing estate" of the neighborhood but in reality the rents in the area are among the most diverse (from council housing to million dollar villas). The privileged position of the area near to Mondello makes it an ambit residential area, suggesting that more and more people - regardless of social class - will eventually move there.

How could sustainable suburbs be made and ensure that housing will work with an appreciable energy savings? This experience seems to paradoxically indicate a direction already known, yet new, toward an architectural project. Inhabitants' needs must be taken into consideration in that in the Zen most construction is autonomous (among other things: verandas, various barricades and air conditioners). Furthermore, the geography and the city must be carefully observed and adhered to. The prerequisite is to develop a design that can include several variables among them those related to plant engineering and sustainability more generally, considered characteristic and inseparable from the concept of life (physical and aesthetic) and which should withstand the test of time.

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### Note

<sup>i</sup> The project was developed by Luciana Macaluso, Tomaso Garigliano and Giovanni Lopes at the MIUR PRIN 2007 - *Retraining and upgrading of public housing. Guidelines for innovative interventions in the IACP districts in the Central and South Italy* - national coordinator prof. Benedetto Todaro. *Palermo neighborhoods, suburbs and cities* head of research prof. Andrea Sciascia.

<sup>ii</sup> «Il cortile Gnazziddi viene a trovarsi inglobato tra la scuola dell'obbligo e la scuola materna integrata dall'asilo nido, quello stesso che avrebbe dovuto sorgere nella stessa posizione qualora si fosse realizzata un'insula. [...] viene così agevolata la ricucitura della edilizia preesistente con una unità morfologica di maggiore compattezza» in AMOROSO, F. BISOGNI, S. GREGOTTI, V. MATSUI, H. PURINI, F. 1980. *Relazione illustrativa, Variante 1980*, p. 4. In SCIASCIA, A. *Tra le modernità dell'architettura...* op. cit., p. 91.