

# The morphological basis of urban design: experiments in Giudecca, Venice

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**Abstract.** *Reconciling progress, on the one hand, and conservation of a rich legacy of physical forms from the past on the other, is a major challenge. In the case of Venice significant change is only possible in its outlying districts, such as Giudecca, since only measures preserving the fabric of the buildings are permitted in the Centro Storico. Giudecca island is used as a case study to explore ways of integrating new ideas in an area which is very much shaped by its historical development. Analysis of the present urban fabric and comparison of different recent design strategies offer solutions to future development of the island.*

*Key Words: urban design, regeneration, historical forms, high density, Venice*

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Every city needs to accommodate changes in society. This accommodation poses major problems for established cities, particularly those with a rich legacy of the products of past societies. This paper considers how new ideas may be integrated into the urban form of a city that has been powerfully shaped by a long history. The solution to the problem of reconciling new with old is sought in the analysis of existing urban form, taking the example of the city of Venice. It focuses particular attention on ways of solving the problem of reconciling high-density urban fabrics with present-day housing standards.

## Venice

Venice, 'the lagoon city', must develop further to be able to face the future. New concepts are necessary to secure the 'real survival' of the city. The city is losing its inhabitants as a consequence of tourism and its status as a

'museified' city. Tourism is unquestionably Venice's main source of income. The housing market and the cost of living, for example, are increasingly related to the demands of tourists. The extremely high costs of housing in the Centro Storico have resulted in the exodus of large numbers of the local population. During the last 20 years Venice has lost one-third of its inhabitants.

The municipality of Venice is striving to slow down the urban exodus and prevent the city from turning into a museum. To achieve this goal it supports change of use and the restructuring of entire areas, especially its industrial estates, seeking to create new housing structures that are adapted to the current situation.

The challenge of building something new in Venice relates to seemingly incompatible facts. As the lagoon city is so much shaped by its historical and cultural heritage, it seems to be nearly impossible to build something new that is of comparable cultural significance to

what already exists. Venice has a very special form and a variety of building types that shape it, such that new ways of building can easily be out of place. Urban designers need to confront a variety of questions. How can up-to-date forms, respecting present-day needs, regenerate the city without destroying its character? Do dwellings built according to the typological tradition still correspond to today's ideas of living? Which typology meets modern needs for quality of life, hygiene and standards of living? How does contemporary architecture work in such historically-shaped dense surroundings? What sorts of land and building use can be included without endangering existing public and private services?

### **Giudecca island**

Giudecca island, which is part of the city of Venice, is well suited to an investigation of new building in a historical context. It has most of the typological features of the main island but is less densely structured. Mainly composed of residential areas and disused industrial estates at the border of the main area visited by tourists, it is connected to the public transport system and can be reached easily from the city centre. It is the only part of the lagoon that offers space for something new, having many unused, or ill-used, industrial buildings that provide scope for new concepts. According to their state of repair, typology and value as monuments, these buildings can either be used differently or they can even be demolished.

The island has been the subject of several planning studies. Projects have already been implemented in some areas, although not all of them are finished. The island has examples of recent construction (Figure 1A) that illustrate different solutions and offer the possibility of an assessment and comparison. In 1984, Alvaro Siza won a competition for the reconstruction of the Campo di Marte: Gianfranco Caniggia submitted a proposal based on well-founded historical studies but was not given an

award. The selected development was only partially implemented and includes architectural designs by Carlo Aymonino and Aldo Rossi (Comune di Venezia, 1986). In 1986, Gino Valle designed a very dense residential area (the Scalera-Trevisan area) – a miniature town, on the south shore of the lagoon (Croset, 1986). In 1997, Cino Zucchi won a competition for the design of a whole district (the Junghans area), the individual houses being designed by ten different architects (Comune di Venezia, 1997). In light of these planning studies, a further project to be considered here concerns the reuse of a disused industrial estate. It is based on work undertaken by the author in the Department of Architecture at the Ecole Polytechnique Fédérale de Lausanne (Gygax, 2003) and focuses on the redevelopment for mixed use of a former shipyard – the Cantieri Navali e Officine Meccaniche di Venezia (CNOMV). The method used by the author might be described as 'experimental exploration'. The design is based on a detailed analysis of the urban structure and its historical development. The proposed forms fit the character and arrangement of existing forms but continue them in a contemporary way. The city's morphology and building typology are the prime underpinnings of the project. Questions about contemporary architectural interventions are answered by examining and comparing different recently proposed designs.

Three types of morphological pattern may be distinguished on the island of Giudecca. The first mainly consists of a very compact, linear development along the Fondamenta in the north. To the south, in the direction of the lagoon, it has a less dense fabric, structured by alleys and canals, disposed in a comb-form. The first building line on the north shore of the island has its most representative façade facing the main island of Venice. The consolidation of the island, according to the building tradition of the lagoon city, began from this side. The second pattern consists of a less dense structure behind the main line towards the open lagoon. This development is somewhat loose and characterized by both

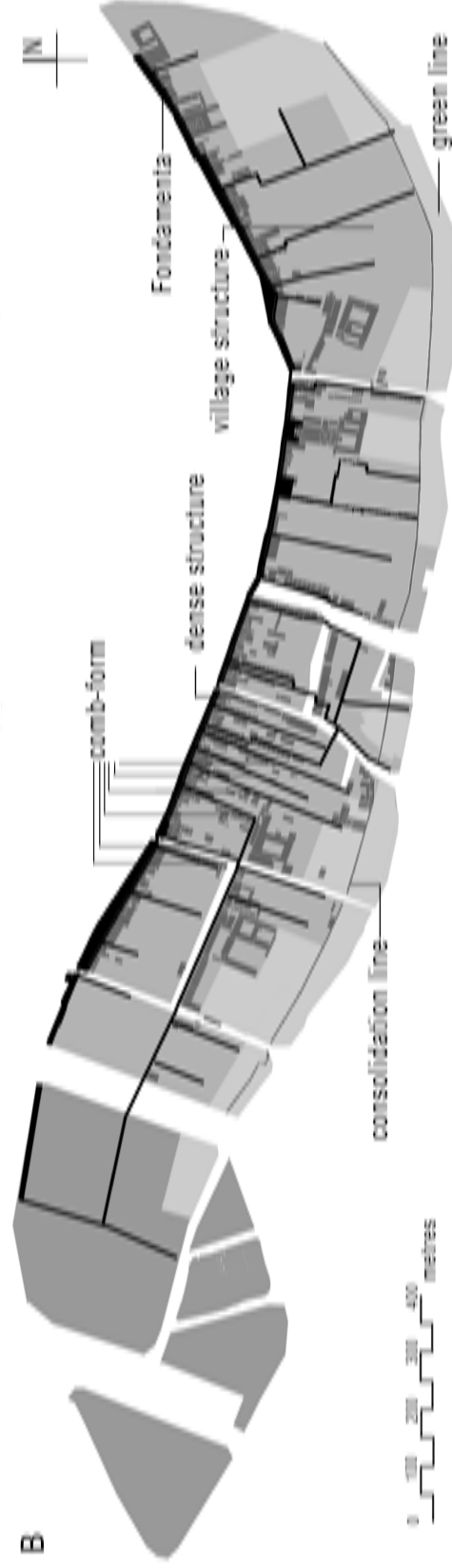
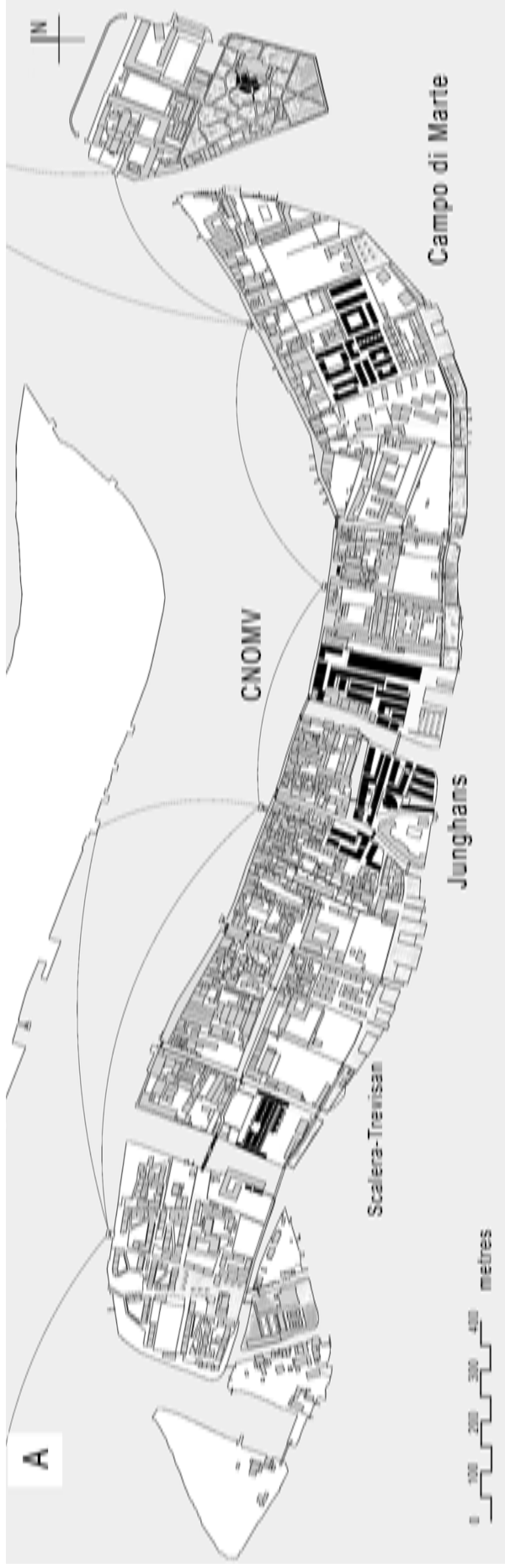


Figure 1. Giudecca Island: (A) location of the projects by Valle, Zucchi, Caniggia and the author; (B) morphological structure

built and unbuilt landscapes, in which the green spaces have a planned appearance. The outlying district in the south-west consists of structurally incoherent elements. The clear structure of the north front contrasts towards the south with this open and less structured system of rows of houses, gardens, squares and parks. The residential buildings in this zone are lined up in rows orthogonal to the Fondamenta. The open composition, with detached blocks and gardens, is associated here with a diverse and sometimes confusing pattern of pathways. Narrow alleys suddenly open out into squares and pathways lead away from them. Enclaves, enclosed units like former monasteries or industrial estates, are further characteristics of this second pattern. The paths and alleys do not constitute a network: all of the connections to the Fondamenta are linear culs-de-sac. The Fondamenta is the main axis and the only thoroughfare from which there are links to the different islands. Many of the alleys orthogonal to the Fondamenta end in private property near the lagoon. All districts of the island reach as far as the boundaries of the second-to-last stage of reinforcement of the land. Consequently the last strip of land in the direction of the lagoon, the third pattern, remains undeveloped and vacant. This green strip is only partly cultivated and makes up the only 'natural' terrain along the lagoon (Trincanato and Umberto, 1971) (Figure 1B).

Giudecca island, like Venice generally, is not only important because of its historical roots. The lagoon city is shaped by contrasts that contribute to the fascination of experiencing its space. The contrast between density and openness is arguably one of the most important features. Narrow streets, which are almost always in the shade, lead through heavily built-up residential areas with very elongated plots. Suddenly a bright and light-flooded square opens up just round the corner. This is where people meet and where the magnificent buildings are: these squares are large enough for the observer to appreciate the ornamented façades.

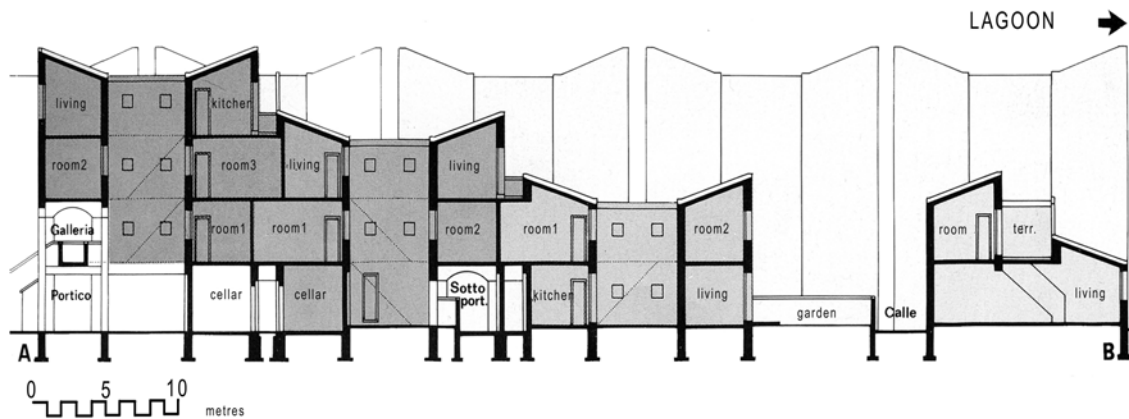
'Repetition and uniqueness' is another feature of Venice. The relatively strict rhythm

of the narrow plots and the repeated lines of terraced houses (*case a schiera*) are interrupted in certain places to accommodate a single 'event', such as a building or a public place. Public and private spaces are two parts of the city that are clearly defined in principle but still merge into each other. Private outdoor space, except for the *palazzi*, is hard to find. Thus the residents, mainly those living in more popular areas, often extend their activities to public spaces and augment their 'private' space. Another characteristic of Venice is the city's 'boundaries and connections'. The canals, which structure the entire city, appear to be boundaries at first sight. From a boat, however, it becomes clear that canals connect everything: every area is directly accessible. The high walls of the single plots divide private from public space. They make a distinction between each property, but they also weld the different groups of houses into characteristic impenetrable blocks.

### Gino Valle and the Scalera-Trevisan area

The housing estate designed by Gino Valle in the Scalera-Trevisan area reflects many of Venice's characteristics. The heavily built-up 'miniature town' is situated in a vacant industrial area and adopted the outer building lines of its neighbour, the Mulino Stucky. The district has its own autonomous spatial structure and is arranged in a strict hierarchy of public and private space. Starting from the street, some narrow footpaths that are interrupted by squares adjoin a footbridge that leads to the entrances to the dwellings. The estate includes 94 dwellings within a structure based on a modular square grid of 1.65 m. All the dwellings directly adjoin public space and offer a view over the lagoon. Consequently they are relatively narrow and have several storeys. The whole neighbourhood is terraced: the northern area has buildings of four storeys, whereas the buildings in the southern area are only of a single storey.

The entire structure has a semi-public character. The area is shaped by a large



**Figure 2. Design for the Scalera-Trevisan area: section. Reproduced from Valle, 1986, with the permission of P. Valle.**

complex building in its central area that adds to an impression of quite high density. Although the dwellings adjoin a public space, they still seem to be quite private. There are private outdoor spaces on the terraces: the single-storey houses are the only ones to have a garden.

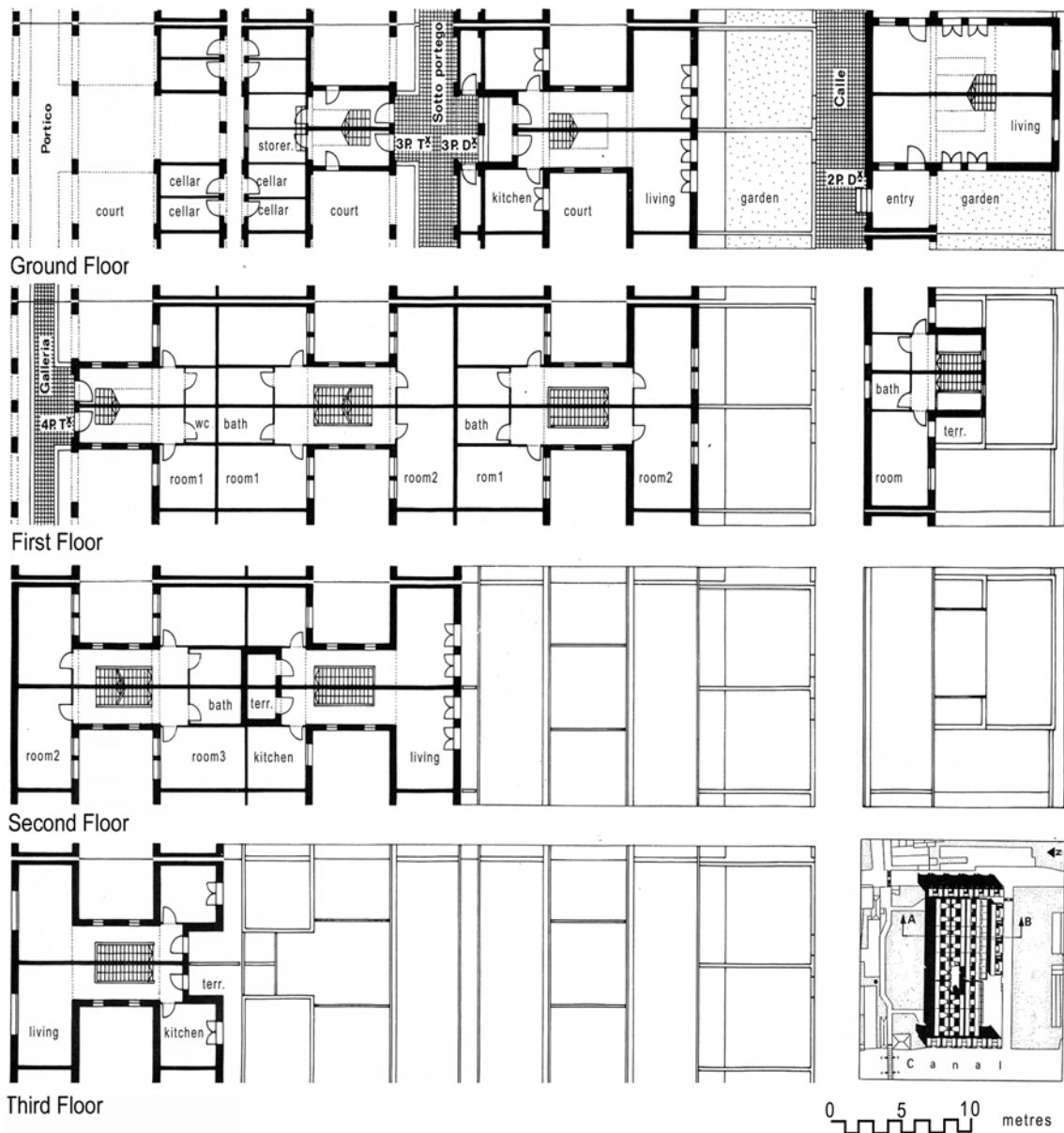
Valle's plan does not take into account the physical form of the surroundings: he only considered the context in so far as it shaped the boundaries of the neighbourhood. His plan is a contemporary interpretation of the general layout of Venice. The chief characteristics, typical features and qualities of the architecture and urban development of Venice are combined in the most confined of spaces. Valle searches for a city module that is valid today and creates space for living by integrating the identity of Venice's architecture with the identity of its inhabitants (Figures 2-4).

As an approach to building high-quality dwellings in a very confined space, the design has much to commend it. The pattern of the public and semi-public space of the area, however, is too strict. The outdoor spaces are somewhat rigid and sterile: they create an almost oppressive atmosphere. This also explains why this part of Giudecca is so quiet. The public space created by Valle has not fostered contact between the inhabitants, nor is their social life well developed.

### Cino Zucchi and the Junghans area

Cino Zucchi's plan for the mixed-use development of the Junghans area was intended to include two different characteristics of Giudecca island. On the one hand, he adopted the recurring dimensions of the traditional building typology and Venice's traditional types of development; on the other hand, he interpreted the lagoon's artificial geography. New roads and public places were built in the heart of the district, and a new 'network of ways' was created on land and at sea. Having its own harbour, the former industrial zone is directly connected to the lagoon. The basic spatial modules of the existing area were maintained. The new buildings reflect the scales and typologies of the houses that were replaced. The radial structure of the former main factory was completely destroyed, but its form is outlined in one of the new buildings in order to evoke the place's former character. In short, the Junghans area was rebuilt according to the existing morphological character of the island, but its architecture and appearance are clearly contemporary.

The Junghans area as it exists today fully accords with Venice's efforts regarding social provision for its inhabitants, providing many new dwellings and space for public and cultural life. Dwellings are of three types: student accommodation, subsidized dwellings and dwellings at market prices. They are of



**Figure 3. Design for the Scalera-Trevisan area: floor plans. Reproduced from Valle, 1986, with the permission of P. Valle.**

various sizes, some having a garden, a terrace or a loggia. There are a variety of types of layout so that people from different socio-professional backgrounds can mix. Implemented only a short while ago, the plan fits its surroundings well. The most important features of the city's construction and physical form were included in the new developments, and the history of the former industrial zone

has been respected. Morphologically, however, the plan contains a slight contradiction: on the one hand, the area almost completely fits into the existing pattern, and the volume and form of the existing houses are reflected; but on the other, the residential area reaches as far as the south shore, leaving no open space between it and the lagoon (Figures 5 and 6).



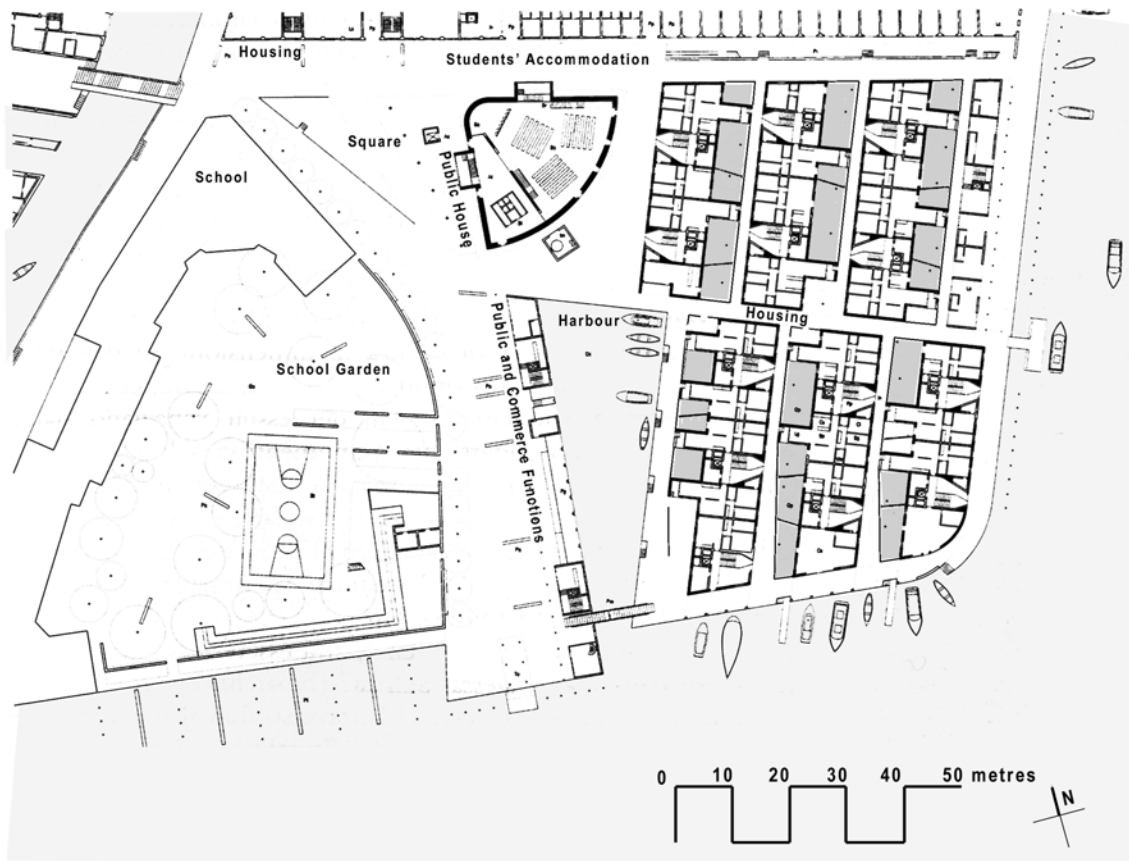
Figure 4. The Scalera-Trevisan area: aerial view. Reproduced from Croset, 1986, with the permission of Lotus International.

### Gianfranco Caniggia and the Campo di Marte

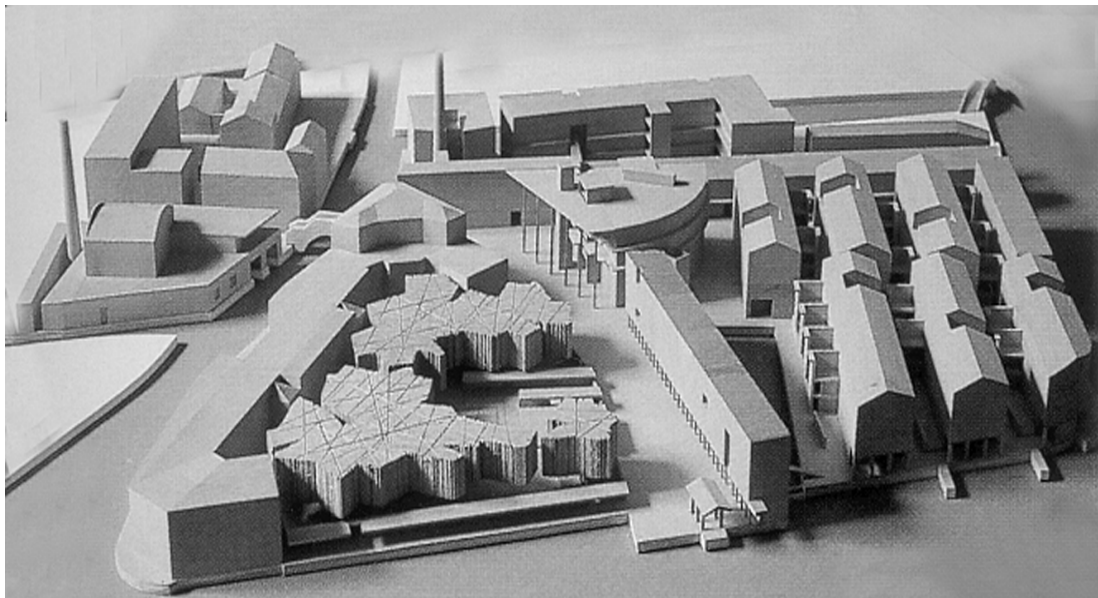
The competition for the design of the Campo di Marte took place 20 years ago. In his winning design Alvaro Siza planned to demolish existing social housing and rebuild the entire area, but today there are still only four new buildings in existence. This reflects the difficulty of finding a good design solution for the area, and it also raises the question whether the winner's project was socio-politically and economically feasible.

Concentrating above all on the area's morphogenesis, Caniggia saw the Campo di Marte as an opportunity to demonstrate how to overcome the lack of accord between the *tessuto reale* (the city structure that has been constantly adapted to the needs of the inhabitants) and the *tessuto progettato* (the city structure that is supposed to be improved

according to the rational criteria of urban development science). The latter, according to Caniggia, has been growing in the twentieth century. He considers the former to be flexible and adaptable, but he regards the *tessuto progettato* as arbitrary in its scale and setting. The existing buildings of the Campo di Marte that were to be replaced clearly belong to the *tessuto progettato*. According to Caniggia the area should no longer be built in this way. He preferred a contemporary design that would create a new and modern *tessuto giudeccano*; a structure characteristic of Giudecca island. He drew up guidelines that were intended to prevent meaningless mimicry, repletion and rigid standards, as he considered them basic mistakes of the architects and town planners of the *tessuto progettato*. 'The project as a process' is the method he pursued. He saw the entire construction of the city as a complex process ongoing for centuries.



**Figure 5. Design for the Junghans area: ground floor.** Reproduced from Comune di Venezia, 1997, with the permission of Cino Zucchi Architetti.



**Figure 6. Design for the Junghans area: model.** Reproduced from Comune di Venezia, 1997, with the permission of Cino Zucchi Architetti.



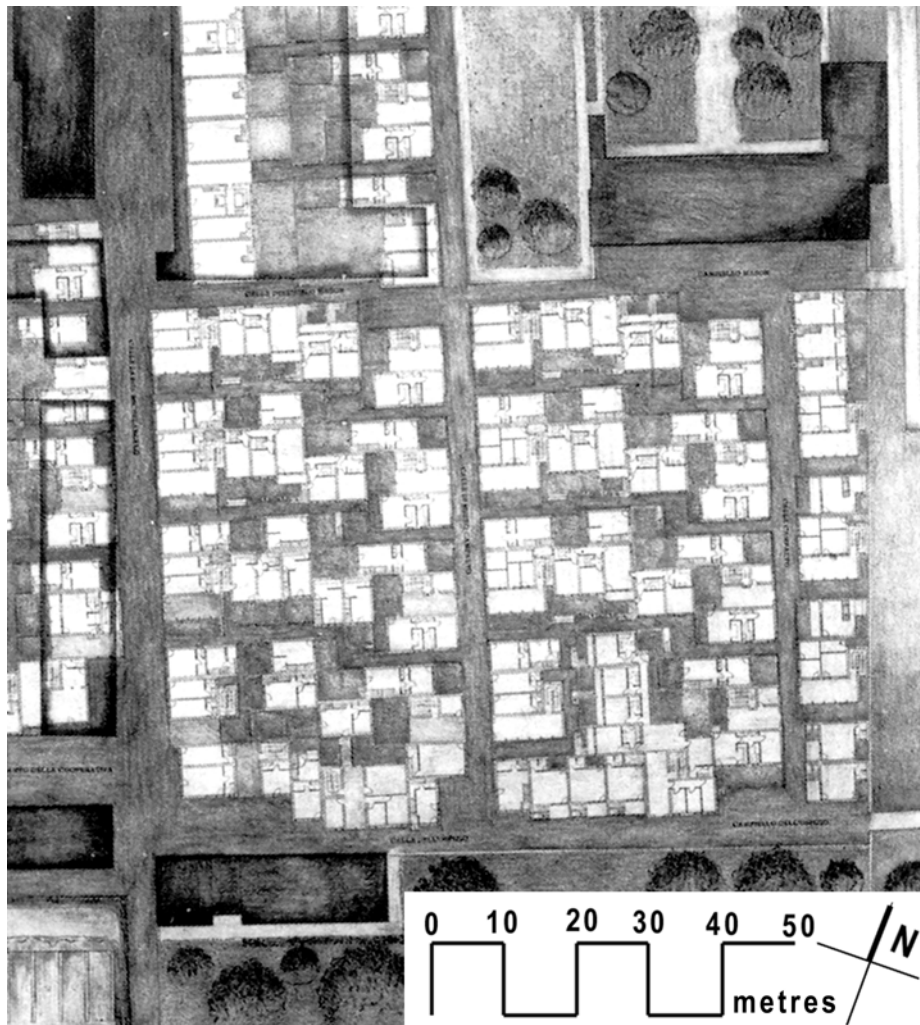
**Figure 7. Design for the Campo di Marte: general view.  
Reproduced from Comune di Venezia, 1986,  
with the permission of Adelaide Regazzoni Caniggia.**

Caniggia's approach included a critical assessment of the process by which Venice's urban structure had been shaped. He simulated the creation of the urban form *in vitro* and wanted to continue the history of the city's development in his plan, which was meant to be an integral part of the morphogenesis of Venice.

Caniggia deduced a formation system from his historical analysis, and based on it he drew up his master plan for the area. The undeveloped Campo di Marte, as it was according to Napoleon's land survey, was his starting point. The area was divided again into single large plots perpendicular to the Fondamenta: thus

integrating streets in 'comb-form' (*calli*), as they had been originally. Then a set of rules governing the proposed different parts was drawn up. This located gardens and public spaces, as well as building sites.

Caniggia then followed the logical phases of formation. The first house to take place on each single plot (the *casa madre*) was the most important and would serve as a foundation for complementary buildings. This system was meant to be reproduced serially along the *calli*. Series of adjoining houses were to be alternately lined up in north-south and east-west directions. According to their position they either share a courtyard with the neigh-



**Figure 8. Design for the Campo di Mare: detail of block.**  
 Reproduced from Comune di Venezia, 1986, with the permission of  
 Adelaide Regazzioni Caniggia.

bouring block or have one of their own. Caniggia specified new house typologies in accord with the competition guidelines. These might be alien to the Venetian city as they included recent structural fittings, but they would give a new and contemporary meaning to the surroundings. The outdoor spaces were to be arranged in a clear hierarchy. It was intended that this would make the houses appear individual and create a private atmosphere (Figures 7 and 8).

The set of rules that Caniggia drew up took account of both the historical development and current circumstances of Giudecca island, but arguably the ground plan and architecture are contradictory in certain respects. Although the

individual new plots are a clear and logical part of the island's urban form, the different sizes of the buildings within the plots are not consistent with this. The plots and paths, for example, are arranged orthogonal to the Fondamenta, but the arrangement of the groups of houses is the opposite of the *tessuto reale*: according to this the rows of houses should line the *calli* in a north-south direction and dwellings should be arranged in an east-west direction. Thus the view between lagoon and Fondamenta is interrupted. Furthermore, public spaces and gardens are often in the shade. Caniggia did not repeat the existing structures of the 1950s, but the positioning of the groups of houses would have created a



**Figure 9. The CNMOV area in 1989.  
Reproduced with permission from Comune di Venezia, 1989.**

relatively uniform fabric. The single groups of houses do have subtle spatial qualities: they differentiate between private, semi-private and public outdoor spaces, but they appear schematic and confusing. Caniggia's draft of the Campo di Marte remains a mechanical scheme that does not attain the spatial qualities for which he was striving.

#### **A proposal for the CNOMV area**

The proposal for the CNOMV area provided a mixture of living, work, leisure, public and private uses (Figure 9). The urban revaluation criteria of the municipal authority were adopted and account was taken of the *Piano Regolatore Generale* (Benevolo, 1996). The starting point was a historical analysis of the area and its



**Figure 10. Design for the CNMOV area: perspective.  
Reproduced with permission from Gygax, 2003.**

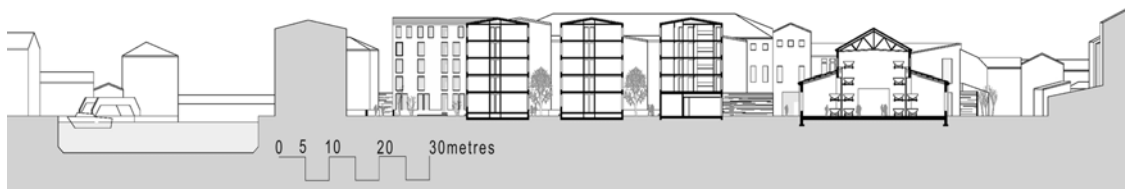
surroundings. Several hypotheses served as a basis for possible solutions and concepts. The effects of each intervention strategy on the existing structures and social environment were considered. This first phase of critical comparison of various layouts allowed optimization of the morphological arrangement of new elements and their uses.

The provision of a promenade gives the island a different character. The southern area of the island becomes accessible and public. The new path along the shore connects the two ends of the island and reveals the green spaces and former gardens. Although the existing walls of the properties along the promenade divide it into a series of different types of space, the rhythmical sequence of spaces has a unifying effect. Working as a counterbalance to the Fondamenta, this southern line becomes the second uninterrupted footpath on the island.

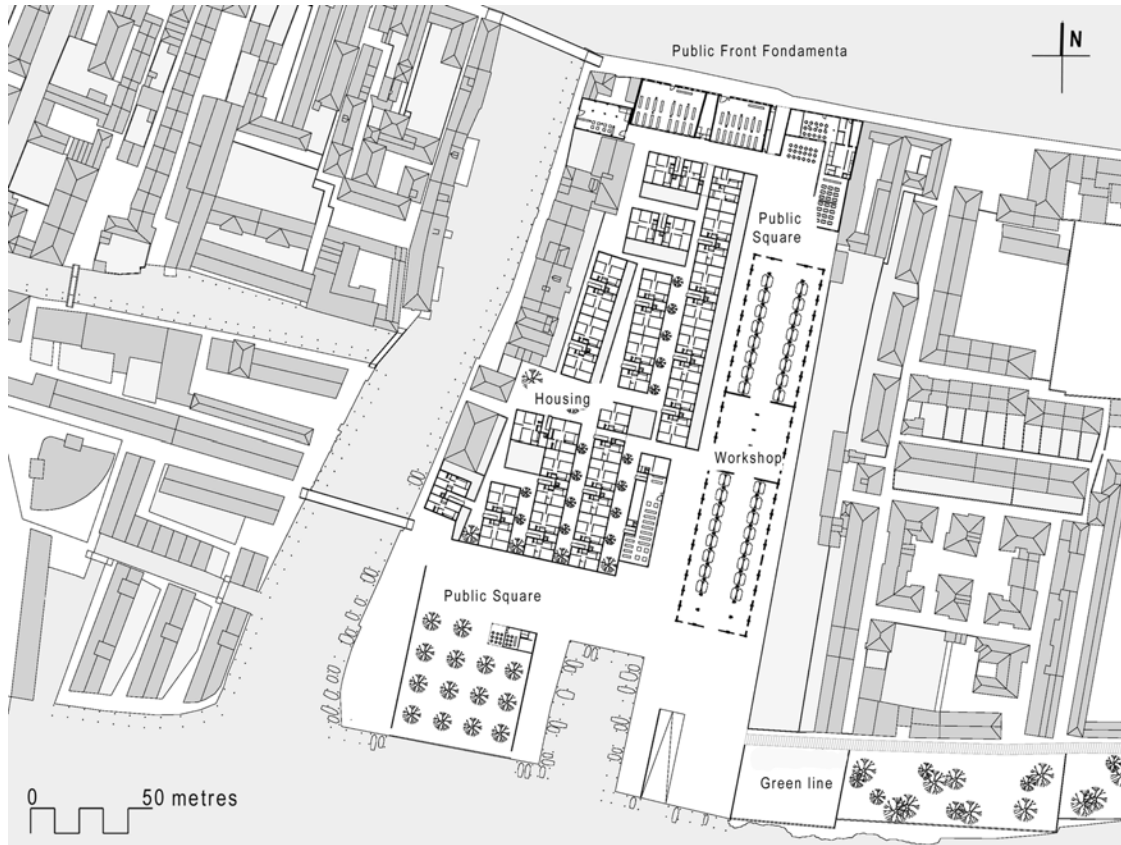
The south shore is different from the Fondamenta, which is very close to the city. The transition from land to sea is more natural here, and the land slopes gently towards the lagoon. The second-to-last stage of reinforcement of the land is also visible in this area. All of the buildings and walls in the proposed design reach as far as the old boundary, outside of which the ground was said to be

unsafe as it was not reinforced and is situated on a lower level than the rest of the island. This led to a clearly defined vacant strip in the south. The promenade runs along the line of the last stage of reinforcement which follows the plot boundaries and is farther back from the sea. This increases the individuality of the south shore in comparison with the north shore. A path made of wooden slats leads through the individual free spaces. As people are expected to look at the lagoon, the walls between the spaces are high enough to separate them visually from one another. The two sorts of promenade spaces create very different relations between land and sea. The green spaces mostly consist of old gardens and trees: the plants and trees act as a kind of filter that people look through when facing the lagoon. The hard surfaces are situated in areas of former shipyards where the terrain is reinforced up to the water and where ramps and platforms provide direct access to the sea.

The promenade also constitutes a part of the island's road network. The publicly accessible strip in the south of the island improves accessibility. Starting from the existing built-up areas and paths, there are several routes leading to the proposed promenade: its beginning and end, as well as the CNMOV area itself, which is situated near the centre,



**Figure 11. Design for the CNMOV area.  
Reproduced with permission from Gygax, 2003.**



**Figure 12. Design for the CNMOV area: ground floor.  
Reproduced with permission from Gygax, 2003.**

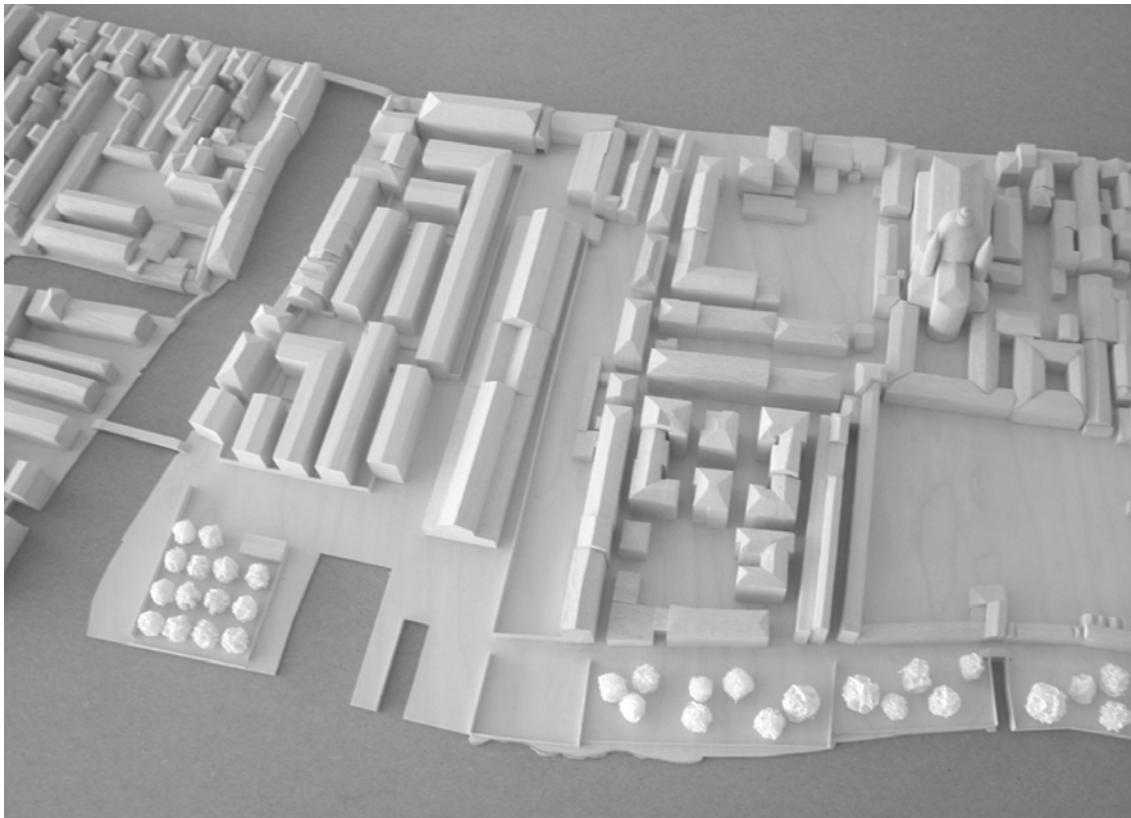
are public rights of way (Figure 10).

Attention is paid to the island's three main characteristics: the built-up, public front in the north, the intermediate zone with its suburban character, and the green strip in the south. The position, building materials and use of the buildings establish a continuity with the surroundings and create outdoor spaces that are characteristic of the island.

As the north front of the island is very important, the buildings along the Fondamenta as well as the Sottoportego, which is the

entrance to the area, are preserved. All the disused industrial buildings within the plot, except for one boatshed, which is to be preserved as a testimony to the past, are to be demolished. Because their existing form does not meet current needs and is not susceptible to conversion to dwellings, the other boatshed had to make room for projects that reduce the housing shortage.

The new residential buildings in the centre of the CNMOV area contribute to its modernization. They are situated between the



**Figure 13. Design for the CNMOV area: model.**  
 Reproduced with permission from Gygax, 2003.

built-up front to the north and the outdoor space to the south which links the quarter to the promenade. The buildings create new connections to the surrounding areas, the Fondamenta and the promenade. To link the area to the public space of the main axis, the buildings along the Fondamenta are re-used for cultural and public purposes. The existing *Sottoportego* opens into a slightly enlarged square which serves as an outdoor space for all the inhabitants. The long residential blocks are principally arranged in a north-south direction. This disposition creates a degree of openness towards the lagoon, and the private and public outdoor spaces in their dense surroundings can gain maximum benefit from sunshine. The new buildings in the north are arranged so as to create a semi-public zone. Private open spaces are bounded by fairly high brick walls, following a still evident tradition on the island. The fronts of buildings to the south are closed to avoid direct interference of the major square

in the south with the purely residential areas. The arrangement of the blocks and the presence of planting at intervals allow the private space to be protected yet open. Semi-public passages in north-south and east-west directions provide 'unexpected' connections. The boatshed, which will still be used to accommodate boats, forms a clear public unit with the square: its function and integration into the area support the mixed use. A synergy is being created: on the one hand, the area profits from increased development; on the other, the activities of the redeveloped district and its functions as an entrance qualify the promenade (Figures 11-13).

The design of the dwellings is inspired by the traditional Venetian house in terms of density of building, relationship of rooms to outdoor spaces and absence of a strong hierarchy in the distribution of dwellings. Semi-public passages within the urban structure lead to the residential buildings.

Open, semi-private staircases lead to the actual dwellings. The ground floors are on a slightly higher level to protect the dwellings from the *aqua alta* and to give the inhabitants greater privacy. Every dwelling has its own outdoor space, a garden or a loggia.

Materials familiar to Venice are employed. The walls and boundaries are of Venetian brick, like the surviving boatshed. The buildings are also of brick, and are plastered in a warm colour and placed on concrete socles. The socles and window reveals of white concrete are reminiscent of traditional Venetian façades ornamented with white Istrian stone. The material of the residential area is different from the concrete of the promenade. This difference was intended to emphasize the leisure port's function as a place of work, rather than to make a distinction between public and private uses.

### Conclusion

In Giudecca, the use of contemporary forms and concepts is definitely feasible. A new project for a part of the town must be integrated into the existing built environment but it must not imitate or wallow in nostalgia. Venice's strong characteristic elements should not appear in a schematic or stereotyped way in a design, although they need to be included because they constitute the special quality of the place. Characteristic elements need to be understood and interpreted in a way that gives them renewed meaning. A design that takes into consideration, on the one hand, historical

development and existing forms and, on the other, current needs makes it possible to create modern spatial qualities that can work as an integral part of a continuously developing urban structure.

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## Jacqueline Tatom

The death has occurred, at the age of 51, of Jacqueline Tatom. She was Assistant Professor of Architecture at Washington University in St Louis and a long-standing member of ISUF. She published a 'viewpoint' in the inaugural issue of *Urban Morphology* in 1997. Her other publications included articles in the *Nordic Journal of Architectural Research* and *Ecumene*. Most recently she was editing a collection of essays on *Towards a*

*metropolitan urbanism*. Born in Morocco, she practised as an architect in France, the United States and West Africa, and held positions at Harvard University and the University of Texas before moving to St Louis. A memorial fund has been established in her honour: The Jacqueline Tatom Memorial Fund, College of Architecture, Campus Box 1079, Washington University, One Brookings Drive, St Louis, MO 63130-4899, USA.

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