

# Urban morphology as a basis for urban design: the project for the Isola dei Cantieri in Chioggia

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*Revised manuscript received 29 November 2004*

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**Abstract.** *Settlements can be considered as complex syntheses of their territory in which economic resources are translated into their structural equivalents. The organization of land usually follows the same criteria that guided the settlement process in which there is a typological correspondence between urban and rural fabric. It enables the formation of a homogeneous land structure on which all later anthropic transformations will be based. For this reason a typo-morphological interpretation of settlements in history can represent an important point of reference for urban design. Unlike the ideological component that characterized the typological debate in Italy during the last century, a return to empirical data can represent a sound basis for a new urban design strategy. It needs to interpret the complexities of the new urban phenomena, yet be fully aware of their historical role and their unique identity. This paper can be considered a first attempt in that direction. It concerns a project for the urban and building renewal of the Isola dei Cantieri in Chioggia. It takes as a starting point the typo-morphological interpretation of the historic centre of Chioggia as part of the wider lagoon human landscape. Using the tools of urban morphology, we set out to design a new urban district that was nevertheless deeply rooted in the building history of this part of the Venetian Lagoon.*

*Key Words:* *typo-morphological, building history, urban renewal, urban design, Chioggia*

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The complexities and contradictions that characterize urban processes are related to the environmental dialectic between human beings and their territory. On the one hand, environmental conditions constitute the inevitable basis of every human settlement; on the other, the interpretation of *place* by different civilizations forges the history and identity of every urban settlement, from the first instances of *shelter* and *sustenance* to the most complex urban phenomena. Moreover, Jean Piaget and other developmental psychologists have demonstrated that the entire history of civilization has been built upon progressive phases of man's growing awareness of reality. Initially, this was through an abstracting and

generalizing conceptualization, in which the pre-eminence of the *object* over the *subject*, of nature over man, was total and human intervention was limited to the recognition of the intrinsic qualities of natural *data*. Once these had been recognized, however, they became *resources* and signalled the grafting of the natural processes of transformation onto the human, leading eventually to a common environmental history.<sup>1</sup>

Every single urban entity may thus be considered as a human settlement in a given territory; in other words, on natural soil that is transformed into civilized soil, hence territory. Strictly speaking, we can locate the initial formation of the human landscape in the

earliest sedentary civilizations, which were the first to modify nature and exploit its resources, through tillage and husbandry, thereby transforming land into settlement. Moreover, every settlement, as the choice of a place based on the need for *shelter*, presupposes an experience of the natural world and, above all, a knowledge of the land that has been gained from its interpretation by the nomadic populations through their activities of hunting and gathering: for instance, in their choice of routes, in order to find the basic necessities for *survival*.

These two basic 'existential' needs (food and shelter) were then translated into two typical and closely related territorial elements: the first routes and the location of stopping places and settlements. From a broader historical perspective, however, while for primitive man settlement models derived, above all, from the physical and animal world, early civilized man derived his *concept* of settlement from human experience itself, whether his models were natural or built. Such models could not have given a merely generic idea of settlement, but must have immediately presented themselves as specific places of synthesis, or convergence, of the territorial routes. Thus while the nomadic populations sought a 'shelter-type' – the settlements were seen as points of arrival or departure for the hunting and gathering routes – the sedentary populations sought their own permanent settlements. Hence the settlement represents an interpretation of the land in its economic potential, which is then translated into an awareness of structure relative to the settlement type and the local routes that converge on it.<sup>2</sup>

The layout, reclamation and colonization of the territory around a settlement generally follow the same criteria with which the latter adapted the natural form of the land to its needs through the creation of subsistence routes. Thus the functional network on a territorial scale tends to be a continuation of that linking the urban axes, to which the settlement-agrarian logic had already assigned an extra-urban role. This network defines the formative rationale of an urban organism by determining its *primary* structure and

consequent subdivision into lots. In this sense, settlements often present themselves as a kind of microcosm of the territory to which they belong. For instance, in pre-Roman and early medieval settlements situated at the top of a ridge, the internal organization in parallel terraces extended to the external fabric of the farmland (as in Ronciglione and other centres in upper Lazio); while in coastal settlements, the internal aggregative structure along the coast was extended in linear fashion in the contiguous rural fabric (as in the Venetian Lagoon).

Thus the typological correspondence between settlements and their rural fabric has made possible, throughout history, the harmonious expansion of the city in its agricultural-territorial context and has characterized urban boundaries as the transitional structures that mediate between city and countryside, or rather, between the two faces of the *human landscape*. Both the urban fabric of the original settlements and the agrarian fabric of the primitive colonies, in keeping with the primitive binomial 'settlement-routes', have left an indelible mark on the land, characterized by a remarkable structural conformity, which constituted the basis for all later historical developments up to the nineteenth century and was translated into a rich and varied yet homogeneous environment.

It is thus the fabric that determines the configuration of the new built environment: the place of social interaction between neighbours. While in the act of settlement, the neighbourhood is a *potential* reality, with the passing of time the social group evolves and becomes more complex. And so it is the built environment of the residential area (*that* street, *that* courtyard) which favours the development of a collective social group and even determines to a certain extent its internal relations. Indeed, for centuries, identification of the neighbourhood unit was the basis for urban-architectural design: English squares, for instance, or the Strada Nuova in Genoa, or again the Venetian Republic and its public institutions (the *Scuole*, the craft and trade guilds), which from the fourteenth to the eighteenth century provided famous and



**Figure 1. Building-courtyard complex of the Marinarezza, Venice (fifteenth century).**

beautiful building complexes for the populace, generally with an awareness of the neighbourhood space *par excellence*: the courtyard. These were building organisms entirely defined by the walls of houses (often in serial repetition, thereby creating a single, harmonious image) and polarized in the centre by collective services (Figure 1). Perhaps even more representative of an urban-architectural individuality matured through time are the numerous ancient streets that often group together specific crafts and trades: Via dei Fabbri, dei Panettieri, degli Speciali, della Lana and so on, which medieval toponymy has handed down to us throughout Europe.

Finally, the social-building neighbourhood does not generally allow any variations that are out of scale: any specialized buildings in the aggregate are either closely connected to the neighbourhood community or remain, in a certain sense, extraneous to it. Every individual building (that particular court, that particular street) is thus an individualized work, one which can attain the excellence of a work of art and yet is the product of a collective individuality, or rather, represents the individualization of a plurality.

Herein lies the contemporary relevance of

what has been said so far: while the present process of globalization sanctions, on the one hand, the progressive reduction of the great twentieth century urban agglomerations, the limits of which will have to be radically rethought, on the other, it implies a new settlement phenomenon that looks to the countryside and more especially to the smaller centres. And so these, too, will have to deal with the urgency of a new urbanism. A typomorphological interpretation of the city, in its historical dimension, thus represents an inescapable methodological basis for a cogent urban design strategy.

Our project for the urban and architectural renewal of the Isola dei Cantieri in the historic centre of Chioggia may be considered an initial attempt in this direction. The work began as a research project in the Faculty of Architecture of Rome University for the architectonic and functional rehabilitation of high quality urban contexts.<sup>3</sup>

Chioggia is the second-largest historic centre in the Venetian Lagoon and the Isola dei Cantieri is one of its four main islands. The eastern gate of the city is mainly public property, as is its main link with the mainland and Adriatic coast. In the 1970s the Isola was the victim of irrational building speculation and so a radical rehabilitation was deemed extremely urgent. The opportunity for our project arose from a series of exigencies expressed by the Comune di Chioggia due to the pressing need for more housing (a need that has characterized the entire history of this settlement area) and, moreover, the desire to save the south-eastern part of the historic centre from total degradation. The architectural, economic and social renewal of the Isola was thus proposed as an effective response to these exigencies.

Before beginning such a complex and uncertain process, however, the Comune di Chioggia asked us to draft a pilot project for the rehabilitation of the area in question, on which they could subsequently base their work. The interest of such a project for us was that it concerned an urban area of great historical value and, above all, that it offered an opportunity to experiment with the use of the epistemological and practical tools of the

urban morphology and building typology school of thought.

### Chioggia and the lagoon settlements

Because of its 'amphibious' nature, the lagoon territory is a highly specialized environment, and this has inevitably conditioned the development of its human settlements. The territory was extensively settled and significantly modified by the Romans (together with the vast Po centuriation system the lagoon formed the major *X Regio Italiae*), though what is particularly interesting is the fact that its solid cultural and natural foundations, which should have limited anthropic development, instead gave rise to two completely different environmental identities.

The lagoon environment is divided into two complementary, yet distant, worlds. Its much larger, more ancient environment is rooted in the original (and uniform) interpretation of the whole lagoon area by the Romans. The most interesting example is the city of Chioggia, though it is part of a wider and more complex historico-environmental context, which includes settlements such as Torcello, Caorle, Pellestrina, Malamocco, Marano and Grado, as well as evident traces to be found in Adria, Spina and Altino.<sup>4</sup> The other, more recent, context is more circumscribed, yet is of notable environmental impact: this is the city of Venice.

This Janus-like character of the lagoon landscape is of great interest, since it delineates not only its two great historical periods, but also two different cultural trends which have conditioned its identity for centuries, and continue to do so. The borderline between these two worlds is anything but clear-cut; rather it is blurred around the various historico-cultural 'edges' that characterize the lagoon area, such as Cannaregio in Venice and the islands of Murano and Burano.

From the beginning, the importance of Chioggia developed in two parallel directions, strategic and economic. The first becomes clear when we examine its location within the lagoon system: not only did all the main navigable routes pass through Chioggia, but it

was an essential and conclusive nodal point of the Po Valley fluvial system. This may be inferred from the name of one of its deep-water canals, Canal Lombardo, which is mentioned by Cassiodorus, Theodoric's minister in Ravenna. The second is based on two other factors. On the one hand, the city was an important centre for the production of salt in Roman times, in addition to being an active trading port. On the other, its position at the southern entrance to the lagoon meant that it had an important strategic-defensive role. An unequivocal sign of the city's economic and political importance and stability was the transferral to Chioggia, in 1110, of an archbishopric, which would only be transferred to Venice in the fourteenth century.

The historic centre of Chioggia is thus witness to a building reality of great interest, not only from an historical perspective, but above all because of the articulate and clearly legible synthesis between a Roman and Late Antique substratum,<sup>5</sup> the mainland of the Po Valley and the natural lagoon environment, which coexist in it and help define its identity. There are several written records of the area during the Roman period. Pliny the Elder refers to a *Fossa Clodia*, near the small port of *Brundulum* (present-day Brondolo), that continued northwards up the lagoon as another canal, the *Fossa Philistina*. The former was probably the *Canal Lombardo*, the existence of which was later confirmed by Cassiodorus. The latter still survives today as one of the main waterways to Venice from the south-east lagoon and is part of the route-map illustrated by the *Tabula Peutingeriana* and the *Itinerarium Antonini*, indicating an outpost called *Fossis* just inside the territory of Chioggia.

The whole lagoon area was thus an important production system linked to the salt works, an activity requiring specific technical skills and an efficient socio-economic organization.<sup>6</sup> The Roman settlement system was the *heredium quadrato*, a proto-urban structure based on a quadrant measuring 240 Roman feet (about 71m<sup>2</sup>), considered the best solution for the economic and residential requirements of the lagoon territory. The

*heredium* consisted of a wide central longitudinal space, extending the whole length of the area, intersected by an orthogonal grid of regular lots (*domus*) on either side, measuring approximately 40 (in width) by 80 (in depth) Roman feet. The role of this structure was above all economic: its organization functioned perfectly for the extraction of salt, with its parallel evaporation tubs and the outlying areas used for storage.

Yet, since the primary needs on which every human settlement is based are those of food and shelter, clearly such an organism as this allowed for the rational and functional location of the dwellings. Indeed, the *heredium* was both a perfect machine for salt production and an efficient system of lots.

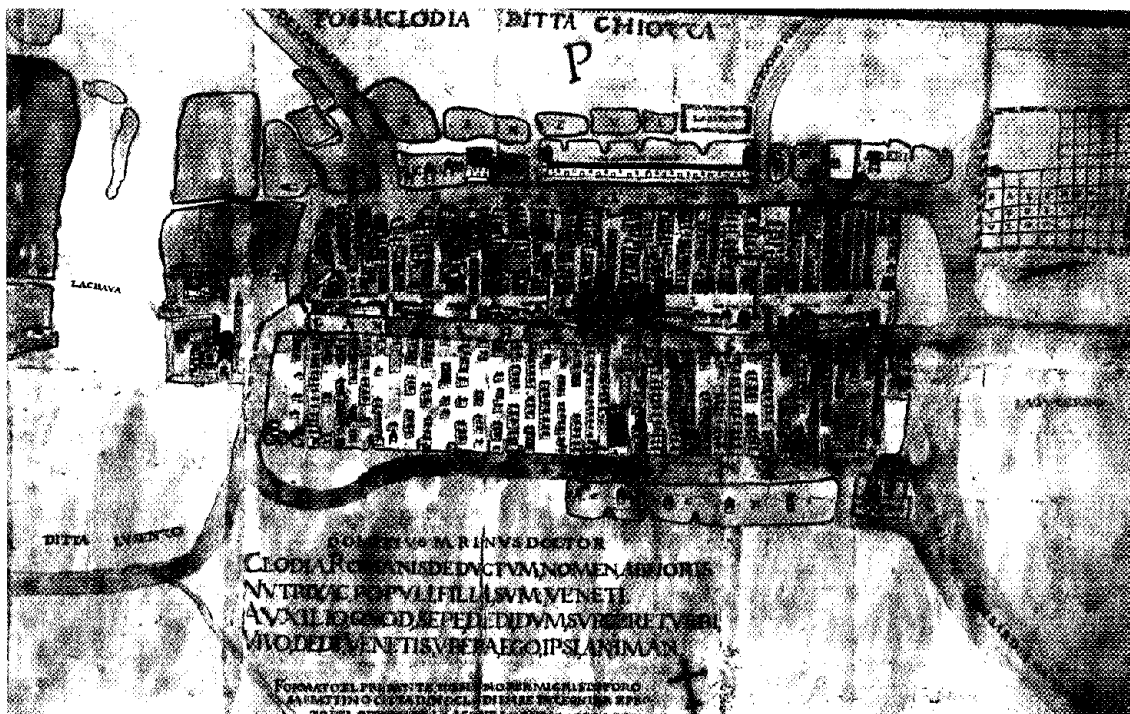
In this regard it is interesting to note that the term *fondamenta* was used to refer both to the settlements and to the salt works, since it indicated the specific lagoon settlement system, which included both and was based on the consolidation and compaction of the ground intended for building. Such a system had to be deeply rooted and codified in order to allow for an efficient and lasting anthropic modification of the territory and to constitute the historico-building basis of the human landscape of the lagoon.

As confirmation of this, we find numerous drawings of the historic salt *fondamenta* in the lagoon area, the dimensions and proportions of which faithfully recall those of the Roman *heredium*: the ancient building foundations of Caorle and Torcello, for instance, or the important case studies of Marano and Malamocco. The latter is particularly significant, since it was an archbishopric shortly before Chioggia, the urban form of which it exactly reproduces, though on a smaller scale. It is organized around a large rectangular central *piazza*, with a regular orthogonal building fabric and two deep canals at either end that terminate the settlement longitudinally. As in Chioggia, a commercial canal divides the city into two islands based on the same clear building organization: that of the north-west island is evidently earlier than the south-east. Moreover, if we examine the many other historic lagoon settlements, such as Grado, Adria, Spina and Altino (all mentioned by

Vitruvius), we find urban structures that are, in terms of settlement form and culture, similar to that of Chioggia.

These similarities, in terms of settlement type, between the two main archbishoprics of the lagoon prior to Venice (similarities which are, moreover, evident throughout the entire lagoon area) testify to the existence of a human landscape founded on a common historico-cultural matrix. Not surprisingly, traces of other square *heredia* are present throughout the entire Venetian urban area, though they never represent true urban nuclei. This becomes clear when we compare the evolution and character of Venetian public spaces with those of Chioggia. Venice is polycentric, its urban squares (*campi*) are scattered throughout the entire building fabric. While San Marco and Rialto certainly play a fundamental role in the urban context, their concrete influence on the settlement system is marginal. On the other hand, Chioggia, like most of the lagoon settlements, is an eminently organic system, and so any transformation in its building structure must be in keeping with its urban design.

Chioggia was already a building reality in the first century BC and its history is characterized by continuity with Roman territorial occupation; indeed, it belongs entirely to the Roman settlement system of the lagoon. While on an architectural scale there is no indication of this, it becomes clear when we analyze the urban structure and building fabric that they are part of a much larger territorial organization. An empirical knowledge of the territory finds its direct application in Chioggia in the typical lagoon settlement economy aimed at guaranteeing the most direct and rational link between canal and *calle*.<sup>7</sup> A ceremonial axis (the main *piazza*) and a commercial canal (Canal Vena) indicate a zone of specialized buildings where all the public buildings are situated, while the commercial structures, as well as the shipyards, are situated outside the settlement, along the deep-water canals called San Domenico and Lombardo. The survey by Cristoforo Sabbadino, dated 1557, in which all the above-mentioned elements are accurately depicted, is especially interesting in this regard



**Figure 2.** Survey of Chioggia drawn by Cristoforo Sabbadino in 1557 for the *Savii alle Acque*. All the public buildings are shown and named. Note the many boatyards beyond the Canal San Domenico, the *Lazzaretto* (left) and the huge salt warehouse across the Canal Lombardo. Note, too, the central paved section of the Piazza in front of the Palazzo Pubblico as well as many other details that confirm the accuracy of this plan.

(Figure 2).<sup>8</sup>

This is not just the well-known economic-settlement system of parallel street-courtyards (*calle-corti*) that characterizes many of the lagoon settlements, from Pellestrina to Murano, Burano and Venice itself, and represents an example of an internally polarized neighbourhood fabric, typical of the serial urban fabric of the lagoon. It is a more articulate foundation system, from a socio-cultural perspective, that assimilates the *calle-corti* logic in a more complex urban organism, in which all the levels of social interaction that define an urban civilization are present.

The spaces of economic social interaction are clearly identifiable and rationally organized: the salt warehouses, the long distance mercantile structures along Canal Lombardo and the shipyards along Canal San Domenico. The public buildings, on the other hand, are in a polar position with regard to the settlement, around the main *piazza*, and follow a strict social hierarchy, with the Palazzo

Pubblico in a central position and the collective buildings, such as the public granary, an important *beguinage* and the main churches, in the zone of specialized building between Canal Vena and the main *piazza*. The monastic complexes are situated on the outskirts of the urban fabric and the patrician *palazzi* along the commercial canal (Canal Vena), while the family dwellings are aligned along the parallel *calle-corti*, here too following a strict hierarchy based on their location within the urban fabric (Figure 3).

This complex, yet clearly legible, urban structure helps define three distinct types of building fabric connected to three aggregative systems based on a single building type: the courtyard house. Buti emphasizes that the courtyard house has obvious Indo-European origins and so it is present, in different forms, in all European regions with a long history.<sup>9</sup> According to Caniggia, the courtyard house type should be included in the general category of houses with an enclosure,<sup>10</sup> since

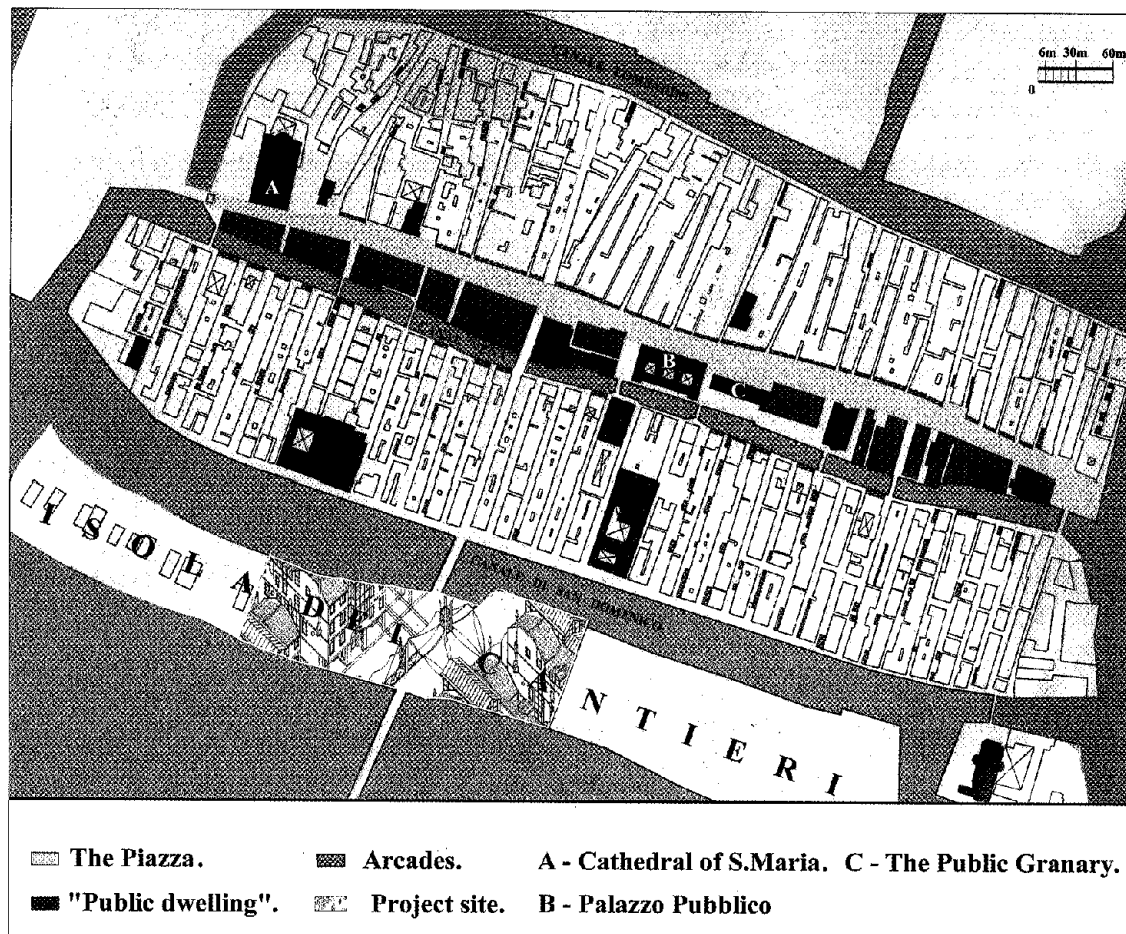


Figure 3. Interpretation of the urban form of Chioggia.

it exemplifies the concept of boundary – not just a physical limit, but also a socio-economic and cultural one – which is a salient feature of this typology.<sup>11</sup>

The oldest remains of Venetian domestic walls date to the end of the twelfth century. They do not show us a house, but rather its specialized structures: ground floor arcades and portals, as elements of a courtyard giving onto a canal. Doors that give access to water (*porte da acqua*), and doors that open onto a courtyard (*portali*), may be considered the architectonic *mostra* of the interpretation of the amphibious lagoon environment. The former are always vaulted and are still legible in the lateral arcades of the courtyards. The latter are generally trabeated: their function is to circumscribe and define a domestic space.

Important examples are the arcades in the Teatro Vecchio courtyard in San Cassiano and those in a courtyard between Calle del

Rimedio and Rio di Canonica, together with the courtyard in the late Byzantine Casa Soranzo. (Architecturally, the arcades of Casa Soranzo belong to a 9m long building – corresponding to 30 Roman feet – covered by a flat ceiling constructed transversally and resting on a slightly fretworked wall.) In all these cases the main portals of the enclosure are situated at either end of the *portego*,<sup>12</sup> never permitting direct access to the original site from the outside. The absence of other buildings on the canal front or, more frequently, the presence of a manifestly later building, which often does not coincide with the original plan, confirms that the foundations of the earlier wall structure ended at the arcades.

In the case of Chioggia, the moment of synthesis of its historico-environmental identity coincides with the confirmation of its urban design as expressed by its built forms:

the urban fabric is organized according to three different aggregative systems, corresponding to three different settlement locations. The building fabric is thus characterized by a process of *tabernization*<sup>13</sup> of the zone of specialized architecture between the main *piazza* and Canal Vena, with the buildings concentrated along the main route and the large courtyards used for trade set back along the canal. This very same process, however, becomes more open on the other side of the main *piazza*, allowing access to the inside of the built area, which later became congested through a process of *insulation* in the direction of one of the wide deep-water canals connecting the lagoon waterways to the Adriatic, thereby creating that system of longitudinal *calli* which is a distinctive feature of most of the urban fabric (Figure 4).

Lastly, there is the area beyond Canal Vena (Figure 5), the configuration of which is of considerable interest, since it represents a fundamental moment of synthesis between a clear urban design, linked to the production of salt, and a consolidated *modus aedificandi*. It thus allows us to verify *a posteriori* the mechanisms of formation and transformation of the city.

Every *calle* has a width that is one-half the depth of each of the blocks of houses on either side of it. The canal end is usually occupied by a Venetian type *palazzetto* with a *sala passante* at the centre, epitomizing the layout of all the later building fabric. This later fabric, formed by a process of insulation of the older courtyard houses along Canal Vena, is organized in mono-cellular pseudo-row houses, measuring approximately 4 by 4 metres, arranged around a central space, later occupied by a staircase, though still clearly legible. This is typical of the processes of insulation in areas where building space is scarce. Their box-like structure is load-bearing and, where possible, arcaded.

The hypothesis of a progressive specialization and articulation of the Roman *heredium*, which gives the western part of the city its more residential and commercial character, thus finds confirmation. This area has a more compact and stratified fabric, while the *Ultra Venam* island accommodates all the

activities concerning the extraction of salt. This diverse articulation may be noted in many other centres of the lagoon, though the most significant is again Malamocco, where the building fabric is better organized in one part of the island, while in the other there are scarcely any buildings at all, though the basic dimensions of the layout are the same as in the built-up part of the settlement.

The arcades deserve a separate analysis. They play a significant role in the building history of Chioggia and have a double function. Those along the eastern side of the main *piazza* (as with many other examples on the Terra-ferma) serve as covered passageways running parallel to the great void of the main *piazza*, while those beneath the patrician *palazzi* along Canal Vena would perform the same function were it not for the fact that the rigid repetition of parallel *calle-corti* interrupts them, thereby defining them as elements belonging to the *palazzi*. Finally, there are a large number of minor arcades serving the houses in all the *calli*. They are always south-facing (the north-facing houses are without arcades), and are situated at the points of intersection between the side streets, which never cut across the street-courtyards and the parallel *calle-corti*. They thus represent minimal nodes of connection on a building scale and, moreover, contribute to and emphasize the organization, or better the mechanisms, of the urban structure on all scales. In Venice, on the other hand, almost all that remains are traces of courtyard arcades, which bear no relation to the considerable urban and building significance of those in Chioggia.

In Chioggia, the formal simplicity and uniformity of the architecture denote another aspect of its urban identity: the widespread use of completely load-bearing structures, which means that the walls are extremely homogeneous and compact (unlike those used in Venice) and are usually plastered. The façade is always a load-bearing structure and is often arcaded. The presence of arcades is perhaps the most significant difference from Venice. Indeed, they belong rather to the consolidated Roman world of the mainland. Istrian stone is used sparingly, mainly in order to highlight the

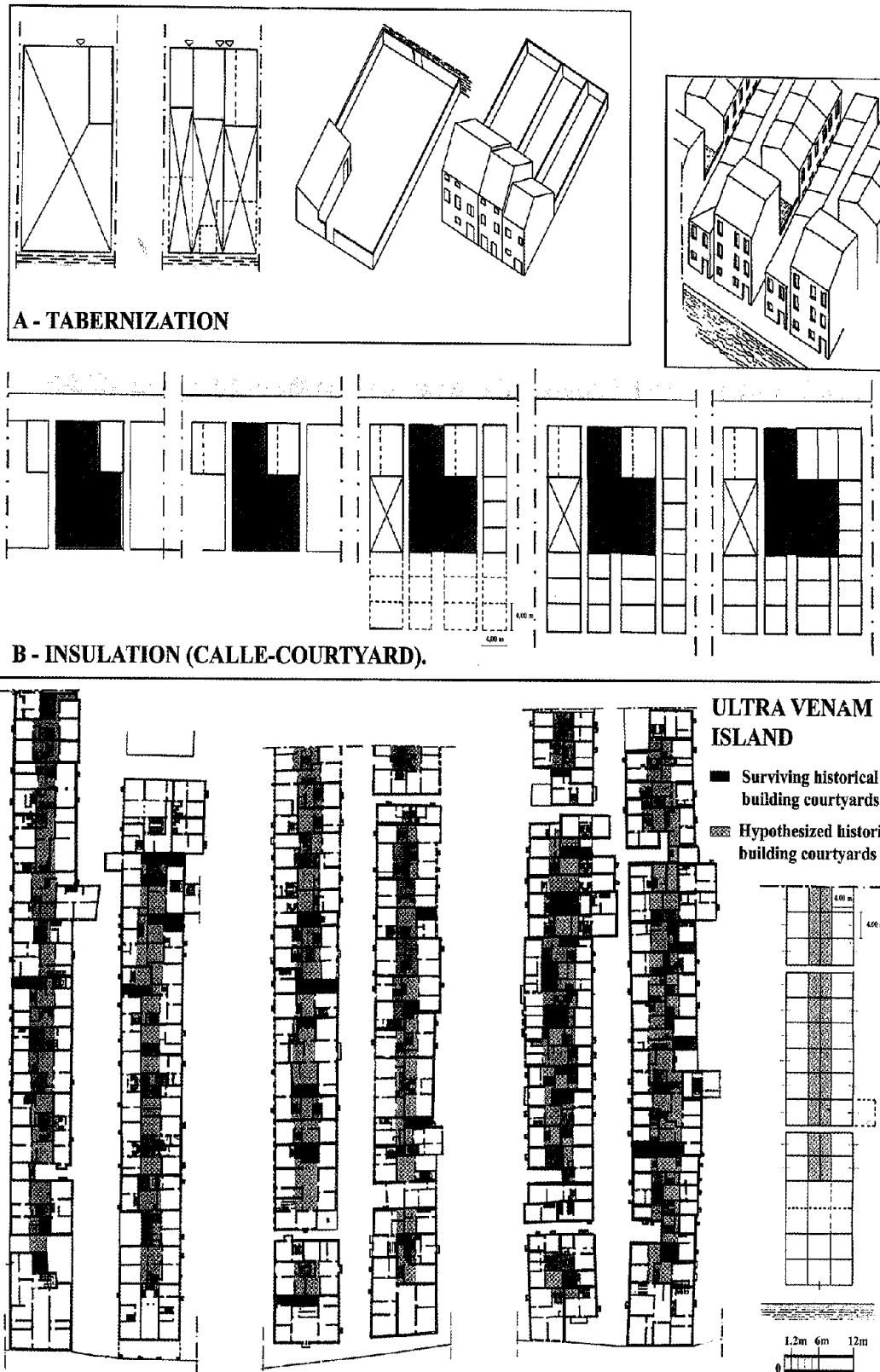


Figure 4. Formation of the urban fabric (*tabernization-insulation* processes) and the *Ultra Venam* building fabric.



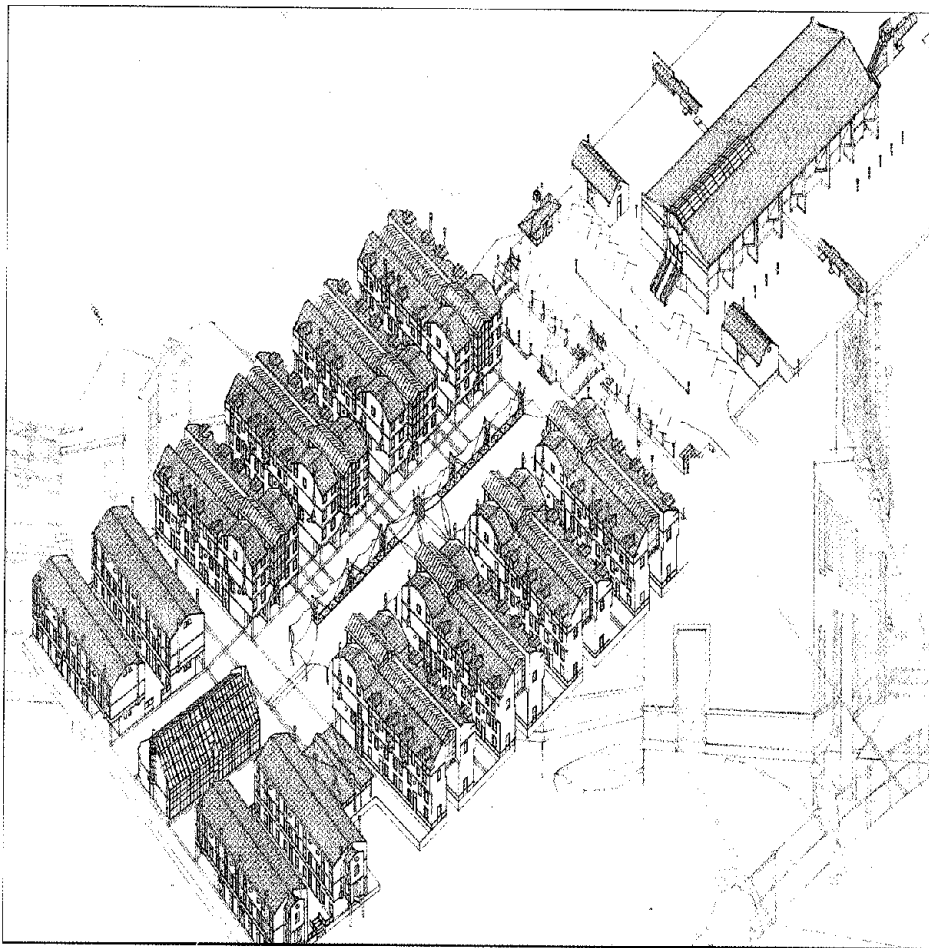
Figure 5. Canal Vena.

most salient features of the façades.

The examples of Palazzo Grassi, attributed to Longhena,<sup>14</sup> Palazzo Moroni Lisatti and Palazzo Ravagnan are especially interesting.<sup>15</sup> Their plans are pure Venetian, with a central *sala passante*, originally served by an external staircase in the rear courtyard and four large rooms, two on either side. What distinguishes them from their Venetian counterparts, however, is the deep arcade at the front and the mouldings in Istrian stone, used to underline the fact that the structural-distributive system of the façade is one of stratification, and is entirely load-bearing. While the cornices and mouldings (*mostra*) of contemporary Venetian *palazzi* are flat and light (the Venetian building tradition essentially considered a *mostra* as evidence of the architectural organism), those of the examples cited in Chioggia are plastic and heavy.

Palazzo Grassi in particular shows how the arrival of Renaissance culture in the lagoon was translated into the use of eminently classical façades, with pediments and decorative panels set into the walls, which, unlike the many Venetian examples of the same period (for instance, Palazzo Corner de la Ca' Grande and Palazzo Belloni-Battaglia), accentuate to the full the plasticity of the façade. They are, indeed, closer to the logic of Roman or Florentine façades than to contemporary examples in the lagoon. What makes this architectural style a distinctive feature of the urban identity of Chioggia, however, is the fact that it is to be found in all the patrician *palazzi* of the city, from the earlier examples to the eighteenth century, and in all the houses that go to make up its urban fabric.

This basic uniformity and simplicity of the formal connotations of the buildings are extremely significant, since they underline the



**Figure 6. The market place island. Note the long market place in the middle, the orthogonal *calle-corte* fabric, the new fish market (north) and the harbour office building (south).**

original settlement rationale of the urban design, which is the true cultural, historical and civic vehicle of its historico-environmental identity. All the typological and formal distinctions that we notice in the building fabric are but a consequence and optimization of the principal nodal points: linchpins in the complex, yet perfect, settlement machine.

#### **The project for the Isola dei Cantieri**

It is clear that any transformation in the building structure of Chioggia must take place within its specific urban design. Any other type of strategy would be a spanner in the works of its efficient urban machinery, merely leading to further social and economic degradation. The debate on the quality of

urban spaces and social degradation has far-reaching implications; indeed, the close connection between the socio-cultural evolution of a civilization and its building consciousness has been clearly demonstrated by cultural anthropology.

The aim of our project was therefore to create a specialized zone that would stimulate the socio-economic renewal of the south-eastern part of the city, which is today very degraded. The solution we proposed was a kind of 'market island', a building fabric around the arcaded *piazza* of the retail food market, closed off at the north and south ends by two specialized buildings. The market place, laid out along the main axis of the island, would have a tensile structure in the centre, over the fruit and vegetable market. Since our intention was to create a true market

place, we chose to enhance the spatial sense of an open *piazza*, and so we designed a lightweight, perforated structure that lets one glimpse both sides of the *piazza*, where the stalls selling meat, fish and other perishable foodstuffs that require permanent structures are located under the arcades. The arcades are not continuous, however, in order not to compete with the *piazza* (by offering an alternative route), which thus functions as a single building organism (Figure 6).

As we have seen, the courtyard plays a fundamental, conceptually unvarying, role in the lagoon environment, emerging from the specialized functions it has taken on in the course of history (private courtyard, closed building space and street-courtyard) and from the different building types that have defined and been defined by it (*palazzo*, pseudo-row house and row-house). So we felt that this historical-building constant could not be ignored, though it naturally had to be adapted to the aims of our project.

The urban fabric is thus a street-courtyard system. It is made up of building units (row houses and rows of apartment blocks) on an orthogonal grid in relation to the market square and arranged around a covered central courtyard that fulfils the specialized function, at the first two levels above ground, of a mooring place for boats, thereby stressing the essential bi-polarism of the city: canal – street. The building units abutting the courtyard are one-room-deep row-houses that give directly onto the *calle*, thereby maintaining the tri-cellular scheme of the block. At the third and fourth levels above ground, the central space fulfils the function of a covered courtyard serving the upper-floor building units (duplexes) that project slightly over the *calle* in order to denote their part in the aggregative system (Figure 7).

In accordance with the building history of Chioggia, the residential units are mono-cellular. In order to guarantee the necessary dimensional and functional flexibility, however, all the building types were designed with a bi-cellular façade (tri-cellular for the houses at the end of the street). By analyzing the mechanisms that have governed the transformations of the modern city of

Chioggia (from the sixteenth century onwards), we noted that they only ever concerned the building fabric running parallel to the *calli*, by reworking and widening the street façades, without ever cutting through the courtyards themselves (Figure 4).

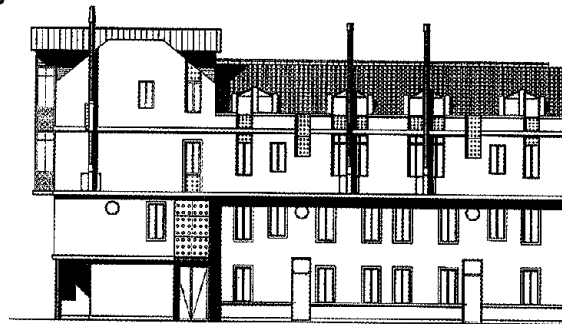
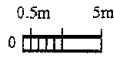
The end of the building complex terminates in an arcaded building with grocery shops on the ground floor, three upper floors and a penthouse apartment: two apartments, both on two levels. A crucial element in the design is a kind of *sala passante*, which not only recalls the Venetian building tradition, but here fulfils the function of indicating in elevation the spatial organization of the block.

The façades looking onto the *piazza*, like the office-block, are characterized by a steel structure with a projecting wooden sunscreen that recalls the shutters in eastern Mediterranean architecture, the history of which is intimately linked to the Venetian Lagoon. At the same time, because of its apparent permeability, it highlights the distinctive transparency of the lagoon environment as well as the building organization of most of the urban fabric (Figures 7-9).

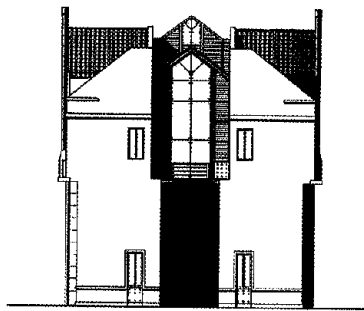
A system of open courtyards characterizes the southern building fabric, thereby mediating the passage to the more open area of the Archaeological Park of the *Squeri* (boat-houses), which the Comune di Chioggia intends to be the southernmost border of the Isola dei Cantieri. In our project, a double row of houses around each courtyard recalls the Venetian *calle-corti* complexes,<sup>16</sup> in that kind of 'in-between' dialectic which has always linked widely disparate human contexts in a common environmental history (Figure 1).<sup>17</sup>

The Piazza del Mercato (market place) and its related building fabric terminate to the north at the Nuovo Mercato del Pesce (new fish market) and to the south at the offices of the Capitaneria di Porto (harbour guard). The former is a two-storey structure: the lower level for unloading and storing fish, the upper for the large Sala Aste (sale room) that overlooks the market place. Like most of the specialized buildings in Chioggia, the new fish

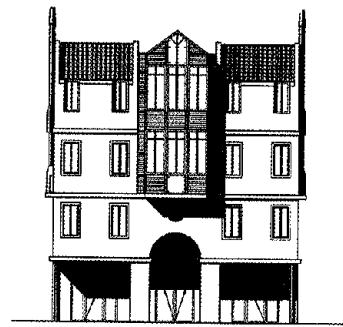
### Courtyard-house Elevations



*Calle-courtyard*

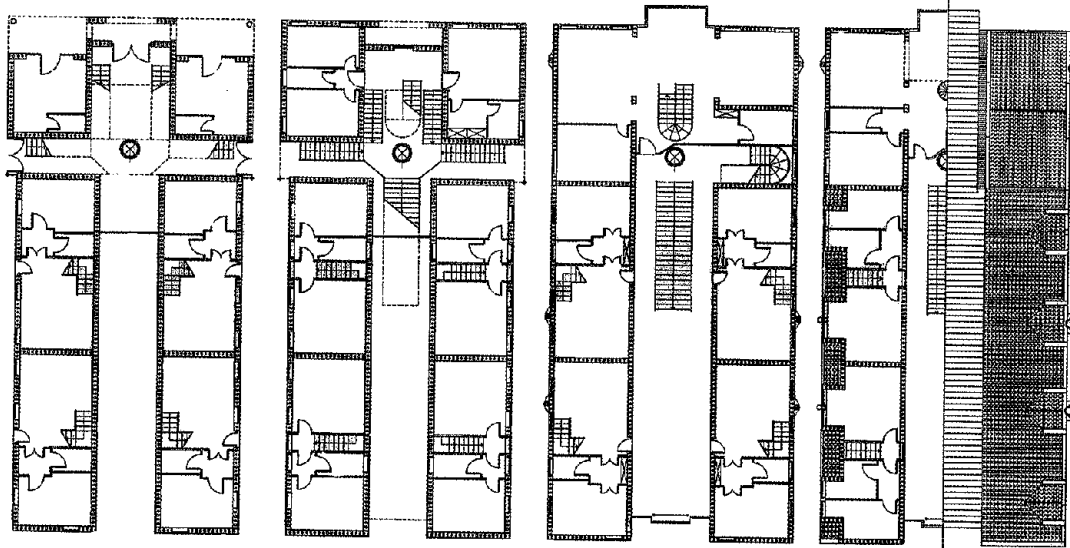


Canal



Piazza

### Courtyard-house Plans



Ground floor

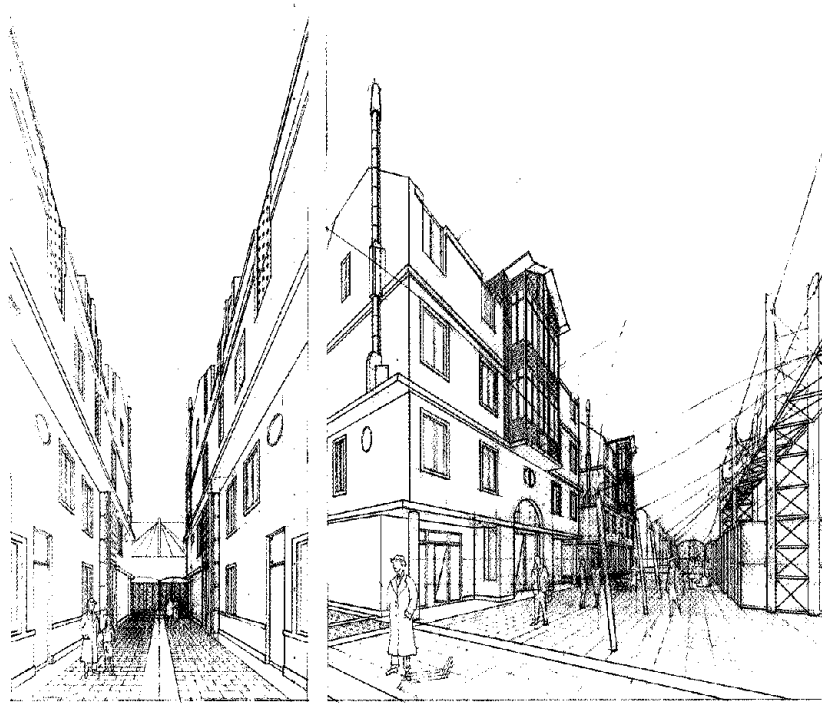
First floor

Second floor

Third floor

Roof

Figure 7. The courtyard house building organism.

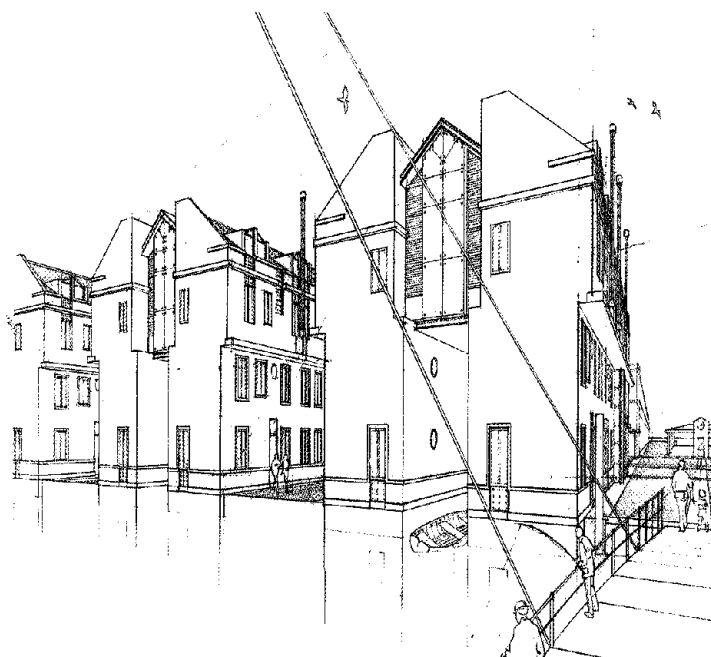


**Figure 8.** View from one of the *calli* (left) and from the market place (right).

market is in rough brickwork. The harbour offices, however, are mainly in wood, evoking the ship-building and port history of the Isola dei Cantieri. Technological advances in the use of wood are now such that it can once again play a crucial role in high quality architecture.

Together with building typologies able to satisfy diverse housing needs,<sup>18</sup> the durability of the architecture, the use of 'passive' systems of environmental control and the possibility of extending the built area if necessary were further requisites. Two-thirds of the apartments were planned to satisfy the needs of young couples with one or two children, another group was planned for the elderly, and another for families in a medium-to high-income bracket. In keeping with the Venetian housing tradition, all the apartments have their front door opening directly onto the street or courtyard. The autonomy of these main entrances, whether in buildings for single- or multi-family units, remained unchanged until the nineteenth century. The refined Venetian examples of Castelforte San Rocco, Calle dei Volti ai Gesuiti and especially the building complex Calle Larga

dei Volti ai Cereri all resolve the problem of access through the use of a spiral staircase (the famous *scala alla leonardesca*). They reveal the urban maturity and cultural continuity that have characterized the Venetian Lagoon *enclave* throughout its history. All the building organisms, moreover, can be extended up to four units towards the canal. The use of an alveolated brick system allows for an efficient climactic regulation as well as relatively easy construction techniques. At the same time, the presence of courtyards and waterways within the fabric favours the natural ventilation of the dwellings. The materials used – wood, brick and Istrian stone – are not only sustainable, but are part of the Venetian Lagoon building tradition, though they have naturally been given a contemporary interpretation. An important part of technological research today (the new High Tech) is the rehabilitation and reinterpretation of natural and traditional materials. Important research has been carried out on wood and brick, while recent studies are yielding interesting results on the use of stone in building techniques. Wood, in particular, was chosen for the sunscreen of the market place,



**Figure 9.** Canal view of one of the building units (*calle-corte*).

the sunscreen of the harbour offices and the moveable fruit and vegetable market stalls (the tensile structure is in steel). These choices reflect the desire to create an urban context that belongs both to the building history of Chioggia and to the shipbuilding traditions of the Isola.

The project for the Isola dei Cantieri thus aims to rebuild a part of the city that will be critically aware of its own past and, as a result, champion of its own modernity.

### Conclusion

The Venetian human landscape is witness to a building reality of considerable interest, not only from a historical perspective, but, above all, because of the complex historical and environmental synthesis between a natural environment of great value, which constitutes the empirical basis of its history, a deep-rooted Roman cultural matrix and the two main human interpretations that coexist in it and help define its identity.

From a methodological viewpoint, this is significant for two reasons. On the one hand, a typo-morphological approach allowed us to analyze the complex historico-cultural *enclave* of the Venetian human environment in all its unique historical and cultural aspects. On the

other hand, it helps demonstrate that the tools of urban morphology and building typology constitute a valuable basis for the urban design project.

To conclude, our project undoubtedly represents only a partial experience (as indeed do all experiences linked to a specific time and place), yet I believe that its importance lies in its attempt to give an adequate response to the complexities and contradictions of the twenty-first century city – a city that will inevitably have to be a planned city – in which a typomorphological interpretation of the human landscape and a conscious urban design project can play a fundamental role.

### Acknowledgement

The author is indebted to Lisa Adams for her translation of this article from the unpublished Italian original.

### Notes

1. See Löwit, K. (1949) *Da Hegel a Nietzsche* (Einaudi, Turin); Marx, K. and Engels, F. (1971) *Scritti sull'arte*, edited by Salinari, C. (Laterza, Bari).
2. See Muratori, S. (1967) *Civiltà e Territorio* (Centro Studi di Storia Urbanistica, Roma).

3. Publication was later sponsored by the Comune di Chioggia. See Maretto, M. (2000) 'Dall'identità storico-ambientale una metodologia di intervento per i centri storici: il progetto di riqualificazione architettonico-edilizia dell'Isola dei Cantieri', in Città di Chioggia (ed.) *Chioggia rivista di studi e ricerche*, 17 (Il Leggio, Chioggia).
4. See Concina, E. (1977) *Chioggia. Saggio di storia urbanistica dalla formazione al 1870* (Canova, Treviso); Maretto, M. (1999) 'The historic centre of Chioggia: a critical and working analysis', in Cataldi, G. and Maffei, G.L. (eds) *Transformation of urban form: from interpretations to methodologies in practice* (Alinea, Firenze); Maretto, M. (2002) 'Water landscapes and urban design: the Venetian lagoon landscape', in Petruccioli, A. (ed.) *Landscapes of water: history, innovation and sustainable design* (Uniongrafica Corcelli, Bari).
5. For the Late Antique period in general, see Riegl, A. (1959) *Arte tardoromana* (Einaudi, Torino); Bowesock, G.W., Brown, P. and Grabar, O. (1999) *Late antiquity: a guide to the postclassical world* (Harvard University Press, Harvard); Brown, P. (1993) *The making of late antiquity* (Harvard University Press, Harvard); Krautheimer, R. (1980) *Rome: profile of a city 312-1308* (Princeton University Press, Princeton).
6. See, for example, Hocquet, J.C. (1970) *Histoire et cartographie: les salines de Venise et Chioggia ou Moyen Age* Lettere ed Arti 28 (Istituto Veneto di Scienze, Venezia).
7. The term *strada* was already a typological concept, part of a neighbourhood fabric, and so it assumes a typical denomination according to place: the Venetian *calle*, the *carrugi* in Genoa, the *contrada* in Vicenza, the *borghi* in Parma and so on.
8. Cristoforo Sabbadino was *Proto alle Acque* of the Venetian Republic around the mid-sixteenth century. He worked on many surveys of the Venetian domains on the Adriatic and throughout the lagoon area. His plan of Chioggia (dated 1557) is the most important surviving representation of the town. It is the earliest survey of Chioggia, drawn as a true plan, but with the detail shown as an aerial view. It provides a unique illustration of the early-sixteenth-century town.
9. Buti, G.G. (1962) *La casa degli indoeuropei, tradizione e archeologia* (Uniedit, Firenze).
10. Caniggia, G. (1986) 'La città nei primi secoli', in Maretto, P. (ed.) *La casa Veneziana nella storia della città* (Marsilio, Venezia); Caniggia, G. (1976) *Strutture dello spazio antropico* (Alinea, Firenze). On the origins of Venice, see also Bellavitis, G. and Romanelli, G.D. (1985) *Venezia* (Laterza, Roma); Bettini, S. (1978) *Venezia, nascita di una città* (Electa, Milano).
11. See the Latin *limes* (border, limit, but also road, path, way) and *limen* (threshold, house).
12. The Venetian word *portego* indicates both the arcade of the original courtyard-house and the famous 'through hall' of the patrician *palazzo*. It characterizes the whole Venetian building tradition.
13. *Tabernization* and *insulation* are the two main processes of progressive infill of a courtyard-house fabric. The former may be noted in correspondence with the street façade and generates commercial areas. It decreases the available open space of the courtyard-house and gives rise to a new two-storey building type. The latter is characterized by a mono-cellular building type constructed within the courtyard. It enables an intensive utilization of space. See Caniggia, G. and Maffei, G.L. (1979) *Lettura dell'edilizia di base* (Marsilio, Venezia).
14. Baldassare Longhena (1598-1682), a pupil of Vincenzo Scamozzi, was perhaps the most important Venetian architect of the seventeenth century. In 1631 he designed the Chiesa della Salute, around 1640 the façade of Santa Giustina, and in 1660 the famous Chiesa degli Scalzi. The importance of his work, for the purposes of our study, lies however in his grandiose projects of Ca' Rezzonico and Ca' Pesaro, which may be considered the most consummate and mature expression of the Venetian patrician dwelling in the history of the city.
15. The Grassi family later moved to Venice, to the homonymous *palazzo* on the Canal Grande.
16. Between the fourteenth and eighteenth centuries, the Venetian Republic built beautiful courtyard building complexes, such as Borgoloco San Lorenzo, the Marinarezza, Corte dei Volti ai Gesuiti and the important Calle Larga dei Volti ai Cereri, in which the whole Venetian typological and urban experience finds one of its most mature expressions.
17. See Lévi-Strauss, C. (1968) *Antropologia Strutturale* (Il Saggiatore, Milano).
18. For a typo-morphological approach to the building history of Venice see Maretto, P. (1986) *La casa Veneziana nella storia della città* (Marsilio, Venezia).