



PERUGIA IN PARTICULAR

The architectural survey of simple elements in the historic city

Dissertation

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Introduction

Following the habit of borrowing existing titles changing their meaning according to the specific goals, the title of the present research project openly claims the reference to the cataloguing work dedicated to the Umbrian city of Foligno, whose title is *Foligno in particolare*¹, which has marked in a decisive way the rebuilding of that city after the earthquake in 1997, year of its publication.

Even if different in the premises, methods and purposes (necessarily connected to the developments happened in the scientific debate throughout the successive twenty years²), the assonance of the title intends to make the heritage of the efforts made since then explicit, increasing the margins and the points of reflection about a subject that is very current and urgent even now, also in function of the last seismic events which struck Central Italy³.

Going into the object in question, the present thesis intends to offer an analytic and systematic approach dedicated to the historic centre of Perugia, interpreted as a complex architectural organism, composed by the aggregation filtered through the composition of elementary parts. The ideological premise resides in the possibility of providing documentary evidence to the identity of a man-made homogeneous territorial context, starting from its anatomical decomposition into simple typological components and from the relative analysis, in an attempt to determine the rule that they assume in the definition of the urban scene figurative character. Although semantically the term *center* refers to a concept of static nature concerning the historic city, its continuous and necessary mutation is likewise undeniable (as much for the effect of physiological evolutions, as for the effect of natural calamities or war events).

From building regulation point of view, the protection of the historic center and of its uniform character, mostly passes through the maintenance of the volumes, while, microscopically, at the level of finishes, there is a continuous mutation and substitution of the elements (simplified by the current instruments of planning⁴), changing the visual perception of the city, often without a critical interpretation of the objects scale of values⁵.

It's from this point of view that, instead of concentrating on emergences, the research inspects tendentially the common simple elements, belonging to the ordinary architecture, whose "monumental" character doesn't derive from being extraordinary presences⁶, but rather from being repeated elements⁷. Trying to define if the complexity of the city, taken in its totality, hides recurring solutions, responding to a "typical" structure (or if, on the contrary, it refers to a list of heterogeneous elements, without any connection), the totality (composed, evoking Francesco Milizia's words, of "a great order in the details" and of "confusion, uproar and tumult in the totality"⁸), is inspected to the scale of fragment, through its elementary parts, noticing similarities and connections.

In this regard, the research acquires the typical method of natural sciences which organize the analysed entities with respect to the similarity of general features, to obtain the building of a framework based on a rigid classificatory taxonomy. The movement of the method to the architecture makes possible a classification based on formal parameters that recognizes a structure which is in common to more objects belonging to the same group.

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In this respect, the use of the architectural survey and of the drawing becomes something necessary, having the goal of obtaining an homogeneous graphic restitution, which makes possible the comparison among the analysed elements, otherwise extremely complex considering the historic building in his totality. The use of homogeneous graphic conventions for the representation of any single element permits the anatomic-comparative analysis which, noticing affinities and differences, underlines the recurring aspects and the individual peculiarities.

The historic city is dissected in systematic groups of five simple elements (entrances, windows, wall textures, external floorings and manholes), reciprocally compared through the analysis of two specific features (compositional and material).

From a strategic point of view, the historic centre of Perugia is analysed according to its traditional spatial articulation in five districts. 100 elements are catalogued for each category, equally arranged in a number of 20 for each district.

The first phase consists in the localization of the element, followed by the photographic documentation (dedicated to all the analysed elements) proceeding then in the detail of the architectural evaluation activity (dedicated to a total of 25 elements, divided into 5 for each district). The information, made homogeneous and systematic thanks to a coherent graphic representation, are developed from a statistical point of view, having the objective of considering the connections among the analysed categories.

It's not the first time that the study on the city of Perugia passes through its simple elements (this happened in the past through photographic and bibliographical investigations⁹), but it's the first time that this happens with the objective of obtaining a systematic interpretation,

integrating the architectural evaluation and the project to statistical methods. However the used instruments are not indifferent at all and, strictly tied to the specific purposes, influence thoughts and reflections. As the environment of mathematical sciences demonstrates in a sharp way through the passage from the Arabic notation to the Latin one of numbers (that is from the individuation of the number through the fulfillment of the calculation, to the individuation of the number through its position): without the overcoming of the first representation complexity, for example, it would have been difficult to formulate the successive observations on prime numbers¹⁰. Even recognizing the limits and the not completeness of the research (many are the aspects to investigate yet, among them, the investigation of further elements categories), the main objective is to offer an united equipment apt to permit an interpretative exam of the city genetic structure, considering this knowledge something necessary for its processes of mutation. It's appropriate to underline, indeed, how the aim of the analysis is not focused on freezing the reality through an inexorable repetition, but rather on recognising in the analytical interpretation of the city the fundamental requirement for any aware intervention applied to it. In the attempt of offering a contribution to the diffusion of the knowledge culture, the research concludes in an open way laying the foundations for possible future developments. The thesis is organized in two main sections, *analysis* and *synthesis*. In the first part, after the definition of the strategy adopted (close to the morphological form of Perugia city) the thesis proceeds to the definition of the method adopted (that is the logical steps of fotografic documentation, architectural survey, graphical restitution and cataloguing activity). The *synthesis* phase concerns the recomposition of the city's genetic code, identifying the most recurrent and widespread features in the analyzed context and contributing to defining its figurative character. The appendix contains the *graphics*, the *tendentious glossary*, the *mentioned sources* and the *bibliography*. With the aim to offer a contribute to the diffusion of the knowledge culture, the research ends in a open way, laying the groundwork for potential development.

notes

¹ See RADI, RADI 1997.

² Giving a sense to the temporal range, the present project represents the third steps of a series of publications that, with an interval of ten years, mark the evolution of the technical and scientific debate that, in the Umbria context, regards the actions on the historical environment. Starting from *Foligno in particolare. Elementi tipologici dell'edificazione storica* (1997), to the "Catalogue of recurring types and elements in the traditional building" (Art. 2 of the Attached «A» to the deed of address approved with DGR. n. 420 of 19 March 2007) (2007), arriving to the present thesis *Perugia in particolare. Analisi degli elementi ricorrenti nella città storica* (2017).

³ The reference is to the Center Italy earthquake of 2016.

⁴ In particular the reference is to the art. 31 del titolo IV (*Norme generali per il recupero del patrimonio edilizio e urbanistico esistente*) of the Law 457 of 5/8/1978, Rules for residential construction (included, with some modifications, on art. 3 of DPR 380/2001, *Testo unico delle disposizioni legislative e regolamentari in materia di edilizia*).

⁵ In this regard: see CULLEN 1960, see LYNCH 2006, see BALZANI, BINI 1989, pp. 15-25.

⁶ "Il monumento ha bisogno tuttavia di una sua dimensione particolare, che come tale è eccezionale; o nella soluzione singola - spesso coincidente con la «prima»: la prima cattedrale gotica, la prima cupola rinascimentale ecc. - o nella ripetizione di una soluzione «tipica» nella sua stabilizzazione tipologica - le torri medievali, le case mercantili, i grattacieli commerciali ecc.". ("However, the monument needs its own particular dimension, which as such is exceptional; or in the single solution - often coinciding with the «first»: the first Gothic cathedral, the first Renaissance dome etc. - or in the repetition of a «typical» solution in its typological stabilization - medieval towers, mercantile houses, commercial skyscrapers etc."). See AYMONINO 2000, p. 21.

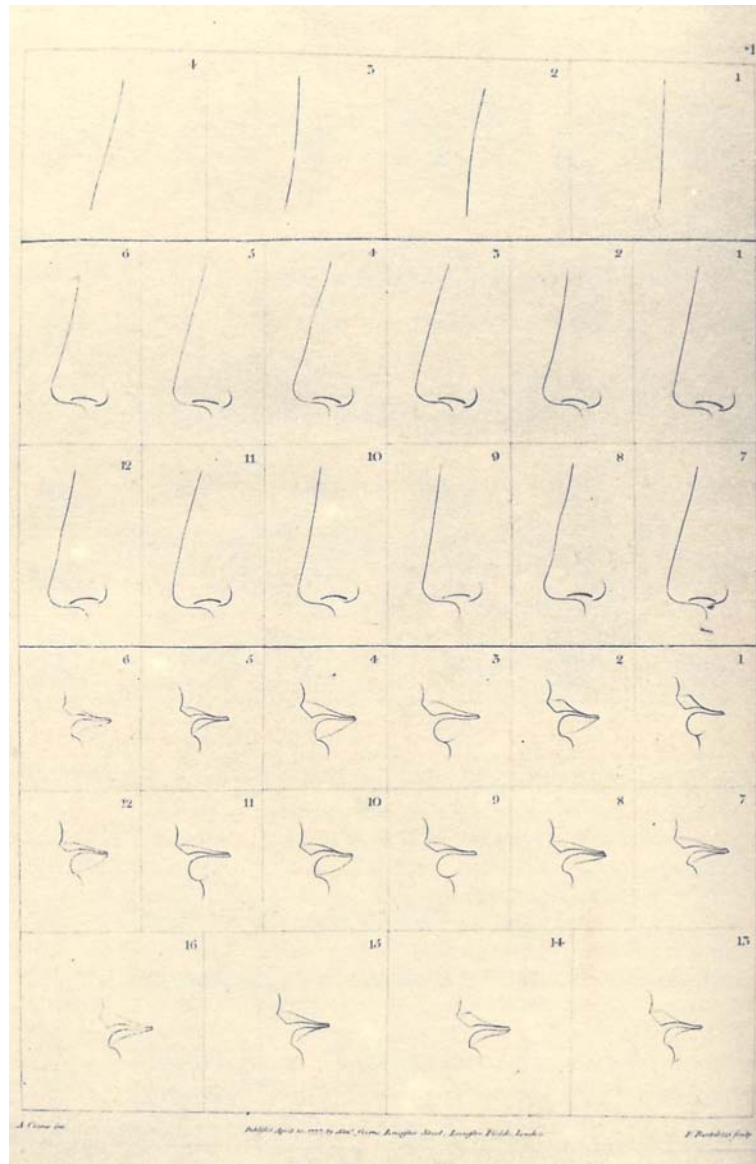
⁷ "I am for richness of meaning rather than clarity of meaning; for the implicit function as well as the explicit function. I prefer «both-and» to «either-or»: black and white, and sometimes gray, to black or white. A valid architecture evokes many levels of meaning and combinations of focus: its space and its elements become readable and workable in several ways at once. But an architecture of complexity and contradiction has a special

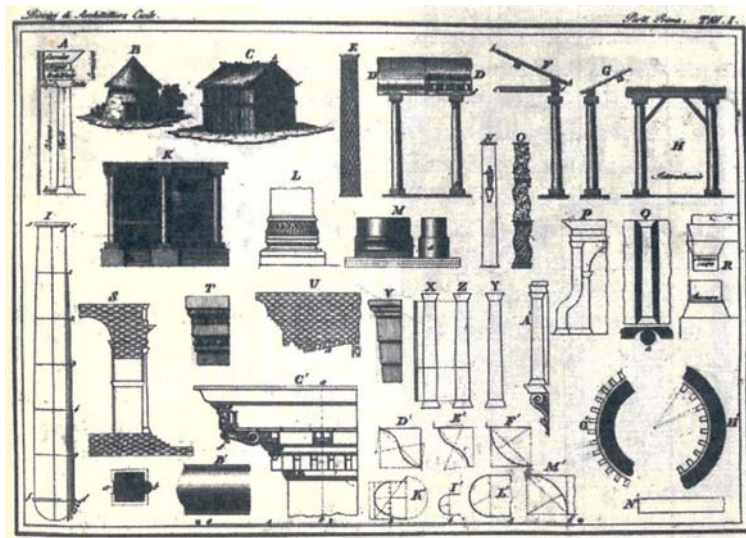
obligation toward the whole: its truth must be in its totality or its implications of totality. It must embody the difficult unity of inclusion rather than the easy unity of exclusion. More is not less". See VENTURI 2005, p. 16.

⁸ "Ne fa prova particolarmente l'Olanda: Chi ha veduta una delle sue Città le ha viste tutte, e chi ha vista una sola strada ha veduta la Città intera. Ogni strada vi è tirata a cordone con canali in mezzo, e con alberi alle ripe: tutto è di sì fredda esattezza, che si fa desiderare il disordine delle nostre Città, dove manca la più necessaria direzione. Vi si vede da pertutto una noiosa ripetizione degli stessi oggetti, che non differiscono, che numericamente, e tutti i quartieri si rassomiglian tanto, che non si distinguono, e vi si perde. Convien evitare l'eccesso di regolarità, e di Euritmia: Chi non sa variare i nostri piaceri, non ci darà mai piacere. Vuol esser in somma un quadro variato da infiniti accidenti; un grand'ordine ne' dettagli; confusione, fracasso, e tumulto nell'insieme. La pianta della Città va distribuita in maniera, che la magnificenza del totale sia suddivisa in una infinità di bellezze particolari, tutte sì differenti, che non sui riscontrino giammai gli stessi oggetti, e che percorrendola da un capo all'altro si trovi in ciascun quartiere qualche cosa di nuovo, di singolare, di sorprendente. Deve regnarvi l'ordine, ma fra una specie di confusione; tutto deve esser dritto, e regolato, ma senza monotonia; e da una moltitudine di parti regolari deve risultare nel tutto una certa idea di irregolarità, e di Caos, che tanto conviene alle Città grandi. Bisogna perciò possedere eminentemente l'arte delle combinazioni, ed aver del fuoco, e dell'ingegno per coglier vivamente le più giuste, e le più felici". ("The Netherlands is the perfect case in point: anyone who has seen one of his cities has seen them all, and those who have only seen one street have seen the whole city. Every road has been laid down straight with channels running down the middle, and trees lining the channel edges: such a perfect, clean arrangement makes us long for the familiar chaos in our cities, where the most necessary direction is lacking. All around you, identical items emerge in fastidious repetition, differing only in their number; in fact, all neighbourhoods resemble each other so much that losing your way becomes a commonplace experience. It is highly advisable to forego such organisational excesses, avoid thus the Eurythmy: we should seek a diverse pleasure palette, or risk losing the taste for pleasure as we drown in boredom. Our picture should be one dotted with endless, profuse details in apparent disarray; confusion, noise, and tumult as a whole. The city layout should be so arranged that its entire splendour is distilled into an infinity of individual beauties, each one of them so unique that coming across twin items would be an oddity, and that, as we traverse the city, each neighbourhood conveys a singular, surprising atmosphere. Order must reign, but amid a confusion of sorts; everything shall be straight and regulated, albeit without monotony; and this multitude of regular parts must yield a certain idea of irregularity and chaos, which truly befits great cities. It is therefore necessary to develop a certain combinatorial dexterity, with the energy and ingenuity to select the most befitting and fortunate arrangements and items"). See MILIZIA 1785, pp. 45-46.

⁹ In this regard: see PIZURRA, TRABALZA 1993, see MOSCONI 1994, see BARTOLI 2004, see ALBERATI 2012.

¹⁰ "Basta prendere un numero primo a tre cifre, anziché due, ad esempio novecentonovantasette, e confrontare le due grafie, 997 e DCCCCLXVII, per rendersi conto di quanto dovesse risultare assolutamente impraticabile ai Latini il concetto di scomposizione fattoriale che consente di *identificare* il novecentonovantasette come numero primo: senza notazione posizionale, era assolutamente impensabile che Fermat potesse formulare le sue osservazioni sui numeri primi". ("Just take a three figures number, instead of a double figures one, for example nine hundred ninety-seven, and compare the two handwritings, 997 and DCCCCLXVII, to understand how difficult it was for Latins the concept of factorial decomposition that makes possible to identify the nine hundred ninety-seven as a prime number: without the positional notation, it was unthinkable that Fermat could formulate his observations about prime numbers"). See RAMBALDI 1979, pp. 1140-1141.





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State of the art. **That is, “get thoughts in order”**

The development of the subject in question underlines on one side, a strong anchorage to questions well-established in the architectural debate of the past, on another an affinity with the most significant subjects in the contemporary debate. Locating the two addressed fundamental themes in the attention to the reinforced urban centres and in the analysis of the apparently “minor” elements which insist on them (the whole thing through the use of the architectural survey and the design, as instruments of analysis and communication), it’s appropriate to introduce two important references which characterize the international stage, just apparently distant. Notably, the goals defined by the Strategy “Europe 2020” in the field of climatic changes and energy sustainability and the *14. International Exhibition of Architecture of Venice*.

In particular, in the definition of environmental and energetic objectives 2020-2050¹, the European Union reiterates and points out the necessity to intervene on the existing, taken as a resource which taking care of (since finished and destined to run out, like the other environmental resources), discouraging the realization of ex novo works and promoting, instead, interventions of retraining of the built².

The virtuous management of the complexity of the whole makes necessary its interpretation, in order to orient aware interventions. Think for example about how much, in the last years, the research of the environmental sustainability is reduced to precise solutions and repeated in vague manner, risking the local dimension in favour of aesthetic validation³.

In this regard, it’s appropriate to remember that, as early as the late eighties, introducing

the volume *Elementi di arredo urbano. Introduzione alla lettura e ai rilievi dei centri storici*⁴, Roberto Maestro mentioned Jaques Tati's movie *Playtime*, with particular reference to the fact that, in the promotion of travels around disparate cities of the world, an agency used posters on which "the same horrible skyscraper stood out, as worrying symbol of this horrible run to the unification and conformism of the urban image"⁵.

The resolute aesthetic judgement, summarized by the adjective "horrible", assumes a character of objectivity if the sense of "beautiful" is entrusted to the one of "adequate", that is of careful and respectful answers of the specific situations.

In line with what has been said is the intent which bases the *14. International Exhibition of Architecture of Venice*, during which the curator, Rem Koolhaas, calls attention to the *Fundamentals*: 15 elements (pavements, walls, ceilings, roofs, doors, windows, facades, balconies, corridors, chimneys, bathrooms, stairways, escalators, elevators and ramps) interpreted as imperceptible manners to express the territorial identity, in opposition to the homogenization of the languages and to the abandonment of own identities⁶.

A collection of architectural foundations, proposed following an historic-encyclopaedic approach: a contemporary essay of architecture, composed by 15 booklets, each one dedicated to a specific element communicated choosing a charming graphic.

Handbook tradition and territorial identity

Proceeding backwards the recent experience finds a first reference in the manuals of the late nineteenth century (born from the distribution of *Encyclopedia*⁷) when, starting from the national unification, the perception of crisis of the own local identity spreads.

In order to safeguard the "dialectal" cultures, in Italy the Regia di Storia Patria is founded, which, located in amusing parts of the peninsula, has the role of reconstructing the documentary history of the most significant monuments⁸.

In this context the architecture develops according to "regional" parameters, supported by manuals which register a local production, representing a fundamental reference to establish the most representative style of the image to spread (no wonder, just for the value assumed in the definition of the urban image, a particularly common genre concerns the collection of facade elements and the relative compositional rules⁹). Inside the technical manuals architectural journalism which is spreading throughout these years, it's possible to identify two main lines of editorial production: the essay, mainly destined to academic uses, in which the subject of construction is addressed, decomposing the building into its architectural parts¹⁰, and the manual, connoted by a more marked didactic character.

In this last case, it's important to point out the historical importance assumed by the pocket manuals born from Swiss editor Ulrico Hoepli's idea.

The technical-editorial formulation of the pocket manual, constitutes an extended and organic Encyclopedia, composed of single volumes, divided into four series (the scientific, historical, literary, juridical and linguistic series; the practical series; the artistic series; the special series) and entrusted to renowned specialists.

With reference to the dissertation of the subject about style and ornamentation, it's important

to remember the volumes edited by Camillo Boito and published in 1882: *I principi del disegno e gli stili dell'ornamento* (which, following an epistolary model in the form of letters addressed to his friend Giovanni, assumes an important methodological relevance¹¹) and *Ornamenti di tutti gli stili classificati in ordine storico ...ad uso degli artisti, delle scuole di disegno e degli istituti tecnici* (which retraces the development of the ornamentation over the centuries, illustrating the elements of the history that are considered virtuous, through 303 carved tables and about 1000 drawings¹²).

The choice of diversifying the contents according to the specific interests and the strategic choice on a typographic side (connected in a particular way to the cover, with dedicated drawings and colours, able to summarize and communicate the content of the text in an efficient way), moves also the most shy public closer to the reading (such a success and popularity, indeed, to influence the tailors to sew the external pockets of the jackets with a size of 11 x 16 cm, in order to contain a Manual¹³).

The attention to the stylistic aspects in the architectural practise, permeates the planning culture too between the two wars. Just consider Daniele Donghi's *Manuale dell'Architetto* which, born from the previous German *Baukandedes Architekten*¹⁴ (as explicitly claimed by the author in the preface to the work¹⁵), differentiates from the last one just for the artistic slant in combination with the more like technical component¹⁶.

Protection and recovery of historical centres

After the mid-nineties, as a result of the expansive phase crisis of the second post-war period, the European architectural debate focuses on the aspect concerning the safeguard of the cities. In this context, the concept of historic centre and the culture of restoration that comes from it, represent the object of many comparison occasions brought to the attention of the scientific community¹⁷.

It's appropriate to underline as in Italy, Umbria plays a pioneering role in this sense, in part attributable to the peculiar settlement that, characterized by an historical heritage distributed in about one thousand historic centres exposed to seismic risk, made and is still making necessary the elaboration of precise choices of overall development of the regional territory that cannot succeed without a parallel theoretical and conceptual development¹⁸.

From this point of view, the National Convention for the Safeguard and Redevelopment of Historic Centres assumes a specific value, organized by the National Association Historic-Artistic Centres (ANCSA) in Gubbio in 1960¹⁹, in which the concept of *historic centre* (for the first time used in a strictly technical-disciplinary sense by Giovanni Astengo in 1957, inside the report of Assisi plan, declining it from the one of "artistic historic centre" introduced in the second post-war period²⁰) moves from the identification with the monument or with the individual good, to the evaluation of the urban system existing in its complexity. From this perspective, the safeguard and the management of the historical heritage require interventions addressed not only to the excellences but also to an overall view of the territory²¹.

This concept, ratified at European level by the Amsterdam Declaration in 1975, transmits a series of experiences at international level aimed at the diffusion of a common conscience of

the European heritage for which a strategy of shared management starts to delineate²².

From the birth of the International Council On Monuments and Site (ICOMOS) in 1965, to the adoption of the *Charter for the preservation of historical cities and urban areas*. This last, drafted in Washington in 1987, proposes the active preservation of the historical cities, considering fundamental the coherent evolution and “the harmonious adjustment to contemporary life”²³ (thanks in part to the participation of citizens in the protection processes), dedicating particular attention to the safeguard of the aspects and qualities considered as expressions of identity characters, both in terms of material elements and immaterial²⁴.

The concept of restoration is indeed complex and includes many ranges of intervention, from the most elusive one relative to the rebuilding of the consolidated settlements sense, to the most concrete one relative to the building detail.

Since the 1980's the first restoration manuals start to take place in Italy. Born from the meeting between the University of Rome and the municipality of Rome, they are perceived as an instrument that constitutes in the same time as inventory (where they can be identified as catalogues of goods to safeguard, differentiated for territorial environments), systematic (where they recreate the scientific principles and the adopted technological procedures) and applicable (where they offer a technical knowledge to employ in the architectural practise)²⁵.

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This line of work spreads rapidly, unto building today one of the perhaps most significant modalities of the contemporary approach to the consolidated city. In many municipalities²⁶ and in some regions²⁷, the manual assumes the value of a knowledge and regulatory project offering a technical line able to transmit the deep sense of the contexts, through a cultural rereading, turned both to technicians and to citizens²⁸. The proposed form, indeed, is that of illustrated dictionaries, with grammar, syntax and lexicon useful to decode the different local architectural languages, through direct observation and comparison.

The attention for the urban questions and for the problems connected to the safeguard and to the exploitation of the historical fabrics has produced interesting results also in the field of the representation disciplines, in order to describe and communicate the urban fact interpreting the dynamic conception and the relation with the framework. In this sense, the support of computer tools has become increasingly important, thanks to which the acquired data can be compared with further aspects identified as significant, differently structured and scalable (iconographic sources, archive ones, technical documents etc.), assuming the value of technical and operative support to the city interventions.

The contemporary of the Umbrian case

From a normative point of view, the definition of the intervention typologies on the existing heritage, has as fundamental reference the Article 31 of Title IV (General Rules for the restoration of the existing building and urban heritage) of the Law 457/1978, *Rules for the residential construction*²⁹). In addition to the new building interventions, the restoration works are grouped in five typological categories, organized according to a progression which goes

from the episodic and simple interventions, to the systematic and the most complex ones. The categories are the ordinary maintenance, the extraordinary maintenance, the restoration and the conservation renovation, the building renovation and the urban renovation.

In this sense, the Regions, in the context of their legislative competences, have issued rules on the building restoration. In the particular case of the Umbria Region, in the '80s the preservation measure of the historical heritage is extended also through pilot studies on the street furniture, putting in place actions coordinated with the local authorities, to whom the management of interventions is connected. In this experimental context, the studies for the paving, for the colour, for the commercial and tourist signage assumed a particular significance, for the incisiveness that determine in the definition of the overall image of the historical centre³⁰. The design assumptions have been considered as useful input to the construction of a general legislation that kept distinct the elements which are of direct public policy remit (external paving and furniture connected to the use of public spaces) and those that contribute to the correct definition of the mainly private intervention on the building structures (colour, signs, architectural elements)³¹.

After the earthquake of 1997, a catalogue of the historical centres in Umbria is elaborated, through the drafting of cards dedicated to the understanding of the territory, which summarize and systematise the computer documentation owned by the National Seismic Service (census data, population density, environmental restrictions) and of other ones coming from the Risk Card of the Central Institute for the Restoration³².

The cards (which contain essential data concerning the history and the seismic events of the territory, the social-anthropological, functional and morphological characteristics of the settlement) illustrate a representative majority of seventy historical centres located in twenty municipalities of the Umbrian territory, selected considering the perceived intensity following the earthquake and the presence of the architectural-historical heritage, preferring the aerial images of the cities immediately after the earthquake.

At the same time the historical centre of Foligno was examined through an enforcement sweep designed to the decisive graphic documentation, through the architectural survey, of the typological elements of the city based on material parameters (stone, brick, sheet metal, iron, wooden works)³³. Aware of this heritage and with the goal of providing a systematic instrument of building knowledge by which define and apply correctly an exhausting and detailed discipline of the interventions relative to the minor building (that is composed of the aggregation of recurring building unities predominantly under residential use), in 2007 the Umbria Region, in the "Official Gazette, Discipline of restoration works of the existing building heritage", has introduced the "Catalogue of recurring types and elements in the traditional building" (structural, architectural and decorative components)³⁴.

The intent is that of realizing a typological fields systematic representation of the structural, architectural and decorative components, which, according to the direct knowledge and the existing documentation, prove to be mainly recurring in the ordinary building of historical origin or of traditional type, present in the regional territory. The premise is based on the consideration by which the existing building heritage comes from the various combinations

of a full but not infinite range of recurring species that, once identified and indexed, make possible to obtain an instrument which allows the description of the building in its details. It's in this phase of the evolution of the cultural process that inserts the research *Perugia in particular*, with the aim of offering a collection of exemplifying cases analysed and put in mutual relationship, in the knowledge and in the critical preservation of the current urban context, that starting from the anatomical analysis of the existing building, answers to its critical and integrated reading.

notes

¹ The goals are outlined inside the Work Program of the Horizon 2020 programs. “The call on Energy Efficiency will give a strong boost in research and innovation investments to remove current technological and market uptake obstacles, by addressing the most pertinent technology-related issues across the energy value chain and non-technology issues. Particular attention will be given to the building area offering the biggest potential for improvement and to improving access to finance”. Horizon 2020, Work Programme 2016-2017, *Table of Contents and General Introduction*, http://ec.europa.eu/research/participants/data/ref/h2020/wp/2016_2017/main/h2020-wp1617-intro_en.pdf [last access: 7 September 2017].

² Thinking of the Umbrian case, in the context of the “Burden Sharing” defined by the Ministerial order March 15th 2012, the Region was called to obtain by 2020 a percent value of 13.7% in the comparison between the consumption of renewable energy sources and gross final energy consumptions. This task inserts into a context of common efforts proposed by the 2010/31/UE Legislation to the Member States, aimed at decreasing the energy consumption produced by the building sector through the construction of near-zero energy buildings but also and above all requalifying the existing buildings.

³ In this regard it's appropriate to point out two recent researches realized in the Umbria Region. The research project *Sostenibile ma bello. Utilizzo di soluzioni innovative nella riqualificazione energetica e ambientale nei contesti di pregio architettonico*, conducted in the 2010 inside the Structural and Environmental Engineering Department of the Università degli Studi di Perugia and whose final results are collected in the volume *Sostenibilità e è bellezza* (see BELARDI, BIANCONI 2012), and the research project of the Umbria Region: *MARIE “Mediterranean Building Rethinking for Energy Efficiency Improvement”*, realized within the Programme Med 2007-2013, whose results are collected in the volume *Catalogue of best practices on improving buildings efficiency* (Del Gallo Editori, Spoleto 2013. See FRATE 2015, pp. 150-159.

⁴ See BALZANI, BINI 1989, p. 9.

⁵ Ibidem.

⁶ “The fact that these elements change independently of each other, according to different cycles and economies,

and for different reasons, turns each building into a complex collage of the archaic and the current, the site-specific and the standard, mechanical smoothness and the spontaneous. Only by looking at the elements under a wide lens can we recognize the cultural preferences, forgotten symbolism, technological advances, mutations triggered by intensifying global exchange, climatic adaptations, political calculations, regulatory requirements, new digital regimes, and, somewhere in the mix - the ideas of the architect that constitute the practice of architecture today". See KOOLHAAS 2014.

⁷ Denis Diderot, Jean Baptiste D'Alembert, *Encyclopédie, ou Dictionnaire raisonné des Sciences, des Arts et des Métiers, recueilli des meilleurs auteurs...*, 17 voll., Briasson, David, Le Breton, Durand, Paris 1751-1772. Before assuming the consistency and the known results, the *Encyclopédie* was born as a translation of the previous *Cyclopaedia or an universal dictionary of arts and sciences*.

⁸ In the Umbria Region, for example, there is a gradual stylistic homogenisation to the medieval models, assumed as reference archetypes. In the specific case of the Perugia, elected as capital of the Umbria Region as a result of the national unification, the autonomous identity of the city is identified with municipal age. To analyse the situation in Umbria see BELARDI, BORI 2013, BELARDI, MENCHETELLI 2011, MENCHETELLI 2012, BELARDI 2016.

⁹ With specific attention to the situation in Umbria, a particular theme is the one relative to the leaning against facades interpreted as "repair" works, both structural and stylistic (in a neoclassical style), of the buildings damaged by seismic events between the half of eighteenth century and the first decades of nineteenth one. See BELARDI 2013, pp. 23-50.

¹⁰ The distribution of this kind of editorial production, contributes to the formation of a wide range of professional and technical figures, that operate at different levels of the building sector and to the circulation of a basic culture and of a professional one able to reduce also the most common building to satisfying levels which can be reread in the building of Italian cities of the end of nineteenth century and the early 1900s. The key element of these publications was that there was an almost total lack of a writing part, or at least theoretical, and that they are essentially constitute of illustrative often colour tables, concerning solutions to typical architectural problems. See BELLONI 2014.

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¹¹ "Ora, caro Giovanni mio, gli elementi del disegno sono come gli elementi del leggere, dello scrivere e del comporre in italiano. Nella scuola elementare del disegno non ci si deve mettere in capo di fare germinare né pittori, né scultori, né architetti, né decoratori; ma bensì di esercitare la mano, l'occhio e la mente dei fanciulli così da renderli atti ad esprimere con chiarezza la forma degli oggetti, che vedono e che pensano. Lettura della forma. Anche qui (scusa se t'annoio) s'intende la forma degli oggetti piuttosto semplici, quelli che occorrono comunemente: utensili domestici, strumenti di mestieri, qual cosetta di quella ornamentazione che serve a tutti, e poco più, come ti dirò poi". ("Now, my dear Giovanni, the elements of drawing are like the elements of reading, writing and composing in Italian. In the elementary school of drawing, one must not make ends meet neither painters, nor sculptors, nor architects, nor decorators; but rather to exercise the hand, the eye and the mind of the children so as to make them suitable for expressing clearly the shape of objects, which they see and think. Reading the form. Here too (excuse me if the bailiff) means the form of rather simple objects, those that commonly occur: domestic tools, tools of crafts, what little thing of that ornamentation that serves everyone, and little more, as I'll tell you then"). See BOITO 1897, pp. 4-5. This was followed, in 1893, by *Questioni pratiche di Belle Arti. Restauri, concorsi, legislazione, professione, insegnamento*, set up with the technique of direct discourse. <https://archive.org/stream/questionipratiche00boit/#page/n5/mode/2up> [last access: 30 May 2017].

¹² See LACAITA, FUGAZZA 2013, pp. 287-288.

¹³ See ASSIRELLI, p. 2.

¹⁴ Edited by Erster Theil, published in 1880 by the publisher Ernst Toeche of Berlin. The publication, measuring 17 × 23 cm, is structured in two volumes. In particular, the second, divided into twenty parts, concentrates the first four on masonry works (Maurer- und Steinmetzarbeiten), wooden works (Zimmerarbeiten), carpentry works (Tischlerarbeiten), iron works (Schlosserarbeiten). <https://archive.org/details/baukundedesarchi00unse> [last access: 30 May 2017].

¹⁵ "Fra i tanti libri che si occupano della costruzione dei fabbricati uno ne trovammo che ci parve di utilissima guida per l'architetto... È il Baukunde des Architekten: e noi pensammo che rendendolo italiano, anche per ciò che riguarda gli usi della nostra vita sociale, e in particolare, i nostri metodi costruttivi, le nostre leggi e regolamenti, e introducendovi le aggiunte e le modificazioni necessarie, avremmo reso un servizio ai nostri colleghi non solo,

ma anche a quei capomastri e costruttori, i quali, lungi dal fossilizzarsi in vietati metodi, seguono il progresso della loro arte, praticandone le utili innovazioni". ("Among the many books that deal with the construction of buildings one found that it seemed very useful for the architect ... It is the *Baukunde des Architekten*: and we thought that making it Italian, even for what concerns the uses of our social life, and in particular, our constructive methods, our laws and regulations, and introducing the necessary additions and modifications, we would have rendered a service to our colleagues not only, but also to those master builders and builders, who, far from becoming fossilized in forbidding methods, follow the progress of their art, practicing the useful innovations"). See BARUCCI 1984, p. 23. For more information on the subject see also CAPUANO 1995.

¹⁶ The work, published between 1906 and 1935 (with the size of 20 x 27 cm) consists of 2 volumes divided in 9 tomes, plus a volume entitled *Appendice*. The first volume, organized in three parts, is dedicated to the building details from a material, finishing and installations point of view, the second volume instead is dedicated to distributive aspects, with typological references (civil residences, places of business, libraries and archives, artists' studios, administrative and judicial buildings) for then concentrating on the architectural decoration and aesthetic interpreted as attention to proportional and stylistic aspects in the composition. The work includes over 4000 images, variously distributed in the text, and over 150 boards. For a deepening in relation to the question: see BARUCCI 1984, CAPUANO 1995.

¹⁷ In this regard, see WARREN ET ALII 1998, see CUTOLO, PACE 2016.

¹⁸ EGIZI ET ALII 1992.

¹⁹ In this regard, see SALVAGUARDIA E RISANAMENTO DEI CENTRI STORICO-ARTISTICI 1961. The convention brought to the editing of the first Gubbio Charter, updated later with the Gubbio Charter of 1990. "Punto 1. Vi è oggi in Europa una emergenza critica della città e del territorio. L'identità storico-culturale, garanzia della qualità dell'ambiente, è minacciata da una pluralità di fattori di cambiamento, il cui esito è la perdita dei caratteri degli insediamenti. Il senso delle memorie stratificate, che caratterizzano le città europee, viene ad essere cancellato. L'Ancsa ritiene prioritario, in ogni intervento di trasformazione urbana e territoriale, il tema della identità culturale: del "centro storico", della città esistente, dell'intero territorio storico. [...] Punto 4. La riqualificazione dell'ambiente insediativo deve essere un'azione capace di ristabilire rapporti di significato tra i luoghi e le loro storie. Ogni intervento deve confrontarsi con i valori della memoria: preliminarmente ad ogni intervento è pertanto la formazione di un *significativo progetto di conoscenza*". ("Point 1. There is a critical emergency of the city and territory in Europe today. The historical-cultural identity, a guarantee of the quality of the environment, is threatened by a plurality of factors of change, the outcome of which is the loss of the characteristics of the settlements. The sense of stratified memories, which characterize European cities, is canceled. The Ancsa considers the theme of cultural identity as a priority in every urban and territorial transformation intervention: of the "historical center", of the existing city, of the entire historical territory. [...] Point 4. The redevelopment of the settlement environment must be an action capable of restoring meaningful relationships between the places and their stories. Each intervention must deal with the values of memory: preliminary to each intervention is therefore the formation of a significant project of knowledge".)

²⁰ See TOPPETTI 2011, pp. 173-182.

²¹ See GAMBINO 2011, pp. 21-28, BENEVOLO 1986, pp. 30-31, CASE E CENTRI STORICI 1977.

²² "The Congress of Amsterdam, the crowning event of European architectural heritage Year 1975, and composed of delegates from all parts of Europe, wholeheartedly welcomes the Charter promulgated by the Committee of Ministers of the Council of Europe, which recognizes that Europe's unique architecture is the common heritage of all her peoples and which declared the intention of the Member States to work with one another and with other European governments for its protection". The Declaration of Amsterdam, Congress of the European Architectural Heritage (Amsterdam 21-25 October 1975). <http://www.icomos.org/en/charters-and-texts/179-articles-en-francais/ressources/charters-and-standards/169-the-declaration-of-amsterdam> [last access: May 2017].

²³ "Charter for the Conservation of the Historic Towns and Urban Areas" ("Washington Charter", 1987). *Preamble and definitions*. https://www.icomos.org/charters/towns_e.pdf [last access: May 2017]. The concepts introduced by the "Washington Charter", are very current considering the recent definition of landscape shared by the European debate. "The European Convention of Landscape" defines the term "landscape" as "an area or a territory, as perceived by the local inhabitants or visitors, whose aspect and character derive from the action of natural and/or cultural factors (that is anthropic). This definition takes into account the idea that the landscapes

evolve over time, because of the effect of natural forces and the action of human beings". Recognizing the active role of citizens "If the relation between the citizens and the places where they live get stronger, they will be able to reinforce both their identities and the local and regional diversities, in order to realize themselves from a personal, social and cultural point of view. This realization is the basis of the sustainable development of any considered territory, since the quality of the landscape constitutes an essential element for the success of the economic and social initiatives, both private and public". *European Landscape Convention* (Florence 2000) Cap. I, Art. 1, par. 38.

²⁴ Among these, the relation between the buildings and the external space and the safeguard of formal characters as the scale of the buildings, the style, the materials, the colours and the decorations. "1. In order to be most effective, the conservation of historic towns and other historic urban areas should be an integral part of coherent policies of economic and social development and of urban and regional planning at every level. 2. Qualities to be preserved include the historic character of the town or urban area and all those material and spiritual elements that express this character, especially: a) Urban patterns as defined by lots and streets; b) Relationships between buildings and green and open spaces; c) The formal appearance, interior and exterior, of buildings as defined by scale, size, style, construction, materials, color and decoration; d) The relationship between the town or urban area and its surrounding setting, both natural and man-made; and e) The various functions that the town or urban area has acquired over time. Any threat to these qualities would compromise the authenticity of the historic town or urban area. 3. The participation and the involvement of the residents are essential for the success of the conservation programme and should be encouraged. The conservation of historic towns and urban areas concerns their residents first of all. 4. Conservation in a historic town or urban area demands prudence, a systematic approach and discipline. Rigidity should be avoided since individual cases may present specific problems". "Charter for the Conservation of the Historic Towns and Urban Areas" ("Washington Charter", 1987). *Principles and objectives*. https://www.icomos.org/charters/towns_e.pdf [last access: May 2017].

²⁵ See GIOVANETTI 2009, pp. 29-46.

²⁶ Among the most famous the "Manual recovery of the City of Rome" (1989, 1997), the "Manual recovery of the City of Città di Castello" (1990, 1992) and the "Manual recovery of the City of Palermo" (1997).

²⁷ Among the most famous the five "Manuals recovery of the Sardinia Region" (2009) and the "Manuale recovery Marche Region" (2009). In 1996 the National Council of Researches Consiglio developed the project titles *Repertorio (Atlante) di tipi architettonici e strutturali urbani in Italia per una normativa appropriata del recupero edilizio*, which represents a manual of recovery extended to the National territory. "The assumption of this Atlanteis complex and diversified: it tends indeed to constitute first of all a real Dictionary of the Italian reasoned building dialects [...], being determined to catch the local modalities of the building techniques and morphemes in a likewise detailed and exhaustive manner as the one of the Dictionaries of local language and dialects, in the linguistic field". See MARCONI 1997, p. 16.

²⁸ See GIOVANETTI 2000, p. 17.

²⁹ This definition was subsequently included in Article 3 of the Presidential Decree (DPR) 280/2001: *Testo unico delle disposizioni legislative e regolamentari in materia edilizia*.

³⁰ See MOSCONI 1994 and the Building Regulations of the cities of Gubbio, Foligno and Orvieto.

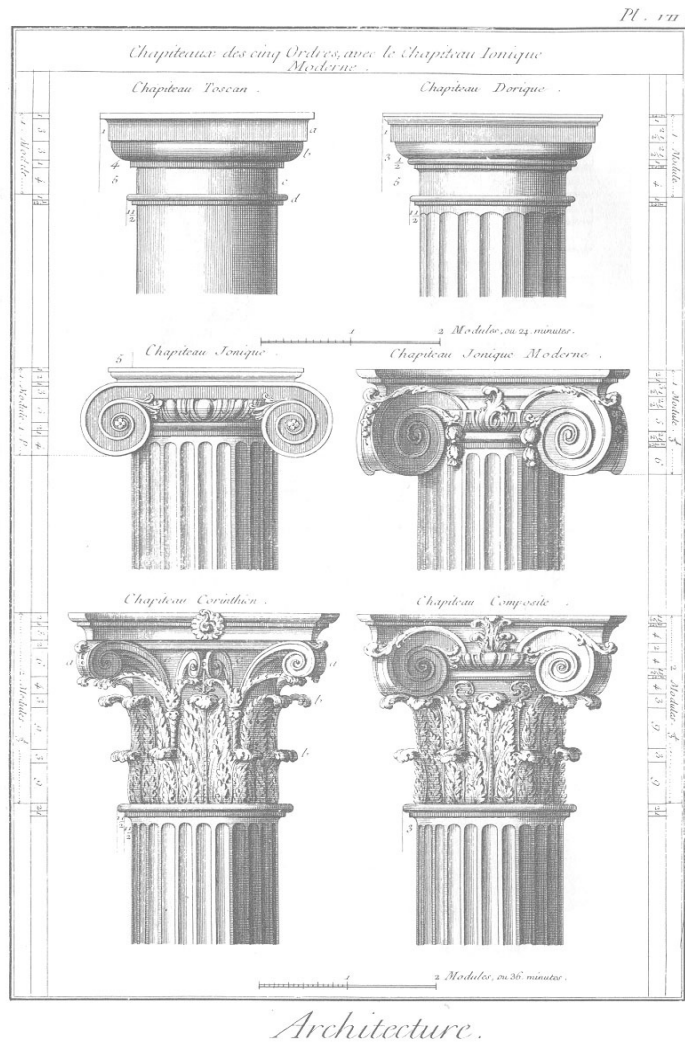
³¹ Among the most significant works that conducted by Adriana Baculo Giusti aiming the realization of *Napoli in Assonometria*. Or again the most recent work dedicated to the analysis and visual communication of the city of Venice (*Visualising Venice*) that is a larger international project that aims to show the evolution of the urban space over time. In this respect see FOSCARI 2014, HUFFMAN LANZONI, GIORDANO, BRUZELIUS 2017. With respect to the updating of the concept of manual see also CONSERVA 2013.

³² Among the municipalities involved those of Costacciaro, Sigillo, Fossato di Vico, Gualdo Tadino, Valfabbrica, Nocera Umbra, Assisi, Bastia, Valtopina, Spello, Cannara, Foligno, Bevagna, Montefalco, Sellano, Trevi, Preci, Campello sul Clitunno, Cerreto di Spoleto, Vallo di Nera. See BENETTI ET ALII 1998

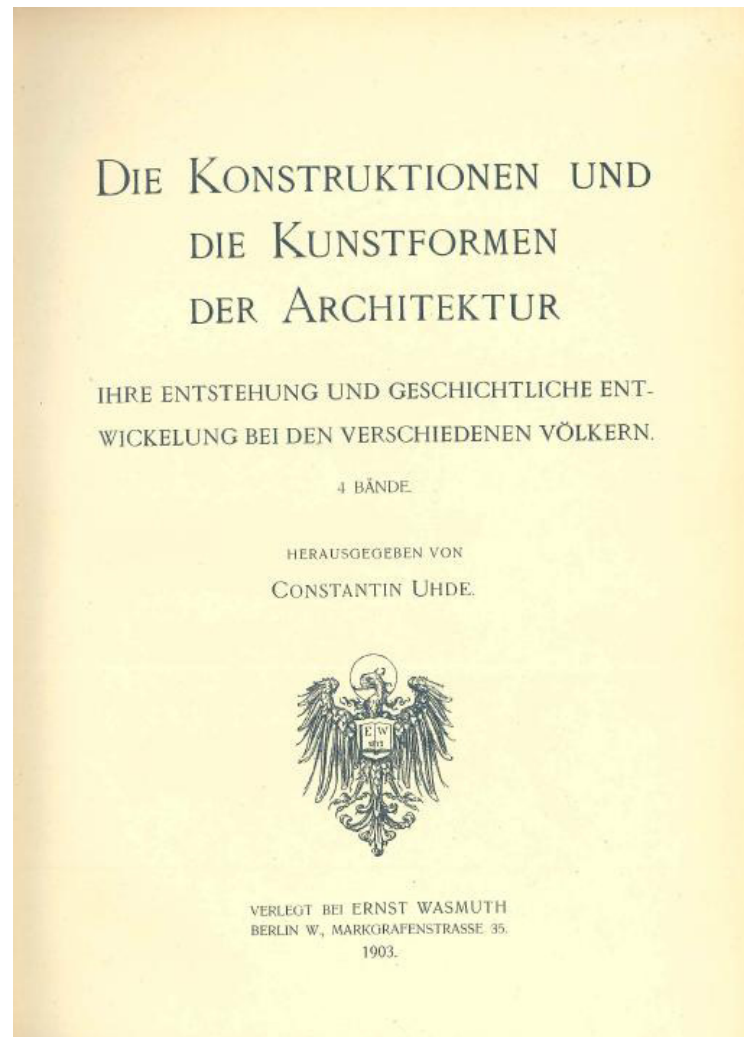
³³ See RADI, RADI 1997. One thinks of the value that a similar documentation could have assumed in the interventions dedicated to the post-war reconstruction and, in the particular case, to the reconstruction of the city of Braunschweig happened following the plan drafted by Flesche and Kraemer intended to the realization of five historical islands developed starting from the recovered surviving buildings, with particular reference to the building of market, through a process of anastylosis based on a documentation of photographic type. In this

respect see GISBERTZ 2014.

³⁴ Ordinary supplement n. 1 in the «Bollettino Ufficiale» - General Series - n. 40 of 12 August 2015. With regard to the investigation on the traditional architecture, a fundamental contribution is represented by the numerous works of documentation and cataloguing having as object the rural architecture in Umbria. In this respect see BOSI 2003; SPERANDIO 1991; CHIUNI 1986; PAGNOTTA 2014.





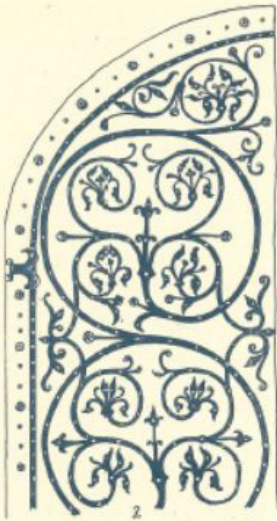


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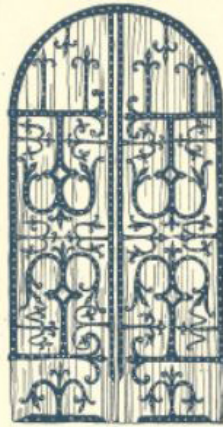
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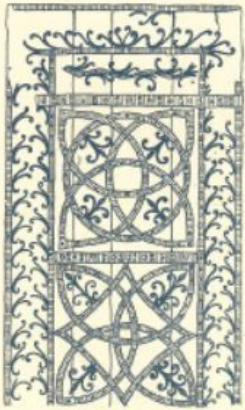
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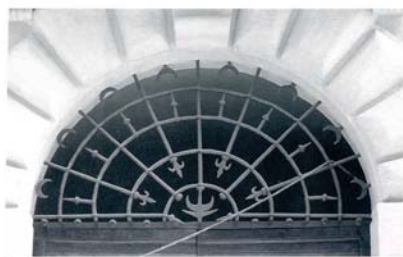


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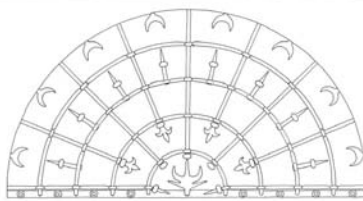
1

Lunette con struttura radiale a maglia su vanti a tutto pieno.

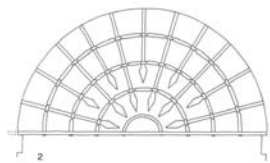
1 - La lunetta, inginocchiata, è arricchita da numerosi elementi ornamentali cipollati e presenta, al centro del traverso, un motivo di origine araldica. La ghiera esterna, in ferro piatto, sulla quale sono ributtati i ferri radiali ed alcuni elementi ornamentali, è ora nascosta dall'innocciato del portale; Palazzo Massarilli, via Garibaldi, XVI secolo.

2 - Piccola lunetta con elementi radiali conclusi a lancia. La ghiera più interna è in ferro piatto.

3, 4 - Nelle due lunette la struttura radiale a maglia è arricchita da elementi ornamentali in ferro piatto legati fra di loro e ai radiali con fascette a cappello di pipe. Nel tipo 4 il motivo floreale al centro del traverso, è elegantemente sbalzato in lamina di ferro (XVIII secolo).



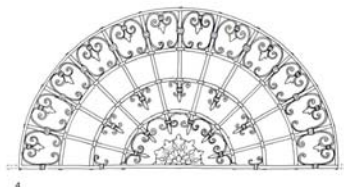
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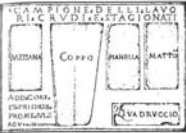


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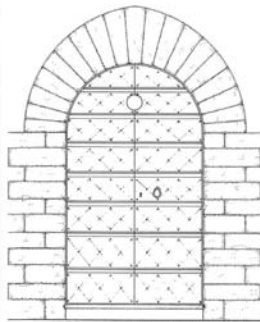




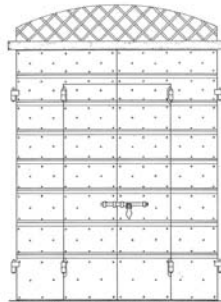
Tipi di porte e portoni

TAVOLA 20

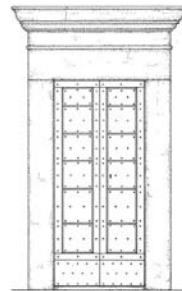
IP RILIEVO



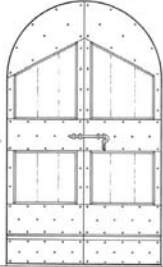
A - Portone alla mercantile a due ante con occhio



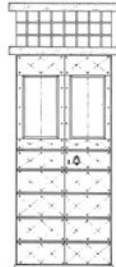
B - Porta di fondo ad ante sdoppiate e battenti esterni



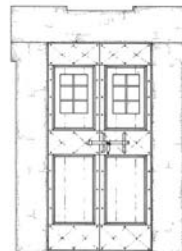
C - Portoncino con mostre riportate



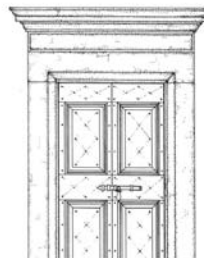
D - Porta di fondo a due ante



E - Portoncino alla mezza mercantile con sopra luce



F - Porta con specchiature riportate



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Analysis

The anatomical breakdown of the city

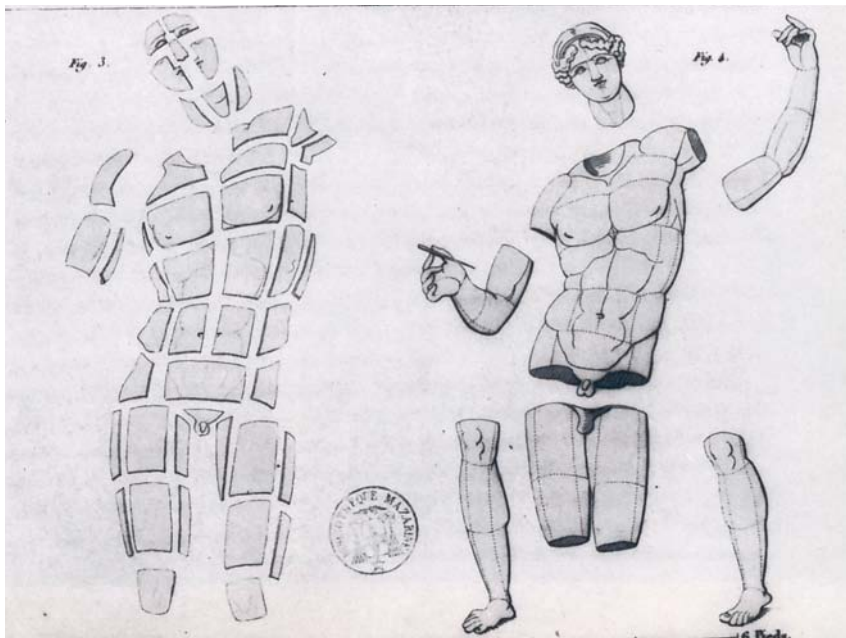
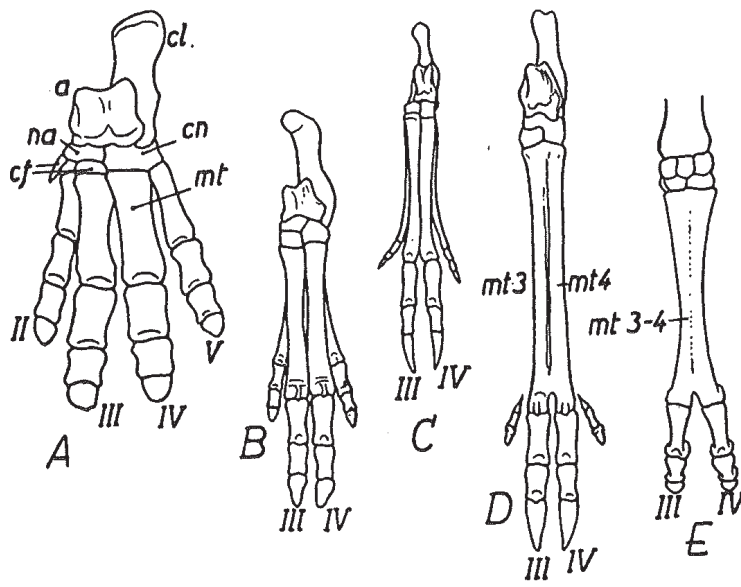
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“Observing natural things, but above all living beings, with the desire of penetrating in the whole organically connected of their existing and acting, we believe to achieve this objective in a better way by decomposing them into parts; and, of course, this procedure allows us to go very far. A nod is enough to remember to the friends of knowledge all we owe to the chemistry and the human anatomy for the comprehension and the general vision of nature. [...] If we anatomically decompose a body and proceed with dividing its parts into which it is decomposable, we will arrive finally to those first beginnings, which are named similar parts”¹.

Exactly “analysis” means a “method of study which proceeds from the particular to the general, through the decomposition of an organic whole into its parts; in philosophy, each logical operation which proceeds through a concatenation of distinct concepts, for arriving to a summary, where the analysed elements gather into unit”². In the specific context of the research, the aim is to offer an interpretative instrument, which tends to decompose and recreate in significant elements the complexity of the city of Perugia, proposing a structure organized uniformly. The morphological characterization of its old town is qualified by a genetic code based on an alphabet that the thesis tries to reveal, identifying the presence of possible relationships among the constituents. In this sense the architectural survey and the drawing

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configure themselves as necessary instruments where, using uniform representations, make possible the comparison among the analysed cases functional to the consecutive concise reading. The analytical intent of the classification orients the procedure which is marked by the sequence cities-districts-simple elements-cities aimed at a reading integrated between general and specific sight.



At the top. Emanuele Padoa, *Manuale di Anatomia comparata dei vertebrati*, 2002.

At the bottom. A. C. Quatremère de Quincy, *Démonstration des procédés de la Statuaire en ivoire*, 1814.

The city divided into districts

In the identification of the spatial categories which contribute to form the mental map of a settlement, the anthropologists Françoise Paul-Lévy and Marion Segaud have identified the notion of limit and orientation³. According to their theory, each foundation implies an orientation and each occupied (circumscribed) place is related (tied) to what is around it according to some oriented axis: only from a centre it's possible to lay the privileged directions which define environments, orientations and traces, constituting the references on which the same social structure is based. The concept, valid at general level, results particularly appropriate for the analysis of the city of Perugia. Because of the hilly system on which the city rises up, it is divided into five districts (Porta Sant'Angelo, Porta Sole, Porta San Pietro, Porta Eburnea, Porta Santa Susanna), to each of which a slice of the territory of Perugia depends on.

The urban morphology of the city is characterized, since from the Middle Age⁴, by the building thickening of the central area, which shows a strong cohesive inclination, from which five generating axis activate (that is the various streets which refer to the five ancient doors, access to the city) around which the respective districts develop, characterized therefore by a radially elongated style, opposed to the concentric form of the old city⁵.

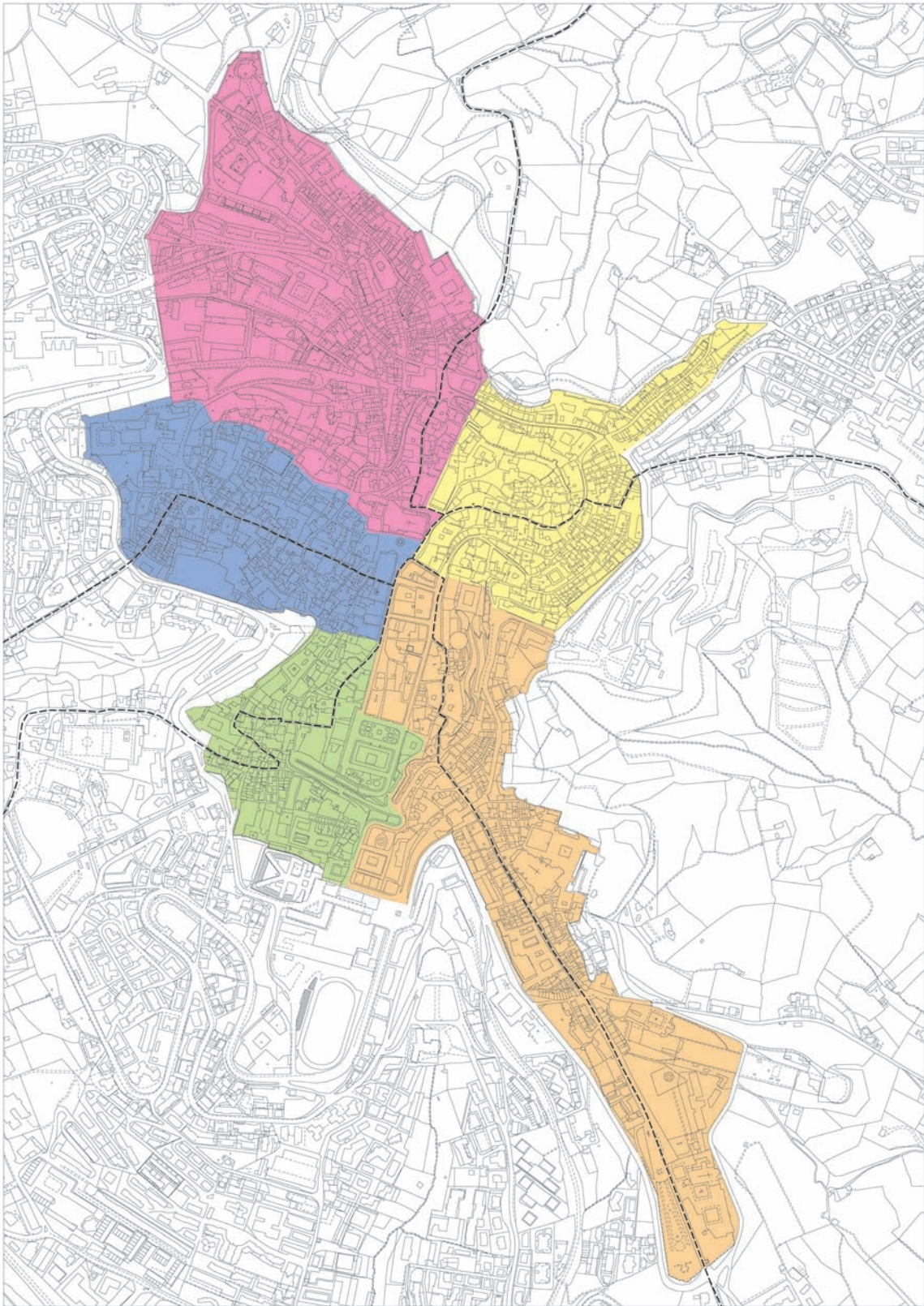
The five regal streets (whose layout is established by a carving modification dating back to 1295) branch off from the urban centre to the external territory, guaranteeing the connection

with the cities of Rome (Porta San Pietro), Cortona (Porta Eburnea), Florence (Porta Santa Susanna), Gubbio (Porta Sant'Angelo) and Fabriano (Porta Sole)⁶. The five districts delineate the city profile, which assumes the characteristic "open-handed"⁷, configuration well defined along the north and southeast axis (that is the districts of Porta Sant'Angelo and Porta San Pietro), and the west and south-west ones (that is the districts of Porta Santa Susanna and Porta Eburnea)⁸.

Although the necessary evolution of the city and the relative processes of expansion⁹, Perugia arrives in the modern times with an extremely stable collective self-representation to which the orthographic conformation of the city contributes to in a determinant way (besides to the construction of the symbolic identity of the same, which develops especially in the 19th century). The strong morphological characterization, indeed, has made possible for the individuals to take possession of the space, in terms of identification, orientation and participation¹⁰. In this sense, although the centrality of the acropolis of Perugia is considered uncontested¹¹ (the current Piazza IV Novembre, Corso Vannucci and Piazza della Repubblica), still recognized as the common space of the city, in the single districts there is the birth of a series of associations and initiatives based on the sense of belonging and historical identity of the districts¹², in order to promote spaces for the sociality and for the public and private quality¹³. To underline the importance that this articulation continues to assume for the city, the reference of it that is done in the current tourist guides¹⁴ and the urban epigraphy which camps in the points of border among adjacent districts, through differentiated plaques for emblems and tonalities (the sun, associated with white for Porta Sole, the keys, associated with orange, for the district of San Pietro, the elephant, associated with green, for Porta Eburnea, the chain, associated with blue, for Porta Santa Susanna, the wings, associated with red, for Porta Sant'Angelo¹⁵) as if it were an illustrative surname¹⁶.



The urban epigraphy.
From the left: Porta Sant'Angelo, Porta Sole, Porta San Pietro, Porta Eburnea, Porta Santa Susanna.



0 100 m



The city divided into districts.
From the top, clockwise: Porta Sant'Angelo, Porta Sole, Porta San Pietro, Porta Eburnea, Porta Santa Susanna.

The study of simple elements

The definition of the method adopted for the study of *simple elements* has made necessary the attempt to explore its meaning and to identify its value. In this sense, three fundamental aspects of the concept have been identified, connected to each other and ascribable to the simple element as *factor of orientation and identity*, as *measure of the built*, and as *hint of urban transformations*.

The simple element as factor of orientation and identity

The fact that a city is not composed of only buildings but that requires many other elements able to describe the urban quality and to guide observer's attention, is a long time consolidated opinion. As claimed in a different manner already in the sixties by Kevin Lynch in the text *The image of the city*¹⁷ and by Gordon Cullen in the text *The Concise Townscape*¹⁸. Introducing the category "landmark", Kevin Lynch underlines the importance of innumerable urban details (as the signs, the fronts of the commercial activities, the handles, etc.) which are used as identity and orientation hints. In a similar way Gordon Cullen proposes the concept of serial sight of the urban context, paying attention to a group of details apparently anonymous (among which there are the different materials used in pavements) which define the peculiarity of a place and which are relevant for the perception of the urban scene¹⁹. Maybe it's not a coincidence if in *Quale storia laggiù attende la fine*²⁰, by Italo Calvino, in

order to identify more easily his loved one, the protagonist makes a simplification of facades, trying to eliminate every detail. However, the result is paradoxical: without elements able to guide him, the protagonist is lost²¹.

The simple element as measure of the built

Inside the *Planning policy Guidance. Planning and the historic environment*²², the document containing the most important guidelines elaborated by the British government in the last years of the twentieth century compared to the design of the new interventions in the historical areas, is underlined as the new buildings have to respect the context, following the fundamental principles (scale, heights, alignments and materials) in order to guarantee an harmonious whole²³. In this sense, the windows, the doors and the other identifiable units, are considered the elements of reference for the expression of the scale in the context where the new intervention inserts²⁴. The term “scale”, here introduced, has to be interpreted opportunely both from a metric point of view and from a significance one connected to the social changes. In this sense the form of a window or of a door, for example, can be the result of a cultural choice: dividing the public space from the private one, the individual from the community, they regulate the way that people relate with the external world²⁵. Or even, the different use of materials which characterizes paving, signals the greater or lesser importance of the surrounding building.

The simple element as hint of urban transformations

The history of a city can be analysed through the scale of details, offering an interpretation of the architectural elements as hints of the urban changes. Observing the composition of the construction weavings of our cities historical buildings, we can notice as, in most cases, these are constituted of various stones²⁶. The stone, thought in the weaving as irremovable element, becomes a component that can be disassembled, moved and placed in different ways. Not only. When the stratification of successive interventions gives place to disorganized or incongruous facades, a new look remedies, in order to guarantee uniformity. One thinks about the fifteenth-century numerous interventions, which introduce new openings to homogenize the prospectuses as a result of building mergers or modernizations, or even about the friezes which geometrically divide the facades, redesigning them for a necessity of decorum and above all of order and symmetry²⁷.

The three identified aspects highlight the relationship of mutual dependence between the whole thing (the city) and the parts (the simple elements). These last, indeed, analysed singularly, would lose their significance without a reading solidly anchored to the peculiarity of the baseline urban reality. On the other hand, if the simple element assumes its value only if inserted inside the complex urban system, that is exactly the repeated nature of the elements, their recurring being, to express the most authentic and so identity value, of the city. In this sense, in order to offer an instrument of reading which tends to decompose into significant elements the complexity of the city, the use of a rigorous method is proposed

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(based on survey and drawing) able to organize and put in order in a critical manner the variety of the existing.

Phase 0. Selection of the sample

The selection of the elements analyzed was carried out with the aim of obtaining a representative sample in order to verify the presence of recurring solutions and to highlight their variation, also in relation to the different location in the urban context.

In this sense the following specific starting points have been formulated, which have oriented the selection criteria for the elements under study.

1. Determining the characterisation of the public image of the city;
2. Determining the characterisation of the ordinary image of the city;
3. Determining the relationship between the variety of elements and their respective locations.

Based on the above considerations, the following strategies have been adopted.

1. To consider the elements placed on the external fronts of buildings and on public roads (no cloisters, courtyards or other environments that deny a direct relationship with the outside are investigated, as well as the roofing mantles of the buildings and the objects on them, such as roof terraces and smokestacks);
2. To consider the elements belonging to ordinary building, mostly with residential use,

avoiding monumental buildings;

3. To consider the elements distributed homogeneously throughout the city.

Having said that, 5 homogeneous categories have been identified as follows: 3 vertical, characterizing the external fronts of the buildings (entrances, windows and wall textures) and 2 horizontal, characterizing the road axes (external floorings and manhole covers)²⁸.

The next step involved the definition of the units to be analysed, taking into account how representative they were with respect to the population to which they belong. In this regard, a *sample* is defined as representative²⁹ when the elementary units subject to observation (and which constitute a particular subset of the population) have a structure that reflects that of the population and a sample size (understood as the number of individuals that make up the sample) adequate to that of the original population.

In the case in question, due to the impossibility of having a complete list of the elements of the population (linked to the fact of analyzing a compact urban fabric, which does not allow to obtain exhaustive information regarding the quality and quantity of the units present) it was necessary to use the informed choice sampling method in the case in question³⁰.

The method adopted falls in the category of *non-probabilistic* sampling³¹, in which the representativeness of the sample is exclusively linked to the surveyor's ability to interpret the characteristics of the population, and to select the units considered in a consistent manner.

Unlike probabilistic sampling (in which the sampling units are identified through random choice, and all have the same probability of being included in the sample), this does not allow quantification of the sampling error (indeed, it is not possible to calculate the theory of probability) nor the generalisation of results by extending them to the entire population. However, starting from the results derived from direct observations and previous studies³², the criteria adopted make it possible to consider the sample, although not representative in a strictly statistical sense, however significant and able to produce useful information. The arbitrariness of the selection is inevitably linked to the application of statistical methods within the context of architectural surveys, in which the interpretation of reality is necessarily guided by the subjectivity of the surveyor, who discretises the information based on their knowledge and for specific purposes.

Finally, the *sample size* was set by establishing a fixed quota of 100 items for each category, ensuring homogeneous and uniform distribution throughout the city for each district (25 elements for each district).

Phase 1. The architectural survey

The architectural survey phase investigated the morphological and material aspects, with the aim of communicating them through graphic representation. Historically, the surveying activity coincides with the acquisition and transmission of the rules of architectural doing: a training practice aimed at developing inductive capacities (consisting in drawing the rule from the results of many particular cases) and deductive (consisting in obtaining a result from a rule, applying it to a particular case)³³. In this context the simplest variation of codes and rules takes on an inventive value. In the actuality of the practice of the survey, however, the decoding of the order of the observed reality is oriented by the meaning and the specific purposes of the survey. On a practical level, therefore, the object is simplified and reduced according to specific purposes, following a process that goes from reality to its graphic representation³⁴. In general, this was achieved by critically selecting the information deemed significant, with the aim of creating a cognitive model³⁵ of the object under investigation able to condense and communicate its complexity.

The survey, therefore, is identified as an operation that involves a critical reading of the architectural and urban organism in which the design is configured on the one hand, and, on the other, serves as a tool for analysing and recording data, as the ultimate outcome of the activity. "Strings" [wrote Edgar Allan Poe] "should not be hidden, rather they should be shown and admired to the same extent as the marionettes they allow to move. [...] The

poetic effect of a work is generated when the procedures used to create it not only serve to define the content, but constitute it - they are put on display as something to be admired.”³⁶ Although aimed at recognising the technical component in the artwork, the text lends itself to expressing the relationship of mutual dependence between the critical activity and design activity, that is, between the design of the survey and the design of the architectural project³⁷. The design, as moved by a precise and conscious cognitive intention, produces an interpretative model of reality that is the result of the deeper meaning of the investigation, and is able to anticipate future actions. In this sense, “design is thought”³⁸.

The subjective component thus far exposed meets the necessary objectivity of the survey, which is required to provide objective measurements and unequivocal representations. The architectural survey is therefore configured as a scientific document through which we can trace the object investigated according to a relationship of close biunivocity³⁹. In this sense the subjective component laid out thus far encounters the objectivity of the survey, which concerns the provision of objective measurements and unequivocal representations. As a scientific discipline, the subjective choices of the surveyor and the consequent methodologies and operations adopted, with the aim of acquiring data, as well as the subsequent processing thereof, must also be made available to the scientific community, to ensure the possibility of evaluation and replicability⁴⁰.

That said, for the specific purposes of the study in question, the field of investigation was mainly intended to graphically recreate the external facades of the elements and, in some cases, a cross section of the profile. The study started by implementing the methodological phases of the direct survey. After a careful examination of the elements to be surveyed, taking into account the location of the elements and the operations to be carried out (survey design), and after the subsequent photographic campaign (documentation), a series of eidotypes was developed to support the direct measurements.

The first phase, relating to the photographic documentation, involved a total of 500 items: 100 for each category analysed, distributed with 20 for each district.

In the subsequent measurement phase, the eidotypes were drawn up and the dimensional characteristics of a total of 125 elements were noted: 25 for each category analysed, distributed with 5 for each district. The direct architectural survey operations were in-depth enough to obtain a homogeneous graphic restitution in terms of the scale of representation (fixed at a ratio of 1:10). The varied positions of the elements determined the use of appropriate criteria based on the different situations. Indeed, while the layout of the entrances, external floors and manhole covers provided immediate contact with the material and dimensional qualities of the elements, allowing the use of direct measuring instruments, in some cases, which mainly concerned the wall textures and windows, the positioning on upper sections that were not directly accessible, made it necessary to use additional monitoring and verification tools, such as photography and dimensional ratios.

Finally came the phase involving representing the acquired data, relating to the graphic restitution through the appropriate assisted drawing and photo-retouching software to support the verification of the data obtained.

Phase 2. Graphic restitution

Drawing was used as a scientific instrument of investigation, to be able to explore the context subject to study and learning through a systematic approach using an appropriately coded representation system.

As such, homogeneous graphic conventions were used to allow for a morphological comparison and then the subsequent phase concerning the reading and interpretation of the data collected. In this regard, the representation enhances the technical drawing, making the content of the communication objective (disregarding the representation of decay, as well as the figurative potential deriving from the use of shadows and halftoning) and using a language that enhances the form.

The description of the object is made through two-dimensional drawings in orthogonal projection, creating facades (circumscribed to the external fronts, with the aim of representing the elements that participate in the formation of the city's public image) and correlated sections (limited to cases in which it was possible to gather useful information during the survey campaign).

During the graphic restitution, which took place in a CAD environment, a hierarchy was established between the lines to be represented, which were necessarily related to the scale of representation, corresponding to a hierarchy of thicknesses during printing. The use of the strokes was then calibrated for the reduction necessary for insertion in the cataloguing

sheets, using nibs of different grades and assigning greater thicknesses to the sectioned parts (0.2 mm), intermediate thicknesses for the projected sections (0.08mm) and light thicknesses for the close-up features (0.05 mm) that evoke the richness of the details.

The graphic restitution was dedicated to a total of 125 elements, with 25 specimens selected for each homogeneous category (25 entrances, 25 windows, 25 wall textures, 25 external floorings and 25 manhole covers, divided into five for each district).

From an dimensional and typological point of view, the groups of homogenous categories were formed through in-depth investigations, resulting in the appropriate articulated graphic drawings that follow.

Entrances and windows

The representation of elements in perspective and in sections follows the decomposition aimed at enhancing the presence of distinguishing parts (the frame, the door, the window, the access etc.). Wherever there were darkening devices (such as blinds, shutters, etc.), they were represented as being closed.

Wall textures and external floorings

The graphic representation of the wall textures and external flooring concerns a representative sample of 1 x 1 m. In particular, the external cladding is represented in perspective, as well as the sectioned profile of the road in the case of external flooring. The in-depth study concerns the material characterisation, represented by means of filled areas that highlight the contrast between the mortar and the cladding.

Manhole covers

The graphic representation of the manhole covers proceeds from the representation of the external front to material characterisation (through the use of filled areas, as was also done in the case of the wall textures and external flooring). Compared to the other elements analysed (with particular reference to the entrances and windows, which, as openings on external facades, can be interpreted as similar to what the manhole covers represent for road surfaces) this case is more rigid in terms of the functional requirements to be met that limit the changes to the form and materials adopted. In this sense, the varied characterisation is able to emerge by investigating the geometric reasons that regulate the composition of the parts in the survey.

Phase 3. Cataloguing

Visual design and coding⁴¹

In the field of architecture, the role of the survey has now become established as a tool for reaching cognitive models that allow for an understanding of the object under investigation. This is linked to a communicative and information-based dimension of the act of surveying. In order to have an understanding of the information obtained, it is not only necessary for the results achieved (in the form of graphic or other types of devices) to have accurate characteristics that leave no room for ambiguity in the interpretation of the information, they must also be easy to read and interpret⁴².

We need only think of the innovation introduced by Jacopo Barozzi da Vignola in the context of classical treatises, which coincides with the introduction of a new graphic design for the *Regola delli Cinque Ordini d'architettura* (1562), in which the contents are no longer communicated exclusively through words. The charts are accompanied by a bare caption introducing a “strictly ethical [value] of the image, in some way presaging potential for the acceleration of learning characteristic of contemporary multimedia”⁴³.

Organising thought in a visual way has always been a human need, one that has become amplified in the contemporary era because of the vastness of the information available. In this context, the discipline of *visual design* aims to summarise the complexity of reality

visually, confining it within the rigour of a visual layout⁴⁴. To avoid misunderstandings, however, it is important to clarify that this is not concerned with beautifying the contents by simply adding an aesthetic component that makes them more appealing, or trivialising them to simplify learning. Rather, it is a question of giving the message to be communicated a clear and exact forms⁴⁵. In this sense, a valid *visual design* project is “technological”, as it responds with essential forms that are strictly bound to the function, and is “economical” in that it “communicates a lot with a little”⁴⁶.

Given this, it was considered appropriate to develop a graphic code governed by icons and symbols, with the aim at conferring greater immediacy on the information communicated and simplifying integrated reading of it. As Oswald Mathias Ungers argued in the 80s, “the modern scientific world is full of complicated symbolic codes and systems of synthetic signs and symbols which are more advantageous because they are unambiguous, distinct, and shorter than regular language”⁴⁷.

When conceptualising the coding system to be used for the catalogue cards, some basic principles were adopted that characterise pre-attentive perception (that is the instantaneous classification of differences and similarities), making visualisation as immediate as possible at the cognitive level⁴⁸.

The brain groups together similar objects and separates them from those that appear different with the aim of saving on processing time. The first distinction that is perceived concerns the variations in shade⁴⁹. Subsequently, the brain concentrates on the differences in form.

In particular, identification of the borders of an object is based on the variations in the colour of the light intensity, and on how defined the margins of the things we see are. The greater the contrast between two coloured spots (or the more distinct the margins), the less time is spent identifying them as different entities. Similarly, a selection of visual elements reduced only to the essentials minimises the amount of information and therefore the time needed to process them. In this case, the brain does not need to perceive every single detail of an object to recognise it as such. Rather, it need only identify certain non-accidental properties, namely those characteristics that normally belong to a particular type of entity (for example, if the brain deduces shapes similar to eyes, a mouth and a nose, it is likely to identify a face).

Taking into account what has been said and proposing a reading that proceeds according to progressive degrees of in-depth analysis, a code has been identified that includes the introduction of symbols to identify the districts and icons to identify the categories of elements analyzed. Simplified graphic representation with few details is still recognisable but also makes it possible to communicate different information through the introduction of minimal graphic variations.

In particular, the districts are identified by circumferences characterised by different shades (through a percentage-based combination of the C, M, Y and K four-colour process while the saturation attribute remains constant at 10%) derived from their chromatic tradition⁵⁰:

Porta Sant'Angelo = magenta (C0 M100 Y0 K0)

Porta Sole = yellow (C0 M0 Y100 K0)

Porta San Pietro= orange(C0 M50 Y100 K0)

Porta Eburnea= green (C50 M0 Y100 K0)

Porta Santa Susanna= blue (C100 M50 Y0 K0)

The icons, shown in white, are placed in the centre of the grey background circle (C50 M50 Y50 K10). There were two main factors motivating the choice to eliminate all information related to colour. On the one hand, there was the desire to achieve a higher level of abstraction, while, on the other, the neutrality of the background avoids any alterations to the perception of colour when combined with the symbol for the district [see pp. 62-64].

Each element is also identified by an alphanumeric code. Unlike the chromatic system, in which the colors allow to differentiate but not to order, in the alphanumeric system the combination between the literal part and the numerical one establishes a hierarchy introducing a logical sequence in the reading⁵¹. In particular, the literal portion identifies the category of belonging while the numerical one orders the element within one of these categories, following a progressive numbering that allows for identification in the site plan. The literal part is encoded as follows:

Entrances = E

Windows = W

Wall textures = WT

External floorings = EF

Manhole cover = MC

Catalogue sheet

The cataloguing phase involved the creation of four groups of graphic drawings that were dedicated to each category of elements analysed, and ordered according to progressive reading depths reflecting the procedure adopted during the analysis phase⁵².

Localisation

According to the interpretation of the city as a homogeneous unit, it is analyzed starting from the superposition of a regular grid to its planimetric representation [see p. 60]. The building aggregate included in this jersey (defined by 20 modules of 250 m x 250 m) was assumed as an operative scale of reference where the quadrants thus obtained correspond to the same number of campaigns carried out during the direct survey activity, by virtue of a necessary relationship between the spatial extent and the number of elements analyzed. Identified through the use of a progressive numeration in Roman characters, the “blocks” identify potential tourist micro-itineraries in which to find the analyzed elements previously placed.

Photographic documentation

This gathers together the results of the campaign dedicated to all the elements investigated. The elements are grouped according to the district to which they belong and registered through the photographic snapshot associated with the information related to the district

and location in question, as well as the alphanumeric identification code.

The catalogue sheet

The conceived layout organises the information on an A3 format table (42 cm x 29.7 cm). The elements are placed according to a hierarchy dictated by a vertical arrangement, proposing a reading from top to bottom (corresponding to information ranging from the general to the more detailed), and horizontally, proposing a reading from left to right (providing progressive insights into the information). On its vertical axis, the board can be divided into three bands. The upper one contains information on the location (on the left) and identification of the element (on the right). The central band contains a photographic image of the element (on the left), followed by the graphic documentation. Finally, the lower part contains the material information (on the left) and the metric scale (on the right) [see p. 65].

The overview table

This gathers together part of the results of the direct survey activities. For each of the five categories, the perspective drawings of the 25 investigated elements were collected (using the same scale of representation) and associated with the identification of the district to which they belong. They were also identified by their relative alphanumeric code, transferring the registration of the other information to the catalogue cards.

notes

¹ J. Wolfgang Goethe, *Urpflanze*, cited in CAJA ET ALII 2015, p. 17.

² DEVOTO-OLI 2014, word *Analisi*.

³ See LA CECLA 2011.

⁴ They are already established in the XI century and saturated during the XIII one. See GROHMANN 1981, pp. 38-39.

⁵ The elongated shape of the districts facilitates the natural inclination to expansion of the city that over the most recent centuries concerns particularly the southern faces of the historic nucleus.

⁶ See GROHMANN 1981, p. 47.

⁷ As in Oswald Mathias Ungers' point of view the scission of Venice refers to a handshake, so, in the 1400s, Leon Battista Alberti recognizes of the profile of the city of Perugia the metaphor of the palm of hand or, in the half of 1600s, Crispolti connects it to the one of a star, with its "greater and smaller" rays. "The meaning of metaphors is based on comparison and similarities most often an anthropomorphical character, like the human body as a metaphor for the shape of a Romanesque cathedral or the conformation of the universe. Designers use the metaphor as an instrument of thought that serves the function of clarity and vividness antedating or by passing logical processes. 'A metaphor is an intuitive perception of similarities in dissimilars', as Aristotle defined it". See UNGERS 1982, p. 10-11.

⁸ The original development is on the southeast side, San Pietro district, having as pole of attraction the Benedictine abbey of San Pietro. Simultaneously there is a development to north-west and west, respectively Sant'Angelo district and Santa Susanna district, which underline an inclination of the city to the Trasimeno Lake.

⁹ Furthermore Perugia enters in the contemporary age following the classic scheme of development for a hilly city. In the period of national unification, the municipality presents a social-spatial stratification articulated in four areas. The first coinciding with the acropolis, location of the civil, religious and economic powers, the second is that of the districts around the walls (Sant'Angelo, Porta Sole, San Pietro, Eburnea, Santa Susanna), inhabited above all by artisans and petty bourgeois classes, the third is that of bridges, constituted by inhabited cores close to Tevere, with a role of linkage between city and countryside and the rural area.

¹⁰ Roberto Segatori underlines as each relation between man and environment involves in particular three dimensions of human experience: existential (concerning the identity of place), mental (concerning the cognitive maps) and emotional (concerning the attachment to the place). See SEGATORI 2014.

¹¹ In 1960, in the context of the conference about Safeguard and renovation of historic-artistic centres, held in Gubbio, Mario Belardi, at the time head of urban section of the section of Perugia, speaking of the historic nucleus of Perugia and the areas for the renovation affirmed: “Il nucleo storico di Perugia si identifica con la città: infatti, per carattere e per estensione, il nucleo storico non può intendersi come una parte staccata dalla vita e dai problemi che coinvolgono il capoluogo umbro. Rispetto alla dimensione della Città attuale il nucleo storico, ambientale e monumentale continua ad avere e ad accogliere i maggiori interessi del nucleo urbano”. (“The historic nucleus of Perugia identifies with the city: indeed, for character and extension, the historic nucleus cannot be understood as a part separated from life and problems which involve the Umbrian country seat. Compared to the dimension of the current City, the historic, environmental and monumental nucleus continues to have and to embrace the greatest interests of the urban nucleus”). Belardi, Mario: *Il nucleo storico di Perugia e le zone per il risanamento*, see SALVAGUARDIA E RISANAMENTO DEI CENTRI STORICO-ARTISTICI 1961, p. 36.

¹² In the district of Porta Sant’Angelo, on the initiative of some residents, in 1979 the Association *Vivi il Borgo* was born in order to promote the knowledge of the history and of the site traditions. In 2005, in the area of Corso Cavour and Borgo XX Giugno, the Association *Borgo Bello* was born. The associative purpose is that of revamping the quality of the district collective life with cultural and recreational initiatives, open to everybody. See SEGATORI 2014, FERRUCCI 2013.

¹³ In this regard, remember as already in the 1980-81 the Council of Europe promoted the project *Campagne pour la Renaissance de la Cité*, which identified as main purpose that of promote the rehabilitation of the abandoned buildings and districts through the direct participation of the inhabitants. Analogously, in the Italian context, the contemporary experience of the *Laboratori di quartiere*, coordinated by Renzo Piano, aimed at restarting the processes of appropriation through mechanisms of maintenance and intervention on residences by the inhabitants and the local workforces. The project proposed as main objective, that of contributing (through the combination among handcrafted work, traditional techniques and materials, with scientifically and technologically advanced instruments) to the restoration operations educating to the identification of the aesthetic content of the membership places, often opposed by repetitive and monotonous interventions, ordered on the ground in a form that denies the social life, typical, instead, of the ancient districts. See PIANO ET ALII 1980.

¹⁴ For example in itineraries described by Andrea Miarelli and Sonia Merli in the guide to Perugia, the districts structure is kept. See DUFOUR 2007.

¹⁵ The blue of Porta Santa Susanna indicates the relationship with the West territory and so with Trasimeno Lake; the green background of Porta Eburnea is the symbol of the gardens and the vegetable gardens of which the district, structured in great terraces falling to the floor, was abundant; the yellow of San Pietro district (symbolized by the keys because of an error which confuses San Pietro Vincioli, to whom the namesake church is dedicated, with San Pietro Apostolo) recalls the plain placed just outside the village to south-east, that, for the favourable exposure was extremely fertile; Porta Sant’Angelo (Arcangelo Michele’s steel gray sword and white wings due to the presence of San Michele church, the Temple, for the inhabitants of Perugia), whose red field recalls the fire; Porta Sole, whose white field (where the anthropomorphic sun, which recalls the presence in the district of the ancient Etruscan temple of the sun, is placed), recalls the flour. See ZAPPELLI 2009, MENICHELLI 2006.

¹⁶ See BASCAPÈ, DE PIAZZO 1983, p. 5.

¹⁷ See LYNCH 1960.

¹⁸ See CULLEN 1961.

¹⁹ As recently highlighted by Carlos Montes Serrano and Marta Alonso Rodriguez: “The initial idea of Cullen and Cronin Hastings was that urban designers had forgotten small details that might go unnoticed or seem trivial, such as the curve of a wall, trees breaking un monotony, an unexpected contrast, a change in level, the closure of a line of sight, foreshortened rows of buildings, differing materials for paving, and so forth. These are details that are relevant for the perception of the urban scene, since it is upon them that the sensation of harmony and the pleasure of living in or going through a city rests. On these lines, Cullen’s articles were intended to draw attention to a whole of anonymous design details present in any location, or to patterns of behavior not kept in mind by urban designers. These were at risk of disappearing completely in a welter of tatty, insignificant, uninteresting and soulless suburbs or cities”. See MONTES SERRANO, ALONSO RODRIGUEZ 2015.

²⁰ See CALVINO 1979.

²¹ In this regard, Professor Franco Purini's different point of view is reported with regard to the role of decoration in the architectural composition: "Tra i già ricordati compiti della decorazione non ultimo è quello di ritardare i tempi di lettura di un manufatto o, all'inverso di accelerarli. Lo scorrere lo sguardo sulla ricorrenza di un intreccio di linee e di campi cromatici, che spesso possiedono un valore simbolico, crea un senso di smarrimento estatico, quasi una seduzione ipnotica che invita la vista a penetrare con movimenti densi di significato in infiniti labirinti mentali". ("Among the already mentioned tasks of the decoration not last it's that to delay the reading times of a product or, conversely, to accelerate them. Skimming the gaze on the recurrence of a weaving of lines and chromatic fields, which often own a symbolic value, creates a sense of ecstatic confusion, almost a hypnotic seduction which invites the sight to penetrate infinite mental labyrinths with movements packed with significance"). PURINI 2000, p. 131.

²² "For centuries an innate and deep understanding of regional or local building tradition and their effective application and development informed design and construction of the majority of the country's vernacular buildings and structures. This ones are frequently valued not only for their particular historic or architectural interest, but because of the considerable contribution they make to the local scene ant to the cultural continuity of local communities. (...) Central government's most relevant advice on the design of new buildings in historic areas is contained in "Planning Policy Guidance: Planning and the historical environment" (1994) (...) Special regard should be had for such matters as scale, height, form and detailed design (e.g. the scale of spacing of window openings and the nature and quality of materials). In particular in 1995 the "Conservation Area Practice" has been published, regarding the design of new buildings in historic area: "In considering proposal for new buildings in conservation areas the principal concerns should be the appropriateness of the overall mass or volume of the building, its scale (the expression of size indicated by the window, doors, floor heights and other identifiable units) and its context". See WARREN ET ALII 1998, pp. 51-58.

²³ "New buildings are designed to respect their settings follow fundamental architectural principles of scale, height, massing and alignment, and use appropriate materials (...) forming a harmonious group". Ibidem, p. 57.

²⁴ "In considering proposal for new buildings in conservation areas the principles concerns should be the appropriateness of the overall mass or volume of the building, its scale (the expression of size indicated by the windows, doors, floor heights and other identifiable units) and its context". Ibidem, p. 57.

²⁵ See FOSCARI 2014, p. 10.

²⁶ See SPERANDIO 2004.

²⁷ Focusing on Umbria, one thinks about the characterization of Via Fontesecca in Spoleto, or, in Perugia, about the intervention realized by Martelli that cuts the arena residence of the Collegio dei Notai and adorns the corners with ashlar, friezes, or even about the alessiano intervention of Via Nuova. See DE ANGELI D'OSSAT, GROHMANN 2003, p. 107, TOSCANO 1963, TOSCANO 1985, SPERANDIO 2004.

²⁸ It should be noted that the selection excluded a series of further elements from the analysis, which, although belonging to the local tradition, were not considered either on the grounds that they were not typical of the ordinary architecture (such as the vertical edges and elements, the horizontal frames and elements, bases and wainscoting) or because they are unevenly distributed throughout the city (such as the sacred aedicules or salvage material included in the masonry, having been appropriated from other buildings).

²⁹ See ROTONDI ET ALII 2011, pp. 60-64.

³⁰ Ibidem.

³¹ Ibidem.

³² See SPERANDIO 2004, GIOVANETTI 2009, RADI 1997, MOSCONI 1994.

³³ See CERVellini 2014, p. 199.

³⁴ See DE RUBERTIS 1996, pp. 9-10; MASSARI 1996, pp. 11-17; IPPOLITI 2000; BELARDI 2001; DOCCI 1996.

³⁵ On the concepts of the model, see MIGLIARI 2003, pp. 14-19, EMLER 2003.

³⁶ Steinmann, Martin: *La réalité en tantqu'histoire. À propos d'une discussion sur le réalism an architecture*, 1975. Cited in BELLONI 2014, p. 72.

³⁷ On the concepts of the model, see CERVellini 2014.

³⁸ See PURINI 2007.

³⁹ See DE RUBERTIS 1991.

⁴⁰ See DOCCI ET ALII 2001, pp. 37-46.

⁴¹ CAIRO 2013; COLIN, TROIANO 2014; MENCHETELLI 2016.

⁴² In the introduction to the Manual recovery of the City of Città di Castello, Francesco Giovanetti emphasises and advocates the importance of beautiful drawing: “Il primo scopo del manuale è quello di favorire la conservazione attraverso l'apprezzamento ed il rispetto per la sostanza materiale dell'edilizia storica. Infatti, grazie alla ricerca svolta, una massa di oggetti relegati a sfondo della vita quotidiana è stata trascinata in primo piano, proponendo un modello di tutela tendenzialmente approfondito fino ai particolari [...]. Per questo nelle tavole non si è insistito solo sull'accuratezza del disegno, che ne sostanzia l'utilità come mezzo di informazione tecnica, ma anche sulla bellezza, intesa come mezzo di propaganda. I disegni di Gabriella Boni, di Giovanni Cangini e degli altri autori evidenziano un'estetica degli elementi costruttivi, proponendoli come l'oggetto di un interesse antiquario”. (“The first purpose of the manual is to promote conservation through appreciation and respect for the material substance of historic buildings. In fact, thanks to the research carried out, a mass of objects relegated to the background of daily life were dragged into the foreground, proposing a model of protection widely explored in detail [...]. This is why there has not only been an emphasis on the accuracy of the drawing in the charts, as this substantiates its usefulness as a means of technical information, but also on beauty, understood as a means of propaganda. The drawings by Gabriella Boni, Giovanni Cangini and the other authors highlight an aesthetic of the constructive elements, proposing them as the objects of an antiquarian interest”). GIOVANETTI 2000, p. 17.

⁴³ “Un valore severamente etico dell'immagine presagendo in qualche modo alle stesse potenzialità di accelerazione dell'apprendimento caratteristiche della contemporanea multimedialità”. See MOROLLI 2013, pp. 122-123.

⁴⁴ Discussing the importance of form as the limitation of a story, Umberto Eco speaks of the shield of Achilles prepared by Hephaestus and described by Homer in the Iliad. “The large river Oceano surrounds, limits and ends every scene, and separates the shield from the rest of the universe. The shield hosts such a quantity of scenes that, without suppose a work of minute goldsmithery, it is hard to imagine the object in all its entirety of details. More over, the representation does not only concern space, but also time, in that the various events follow one another, as if the shield were a cinema screen or a long, extended comic book. [...] The shield of Achilles is therefore the epiphany of the Form, of the way in which the art manages to construct harmonic representations that establish an order, a hierarchy, and a figure-background relationship between the things represented.” Eco 2009, pp. 11-12.

⁴⁵ See FALCINELLI 2014, p. 219.

⁴⁶ See CAIRO 2013, p. 63.

⁴⁷ See UNGERS 1985, p. 13-45.

⁴⁸ The mechanisms of brain perception have been studied by the school of Gestalt psychology, which was established in Germany at the beginning of the 20th century. The cardinal principle of Gestalt theory is that the brain does not recognise spots of colour and shapes as single entities, but rather as complex forms following precise mechanisms for the organisation of perception (such as *nearness*, which hypothesises that when objects are close together they tend to be perceived as natural groups, *similarity*, according to which identical objects are perceived as belonging to a group, *connection*, *continuity*, according to which principle it is easier to perceive the approximate shape of an object as a coherent totality when its contours are flat and round, rather than when they are angular and hard, and *closure*). See CAIRO 2013.

⁴⁹ The *shade* represents, together with the *brightness* and *saturation*, one of the three main psychological attributes (as they do not concern measurable quantities but correspond to qualitative assessments linked to the appearance of the subjective gaze) through which a color can be defined. In particular, while the *shade* represents a chromatic attribute (determined by the variation of the wavelengths), the *brightness* is a tonal attribute (where it is relative to the quantity of light present) and the *saturation* concerns the fullness, that is the amount of shade perceived in relation to brightness. See FALCINELLI 2017, pp. 417-439.

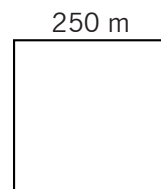
⁵⁰ See paragraph *The city divided into districts*, pp. 38-41 of the present work.

⁵¹ See FALCINELLI 2017, p. 435.

⁵² On the cataloguing of the architectural heritage, see ISTITUTO CENTRALE PER IL CATALOGO E LA DOCUMENTAZIONE 1984; CARBONARA 1990; DOCCI, MAESTRI 2010, pp. 295-321.



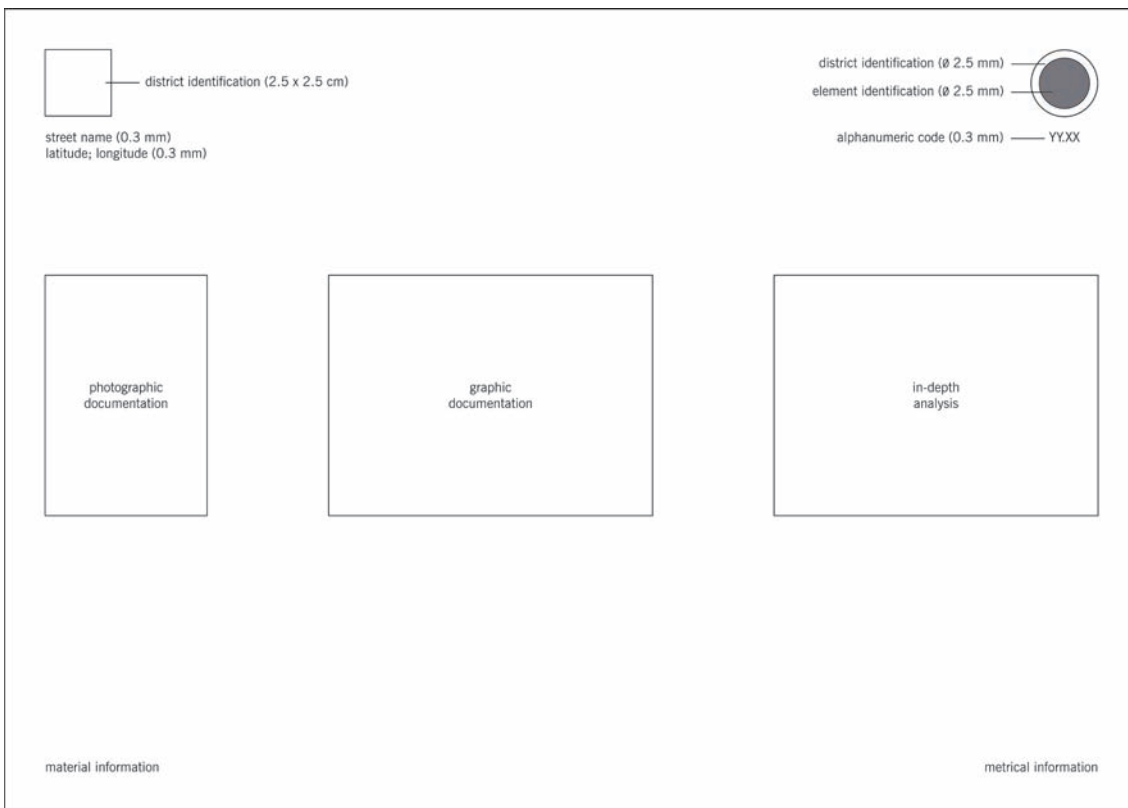
Perugia planimetric representation. The regular grid overlapping.











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Synthesis

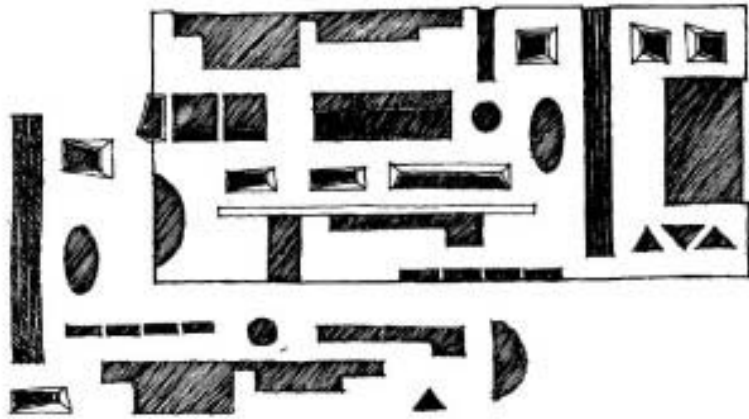
Identification of the occurrences

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“Each window is a word that goes for itself, for what it says, for what it takes; it should not be aligned or proportionate at all. It can take any form: rectangular, square, circular, elliptical, triangular, composite, a free profile. According to the space to be illuminated, it can be a long and narrow cut, wired to the ceiling or to the floor, a cut wired to the wall, a continuous strip at man’s height: what is believed correct after the evaluation of its function, setting by setting. There isn’t a reason to make windows uniform, by mortifying their specificity; once back out of the classicist empire, they will be the more efficient the more different, vehicled of plural messages”¹. (Bruno Zevi, 1973)

Properly by synthesis we mean “every cognitive form in which, starting from a multiplicity of elements, we reach a unitary conclusion”². In this sense, the method adopted in the graphic restitution during the analysis phase has proved to be decisive. In particular, the composition of the summarizing tables, where the elements belonging to homogeneous categories were arranged in an organized way, one next to the other, made possible a synthetic reading deriving from the easy comparison. The approach adopted recalls the table conceived by Jean-Nicolas-Louis Durand³: a catalog of examples of architecture that, de-contextualized by the place and the historical period, open the contents to variations and operational developments. “I thought that, by isolating only those items of mandatory study

and knowledge, I could have brought them together in a single volume; [...] this meant being able to present architects with a general and inexpensive framework of architecture. A framework they could have browsed through in no time, digesting its content unhindered and for good educational gain; above all, this would have been the case if I had classified buildings and monuments according to their genre, if I had combined them according to their degree of analogy, and if I had represented them all on the same scale”⁴. The variety of elements analyzed is collected within a visual list that is simultaneously configured as an analytical and design method. In fact, coexistence necessarily implies a relationship: if on the one hand (list interpreted as an analytical method) the fact of combining elements represented in a homogeneous manner makes possible to read the recurrences and the peculiarities, on the other (list interpreted as design method) the listing leads to the attribution of a new meaning to elements consolidated in the architectural lexicon, allowing innovative combinations⁵. As an example, we can think about the suggestive creations of Agostino Osio in which photographic images of building portions and details, are combined in an ideal order, where the reorganization of the city’s fragments is the result of a deep awareness of his memory and his identity.



At the top: B. Zevi, the list and the assemblage, 1973.
At the bottom: A. Osio, *Spaces-areas*, 2013.

Introductory note

To synthesize the information obtained in the analysis phase, a graphical table dedicated to each element analyzed has been devised. The table is structured in 100 lines (as many as the elements analyzed), grouped into 5 horizontal blocks (corresponding to districts) and a variable number of columns, corresponding to the components characterizing each analyzed element. The graphical result allowed to evaluate the most recurring characters as a first approximation. This starting elaboration, effective from a communicative point of view but limited from the operational point of view, has led to the further development of information using methods of descriptive statistical analysis that allow to summarize the information in mathematical indexes, giving the process more effectiveness and speed. Since the data available are characterized by nominal or qualitative attributes (such as the form, the material, etc.), the first step involved the codification of information. In order to transform qualitative characters into variables (to be compatible with the adopted data management system) a numeric code has been associated with each attribute. In particular, the application was carried out through the SPSS data analysis program (Statistical Package for the Social Science)⁶. For each category of analyzed elements, the data have been inserted into a matrix in which the rows represent the number of detections (equal to 100 in the case under examination) and the columns represent the number of variables detected⁷ (this value is different according to the element analyzed).

The first level of statistical analysis concerned the analysis of the variables frequency⁸ within the sample analyzed, aimed at highlighting how often a given phenomenon manifests itself in the statistical sample surveyed. The procedure has been applied by first considering the historical center as a whole and, subsequently, analyzing the distribution in each district. The output obtained from the program have been developed and graphically reprocessed, guaranteeing a coherent language. In particular, the gray scale was used for the diagrams that give general information about the city, assigning different intensities based on the frequencies found. The relative color code assigned during the analysis phase was used for the diagrams dedicated to the individual districts.

The second level of statistical analysis concerned the analysis of the contingency tables (or cross tabulation) aimed at verifying the existence of a correlation between pairs of nominal variables (bivariate statistics). This evaluation has been carried out considering the sample extended to the entire city. By defining a dependent variable and an independent variable (placed respectively in a row and in a column within a square matrix), the contingency table represents the combined frequencies of the variables. In particular, based on the value assumed by the quadratic contingency index X^2 , the statistical independence or the connection between the two variables can be determined. The index X^2 is :

$$X^2 = \frac{\sum_{i=1}^k \sum_{j=1}^h (n_{ij} - n_{ij}^*)^2}{n_{ij}}$$

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It is based on the comparison between the observed absolute frequencies n_{ij} (contained in the contingency table) and the theoretical frequencies n_{ij}^* , which would be observed in the event of independence and should be calculated.

$$n_{ij}^* = \frac{n_i \cdot n_j}{n}$$

where $i = 1, 2, \dots k$; $j = 1, 2, \dots h$ (k represents the number of rows and h the number of columns).

If $n_{ij} = n_{ij}^*$, there is a statistical independence, otherwise there is connection.

The normalized index C is used to know the connection between the variables.

$$C = \frac{X^2}{n (\min\{h - 1, k - 1\})}$$

It assumes values between 0 and 1 (0 in the case of statistical independence, that is the absence of association between the two variables, and 1 in the case of maximum connection).

The information obtained has been reprocessed and returned into block diagrams, consisting of overlapping rectangles. This graphic solution containing multiple levels of reading. On

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the one hand, the relative frequency of the variable (expressed by the total height of the block), on the other, the degree of combination with the dependent variable (expressed by the number of framed rectangles).

Entrances

In the case of the entrances, 5 variables have been considered corresponding to the type of vane, the type of cornice (considered both in the cases where it is on the same level of facade or is overhanging), the type of fanlight, the type of leaf and the type of access. The data were then inserted into an array of 100 rows by 5 columns. Starting from the results obtained in the analysis phase, each variable can have the following typologies.

Vane

- Round-arched or segmental arch
- Rectangular
- Pointed

Cornice

- Arched
- Rectangular
- Absent

Fanlight

- Arched

- Rectangular
- Absent

Leaf

- Single leaf
- Double simmetrical leaf
- Different leaf

Access

- In plane
- Sloping (including the possibility of a step as a link between the inclined road and the access to the building)
- With stair

The most recurrent elements are the round arch (55% of cases), which corresponds to the shape of the cornice (61% of cases) and of the fanlight (56% of cases). The door is mostly with double symmetrical opening (76% of cases) and access requires the presence of stairs (47% of cases). These results, which emerged from the analysis of the historical center considered as a whole, were compared with those obtained considering the individual districts. If the double symmetrical opening occurs in all the districts, the round-arched vane is a minority in the districts of Porta Sant'Angelo and Porta Santa Susanna, where the rectangular type prevails (with a frequency of 50% and 60%, respectively). It is also interesting to note that the districts of Porta San Pietro and Porta Santa Susanna are the ones that contribute to the high frequency of stair access (reaching respectively 55% and 85%), while the slope access prevails in the remaining 3 districts. This result is however a predictable one taking into account the hilly nature of the city and its sloping conformation as a consequence.

The analysis of the relationship between variables indicates a good degree of dependence between vane-cornice, vane-fanlight, and cornice-fanlight (with contingency coefficients respectively equal to 0.631, 0.563, 0.597). The presence of an architrave set on shelves, detected in the Porta Eburnea district (E.61, E.62, E.67, E.75) and the overhanging cornice characterized by an arch in brick E.34 or in terracotta (E.33, E.46) can be considered as outlier. Furthermore, the survey carried out shows the introduction of shutters to replace the more traditional doors. This presence, although limited to only two cases (E.3, in the district of Porta Sant'Angelo and E.30, in the district of Porta Sole) is nonetheless significant because it indicates the presence of non-domestic use (for example commercial or deposit).

Windows

In the case of windows, 5 variables have been considered corresponding to the type of vane, the type of cornice (considered, similarly to the entrance element, both in the cases where it is on the same level of facade or is overhanging), the grating, the window type and the shutter. The data were then inserted into an array of 100 rows by 5 columns. Starting from the results obtained in the analysis phase, each variable can have the following typologies.

Vane

- Round-arched or segmental arch
- Rectangular with vertical development
- Pointed
- Rectangular with horizontal development
- Squared

Cornice

- Arched
- Rectangular
- Absent

Grating

- Present
- Absent

Leaf

- Single
- Double
- Absent

Shutter

- Present
- Absent

The most recurrent elements are the rectangular vane with vertical development (58% of cases), the presence of the grating (in 66% of cases), the double-leaf window (in 68% of cases) and the absence of shutters (present only in 20% of the cases analyzed). As for the entrances, being empty spaces, the vane and its cornice are what most characterizes these elements. However, the cornice is absent in half of the cases (with a percentage of 47%). In this sense, the ogival vanes (W.63, W.64, W.66, W.71, W.72) constitute an exception. They can be found with a frequency of 7% and they are concentrated in the Porta Eburnea district (where they reach a frequency of 25%, equaling the spread of the round-arched vane in the same district). This particular kind of vane is always admitting the presence of the frame (made with perfectly squared stone blocks on in line with the facade) while it excludes the presence of the shutter.

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The results obtained globally coincide with the recurrences emerged from the analysis of the individual districts, with the exception of the district of Porta San Pietro where the rectangular vane with vertical development, which continues to represent the most widespread case (with a frequency of 45%), is associated with the presence of a cornice (with a frequency of 45%). Although the metric data were not taken into account in the statistical analysis, the graphic representation included in overview table, makes it possible to note a difference in size for the windows located in Porta San Pietro district compared to the substantial homogeneity in the other districts. The result is partly justifiable taking into account the shape of the San Pietro district, which, due to its narrow and elongated course, has large buildings in correspondence of the main streets, leaving little room for the development of a smaller buildings that are widespread in the remaining districts. Considering the combination of variables, in addition to a good degree of dependence between vane and cornice (contingency coefficient equal to 0.662) similar to what is detected by analyzing the inputs, the relationship between grating and shutter appears to be significant. The combination of the two elements, in fact, occurs with a frequency of 3% (W7, W57, W62), suggesting a disjointed use of the two elements presumably linked to a use of the shutter with a protective rather than obscuring function.

Wall textures

The analysis concerned the finishing techniques of the external faces characterizing the aesthetic and architectural aspect of the walls. To this end, 2 variables were identified, corresponding to the type of material used and the type of texture (analyzing the composition of the elements within the building complex).

The data has been inserted into a matrix of 100 rows by 2 columns. Starting from the results obtained in the analysis phase, each variable can have the following typologies.

Material

- Brick
- Stone
- Mixed

Texture

- Regular
- Irregular

The most frequent typologies are the mixed material (in 45% of cases) and the irregular texture (in 55% of cases) with a mutual dependence expressed by the value of the contingency

coefficient equal to 0.501. In particular, the irregularity of the texture is linked to the use of mixed material while, in cases where the material used is exclusively stone (in 38% of cases) or brick (in 17% of cases), the texture results regular (in 68% and 76% of cases respectively). In fact, the type of material used, as well as the processing of the individual components, affect the texture. Taking into account the cases in which the texture consists of travertine blocks perfectly squared off with sharp corners (WT.20, WT.21, WT.51, WT.90), they are arranged on perfectly horizontal rows, guaranteeing an absolute regularity of the texture. The data obtained globally do not find similar results in the districts of Porta Sole and Porta Eburnea. In both these cases, in fact, the prevailing material is the stone (with a frequency of 40% and 55% respectively) and the regular texture (with a frequency of 50% and 60% respectively).

In the case of combined use of stone and brick, the latter is used as a topping (WT.8, WT.9) or as a infill material for previous openings (WT.7, WT.19, WT.74): in these cases, the contact line between different materials makes the transformations to which the building has been subject to over time readable.

It is opportune to specify how the term stone, includes the following specific meanings: the sandstones (Serena stone), limestone (such as travertine, with some particular varieties, as in the case of pietra rosa di Assisi used for example in the case WT.52, in which pink and white calcareous stones are alternated) and volcanic stones (such as tuff).

External floorings

In the case of external flooring, the analysis was limited to the paving solutions, identifying 3 significant variables, corresponding to the type of material, the type of texture and the slope of the ground where the flooring is applied. The information was then inserted into an array of 100 rows by 3 columns. Starting from the results obtained in the analysis phase, each variable can have the following typologies.

Material

- Brick
- Stone
- Cobbles
- Mixed
- Concrete

Tessitura

- Regular
- Irregular

Slope

- In plane
- Sloping
- With stairs

The most recurrent material is the stone (55% of cases), which goes alongside the type of regular covering (in 80% of cases) and the sloping ground (54% of cases). Unlike what happens in the case of the wall texture, external floorings are regular even in cases where the material is mixed. This result is justifiable considering that the use of different materials is functional to an overall design and therefore presumably oriented by a planning intention.

In the cases dedicated to the covering of the steps (both of stairs and sidewalks), the most frequently adopted solution involves the realization of the riser through the use of blocks in stone (in particular in travertine) laid down in the cut, while the tread is constituted from sandstone (EF.23) or brick elements (EF.13, EF.29, EF.31, EF.44, EF.45, EF.71, EF.88, EF.98).

During the research activity it was possible to view the results of the photographic survey activity of the external floors of the historical center of Perugia, conducted by the Municipality of Perugia in the nineties⁹. The identified categories, grouped into 7 types, are consistent with those still present¹⁰. The analysis of the materials reveals a substantial diffusion of the sandstone which guarantees a homogeneous appearance to the road system of the city center. In particular the sandstone ashlar, treated on the surface with the technique of mechanical sanding and taped at the edges, due to the low abrasion resistance that characterizes the material, are used in correspondence with the pedestrian sections. In particular, they characterize the road sections of Corso Vannucci, Corso Garibaldi and Via Ulisse Rocchi (EF.5 and EF.20, with rows arrangement) in the district of Porta Sant'Angelo; Piazza Piccinino, Via Bontempi and Via della Viola (EF.21, EF.22 and EF.28, with rows arrangement) in the Porta Sole district; the sidewalks along Corso Cavour and Borgo XX Giugno (EF.47 and EF.50) in the district of Porta San Pietro; Via Caporali and Via Mariotti (EF.63 and EF.67, with a herringbone pattern and rows at the lateral loglines) in the Porta Eburnea district; Via dei Priori (EF.93, with a herringbone pattern) in the Porta Santa Susanna district. The stretches of Piazza Matteotti and Via Baglioni (EF.59) are characterized by porphyry cubes arranged in circular arches, for the driveway, and the combination of sandstone arranged in rows and travertine for the sidewalks (similar to what was found for the sidewalks along Corso Cavour and Borgo XX Giugno). The pedestrian stretches of Via Oberdan and Via Floramonti are characterized by the integration between brick and sandstone. This paving dates back to an intervention conducted by the Municipality of Perugia in the years 1992-1993¹¹. In particular, the bricks cover the entire road surface with a herringbone pattern interrupted in the middle by sandstone slabs for the water collection. Finally, in correspondence with the monumental buildings (with particular reference to the churches) there is the presence of bricks paving that identify the entrance. This is the case, for example, of Piazza Lupattelli, in front of the church of Sant'Agostino, in the district of Porta Sant'Angelo (EF.9); of Piazza Raffaello, in correspondence of San Severo chapel, in the district of Porta Sole (EF.32); of a

stretch of Corso Cavour, near the Auditorium Marianum, in the district of Porta San Pietro (EF.53); a stretch of Piazza Mariotti, near the Annunciation oratory, in the Porta Eburnea district (EF.68); of Via Sant'Agata, in front of the church of the same name, in the district of Porta Santa Susanna (EF.86).

Manhole covers

In the case of manhole covers, 4 variables were considered, corresponding to the type of vane, the type of closing, the type of material and the type of flooring in which the element is inserted (with reference to the material characterization). The data were then inserted into an array of 100 rows by 4 columns. Starting from the results obtained in the analysis phase, each variable can have the following typologies.

Vane

- Circular
- Squared
- Rectangular
- Oval

Tamponatura

- Full
- Pierced

Material

- Metal

- Stone
- Same as flooring

Flooring

- Stone
- Brick
- Cobbles
- Concrete

The most recurrent type of vane is squared (70% of cases), characterized by a full infill (68% of cases), realized in metal (92% of cases) and included in a stone paving (54% of cases). The results obtained globally are confirmed by the analysis of the individual districts.

It should be noted that the predominant use of metal, especially cast iron, is conditioned by recent regulatory requirements¹², while the use of stone (limited to 6% of the cases analyzed) denounces a more ancient origin of the element.

The relationship between the vane and closing variables highlights the absence of a pierced surface in the presence of an oval vane. This form, in fact, indicates the presence of an underground hydrant (present in some cases also in the circular version characterized by diameters considerably smaller than the average - about 15 cm compared to an average of 60 cm in diameter) while the holes in the surface work as drains. The latter, included in stone and brick floorings, are located in any case in the impluvium areas (or in the lower-level steps in the case of placement along the stairs).

The above considerations highlight the strict dependence between functional objectives and their aesthetic outcomes. The relief motifs that characterize the surface, for example, have an anti-slip function and very often include information related to the company executor, the type of function (aqueduct, sewage, power line or telephone, etc.) and the regulatory criteria adopted during realization¹³.

In this sense, the element identified by the code MC.61 represents an exception. Located in the Porta Eburnea district, in an area covered with a portico, and therefore not exposed to rain, it has a smooth and uniform surface with an exceptional decorative character, more linked to a role of urban decoration than to its mere function. Also in the Porta Eburnea district, a further exception is represented by the SC.88 manhole cover, in which the functional aspect orientates the realization in an original way: in this case, in fact, the cover has a metal hinge, introduced as a device for rotation for the purpose of opening and inspection.

In 1992 (together with the repainting works of Via Floramonti and Via Oberdan), the Perugia manhole was created, starting from the reinterpretation of the above examples. Designed to punctuate the sandstone impluvium, it has a geometric composition that allows to identify a subdivision into four concentric areas of which the last shows in relief information relating to the date and the company executor (Foundry La Porziuncola, Santa Maria degli Angeli-Perugia)¹⁴.

Finally, with the aim of not interrupting the overall design, there are particular cases in

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which the material solution adopted for the external flooring is extended to the surface of the manhole cover. This occurs in Via Floramonti, in the areas treated in bricks (MC.42) and in Via San Giacomo, in the presence of sandstone cladding (MC.79).

notes

¹ “Ogni finestra è una parola che va per sé, per quel che dice, per quanto serve; non va affatto allineata, né proporzionata. Può assumere qualsiasi forma: rettangolare, quadrata, circolare, ellittica, triangolare, composita, a profilo libero. Rispetto alla stanza che deve illuminare, può essere a un’asola lunga e stretta, a filo di soffitto o di pavimento, un taglio a filo di una parete, un nastro continuo ad altezza d’uomo: ciò che si vuole o si ritiene giusto dopo aver calcolato, ambiente per ambiente, la sua funzione. Non c’è motivo di uniformare le finestre, mortificando la loro specificità; una volta sottratte all’impero classicista, saranno più efficaci quanto più diverse, veicoli di messaggi plurimi”. See ZEVİ 1973, p. 14.

² See DEVOTO-OLI 2014, word *Sintesi*.

³ In particular the reference is to *Précis de leçons d’architecture données à l’École Polytechnique*, Paris 1802.

⁴ “Ho pensato che, isolando i soli oggetti da conoscere necessariamente, io avrei potuto raccogliarli in un unico volume; [...] ciò significava poter presentare agli architetti un quadro generale e poco costoso dell’architettura. Un quadro che essi avrebbero potuto scorrere in poco tempo, analizzare senza fatica, studiare con profitto; soprattutto questo si sarebbe realizzato se io avessi classificato gli edifici e i monumenti in base al loro genere, se li avessi accostati in funzione del loro grado di analogia, se inoltre li avessi rappresentati tutti alla medesima scala”. Text cited in PANERAI 2015, p. 168.

⁵ See ZEVİ 1973, p. 14.

⁶ This method is usually used in particular scientific sectors, like natural sciences, medical, psychological and social sciences, or in archeology with the aim to highlight the similarities between variables so to determinate the cultural origin of objects.

⁷ A statistical variable is defined as the set of manifestations (subsequently defined as modalities) of a detectable character on the statistical units.

⁸ *Absolute frequency* means the total number of cases in which a given variable or a modality of it occurs in the totality of the detection units. The *relative frequency*, instead, expressed as a percentage, is given by the ratio between the absolute frequency and the total number of cases taken into consideration. See MOSCATI 1987, p. 61.

⁹ Municipality of Perugia city, Department of Regional Planning, Equipment Distribution, Public Building Section, External Paving of the Historic Center of Perugia, Photographic documentation, November 1990.

¹⁰ In particular was observed the presence of brick and arenaria stone floorings and in brick and calcareous stone floorings; brick and travertine floorings; arenaria and calcareous stone floorings; cobblestone floorings; calcareous stone floorings; arenaria stone floorings; brick floorings.

¹¹ See MOSCONI 1994.

¹² The reference standard is the UNI EN 124: 1995 “Dispositivi di coronamento e di chiusura per zone di circolazione utilizzate da pedoni e da veicoli. Principi di costruzione, prove di tipo, marcatura, controllo qualità” (“Crowning and closing devices for traffic areas used by pedestrians and vehicles. Principles of construction, type tests, marking, quality control”) that introduces the materials to be used (cast iron, steel and reinforced concrete).

¹³ In this sense let's think about the *Sfera* manhole cover, a project designed by Giulio Iacchetti and Matteo Ragni and produced by Montini company that is one of the winners of the *XXIII Compasso d'Oro ADI* (2014) “because the expressive and ironic way of reinterpretation of a functional urban element”. Or again, let's think about *Raubdruckerin*, an experimental printmaking project launched in Berlin which reinterprets the geometries of urban works (like manhole covers, grids, technical objects and other surfaces of the urban landscape) to create graphic patterns.

¹⁴ For further information related to the compositive aspects, please refer to the dedicated sheet in *Appendix*.

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Final remarks

Results achieved

Starting from the reasons expressed in the introductory chapter, aimed at evaluating the importance assumed by the ordinary architectural heritage in defining the figurative and identifying character of the city, the research presented concerned the analysis of simple elements, with direct application to the architectural reality and urban of the historic city of Perugia. In fact, if on the one hand the value attributed to monumental buildings appears undisputed, for which the procedures for intervention are known, the value attributed to the buildings belonging to the ordinary fabric and, consequently, to the modalities of intervention dedicated to them often faced in an isolated and discontinuous manner. However, the repetition of widespread elements within the city strongly contributes to determining its figurative and identity character. For the purposes of an integrated vision between the elements and the urban fabric, the study was dealt with at a settlement level rather than at the level of the single object, thus identifying a systemic vision within which to place future project actions. The research, driven by the objective of deciphering the city's genetic code, has investigated its identity. This concept, elusive if considered in its entirety, has found a concrete interpretation linked to the analysis of simple elements as objective expressions of architectural and urban culture. In this sense, the initial phase of the research it is focused on the study of existing applications of similar approaches, with particular reference to the urban centers of Italy and Umbria. Based on this scientifically found background, the thesis

has uniformed and developed the existing approaches to lead to the coding of a scientifically sound operating method.

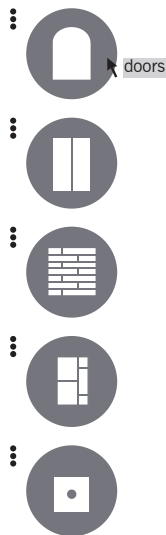
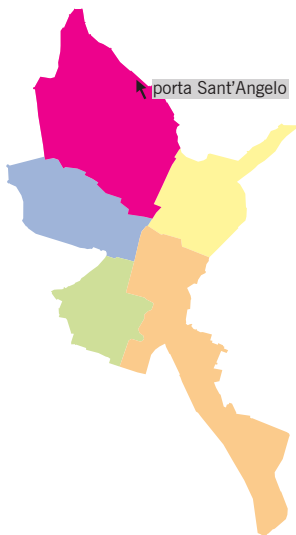
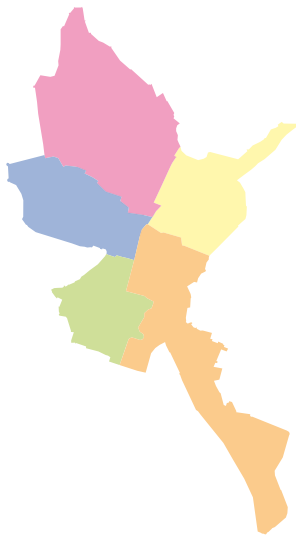
The proposed methodology, based on the tools of architectural survey and drawing, provides in the synthesis stage the contamination with descriptive statistical type analysis, proposing a synergistic reading unpublished in the perspective of an open comparison with other disciplinary sectors. The analytical investigation has allowed the identification of some recurring characters that contribute to the definition of the complexity of the city and to its formal recognizability. Traditionally used in the architectural survey to attribute the paternity of an uncertain work, this approach is extended to the city and oriented to determine the belonging of the elements to the urban context of Perugia. Although some of the features found are more common in some districts, each of them holds the overall variety of the city, offering a unitary image that distinguishes the public spaces of the city, in the face of the contemporary tendency to exacerbate the differences by enhancing the fragmentation of the city. The variety that emerges from the analysis returns a vital and dynamic whole, but at the same time extremely coherent, where the elements, differently localized, declare a common sense of belonging to the city. The uniform character, in fact, should not be understood as "unit" (this would not be possible considering the genesis of the historical city which is the result of interventions stratified over time) but rather a system formed and composed of several connected parts according to precise structuring. In this sense, the cataloguing and ordering of information serve to the transmission of knowledge, with the specific aim of promoting a reflection on the existing city and supporting its aware renewal. Far from any reproduction or imitation process, the architectural survey offered the possibility to realize a process based on a global framework of relationships. The operative methodology that has been developed represents a general and systematic procedure that is open to future research integration. Although with the limits linked to the historical and environmental characteristics of the considered context that have inevitably conditioned the analyzes carried out (in terms of the amplitude of the involved context, of the intervention scale, of the quality and the number of objects detected) the method, appropriately reformulated and declined on the basis of specific singularities, it can be applied to different territorial contexts, including urban suburbs, whose complexity, often apparently interpreted as chaotic and fragmented, if deciphered through the investigation of its elementary parts can detect the presence of figurative characters (consolidated or in progress) whose knowledge is decisive to avoid project responses that, regulated by a uniform architect alphabet, are likely to lead to the conformism of urban images.

Outlooks

Many the aspects remain to be investigated, starting from an extension of the survey campaign by increasing the number of the elements analyzed. Moreover, while the acquisition and representation of the data detected, albeit evolving, belongs to codified and consolidated methodologies, it is evident that, within the different phases of the knowledge process connected to the preservation and valorization of the historical built heritage, the problem of the organizing and managing the knowledge represent the crucial methodological and conceptual aspect to be further investigated. In this sense, the homogeneity of the data and the conventions adopted suggests the development of a digital information system as a natural continuation of the research. In this respect, the information concerning the elements detected could find an organization accomplished according to a congruous logical criterion, which moves from representation to fruition of knowledge, in which the collected data are comparable. Leaving out the specific problems that may emerge in the implementation phase, a hierarchical structure of information and a hypothesis of graphic layout are proposed.

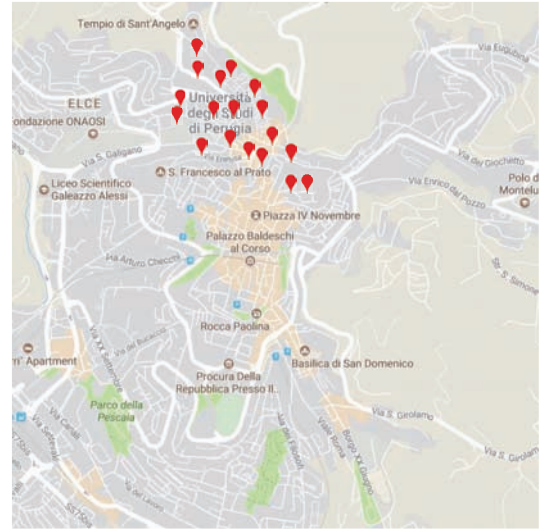
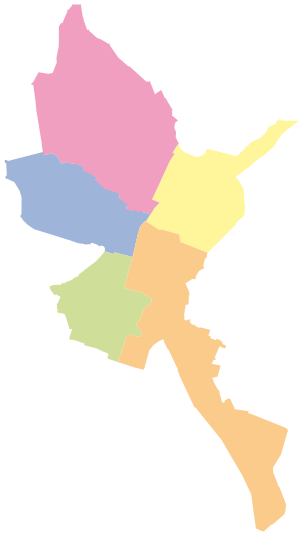
The hypothesized system foresees the presence of an initial screen in which homogeneous information (the districts and the simple elements) are grouped in specific areas. In particular, the screen can be divided into 3 areas: a first dedicated to the selection of the district, a second dedicated to the selection of the category to be investigated and finally, as a result of the previous choices, a third dedicated to the visualization of the distribution of the elements

on a map. These are identified by means of icons conceived as connecting buttons through which to access the technical data sheets in which the graphic, photographic and statistical information is collected, the result of direct architectural survey activity and of the synthesis phase. The system, so designed, offers values such as updatability and implementation of information. By defining suitable itineraries of knowledge and levels of fruition differentiated also on the basis of specific authorization procedures, it may be intended for different users and for different purposes; from the citizens, driven by simple curiosity, to tourists, proposing unpublished urban itineraries; from the technicians, offering insights useful for the development of specific skills, to administrators, offering information to support management and urban planning. In fact, if the current conditions in the design field see the diffusion of highly personalized but poorly connected architectonic objects, declaring the absence of a shared approach, the goal of working in respect of the urban identity needs to propose answers that are aware of acting within the logic of a process. At every level.

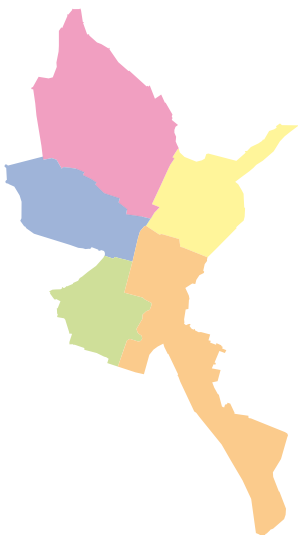


Digital information system, graphic hypothesis.
At the top: homepage.
At the bottom: the selection of the districts and element's category.

Perugia
in
particular ●



94



Digital information system, graphic hypothesis.
At the top: individuation of the elements according to the previous selection.
At the bottom: access to the catalogue sheet.

Perugia
in
particular ●

Appendix

Perugia
in
particular ●

Graphics

Introductory note

The documents presented below contain the graphic outcomes of the analysis and synthesis activities previously exposed. Taking into account each of the 5 categories of elements analyzed, the order of presentation follows the methodology adopted. In particular, if the instruments used for direct architectural survey and drawing were adopted during the analysis phase, these tools were integrated into those of the statistical analysis in the synthesis phase.

Analysys

Step 1. Location

This phase was dedicated to 100 elements for each of the 5 categories analyzed, uniformly distributed in the number of 20 for each district.

Step 2. Photographic documentation

This phase was dedicated to 100 elements for each of the 5 categories analyzed, uniformly distributed in the number of 20 for each district.

Step 3. Architectural survey activity and graphical restitution

This phase, aiming the realization of the catalogue sheets, was dedicated to 25 elements for each of the 5 categories analyzed, uniformly distributed in the number of 5 for each district.

Synthesis

Step 4. Overview table

In this phase the 25 elements analyzed through the architectural survey are represented side by side adopting a homogeneous graphic convention. This comparative reading allows the evaluation of recurrent characters.

Step 5. Synthesis graphs

Composed of a constant number of rows (equal to 100 and corresponding to the number of elements analyzed for each category) and a changing number of columns by virtue of the typological variety found in the previous phases.

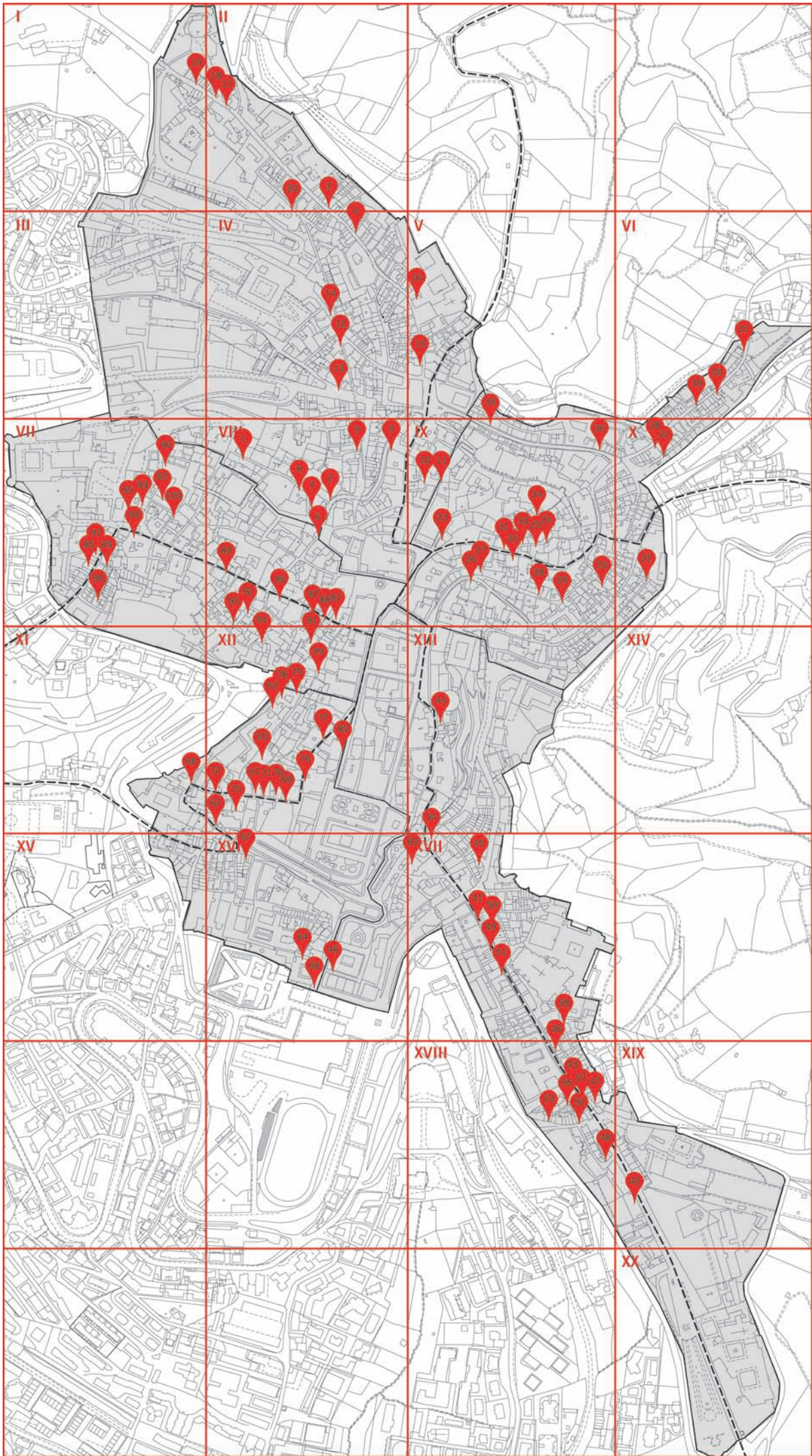
Step 6. Statistical reading

This phase includes the creation of 3 types of graphs.

- Pie charts, characterized by the gray scale, to underline the frequencies with which the most recurring characters are distributed in the historic city;
- Pie charts, to underline the frequencies with which the most recurring characters are distributed in each district. To this end, the graph has been divided into 5 parts, corresponding to the wards, identified thanks to the action of the relevant color code;
- Bar charts, outcome of the cross tabulation, to underline the correlation between pairs of nominal variables. Tale aspetto viene valutato tenendo conto dei risultati ottenuti dall'analisi della città nel suo complesso.

Entrances

Step 1



Step 2



E.1
Via del Verzaro



E.2
Via Baldeschi



E.3
Corso Garibaldi



E.4
Via del Verzaro



E.5
Via Lucida



E.6
Piazza Cavallotti



E.7
Via del Verzaro



E.8
Via del Verzaro



E.9
Via Appia



E.10
Piazza Alfani



E.11
Via Bartolo



E.12
Via Acquedotto



E.13
Via Santa Elisabetta



E.14
Via Fabretti



E.15
Corso Garibaldi



E.16
Corso Garibaldi



E.17
Corso Garibaldi



E.18
Via del Tempio



E.19
Corso Garibaldi



E.20
Via Benedetta



E.21
Corso Bersaglieri



E.22
Via delle Prome



E.23
Via Raffaello



E.24
Via S. Giovanni del Fosso



E.25
Via Volte della Pace



E.26
Corso Bersaglieri



E.27
Corso Bersaglieri



E.28
Via Alessi



E.29
Via dei Cartolari



E.30
Via dei Cartolari



E.31
Via della Viola



E.32
Via Bontempi



E.33
Via Bontempi



E.34
Via Abruzzo



E.35
Piazza Raffaello



E.36
Via Aquila



E.37
Via Pinturicchio



E.38
Via Pinturicchio



E.39
Via del Pasticcio



E.40
Corso Bersaglieri



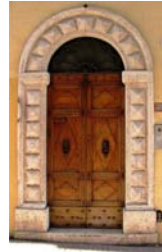
E.41
Corso Cavour



E.42
Borgo XX Giugno



E.43
Corso Cavour



E.44
Via Oberdan



E.45
Via XIV Settembre



E.46
Via Fanti



E.47
Corso Cavour



E.48
Corso Cavour



E.49
Corso Cavour



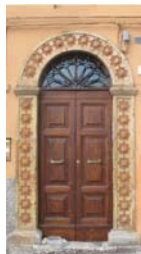
E.50
Corso Cavour



E.51
Corso Cavour



E.52
Via Sant'Anna



E.53
Via Sant'Anna



E.54
Via Sant'Ercolano



E.55
Via del Grillo



E.56
Via del Conventuccio



E.57
Corso Cavour



E.58
Via Laberinto



E.59
Via dei Ghezzi



E.60
Viale Indipendenza



E.61
Via Caporali



E.62
Via della Cupa



E.63
Via Mariotti



E.64
Via del Parione



E.65
Piazza della Sapienza



E.66
Via Masi



E.67
Via Fatebenefratelli



E.68
Via Mariotti



E.69
Via Caporali



E.70
Via Caporali



E.71
Via Caporali



E.72
Via Caporali



E.73
Via San Giacomo



E.74
Via Menicucci



E.75
Via Bruschi



E.76
Via Bonazzi



E.77
Via Bonazzi



E.78
Via della Cupa



E.79
Via della Cupa



E.80
Corso Vannucci



E.81
Via dei Priori



E.82
Via del Poggio



E.83
Via del Poggio



E.84
Via della Sposa



E.85
Via della Sposa



E.86
Via dei Priori



E.87
Via dei Priori



E.88
Via dei Priori



E.89
Via dei Priori



E.90
Via dei Priori



E.91
Via Sant'Agata



E.92
Via Deliziosa



E.93
Via Deliziosa



E.94
Via del Silenzio



E.95
Via San Francesco



E.96
Via del Poggio



E.97
Via della Sposa



E.98
Via Nebbiosa



E.99
Via della Luna



E.100
Via degli Sciri

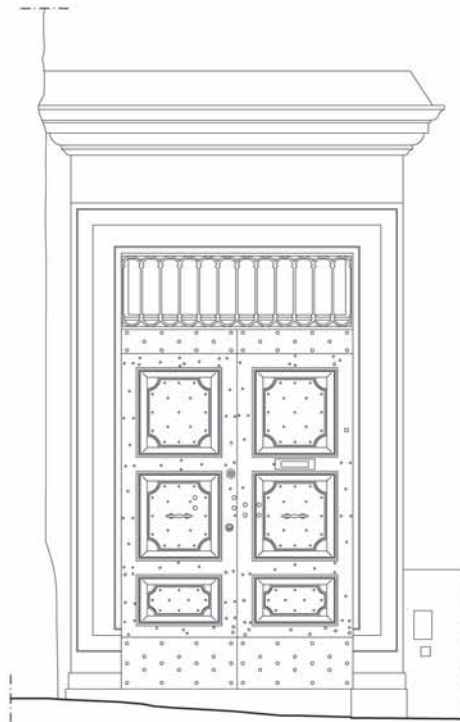
Step 3



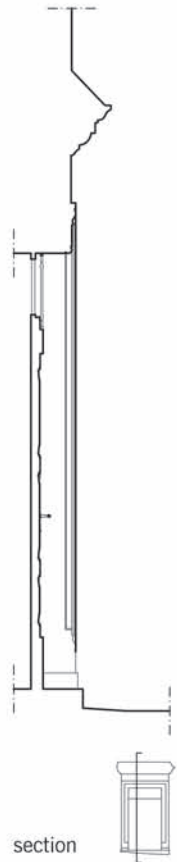
via dei Baldeschi
43.11326; 12.389057



photographic documentation



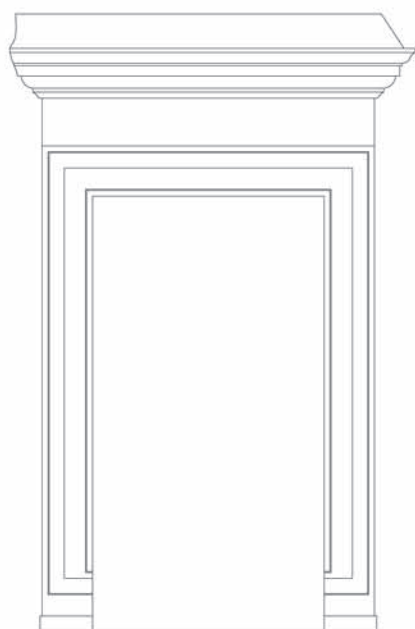
front view



section



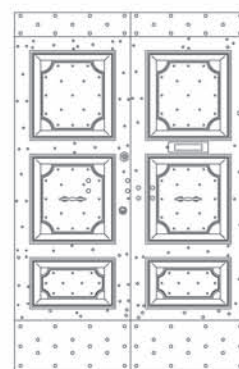
E.2



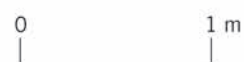
cornice



fanlight



door

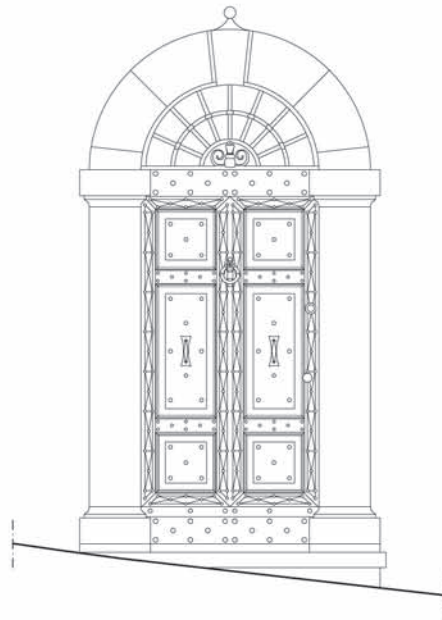




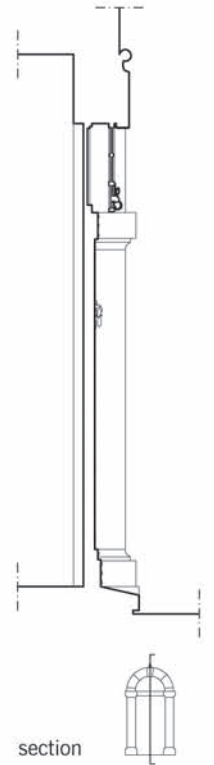
via Raffaello
43.11326; 12.389057



photographic documentation



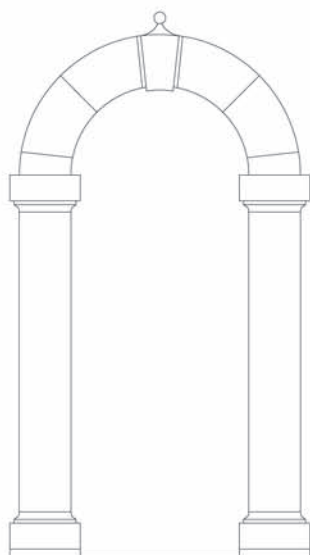
front view



section



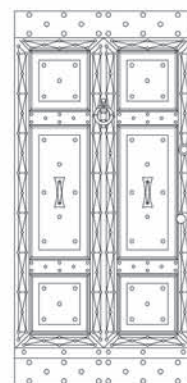
E.23



cornice



fanlight



door





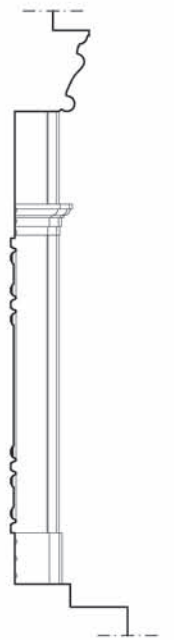
via XIV Settembre
43.11326; 12.389057



photographic documentation



front view

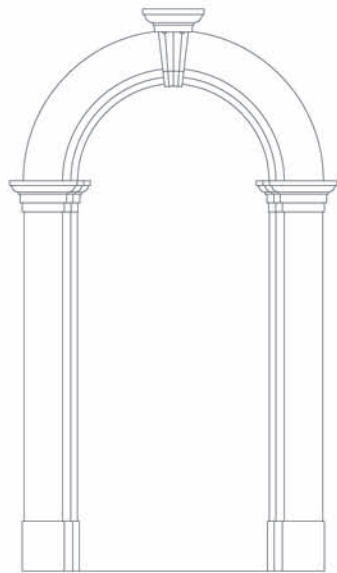


section





E.45



cornice



fanlight



door

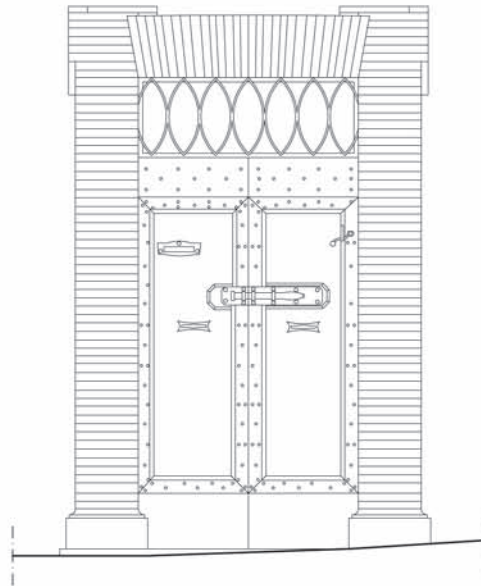




via del Parione
43.24326; 12.419057



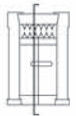
photographic documentation



front view

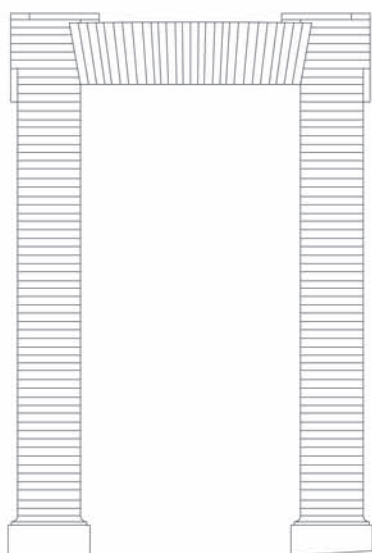


section

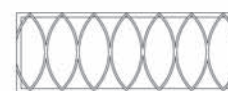




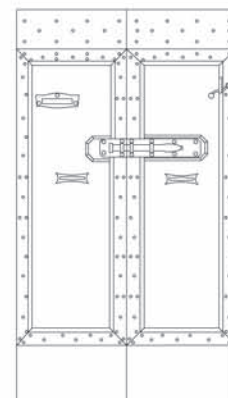
E.64



cornice



fanlight



door

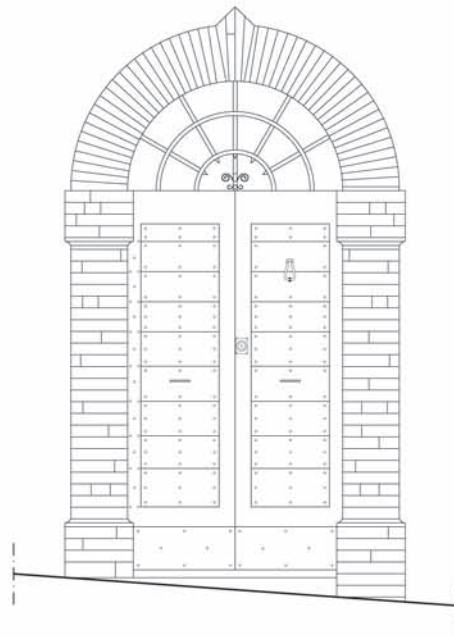




via del Poggio
41.11006; 12.109057



photographic documentation



front view

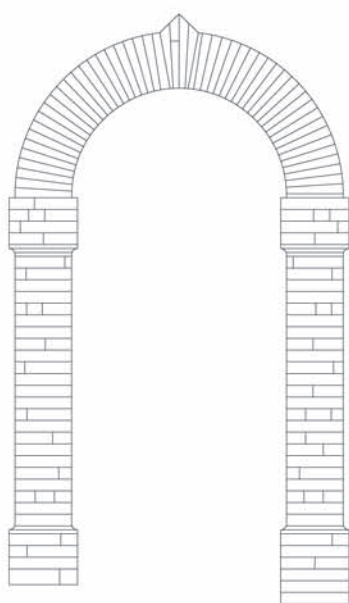


section





E.82



cornice



fanlight



door



Step 4



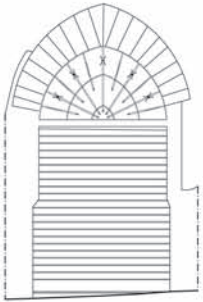
E.5



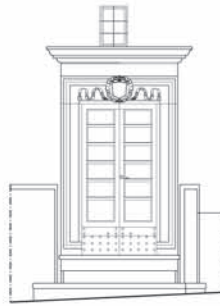
E.23



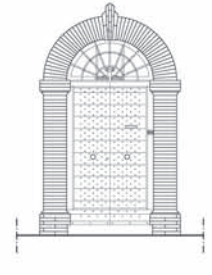
E.45



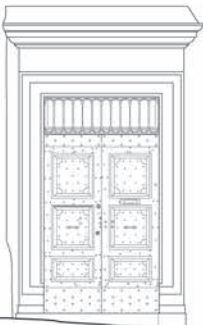
E.3



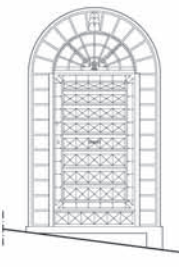
E.24



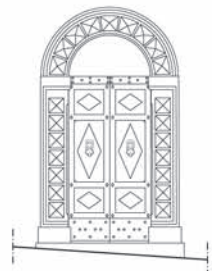
E.43



E.2



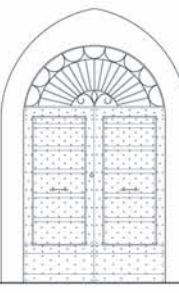
E.25



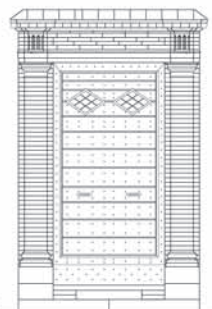
E.44



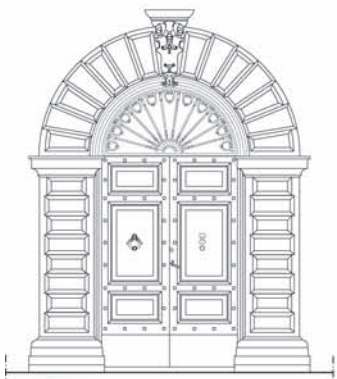
E.4



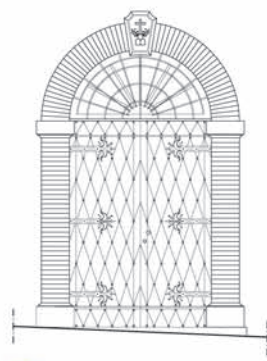
E.22



E.42



E.1



E.21



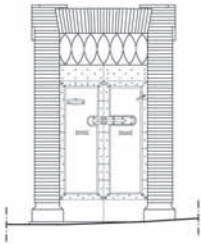
E.41



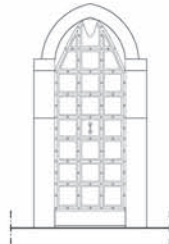
E.62



E.85



E.64



E.83



E.65



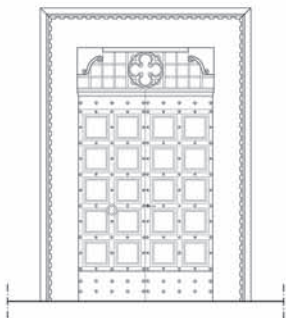
E.81



E.63



E.82



E.61



E.84

0 1 m

Step 5



recurring characters



round arched vane



round arched cornice



round arched fanlight

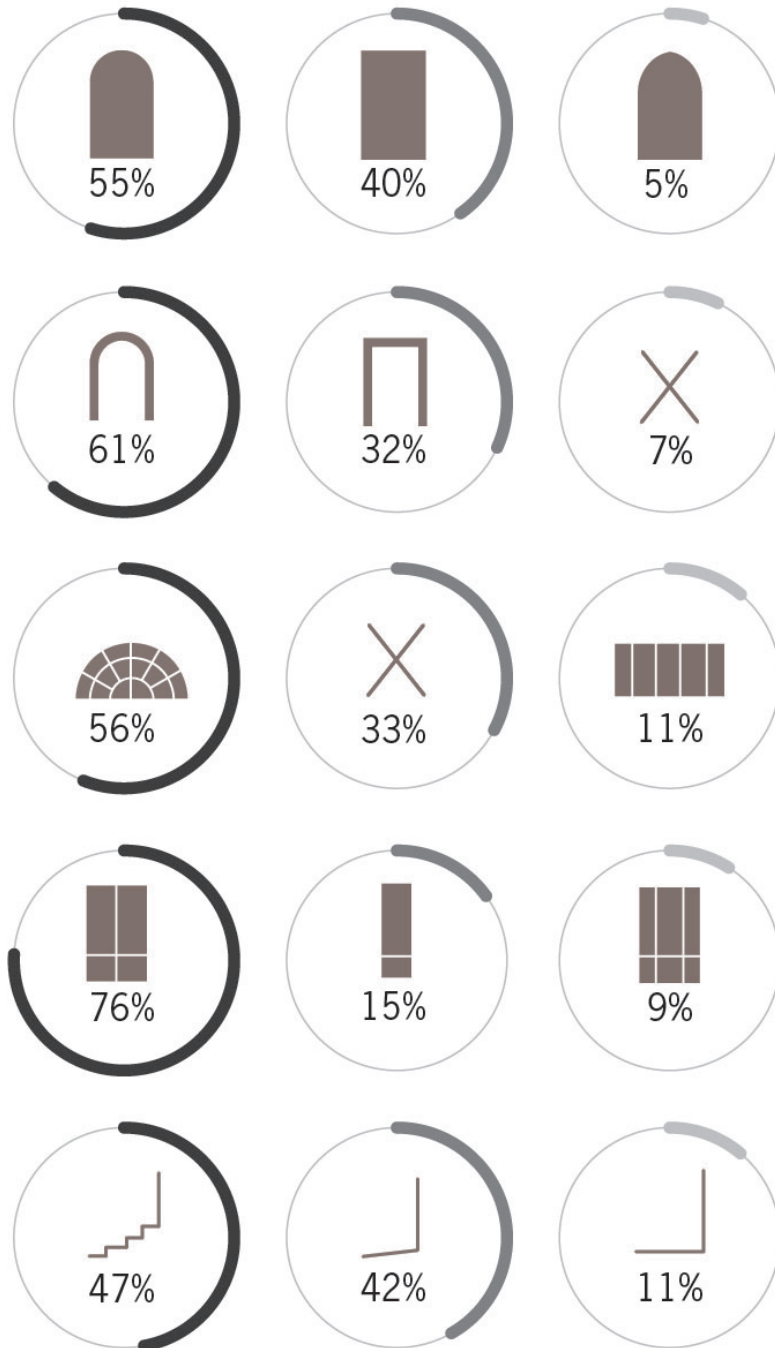


double-leaf door

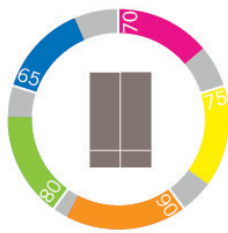
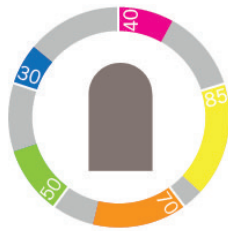


access with stairs

Step 6

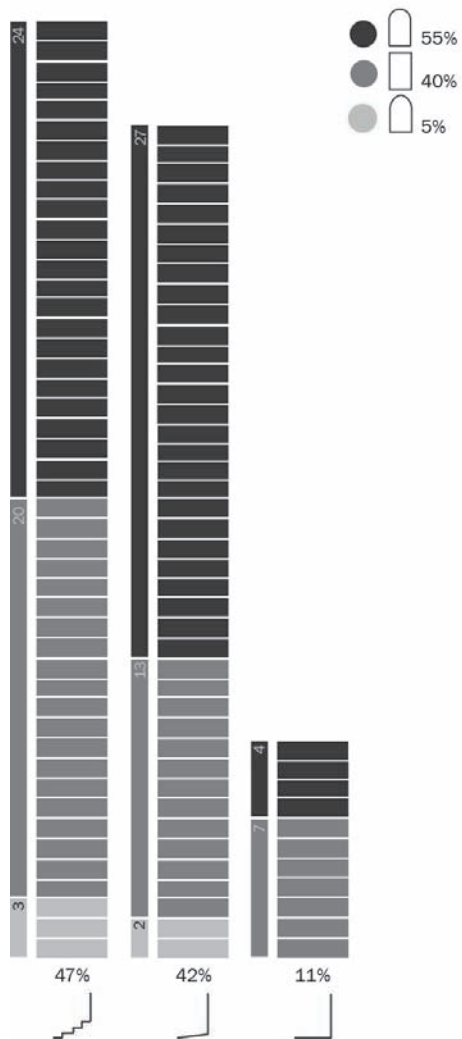


The distribution of the most common characters in the historic city.

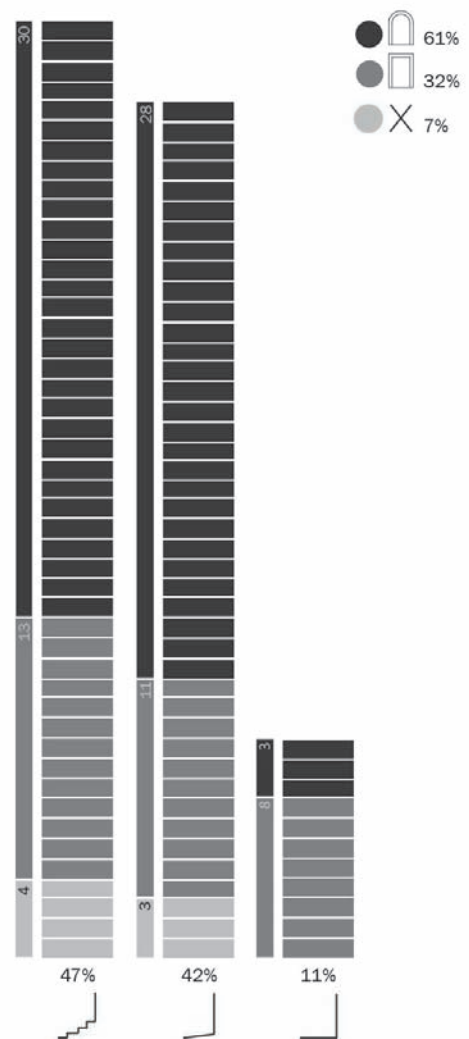


The distribution of the most common characters in each district.

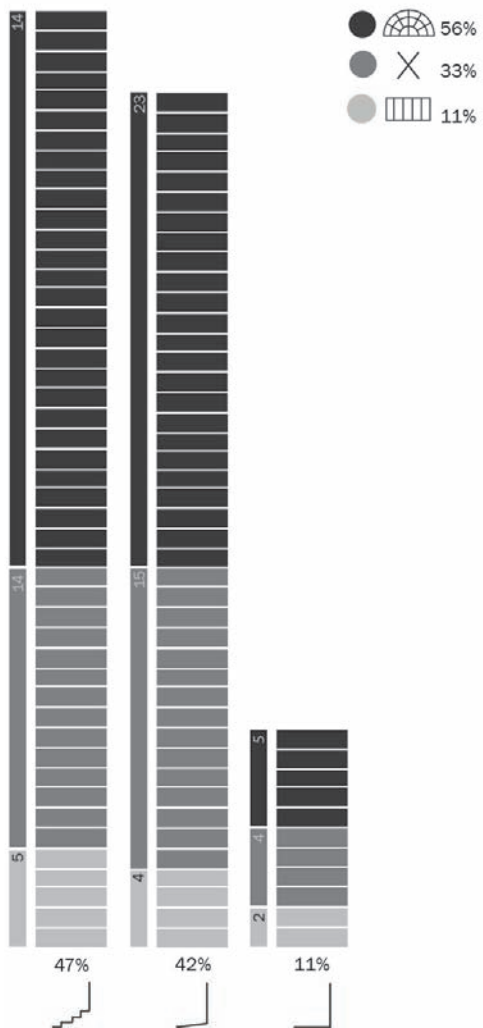
Access-vane
C=0.212



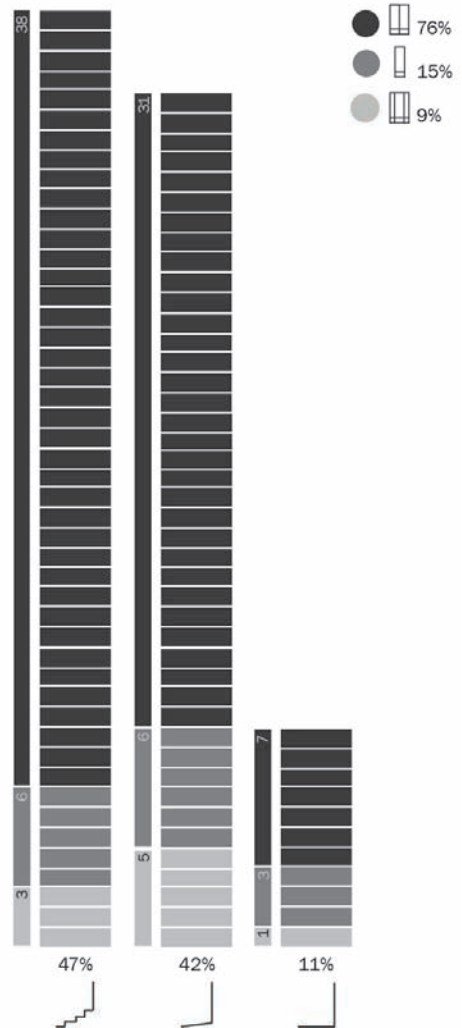
Access-cornice
C=0.297



Access-fanlight
C=0.110

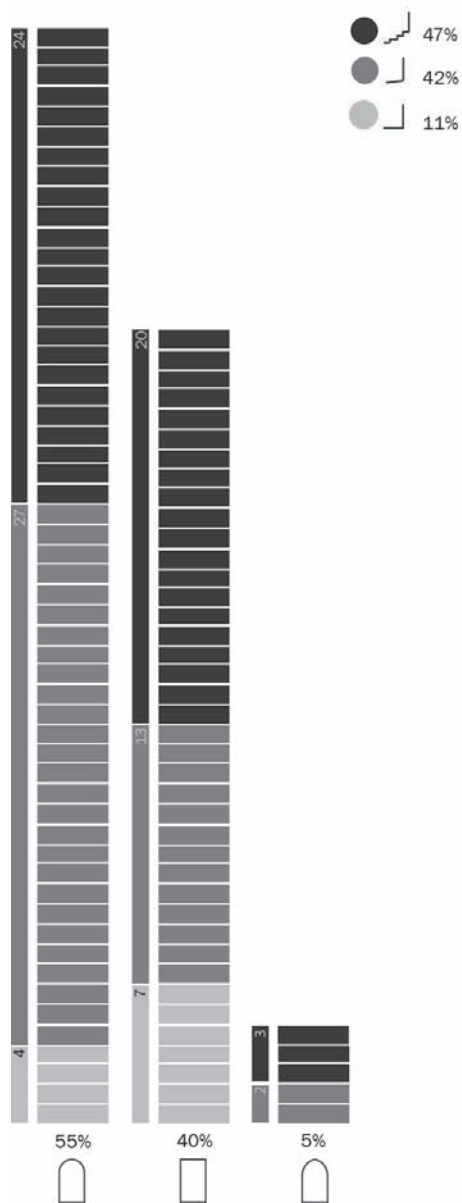


Access-leaf
C=0.154



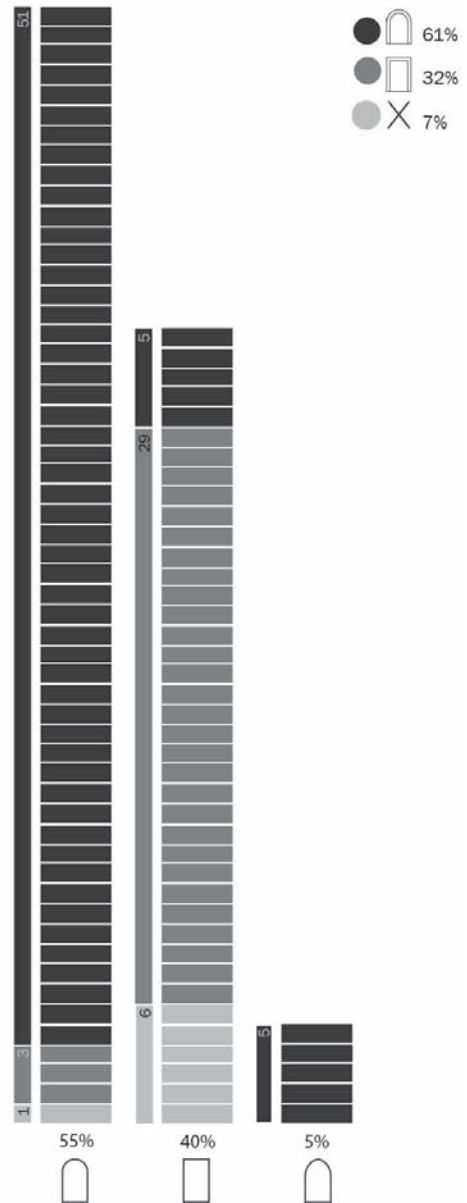
Vane-access

C=0.212



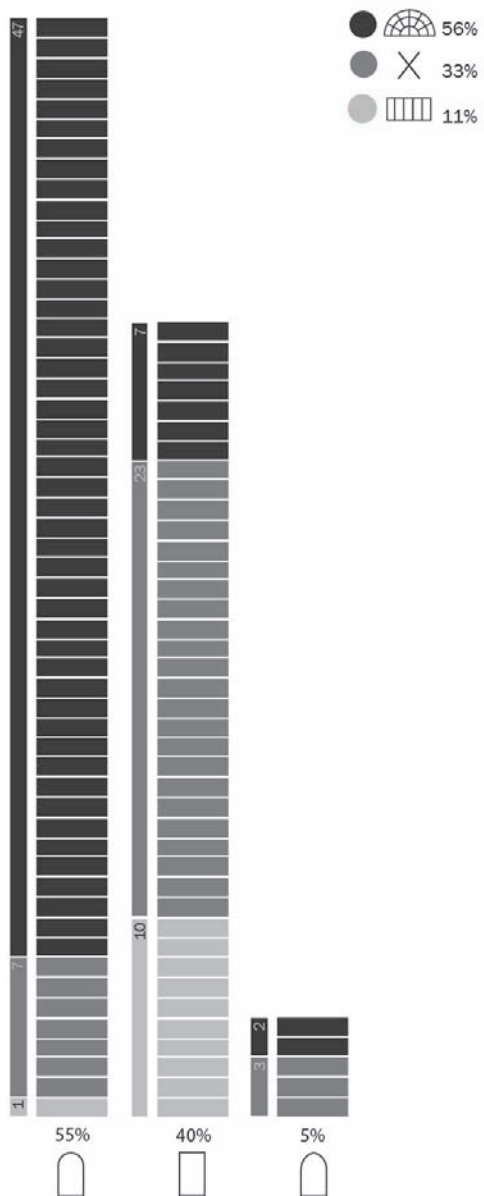
Vane-cornice

C=0.631



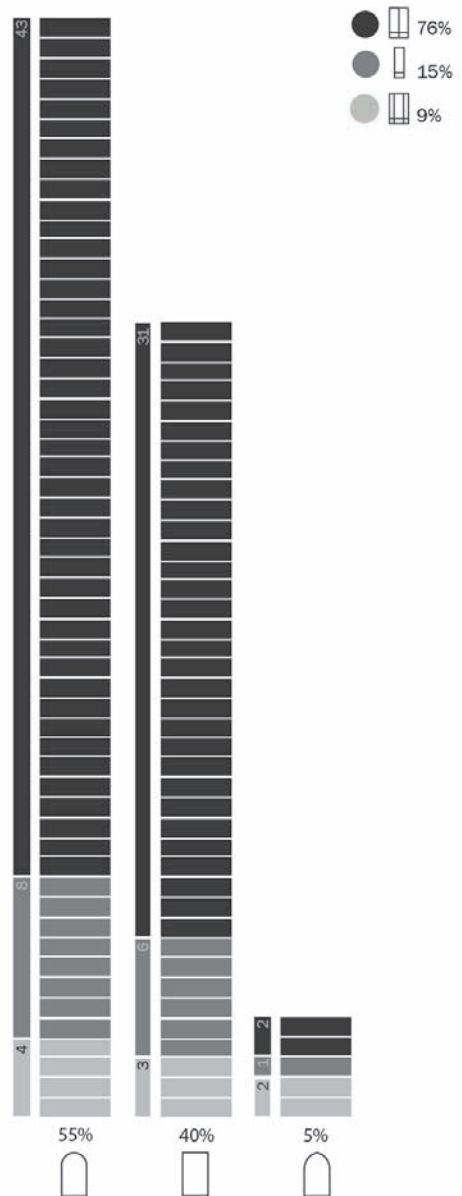
Vane-fanlight

C=0.563

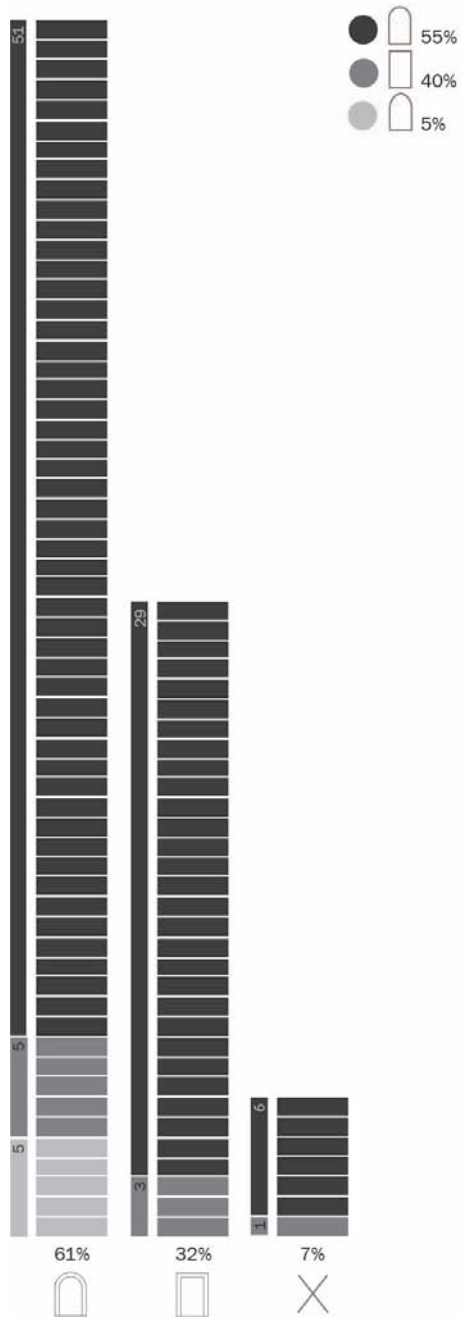


Vane-leaf

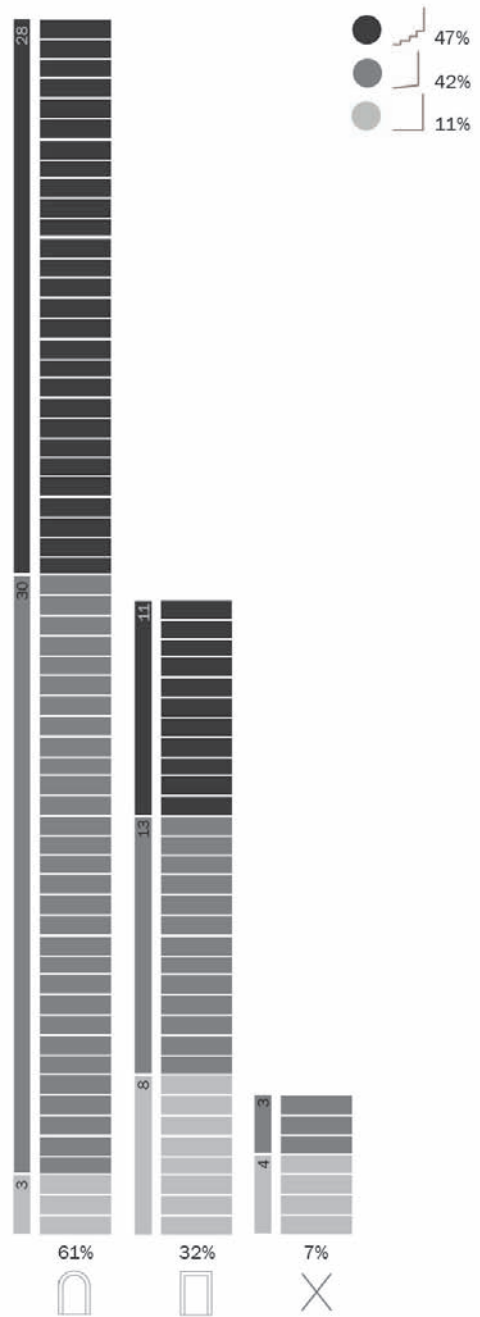
C=0.249



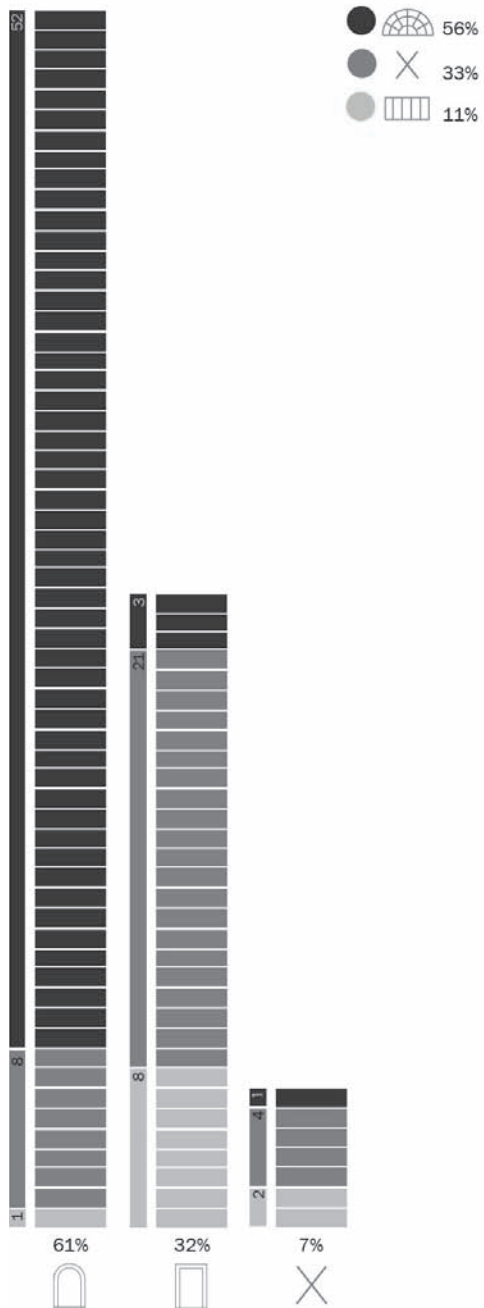
Cornice-vane
C=0.631



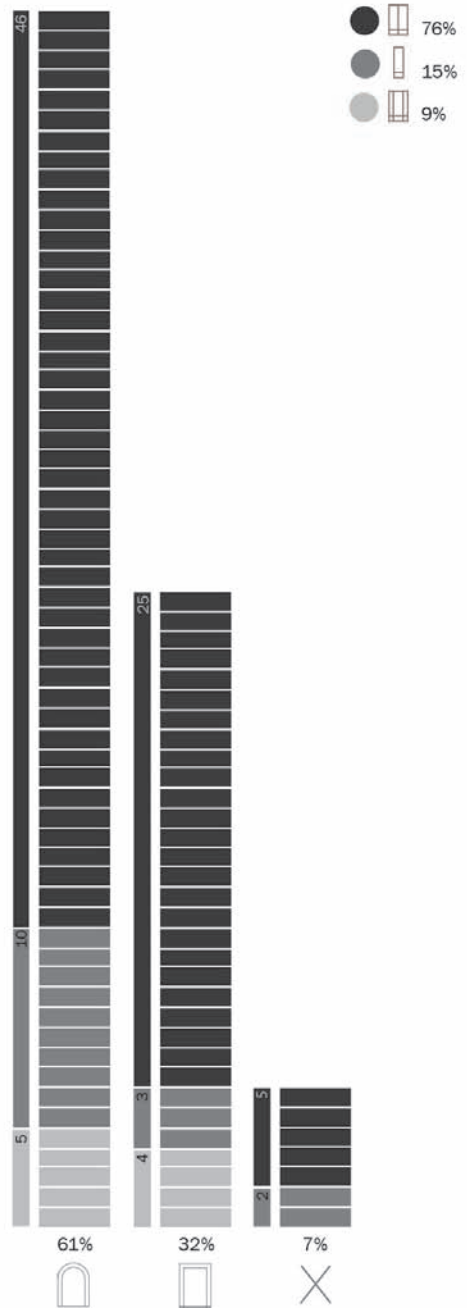
Cornice-access
C=0.297



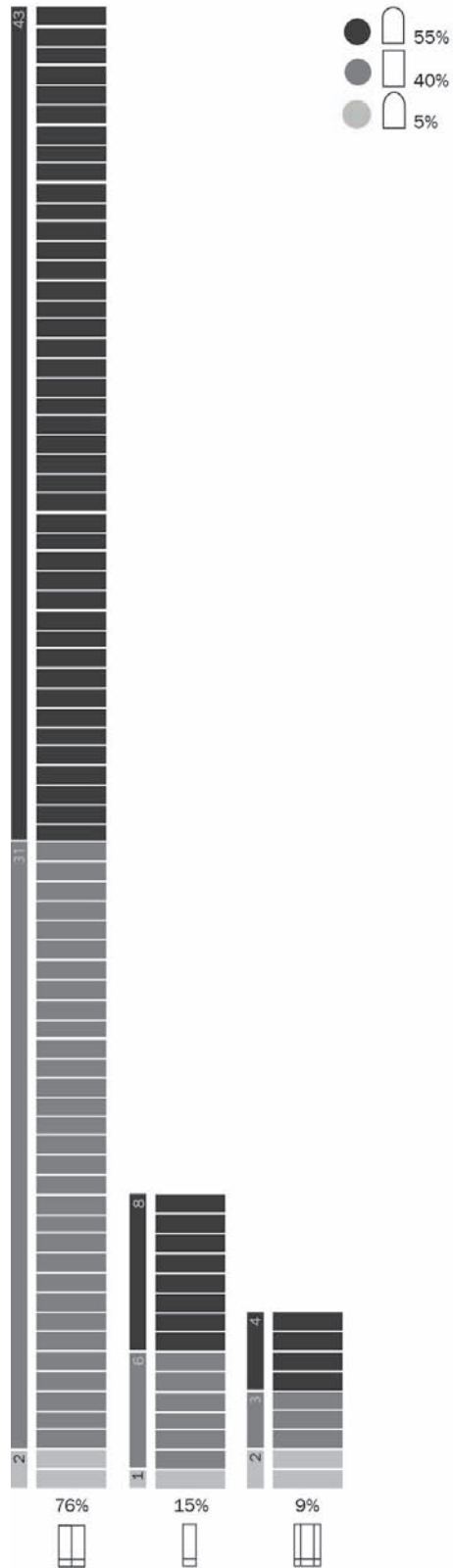
Cornice-fanlight
C=0.597



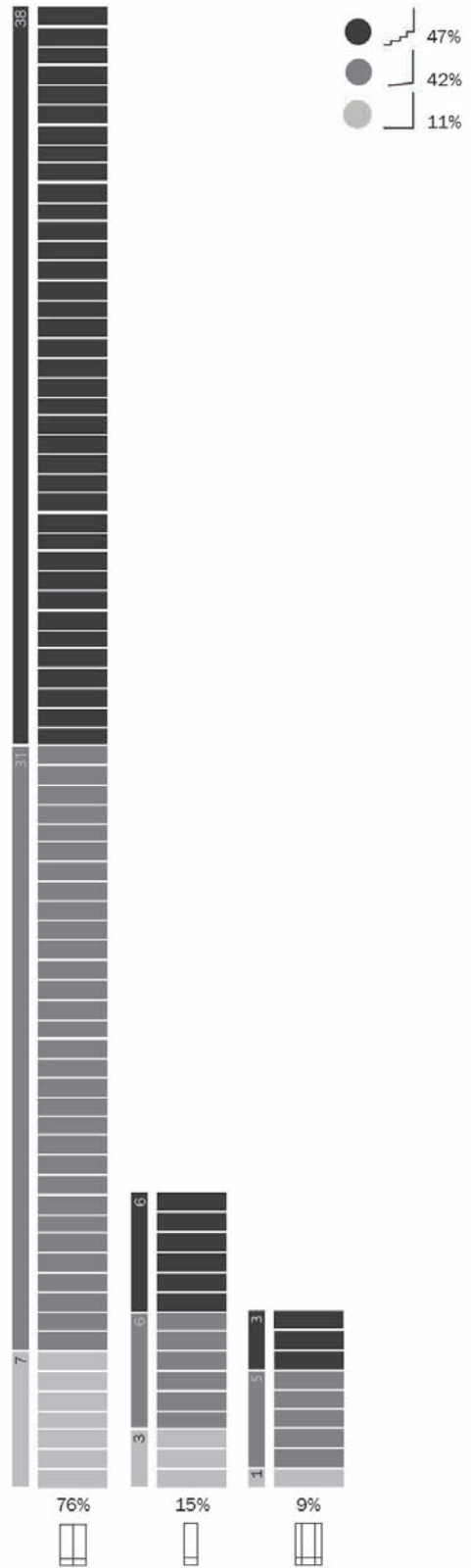
Cornice-leaf
C=0.164



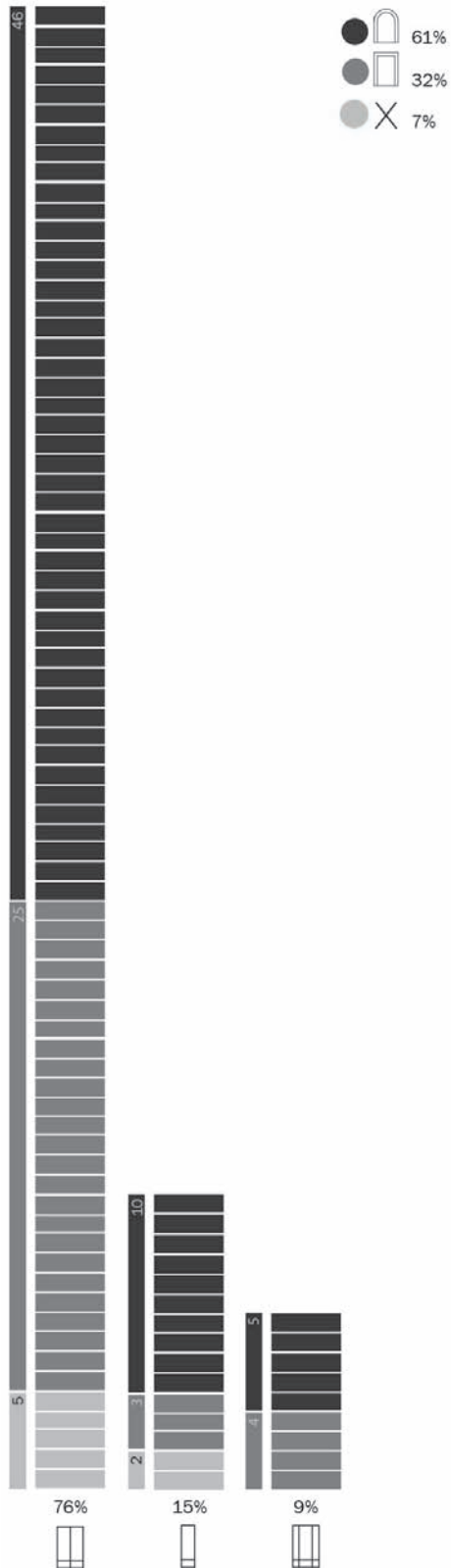
Leaf-vane
C=0.249



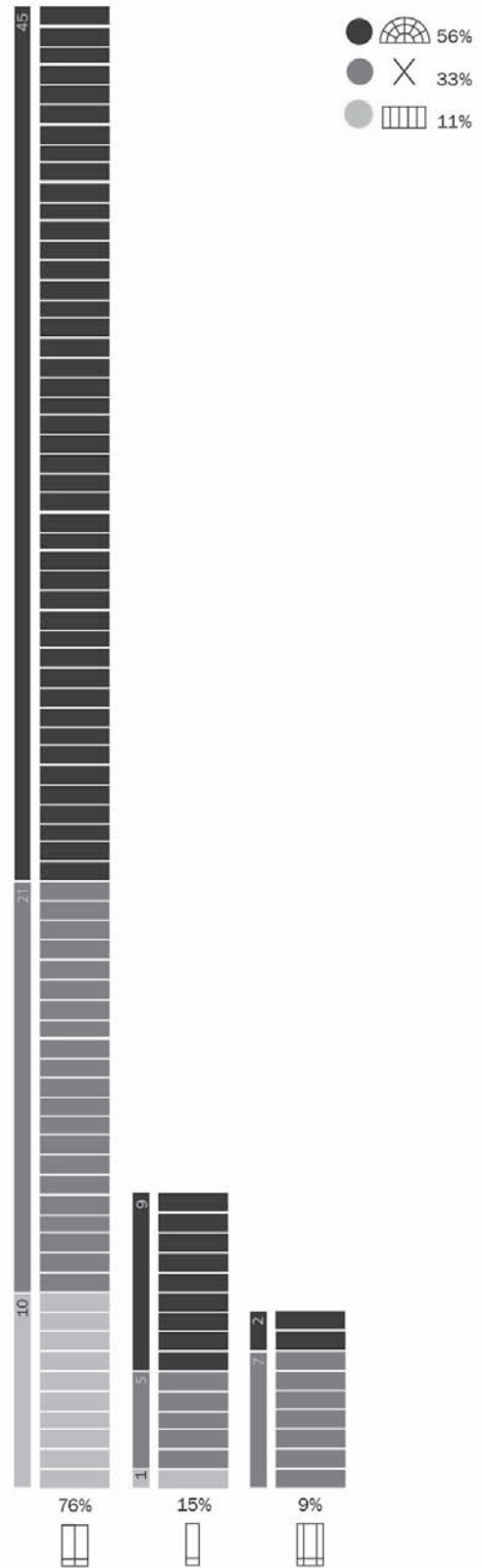
Leaf-access
C=0.154



Leaf-cornice
C=0.164

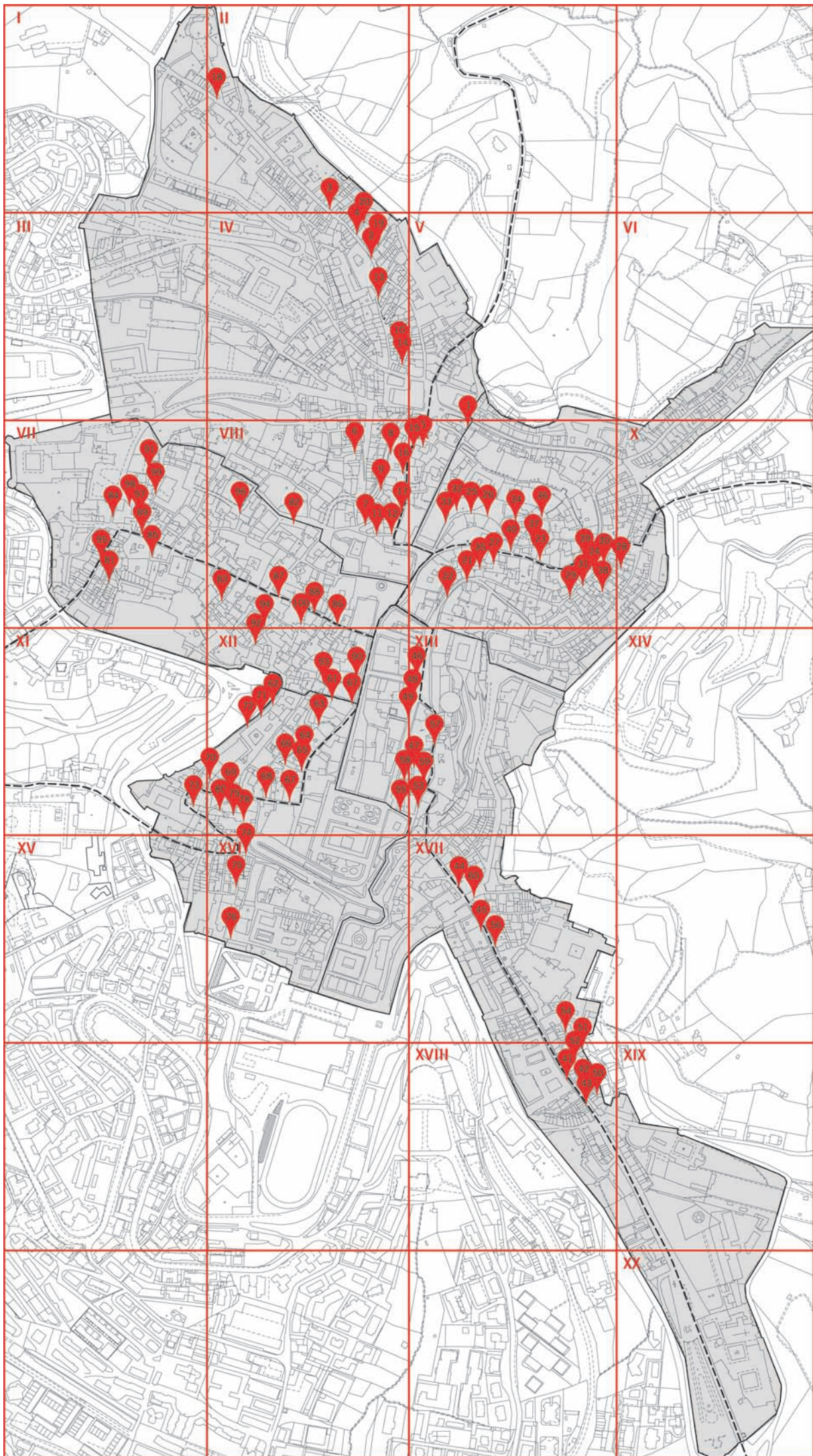


Leaf-fanlight
C=0.298



Windows

Step 1



Step 2



W.1
Via Bartolo



W.2
Corso Garibaldi



W.3
Corso Garibaldi



W.4
Corso Garibaldi



W.5
Via della Sinagoga



W.6
Via Appia



W.7
Via Baldeschi



W.8
Via Battisti



W.9
Via Battisti



W.10
Via del Senso



W.11
Via delle Cantine



W.12
Via delle Cantine



W.13
Via Lupattelli



W.14
Via Piacevole



W.15
Via Rocchi



W.16
Via Rocchi



W.17
Via Rocchi



W.18
Corso Garibaldi



W.19
Via del Pepe



W.20
Via Lucida



W.21
Via Alessi



W.22
Via Alessi



W.23
Via Bontempi



W.24
Via Sdrucchiola



W.25
Via del Sole



W.26
Via del Sole



W.27
Via Volte della Pace



W.28
Via della Scala



W.29
Via della Viola



W.30
Via della Viola



W.31
Via della Viola



W.32
Via delle Prome



W.33
Via delle Prome



W.34
Via Mattioli



W.35
Via Volte della Pace



W.36
Via dell'Aquila



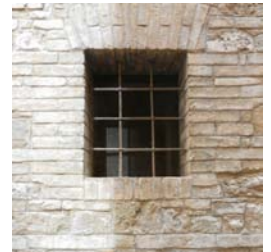
W.37
Via Raffaello



W.38
Via S. Giovanni del Fosso



W.39
Via Sdrucchiola



W.40
Via Raffaello



W.41
Borgo XX Giugno



W.42
Borgo XX Giugno



W.43
Corso Cavour



W.44
Corso Cavour



W.45
Corso Cavour



W.46
Piazza Matteotti



W.47
Via Alunni



W.48
Via Baglioni



W.49
Via Baglioni



W.50
Via degli Archi



W.51
Via del Cortone



W.52
Via del Deposito



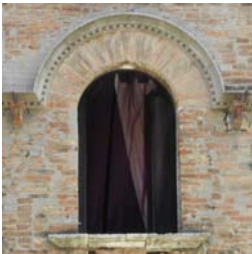
W.53
Via Floramonti



W.54
Via Labirinto



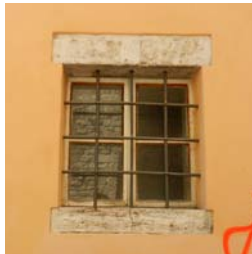
W.55
Via Marzia



W.56
Corso Cavour



W.57
Via Oberdan



W.58
Via Santa Lucia



W.59
Via Santa Lucia



W.60
Via XIV Settembre



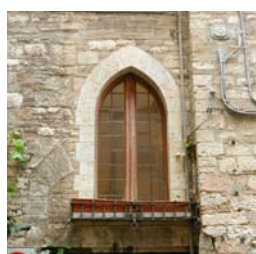
W.61
Via della Luna



W.62
Via della Cupa



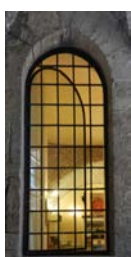
W.63
Via delle Streghe



W.64
Via Larga



W.65
Via del Bufalo



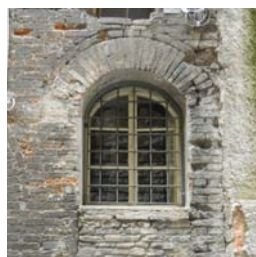
W.66
Via del Bufalo



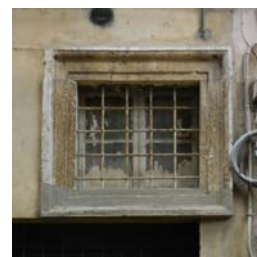
W.67
Via Caporali



W.68
Via Caporali



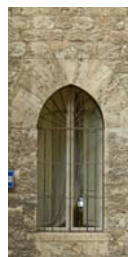
W.69
Via Caporali



W.70
Via Alba



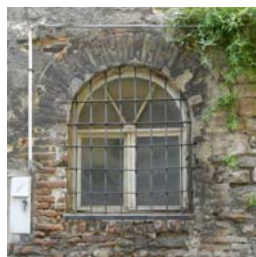
W.71
Via della Cupa



W.72
Via della Cupa



W.73
Piazza Mariotti



W.74
Via Fatebenefratelli



W.75
Via del Parione



W.76
Via del Parione



W.77
Via della Luna



W.78
Via del Pozzo



W.79
Via Menicucci



W.80
Via Menicucci



W.81
Via del Tordo



W.82
Piazza Morlacchi



W.83
Via Benincasa



W.84
Via Curiosa



W.85
Via degli Sciri



W.86
Via dei Priori



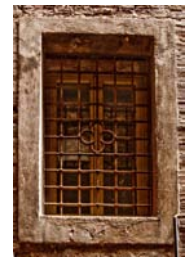
W.87
Via dei Priori



W.88
Via dei Priori



W.89
Via dei Priori



W.90
Via Scura



W.91
Via del Poggio



W.92
Via del Silenzio



W.93
Via della Brocca



W.94
Via della Cupa



W.95
Via della Sposa



W.96
Via Guardabassi



W.97
Via San Francesco



W.98
Via San Francesco



W.99
Via San Paolo



W.100
Via Vermiglioli

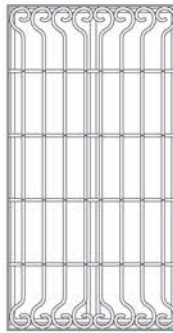
Step 3



via del Pepe
43.11704; 12.38877



photographic documentation



front view

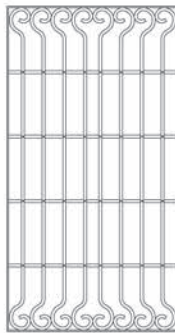


section

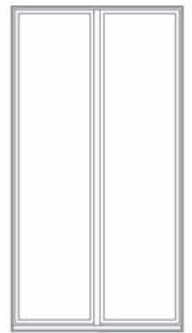




W.19



grating



window

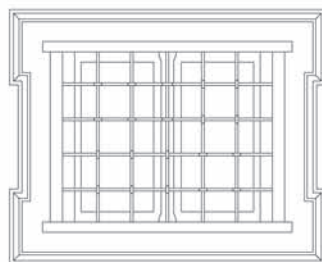
0 1 m



via Volte della Pace
43.11235; 12.39036



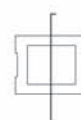
photographic documentation



front view

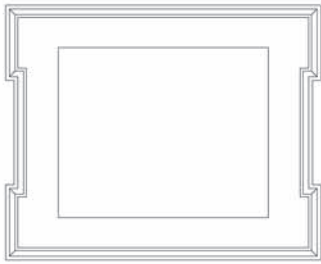


section

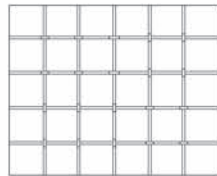




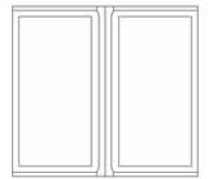
W.27



cornice



grating



window

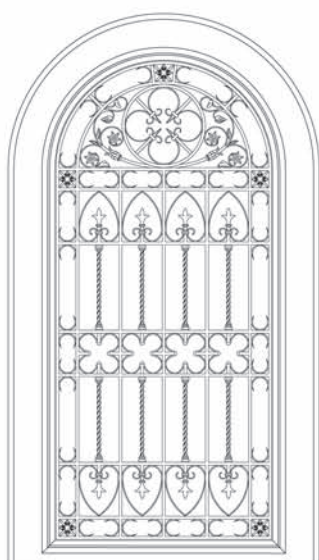




piazza Matteotti
43.11064; 12.38951



photographic documentation



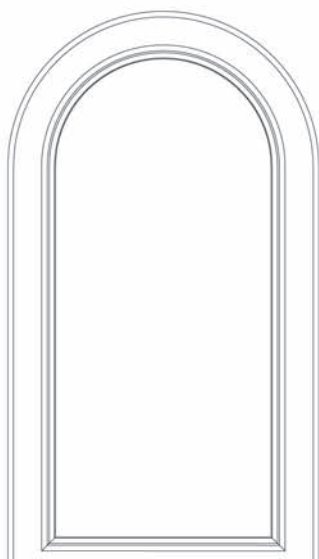
front view



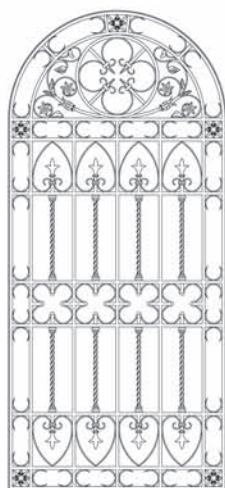
section



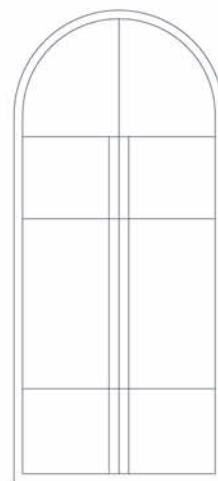
W.46



cornice



grating



window

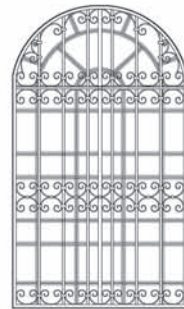




via Menicucci
43.10903; 12.38624



photographic documentation



front view

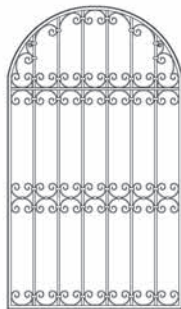


section

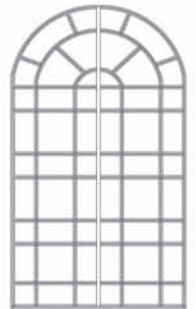




W.80



grating



window

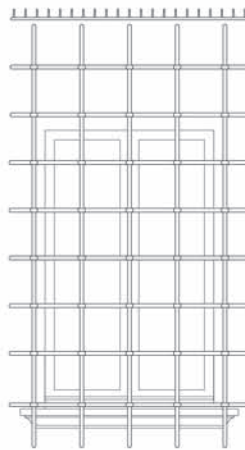
0 1 m



via del Poggio
43.11349; 12.38458



photographic documentation



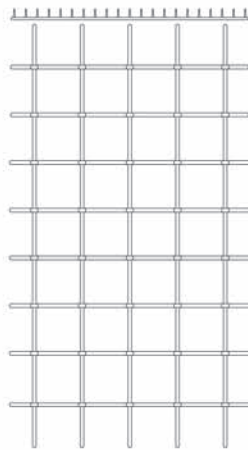
front view



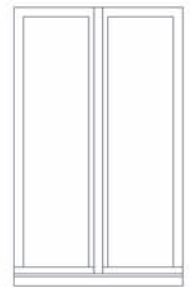
section



W.91



grating



window



sill



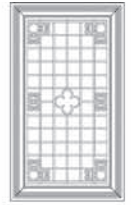
Step 4



W.20



W.40



W.53



W.19



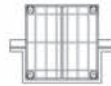
W.35



W.46



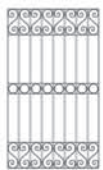
W.18



W.36



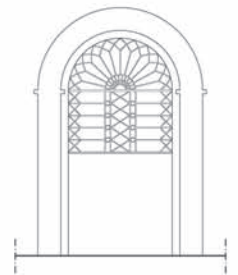
W.41



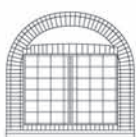
W.1



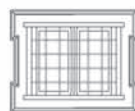
W.32



W.60



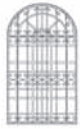
W.2



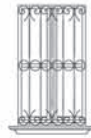
W.27



W.56



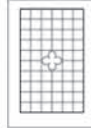
W.80



W.81



W.78



W.90



W.77



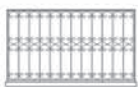
W.92



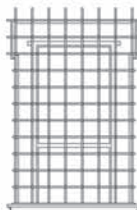
W.62



W.91



W.79



W.82



Step 5



recurring characters



rectangular



abstent



present

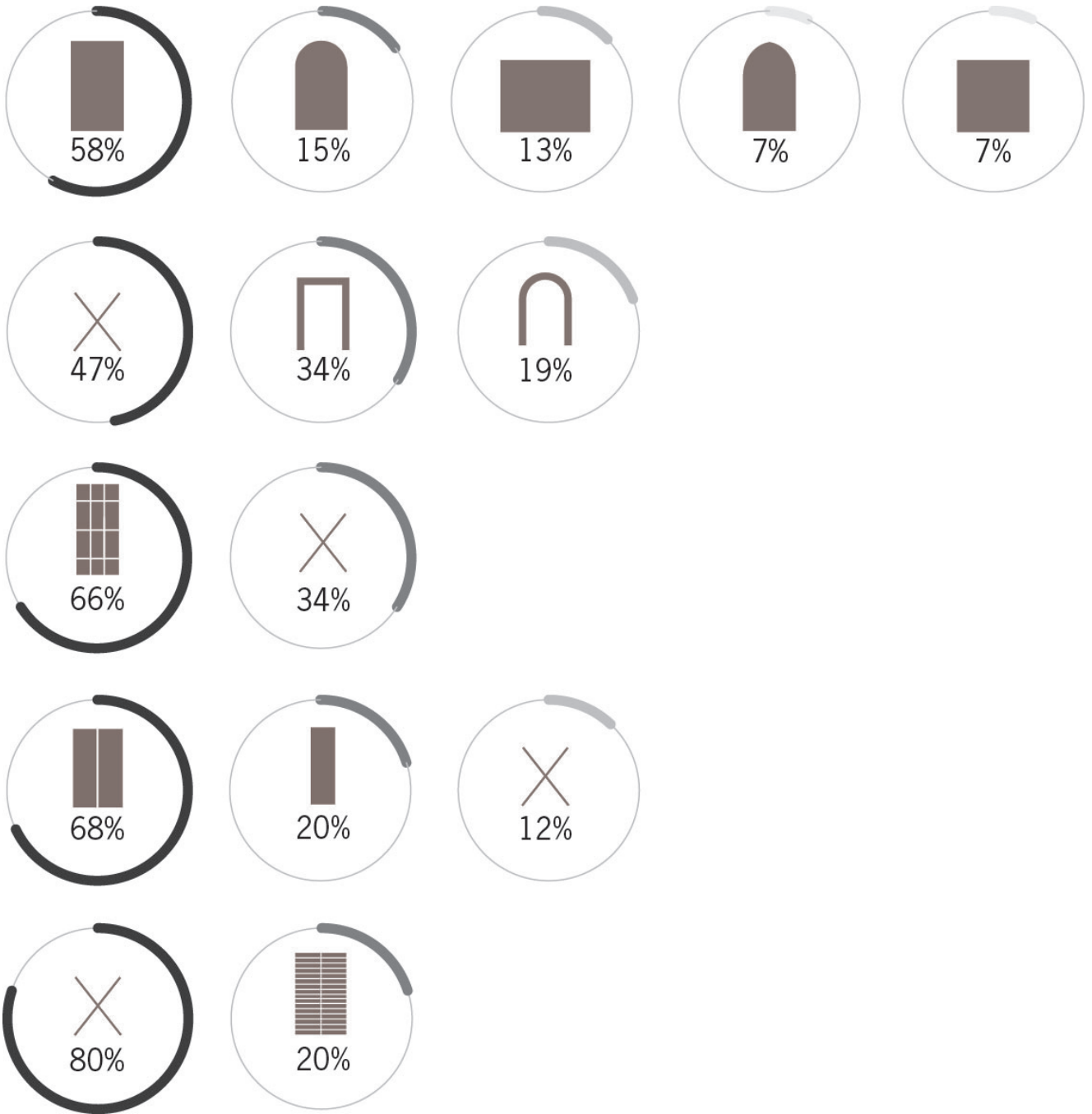


double-leaf

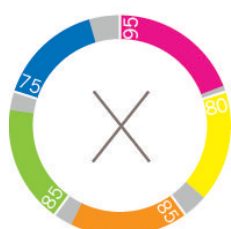
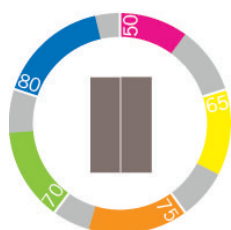
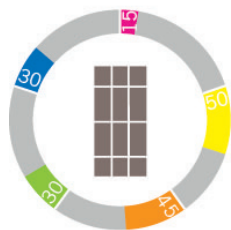
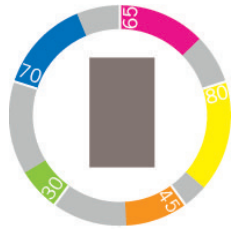


abstent

Step 6

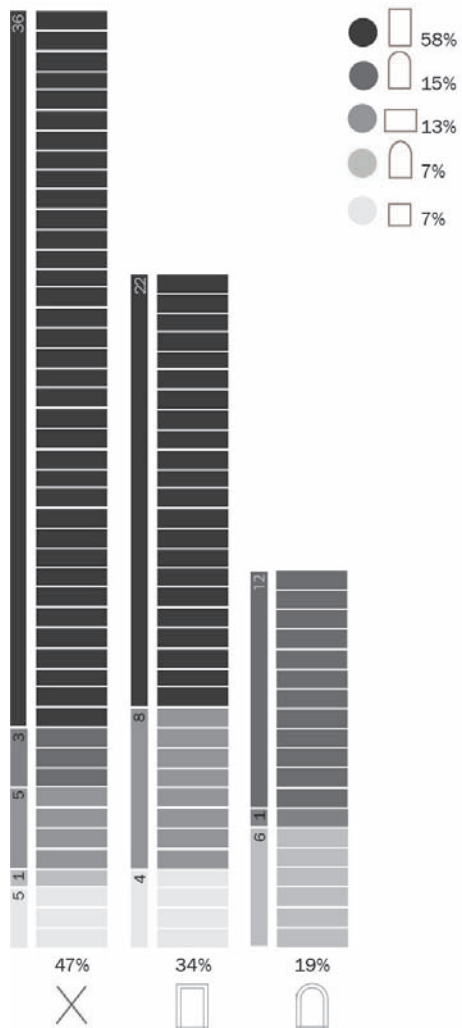


The distribution of the most common characters in the historic city.

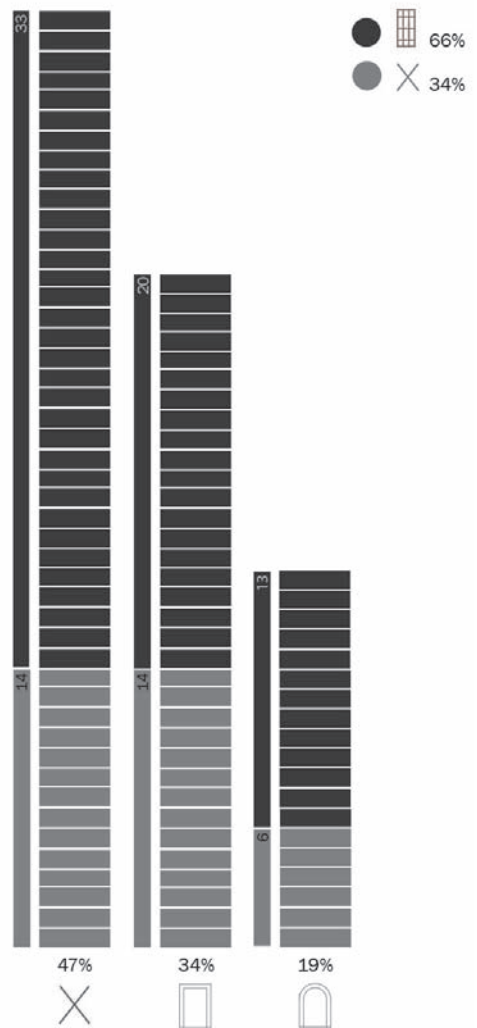


The distribution of the most common characters in each district.

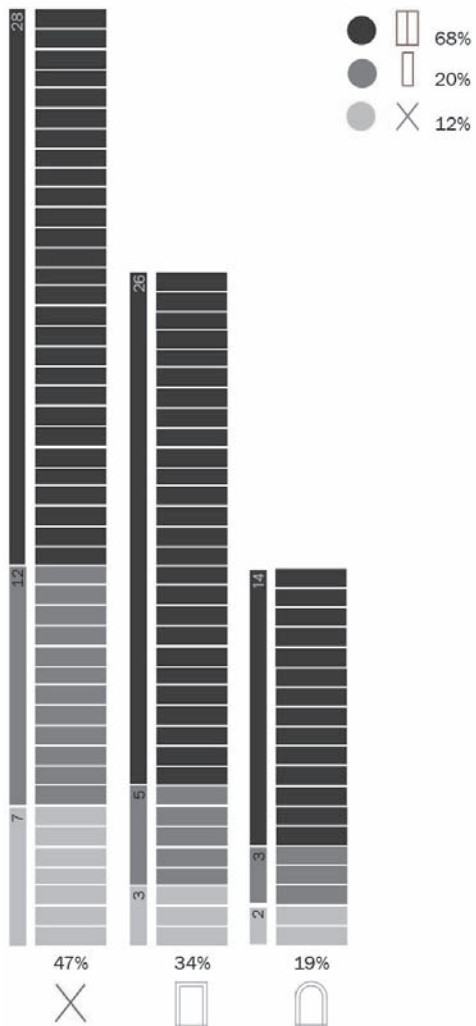
Cornice-vane
C=0.662



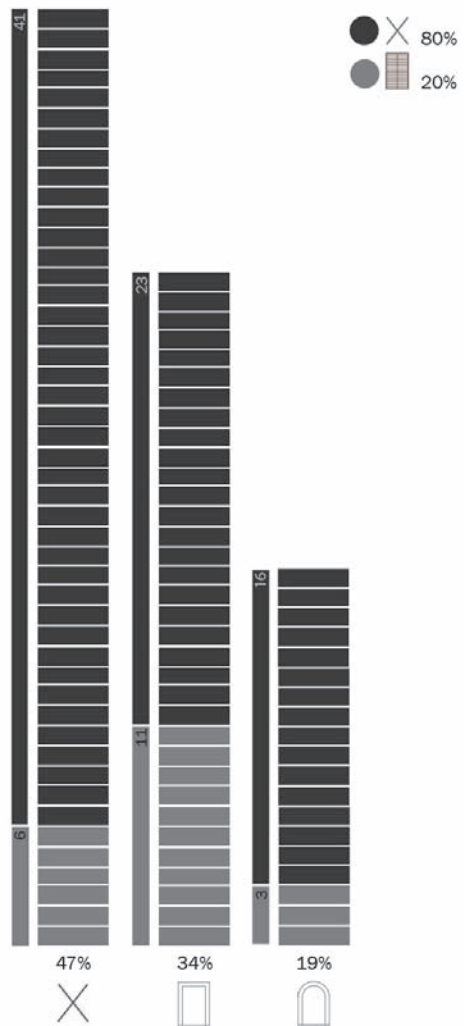
Cornice-grating
C=0.109



Cornice-leaf
C=0.169

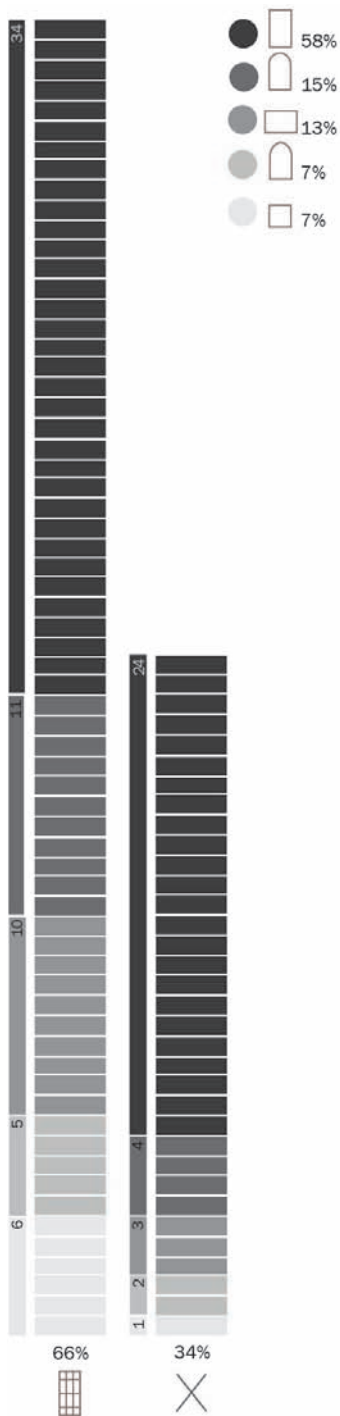


Cornice-shutter
C=0.218



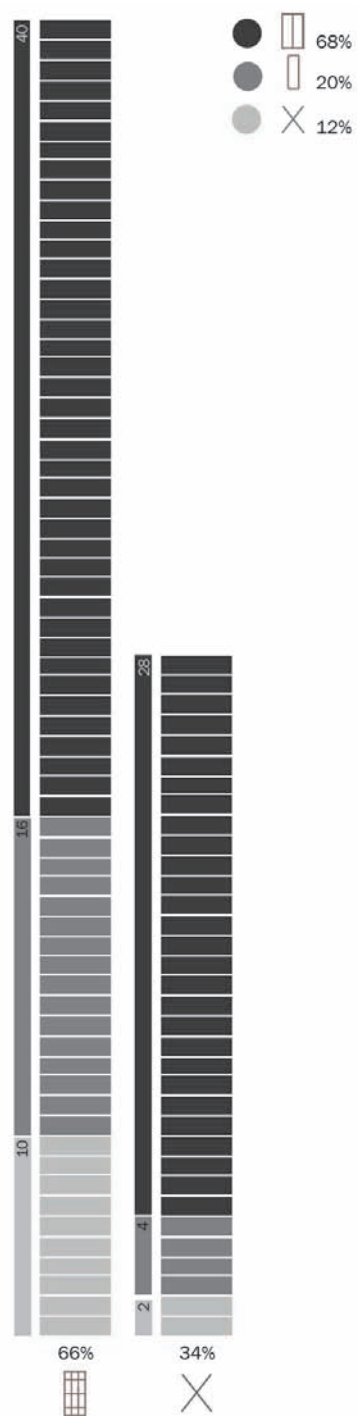
Grating-vane

C=0.190



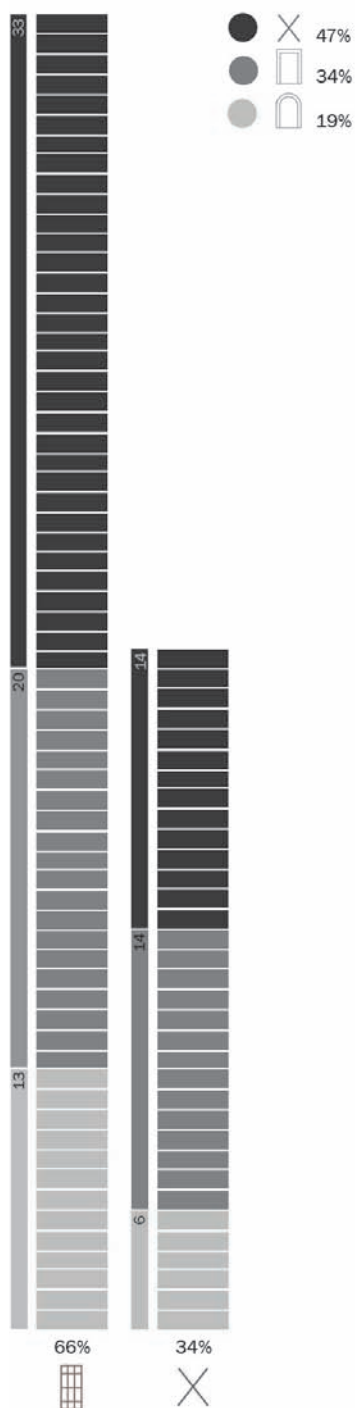
Grating-leaf

C=0.216



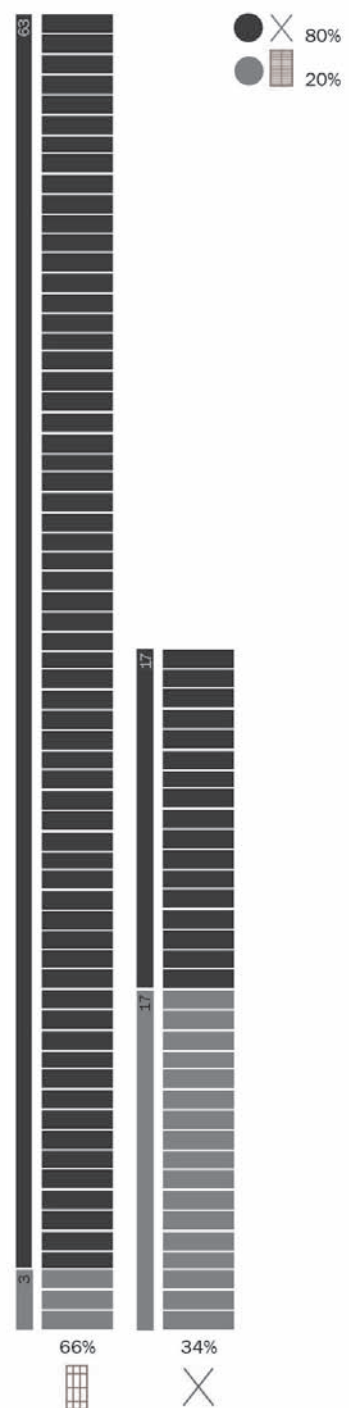
Grating-cornice

C=0.109



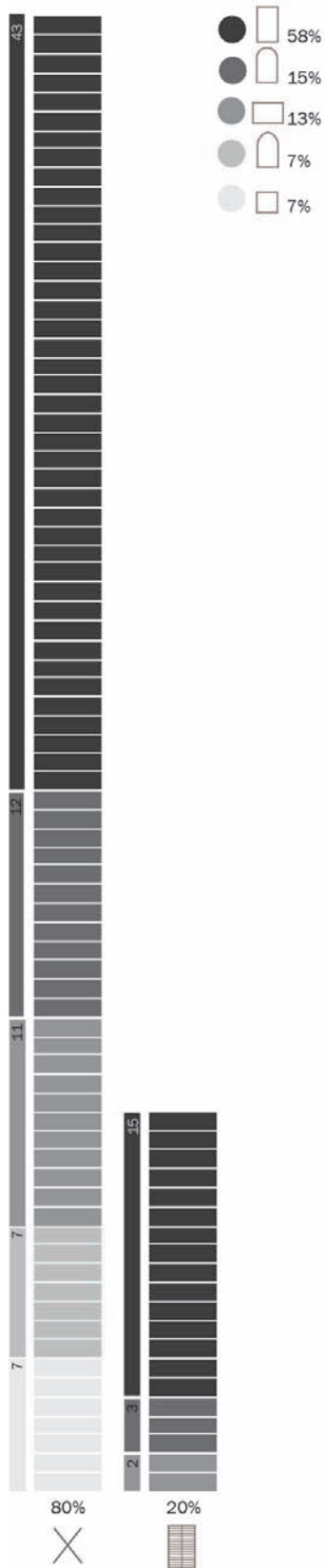
Grating-shutter

C=0.474



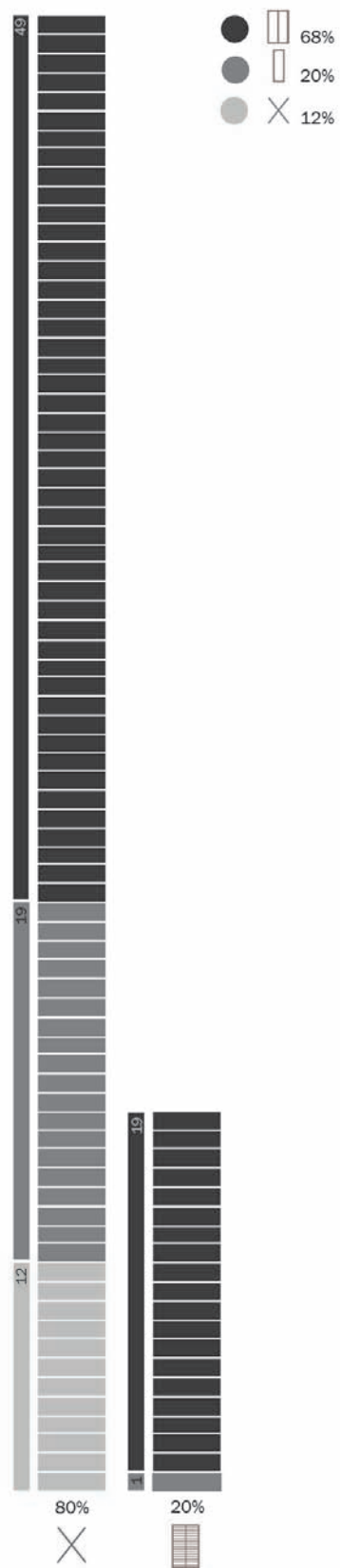
Shutter-vane

C=0.217



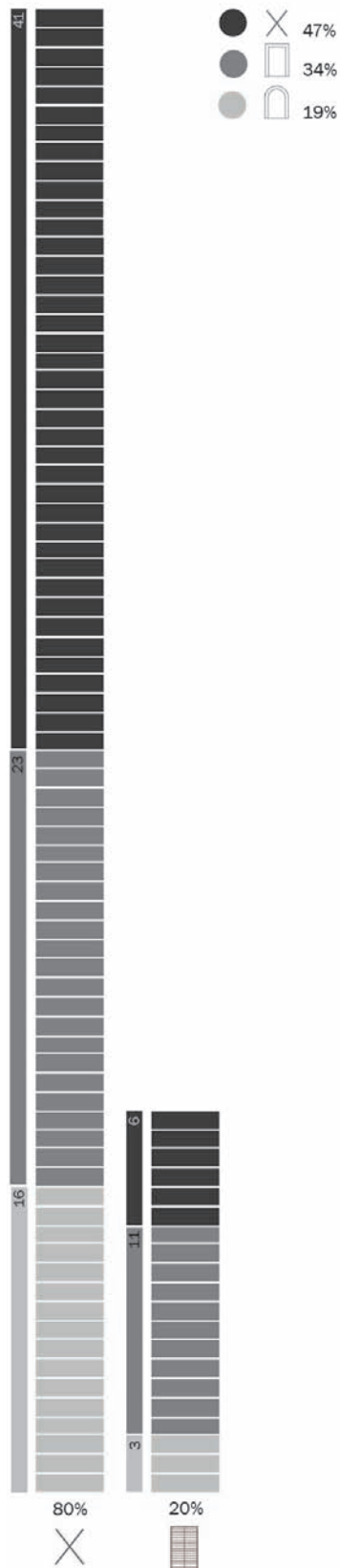
Shutter-leaf

C=0.280



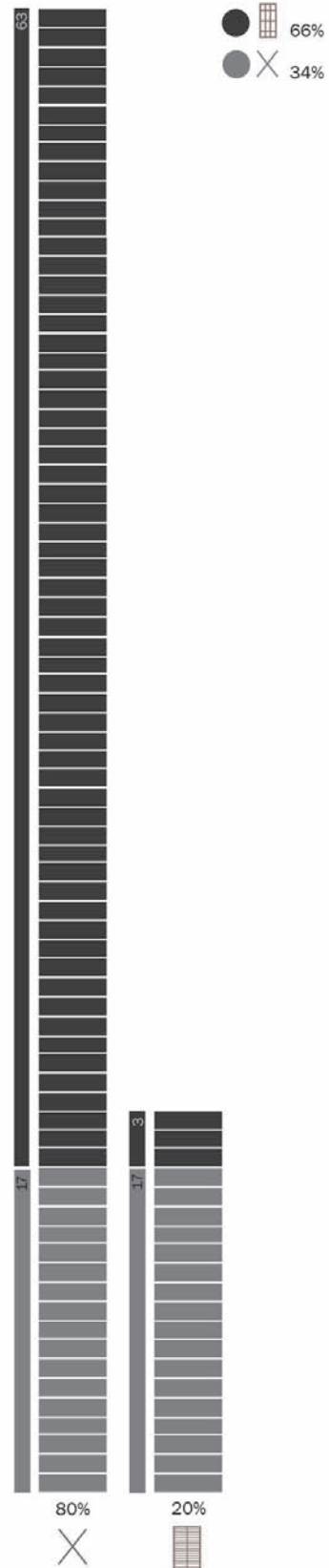
Shutter-cornice

C=0.218

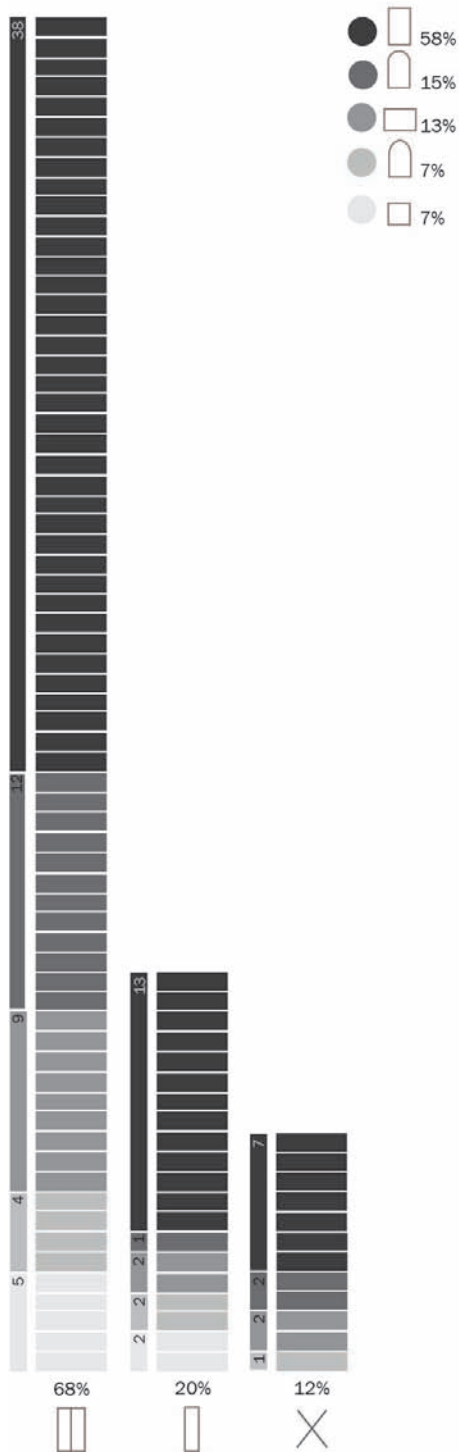


Shutter-grating

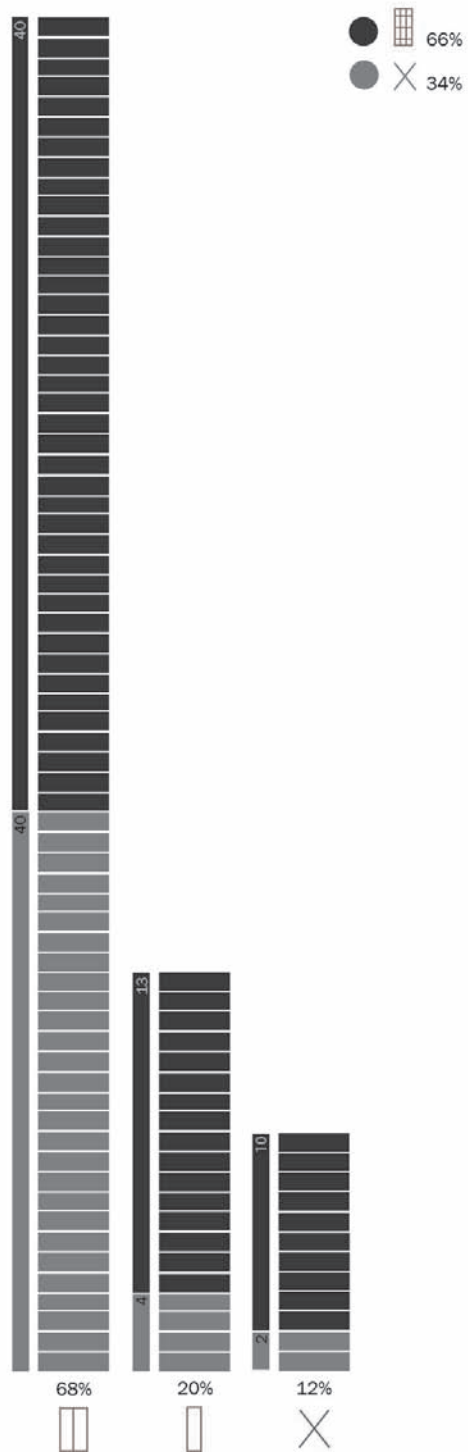
C=0.474



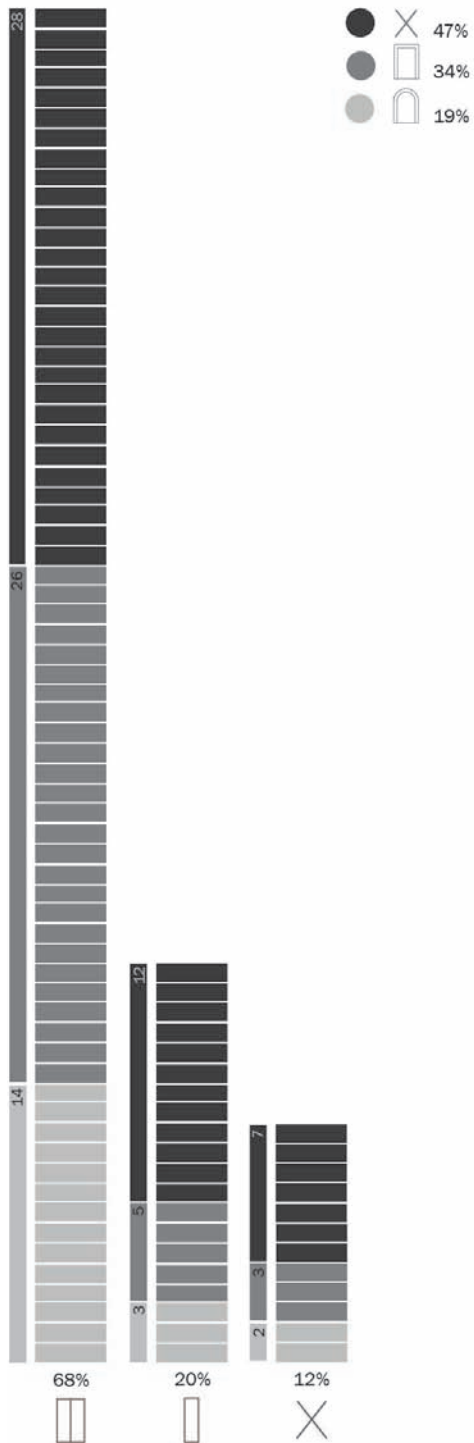
Leaf-vane
C=0.188



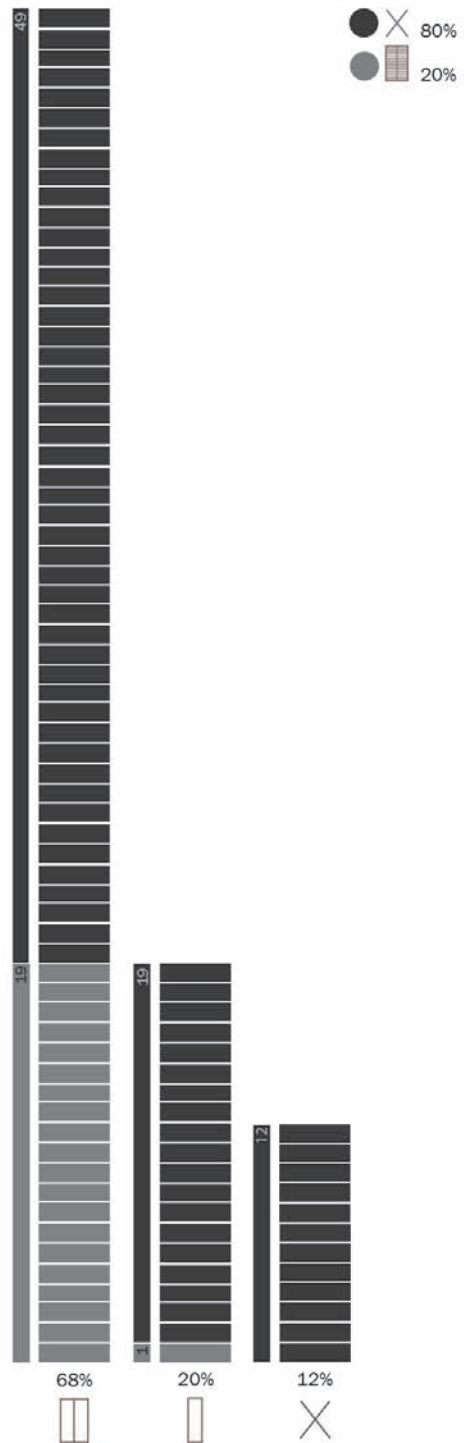
Leaf-grating
C=0.216



Leaf-cornice
C=0.169

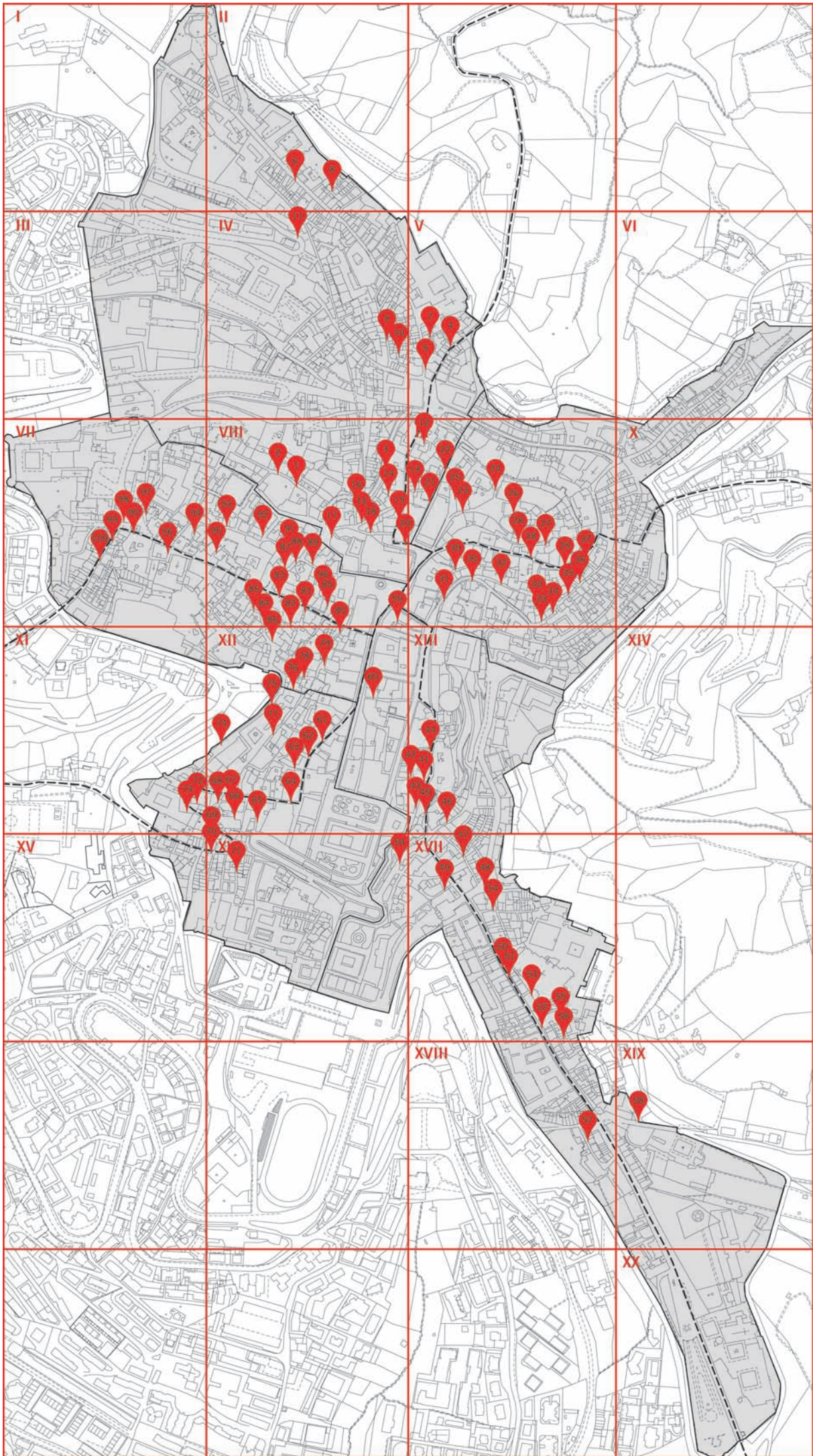


Leaf-shutter
C=0.280



Wall textures

Step 1



Step 2



WT.1
Via del Verzaro



WT.2
Via del Verzaro



WT.3
Via Battisti



WT.4
Via del Bulagaio



WT.5
Corso Garibaldi



WT.6
Corso Garibaldi



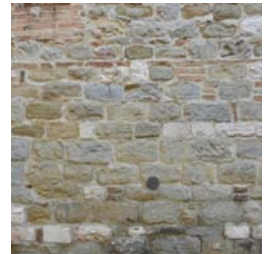
WT.7
Via dei Pellari



WT.8
Via del Canerino



WT.9
Via Luppattelli



WT.10
Via del Senso



WT.11
Via del Fagiano



WT.12
Piazza della Sinagoga



WT.13
Via della Nespola



WT.14
Piazza Ansidei



WT.15
Via Baldeschi



WT.16
Via Appia



WT.17
Piazza Morlacchi



WT.18
Via delle Cantine



WT.19
Via Rocchi



WT.20
Via Rocchi



WT.21
Via Bartolo



WT.22
Via Bartolo



WT.23
Via del Sole



WT.24
Via del Sole



WT.25
Via delle Prome



WT.26
Via dell'Aquila



WT.27
Via Raffaello



WT.28
Via Cesarei



WT.29
Via Bontempi



WT.30
Via Alessi



WT.31
Via Alessi



WT.32
Via dei Cartolari



WT.33
Via della Viola



WT.34
Via della Viola



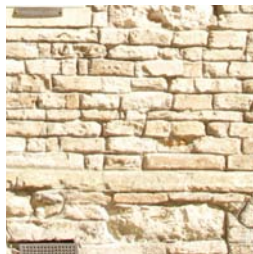
WT.35
Via della Viola



WT.36
Via della Viola



WT.37
Via Sdrucchiola



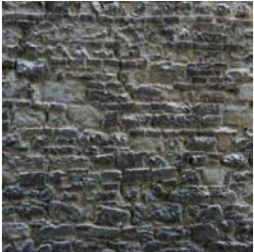
WT.38
Via Bontempi



WT.39
Via Volte della Pace



WT.40
Via della Madonna



WT.41
Via Santa Lucia



WT.42
Via Alunni



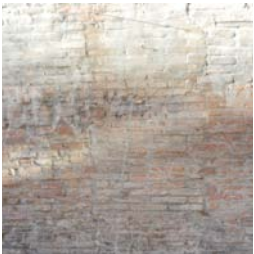
WT.43
Via Floramonti



WT.44
Via Oberdan



WT.45
Via Sant'Ercolano



WT.46
Via Campo di Battaglia



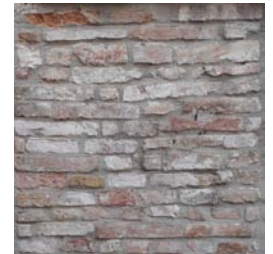
WT.47
Via Guerriera



WT.48
Via XIV Settembre



WT.49
Via Vibi



WT.50
Corso Cavour



WT.51
Corso Cavour



WT.52
Corso Cavour



WT.53
Via del Castellano



WT.54
Via del Cortone



WT.55
Via Laberinto



WT.56
Via del Deposito



WT.57
Via dei Ghezzi



WT.58
Via Bonfigli



WT.59
Via del Forno



WT.60
Via Donzetta



WT.61
Via Bonazzi



WT.62
Via Larga



WT.63
Via del Bufalo



WT.64
Via Caporali



WT.65
Via del Pozzo



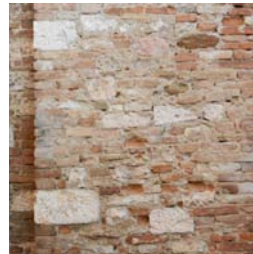
WT.66
Via Menicucci



WT.67
Via Bruschi



WT.68
Via Bruschi



WT.69
Via del Paradiso



WT.70
Via San Giacomo



WT.71
Via del Parione



WT.72
Piazza Mariotti



WT.73
Piazza Mariotti



WT.74
Via della Cupa



WT.75
Via della Cupa



WT.76
Via della Luna



WT.77
Via della Luna



WT.78
Via Boncambi



WT.79
Via Boncambi



WT.80
Via dell'Orso



WT.81
Via Vermiglioli



WT.82
Via Cumana



WT.83
Via dei Priori



WT.84
Via della Cupa



WT.85
Via Deliziosa



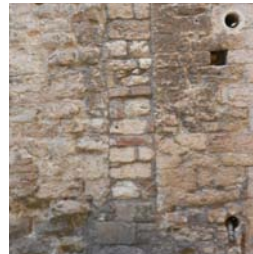
WT.86
Via del Silenzio



WT.87
Via della Stella



WT.88
Via della Stella



WT.89
Via Fratti



WT.90
Via del Priori



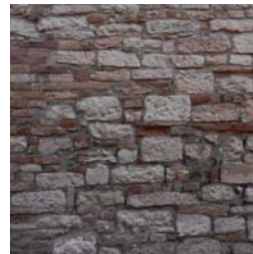
WT.91
Via degli Uffici



WT.92
Via Tiberi



WT.93
Via Vincioli



WT.94
Via Santo Stefano



WT.95
Via del Morone



WT.96
Via degli Sciri



WT.97
Via del Poggio



WT.98
Via della Sposa



WT.99
Via della Sposa



WT.100
Via della Sposa

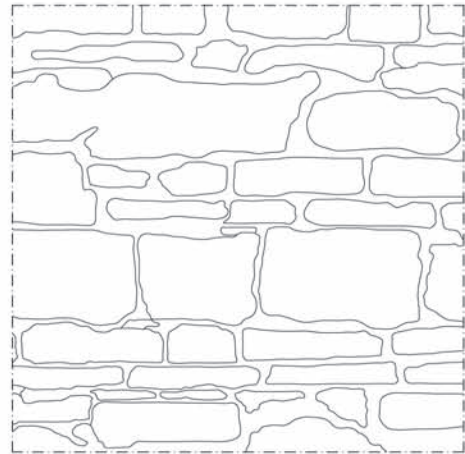
Step 3



via Bartolo
44.275153; 16.390379



photographic documentation

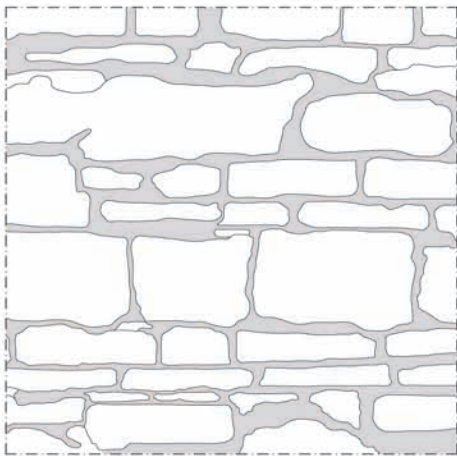


front view

-  mortar
-  bricks
-  stone



WT.13



material representation



material representation

0 50 cm



piazza Italia
43.114153; 12.390260



photographic documentation

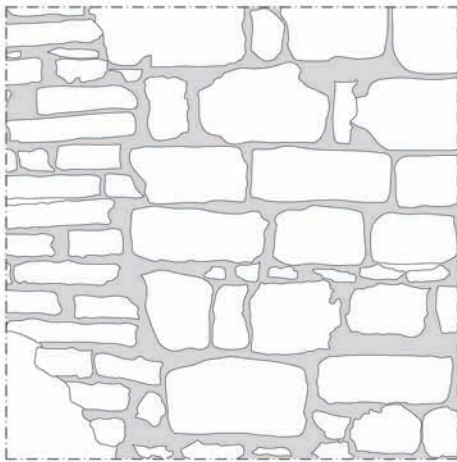


front view

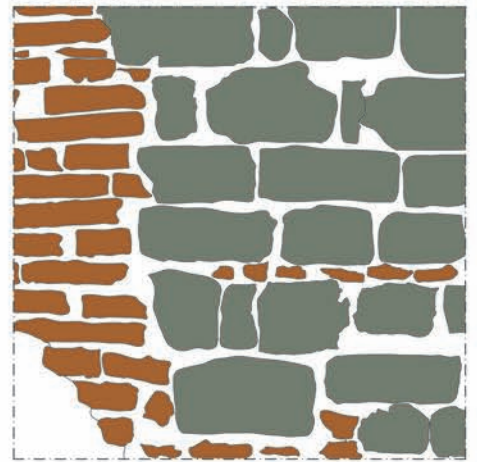




WT.23



material representation



material representation

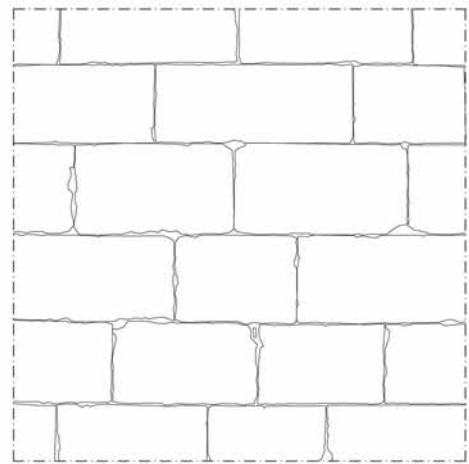
0 50 cm



via dei Priori
43.114153; 12.390260



photographic documentation

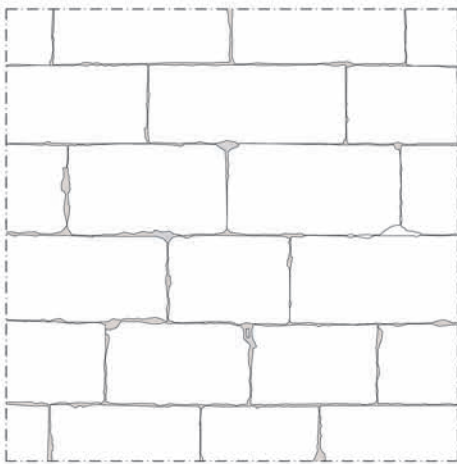


front view

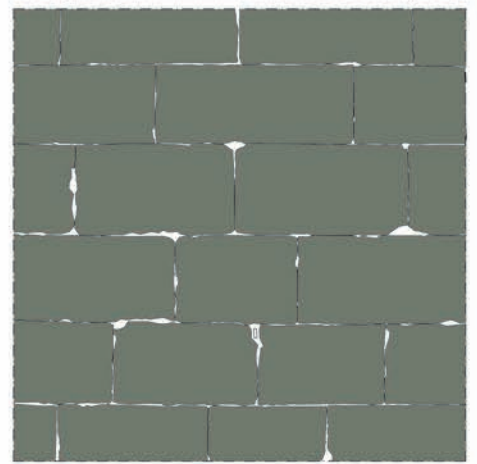




WT.52



material representation



material representation

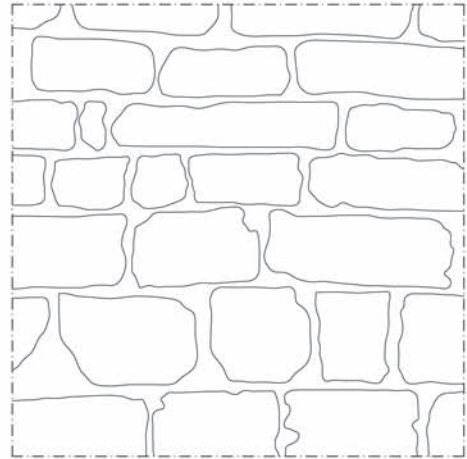
0 50 cm



via dei Priori
43.114153; 12.390260



photographic documentation

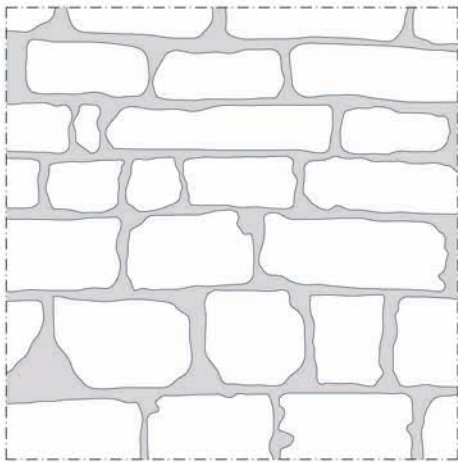


front view





WT.64



material representation



material representation

0 50 cm



via dei Priori
43.114153; 12.390260



photographic documentation

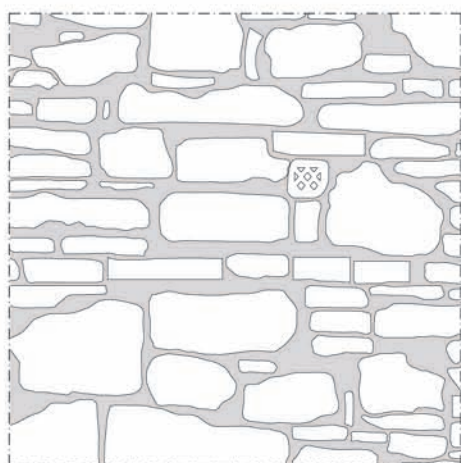


front view





WT.99



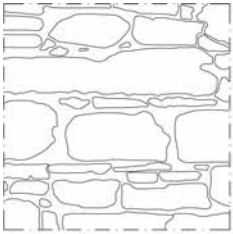
material representation



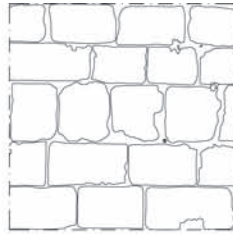
material representation

0 50 cm

Step 4



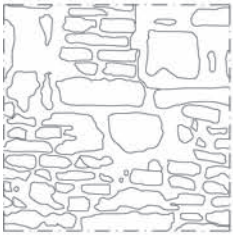
WT.2



WT.21



WT.49



WT.3



WT.23



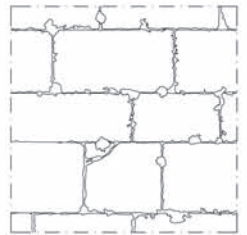
WT.50



WT.6



WT.29



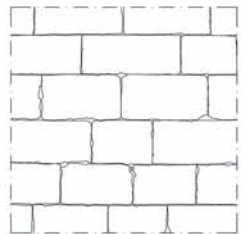
WT.51



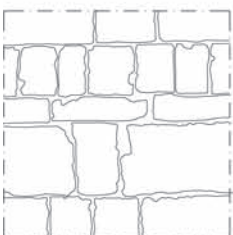
WT.13



WT.30



WT.52



WT.20



WT.32



WT.53



WT.64



WT.83



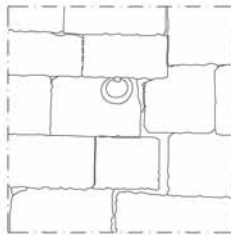
WT.66



WT.85



WT.70



WT.90



WT.74



WT.95



WT.75



WT.99

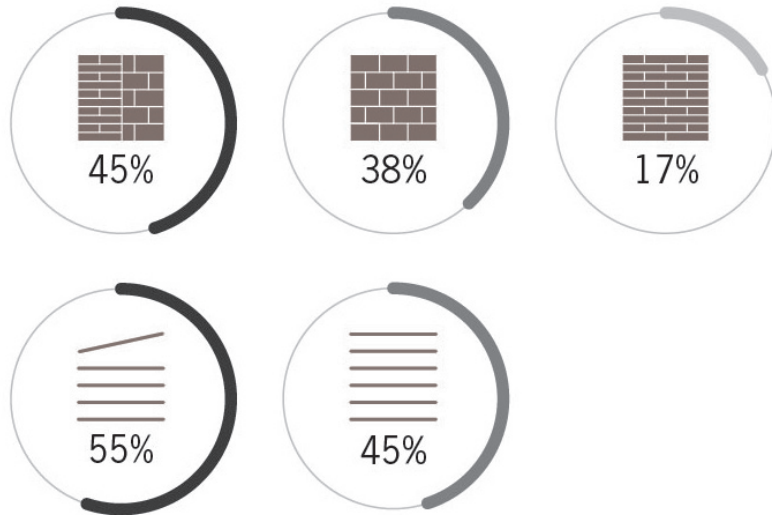


Step 5

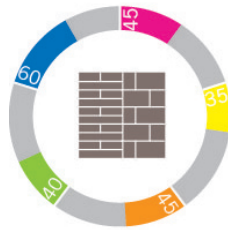
material			texture	



Step 6

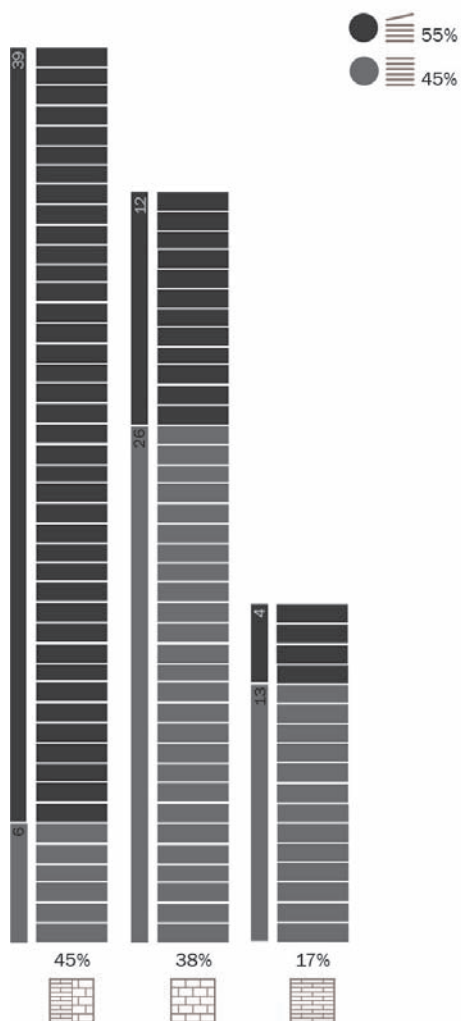


The distribution of the most common characters in the historic city.



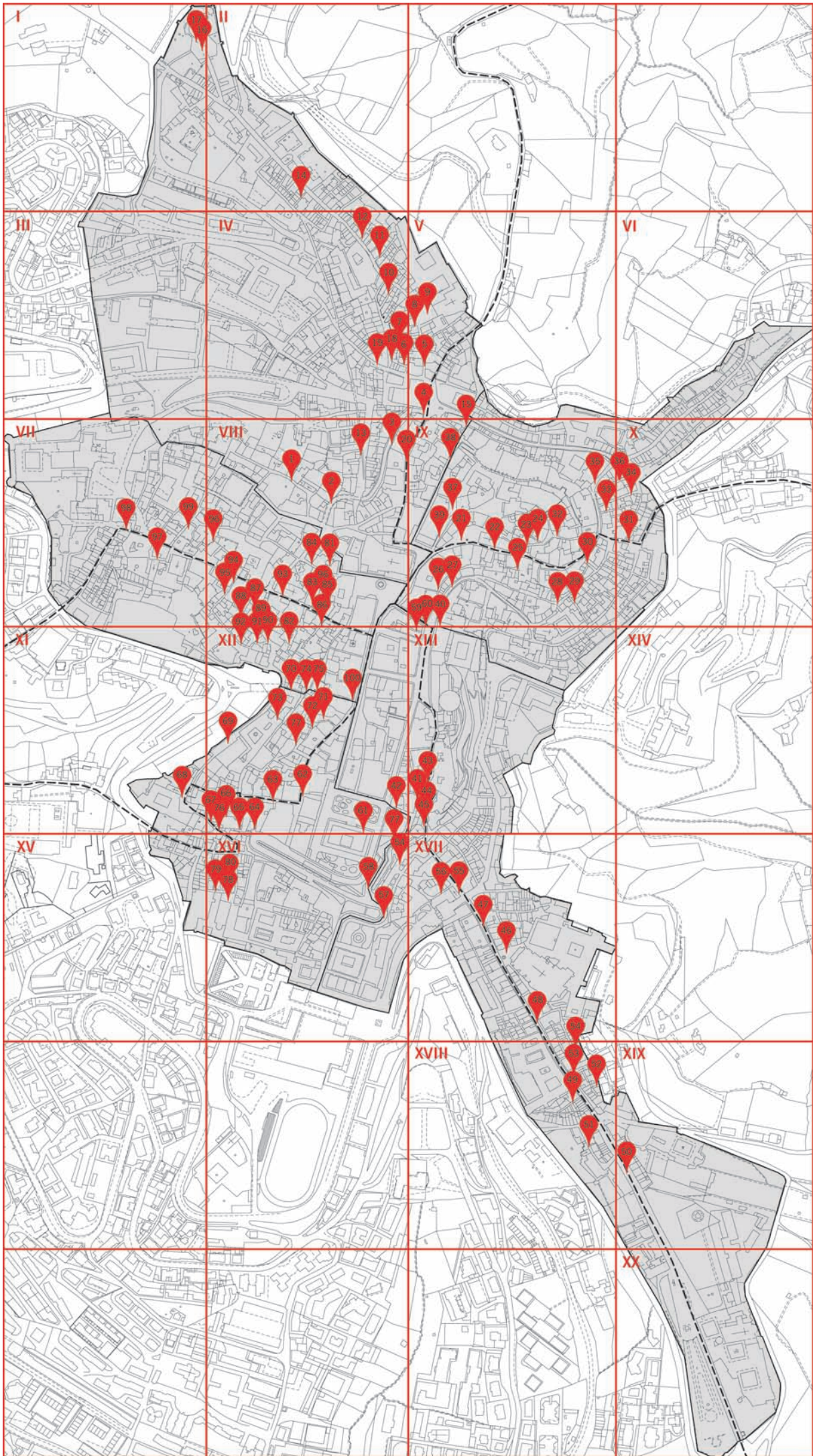
The distribution of the most common characters in each district.

Material-texture
C=0.501



External floorings

Step 1



Step 2



EF.1
Via del Verzaro



EF.2
Via Battisti



EF.3
Via Battisti



EF.4
Piazza Fortebraccio



EF.5
Corso Garibaldi



EF.6
Via Piacevole



EF.7
Via Lupattelli



EF.8
Via Graziosa



EF.9
Piazza Lupattelli



EF.10
Via Tedesca



EF.11
Via dell'Oro



EF.12
Via del Mogherino



EF.13
Via Appia



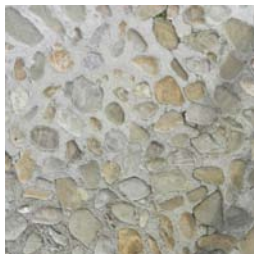
EF.14
Via della Pietra



EF.15
Via Scoscesa



EF.16
Via del Tempio



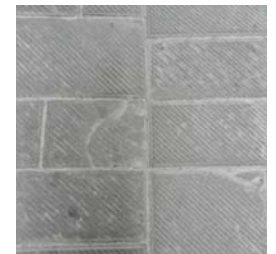
EF.17
Via del Tempio



EF.18
Via del Senso



EF.19
Via Fabretti



EF.20
Via Rocchi



EF.21
Piazza Piccinino



EF.22
Via Bontempi



EF.23
Via Raffaello



EF.24
Via Cesarei



EF.25
Via Volte della Pace



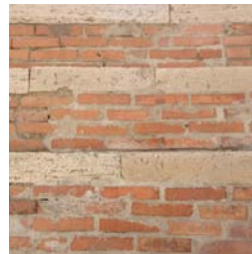
EF.26
Via Volte della Pace



EF.27
Via Alessi



EF.28
Via della Viola



EF.29
Via della Madonna



EF.30
Via Sdruciola



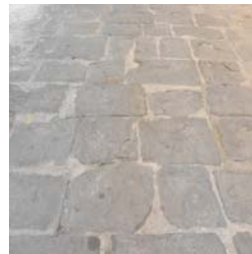
EF.31
Via del Carmine



EF.32
Piazza Raffaello



EF.33
Via del Lupo



EF.34
Via Bella



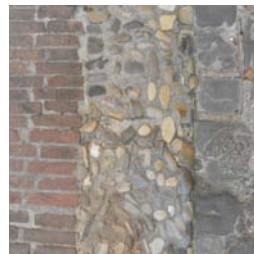
EF.35
Via del Roschetto



EF.36
Via dei Ciechi



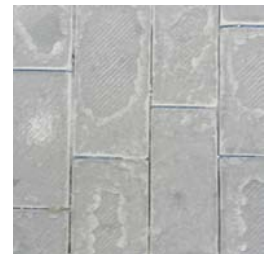
EF.37
Via delle Prome



EF.38
Via Bartolo



EF.39
Via del Sole



EF.40
Via sant'Andrea



EF.41
Via Floramonti



EF.42
Via Marzia



EF.43
Via Oberdan



EF.44
Via Sant'Ercolano



EF.45
Via Sant'Ercolano



EF.46
Piazza Bruno



EF.47
Corso Cavour



EF.48
Corso Cavour



EF.49
Via del Grillo



EF.50
Borgo XX Giugno



EF.51
Via Ghezzi



EF.52
Via degli Archi



EF.53
Corso Cavour



EF.54
Via del Deposito



EF.55
Corso Cavour



EF.56
Via Vibi



EF.57
Via Masi



EF.58
Viale Indipendenza



EF.59
Piazza Matteotti



EF.60
Via del Forno



EF.61
Piazza Italia



EF.62
Via Grecchi



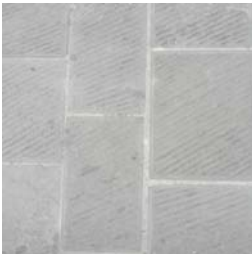
EF.63
Via Caporali



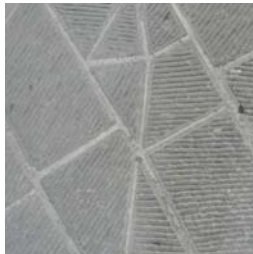
EF.64
Via del Pozzo



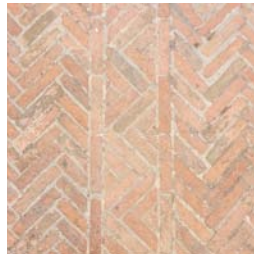
EF.65
Via Bruschi



EF.66
Via Bruschi



EF.67
Via Mariotti



EF.68
Piazza Mariotti



EF.69
Via della Cupa



EF.70
Via Boncambi



EF.71
Via della Luna



EF.72
Via della Luna



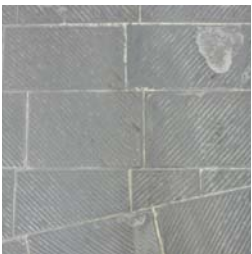
EF.73
Via della Luna



EF.74
Via dell'Orso



EF.75
Via Scura



EF.76
Via San Giacomo



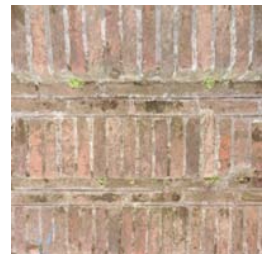
EF.77
Via Marzia



EF.78
Via del Parione



EF.79
Via degli Orti



EF.80
Via degli Orti



EF.81
Via Ritrosa



EF.82
Via Vermiglioli



EF.83
Via dei Priori



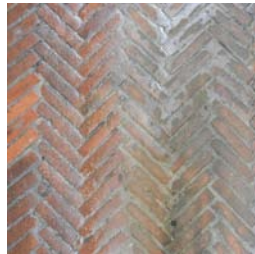
EF.84
Via Fratti



EF.85
Via Fratti



EF.86
Via Sant'Agata



EF.87
Via Deliziosa



EF.88
Via Deliziosa



EF.89
Via della Cupa



EF.90
Via del Silenzio



EF.91
Via del Silenzio



EF.92
Via Benincasa



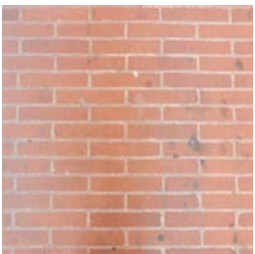
EF.93
Via dei Priori



EF.94
Via Benincasa



EF.95
Via Benincasa



EF.96
Via del Morone



EF.97
Via degli Sciri



EF.98
Via dei Priori



EF.99
Via Santo Stefano



EF.100
Via Scura

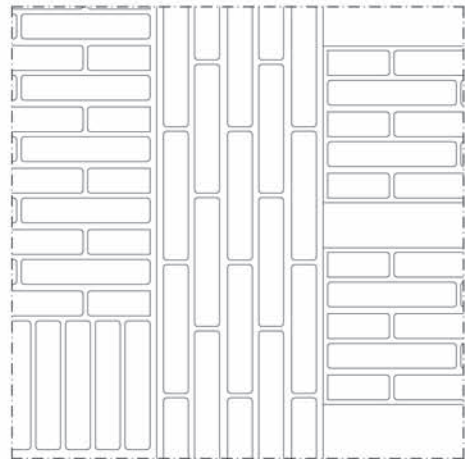
Step 3



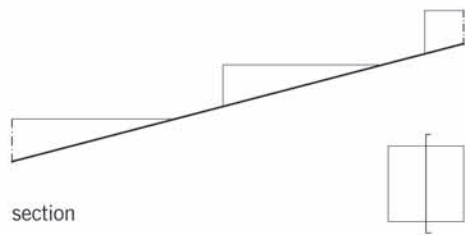
via Appia
43.114153; 12.390260



photographic documentation



front view

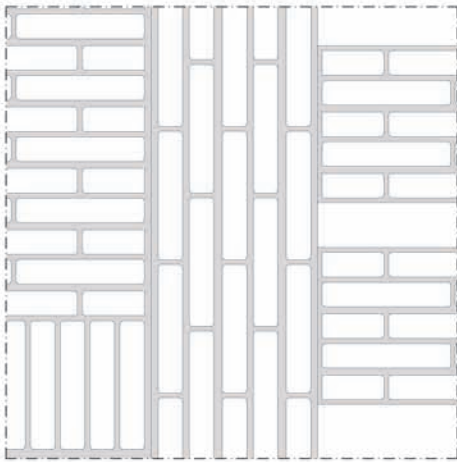


section

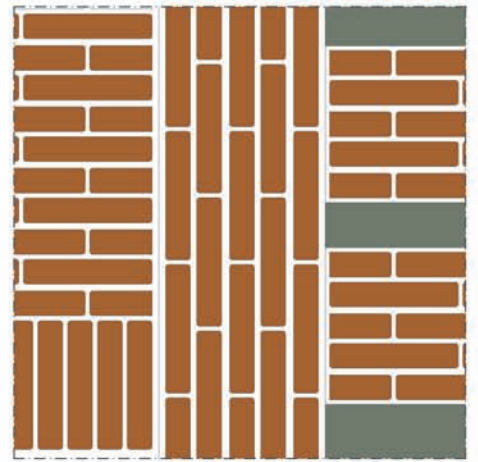




EF.13



material representation



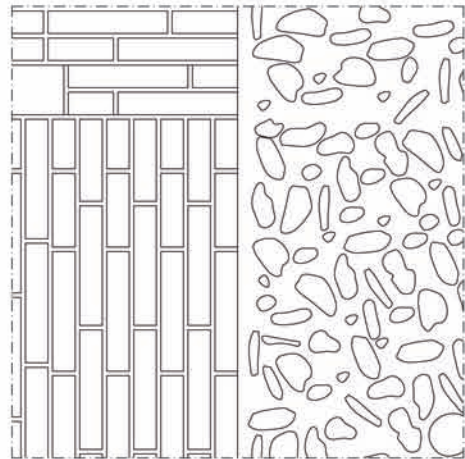
material representation



Via Bartolo
43.113582; 12.389906



photographic documentation



front view

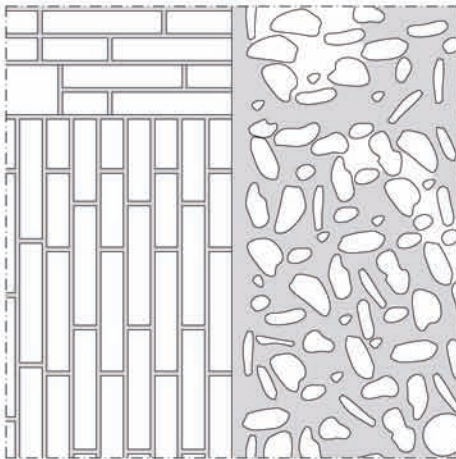


section

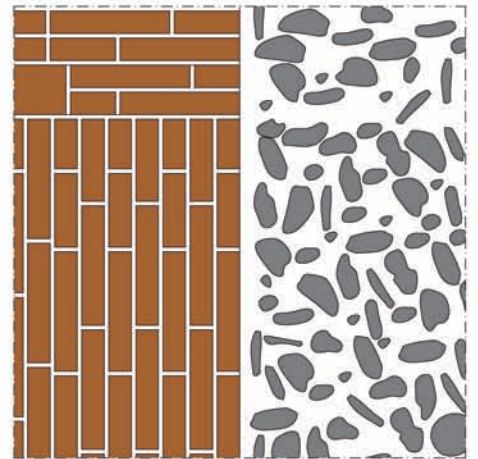
-  mortar
-  bricks
-  cobbles



EF.38



material representation



material representation

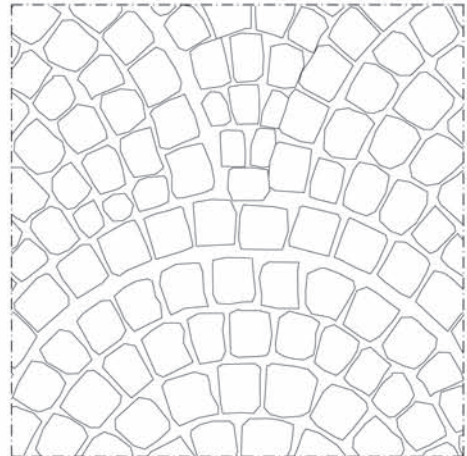
0 50 cm



piazza Matteotti
43.114153; 12.390260



photographic documentation

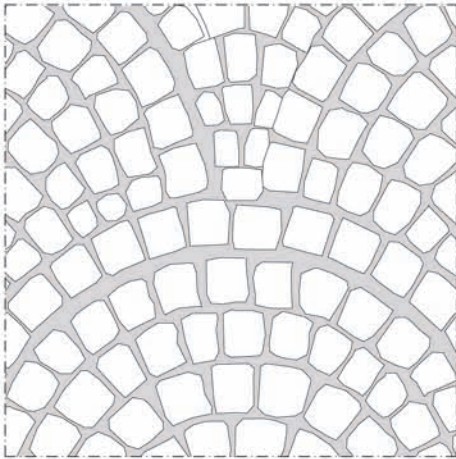


front view

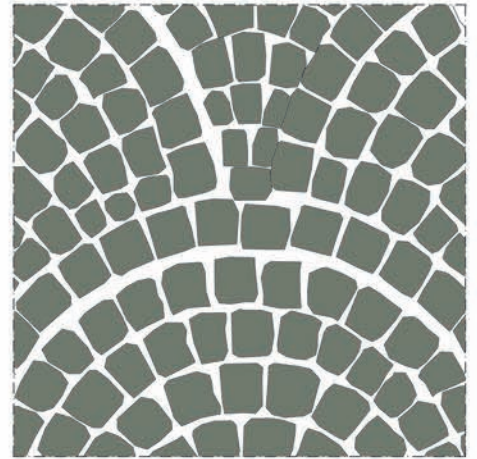




EF.59



material representation



material representation

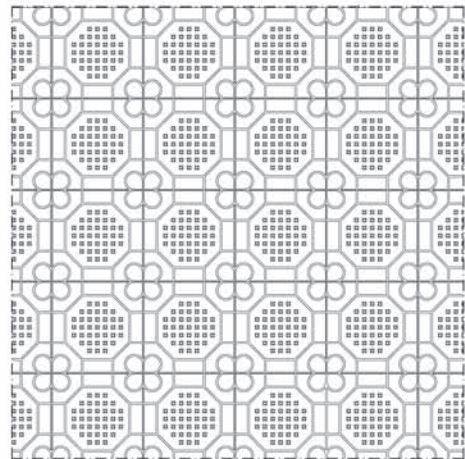
0 50 cm



piazza Italia
43.114153; 12.390260



photographic documentation



front view

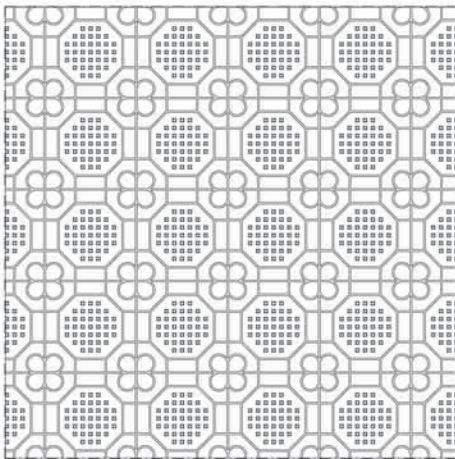


section

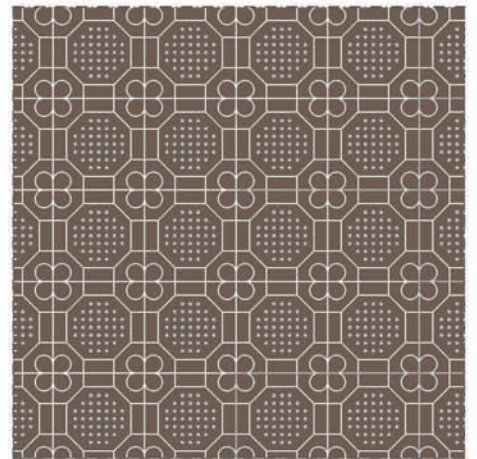




EF.61



material representation



material representation

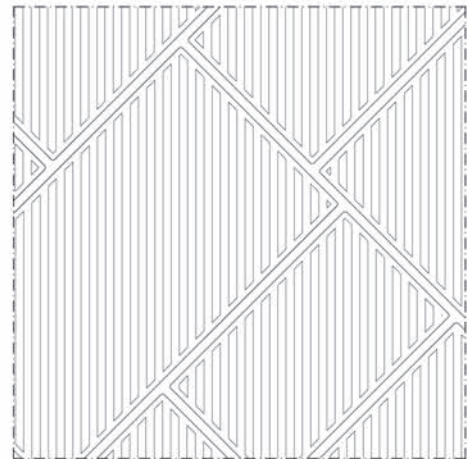
0 50 cm



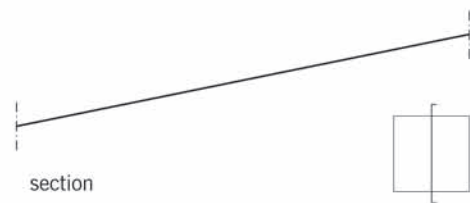
via dei Priori
43.114153; 12.390260



photographic documentation



front view

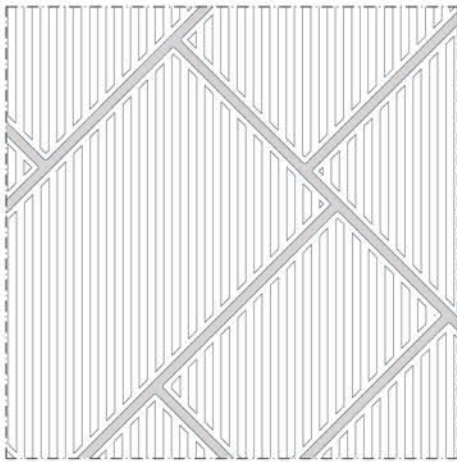


section

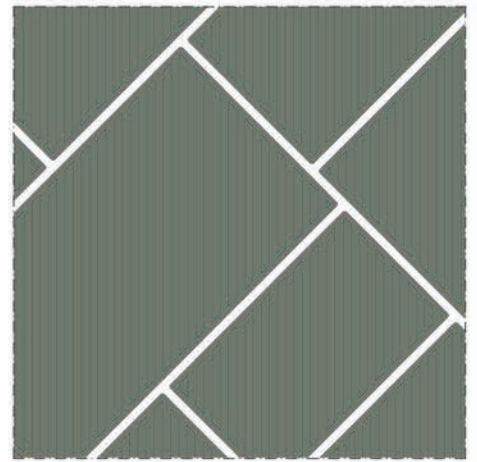




EF.93



material representation



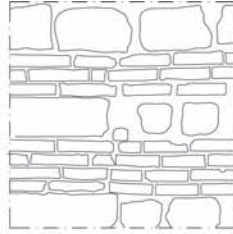
material representation

0 50 cm

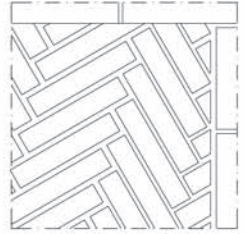
Step 4



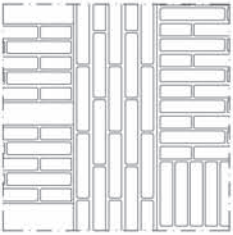
EF.6



EF.23



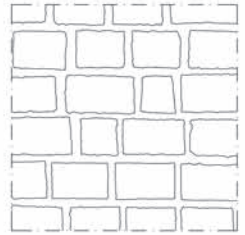
EF.41



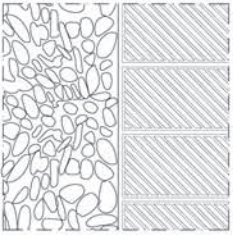
EF.13



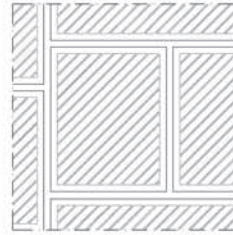
EF.26



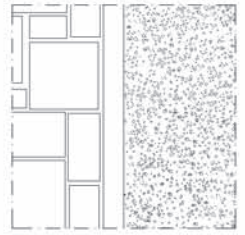
EF.57



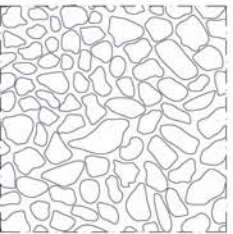
EF.15



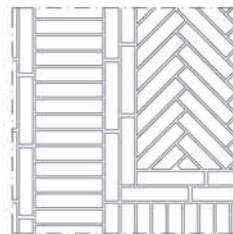
EF.28



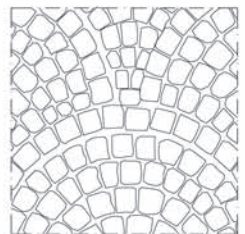
EF.58



EF.17



EF.32



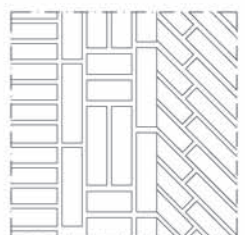
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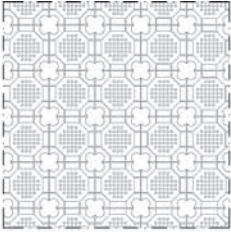
EF.18



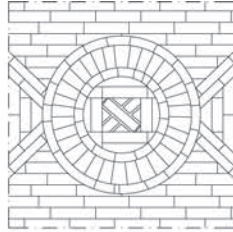
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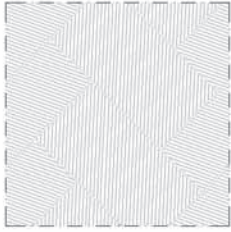
EF.60



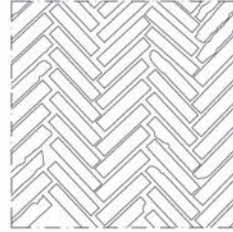
EF.61



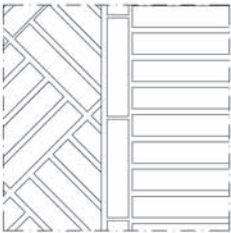
EF.86



EF.63



EF.87



EF.65



EF.93



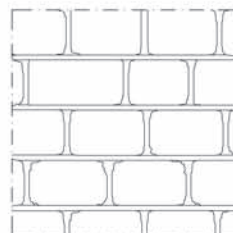
EF.73



EF.98



EF.77



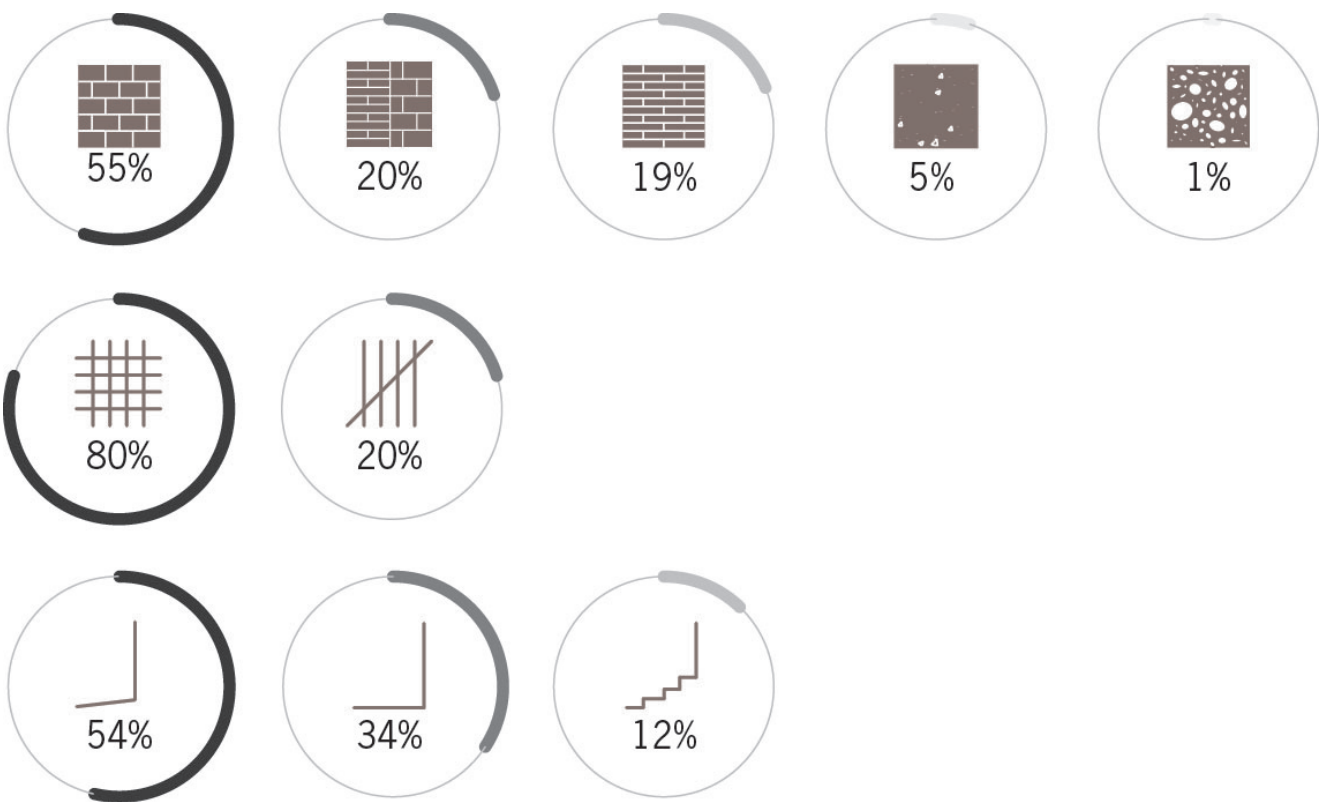
EF.100

0 1 m

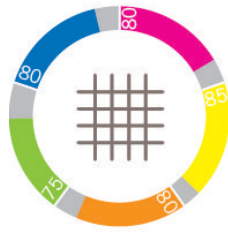
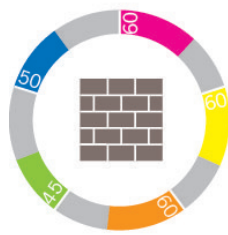
Step 5



Step 6

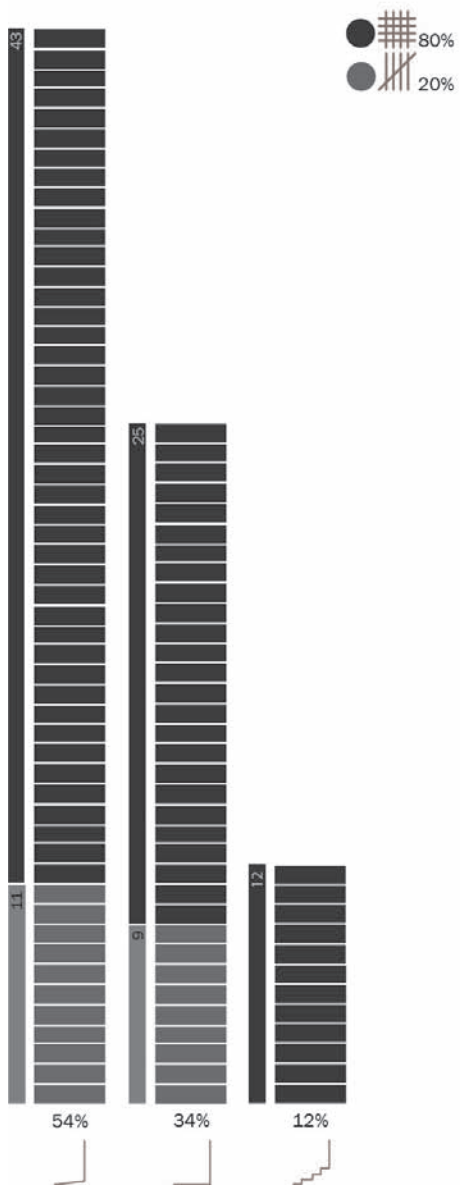


The distribution of the most common characters in the historic city.

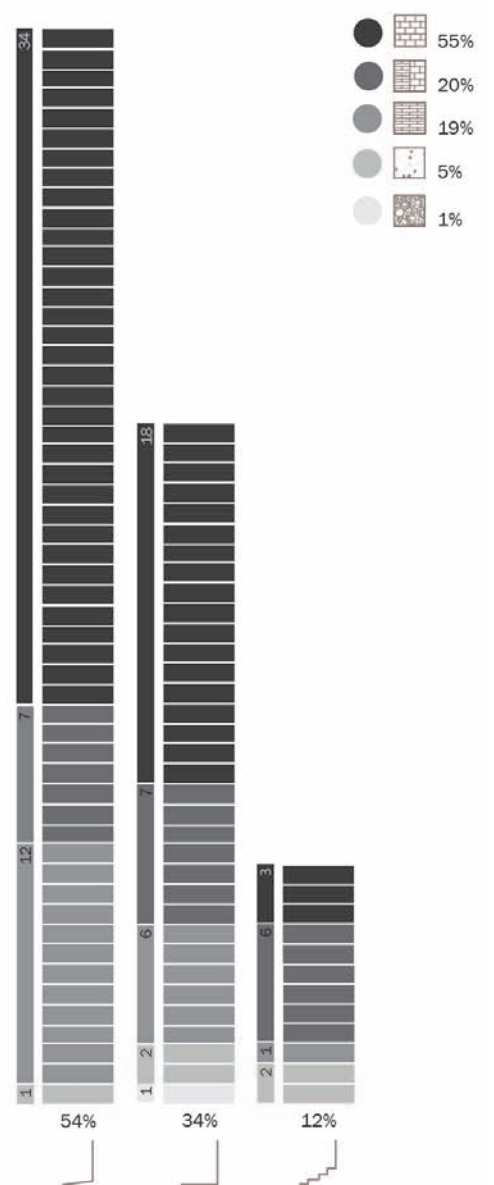


The distribution of the most common characters in each district.

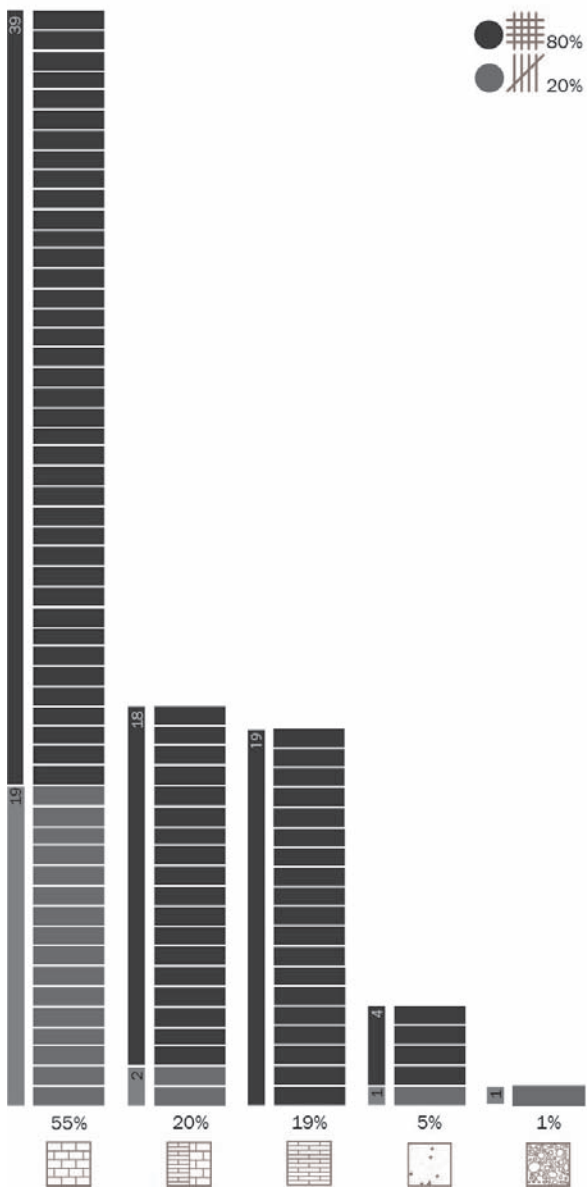
Slope-texture
C=0.194



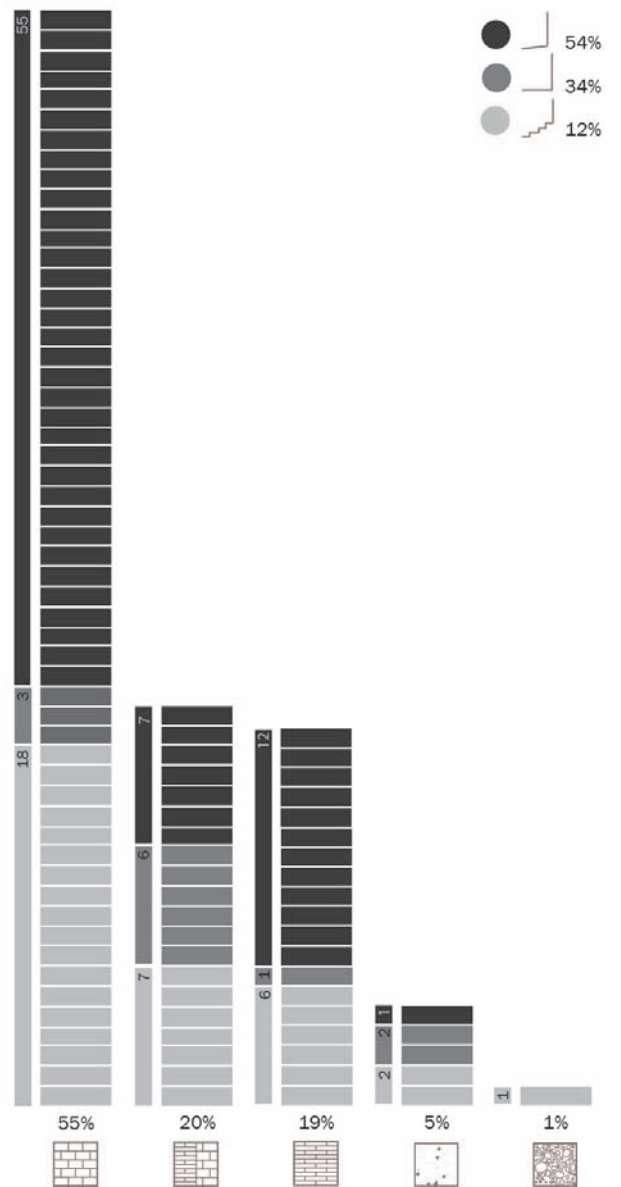
Slope-material
C=0.379



Material-texture
C=0.337

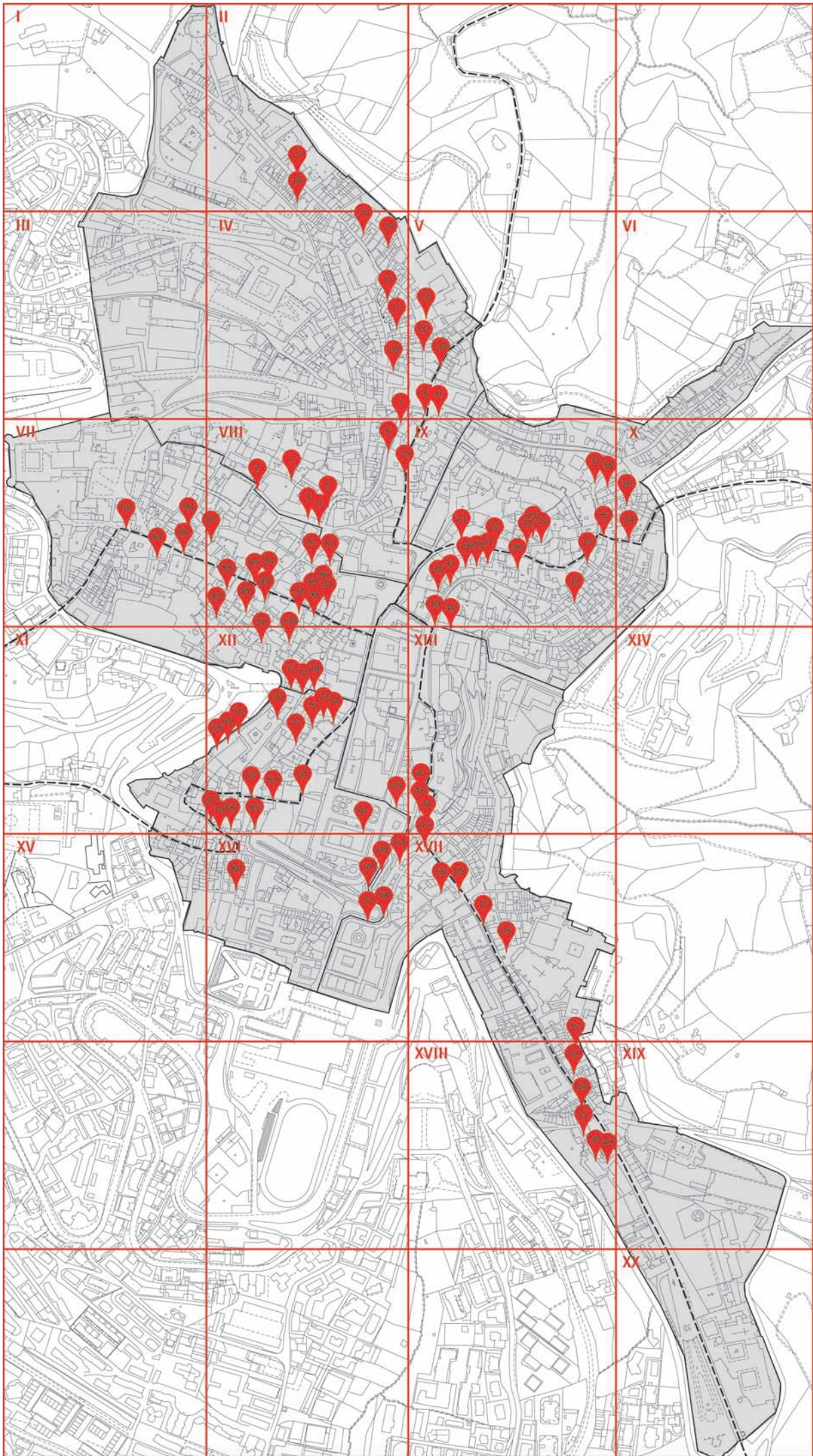


Material-slope
C=0.379



Manhole covers

Step 1



Step 2



MC.1
Via del Verzaro



MC.2
Via della Pernice



MC.3
Piazza Morlacchi



MC.4
Piazza Morlacchi



MC.5
Via Battisti



MC.6
Via Battisti



MC.7
Via Battisti



MC.8
Piazza Fortebraccio



MC.9
Piazza Fortebraccio



MC.10
Via del Bulagaio



MC.11
Via Graziosa



MC.12
Piazza Lupattelli



MC.13
Via Tedesca



MC.14
Via dell'Oro



MC.15
Via del Mogherino



MC.16
Via della Pietra



MC.17
Via della Spada



MC.18
Via Fabretti



MC.19
Via Rocchi



MC.20
Corso Garibaldi



MC.21
Piazza Piccinino



MC.22
Via Bontempi



MC.23
Via Raffaello



MC.24
Via Cesarei



MC.25
Via Cesarei



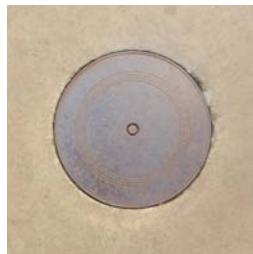
MC.26
Via Volte della Pace



MC.27
Via Volte della Pace



MC.28
Via Volte della Pace



MC.29
Via Volte della Pace



MC.30
Via Volte della Pace



MC.31
Via Alessi



MC.32
Via della Madonna



MC.33
Via Sdrucchiola



MC.34
Via del Carmine



MC.35
Via del Duca



MC.36
Via del Lupo



MC.37
Via del Roschetto



MC.38
Via dei Ciechi



MC.39
Via Sant'Andrea



MC.40
Via Sant'Andrea



MC.41
Via Floramonti



MC.42
Via Floramonti



MC.43
Via Marzia



MC.44
Via Sant'Ercolano



MC.45
Via Sant'Ercolano



MC.46
Piazza Bruno



MC.47
Corso Cavour



MC.48
Via del Grillo



MC.49
Via Ghezzi



MC.50
Via Ghezzi



MC.51
Via Ghezzi



MC.52
Corso Cavour



MC.53
Via del Deposito



MC.54
Via Marconi



MC.55
Corso Cavour



MC.56
Via Vibi



MC.57
Via Masi



MC.58
Via Masi



MC.59
Viale Indipendenza



MC.60
Viale Indipendenza



MC.61
Piazza Italia



MC.62
Via Grecchi



MC.63
Via Caporali



MC.64
Via Caporali



MC.65
Via del Pozzo



MC.66
Via Bruschi



MC.67
Via Mariotti



MC.68
Via della Cupa



MC.69
Via della Cupa



MC.70
Via della Cupa



MC.71
Via Boncambi



MC.72
Via Boncambi



MC.73
Via della Luna



MC.74
Via della Luna



MC.75
Via della Luna



MC.76
Via della Luna



MC.77
Via delle Streghe



MC.78
Via dell'Orso



MC.79
Via San Giacomo



MC.80
Via degli Orti



MC.81
Via Fratti



MC.82
Via Benincasa



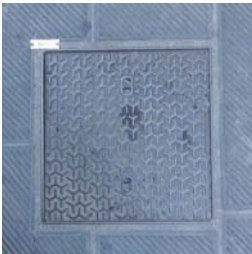
MC.83
Via Benincasa



MC.84
Via degli Sciri



MC.85
Via dei Priori



MC.86
Via dei Priori



MC.87
Via del Morone



MC.88
Via Deliziosa



MC.89
Via della Cupa



MC.90
Via della Cupa



MC.91
Via Fratti



MC.92
Via dei Priori



MC.93
Via dei Priori



MC.94
Via dei Priori



MC.95
Via dei Priori



MC.96
Via dei Priori



MC.97
Via Ritrosa



MC.98
Via Santo Stefano



MC.99
Via dei Priori



MC.100
Via Vermiglioli

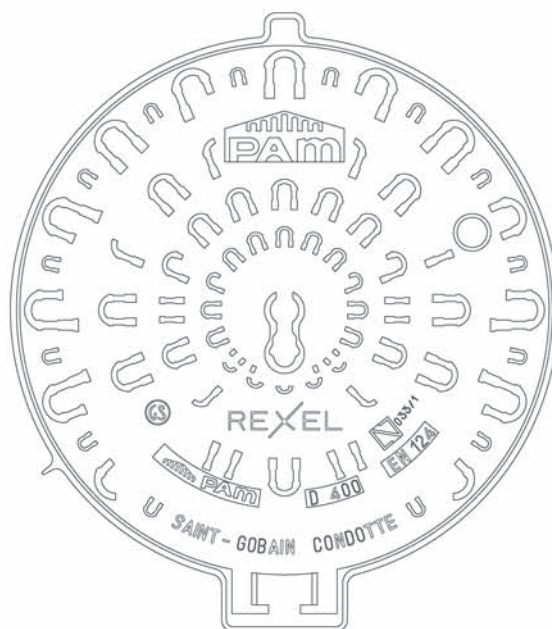
Step 3



piazza Morlacchi
43.108633; 12.388435



photographic documentation



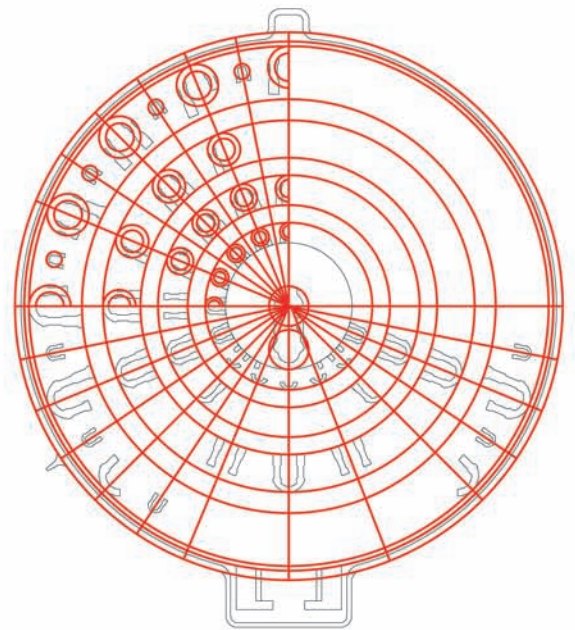
front view



MC.4



material representation



geometrical reasons

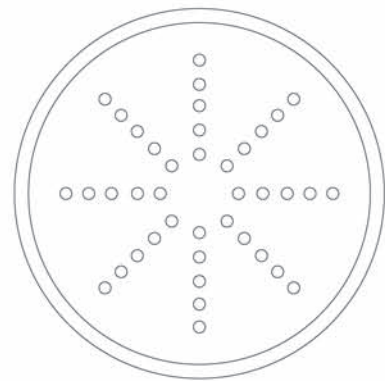
0 25 cm



via del Duca
43.201522; 12.401436



photographic documentation



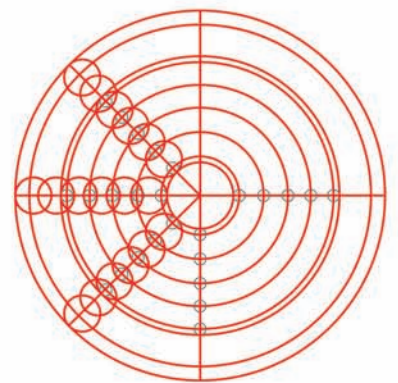
front view



MC.35



material representation



geometrical reasons

0 25 cm



via Floramonti
43.11633; 12.401435



photographic documentation



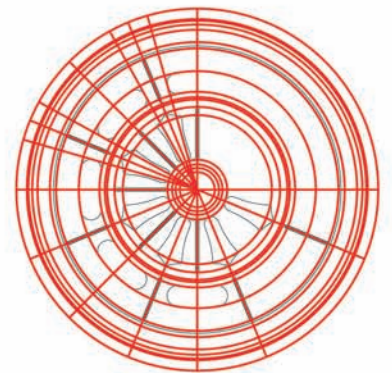
front view



MC.41



material representation



geometrical reasons

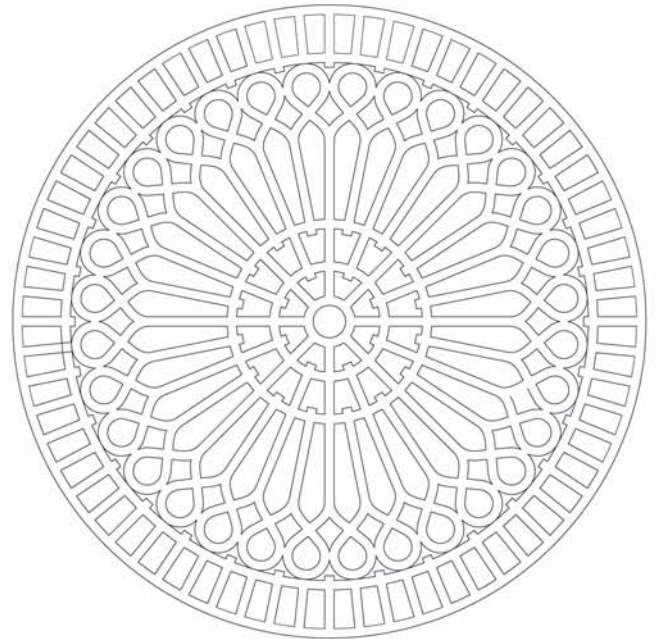
0 25 cm



piazza Italia
43.108633; 12.388435



photographic documentation

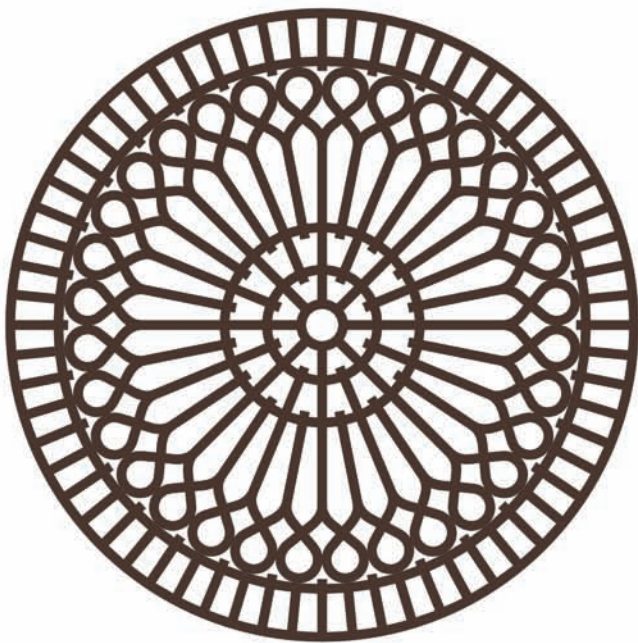


front view

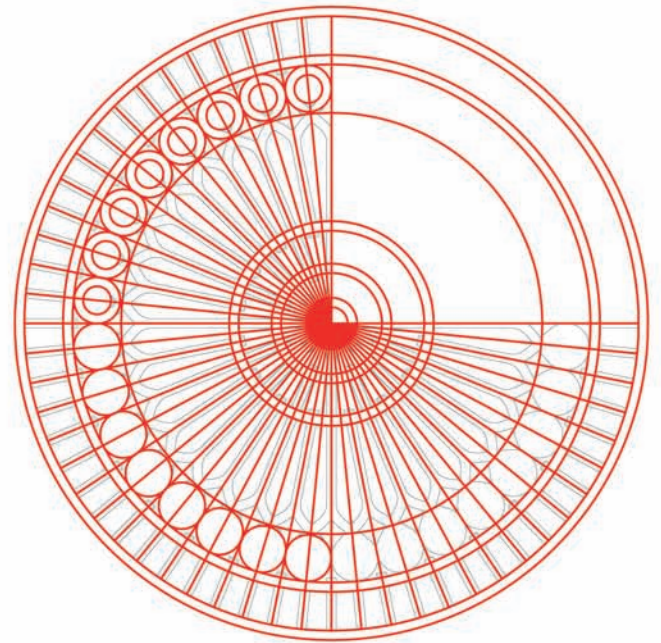
 cast iron



MC.61



material representation



geometrical reasons

0 25 cm



via Santo Stefano
43.985633; 12.388552



photographic documentation



front view

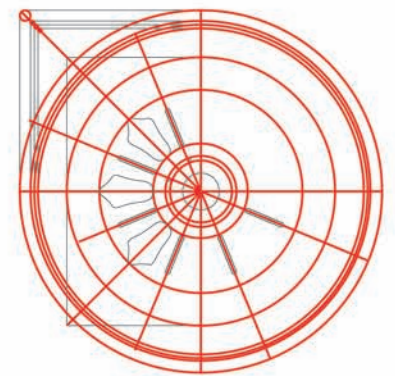
 cast iron



MC.98



material representation



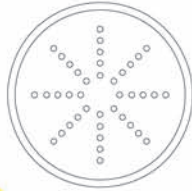
geometrical reasons

0 25 cm

Step 4



MC.1



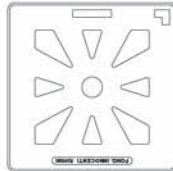
MC.35



MC.41



MC.18



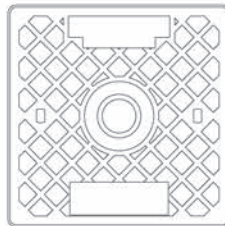
MC.34



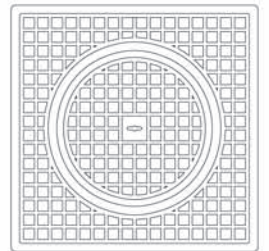
MC.55



MC.9



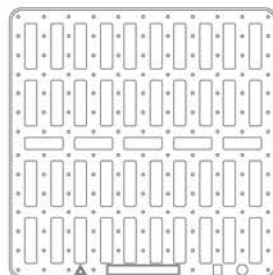
MC.27



MC.52



MC.7



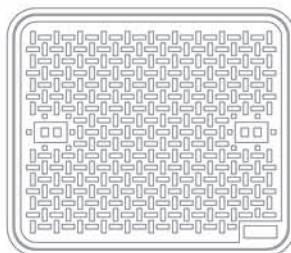
MC.40



MC.48



MC.4



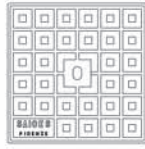
MC.26



MC.49



MC.75



MC.94



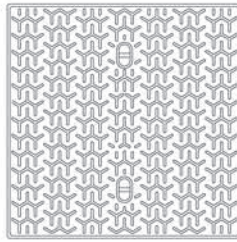
MC.74



MC.98



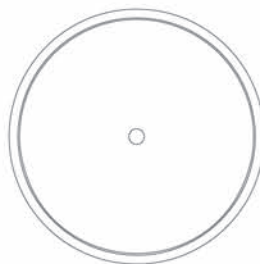
MC.63



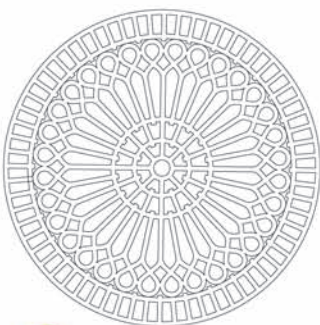
MC.86



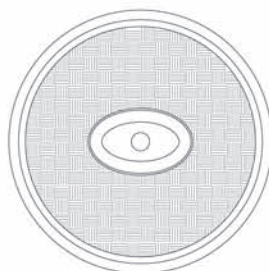
MC.77



MC.93



MC.61



MC.89

0 50 cm

Step 5

vane				closing		material			flooring			

1% =



recurring characters



squared



full

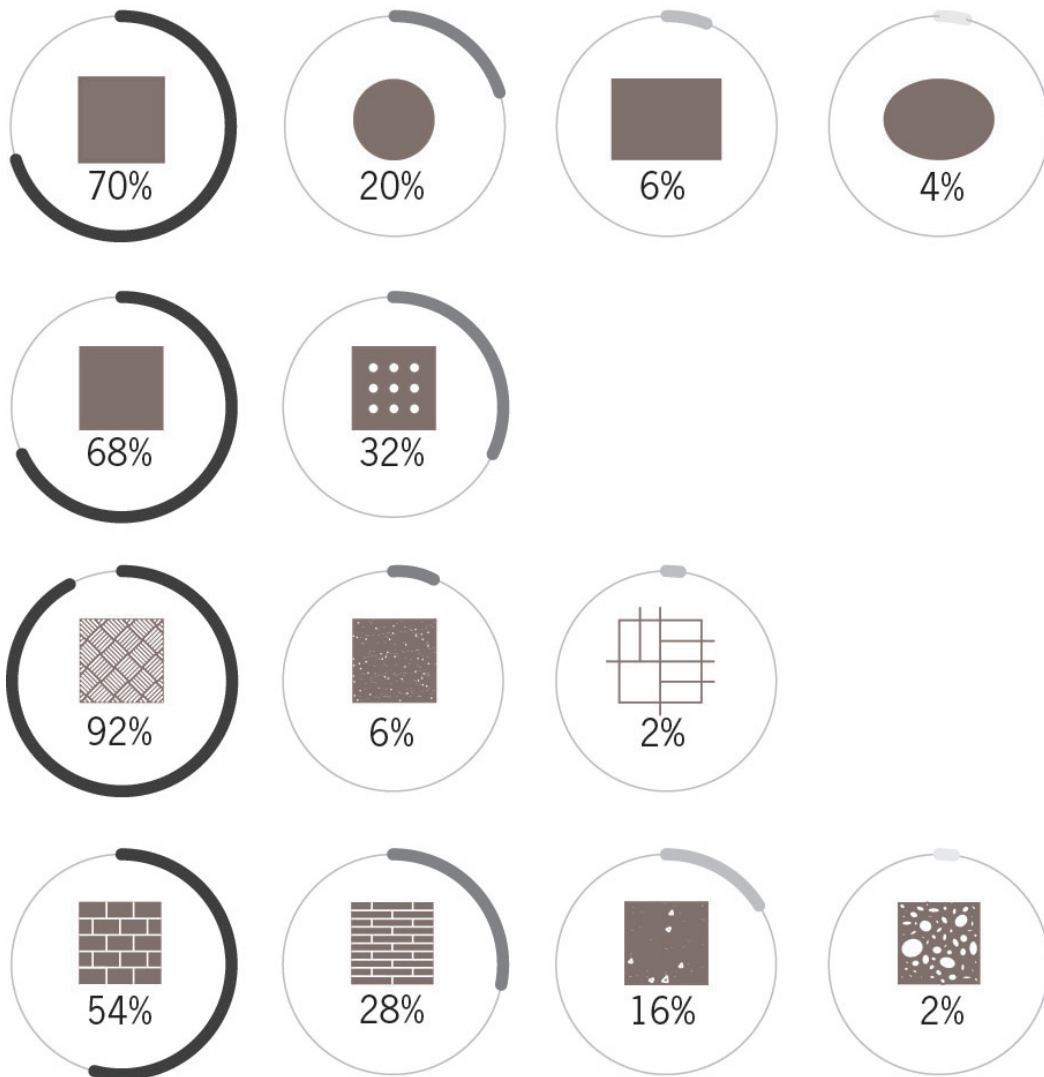


metal

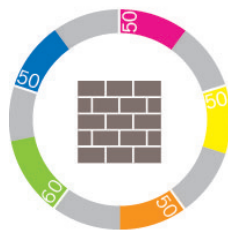
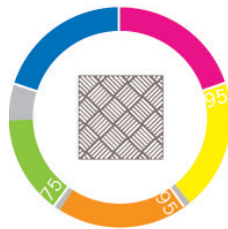
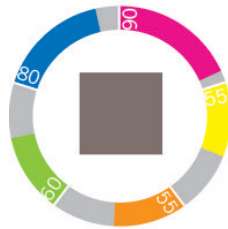
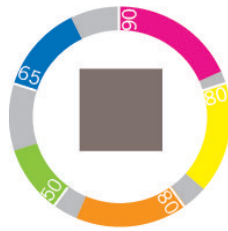


stone

Step 6

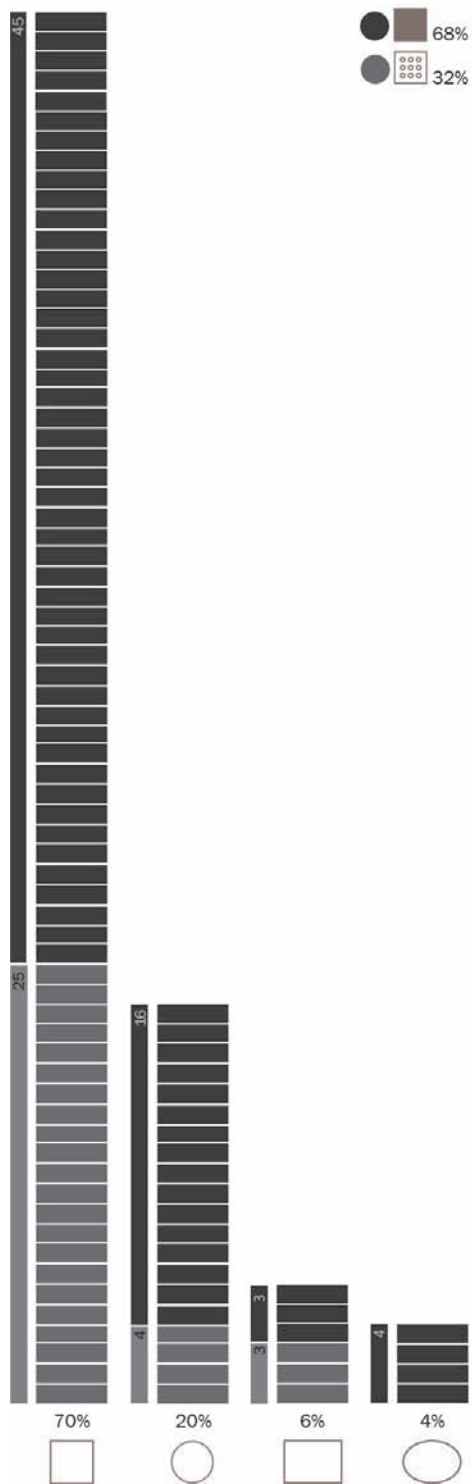


The distribution of the most common characters in the historic city.

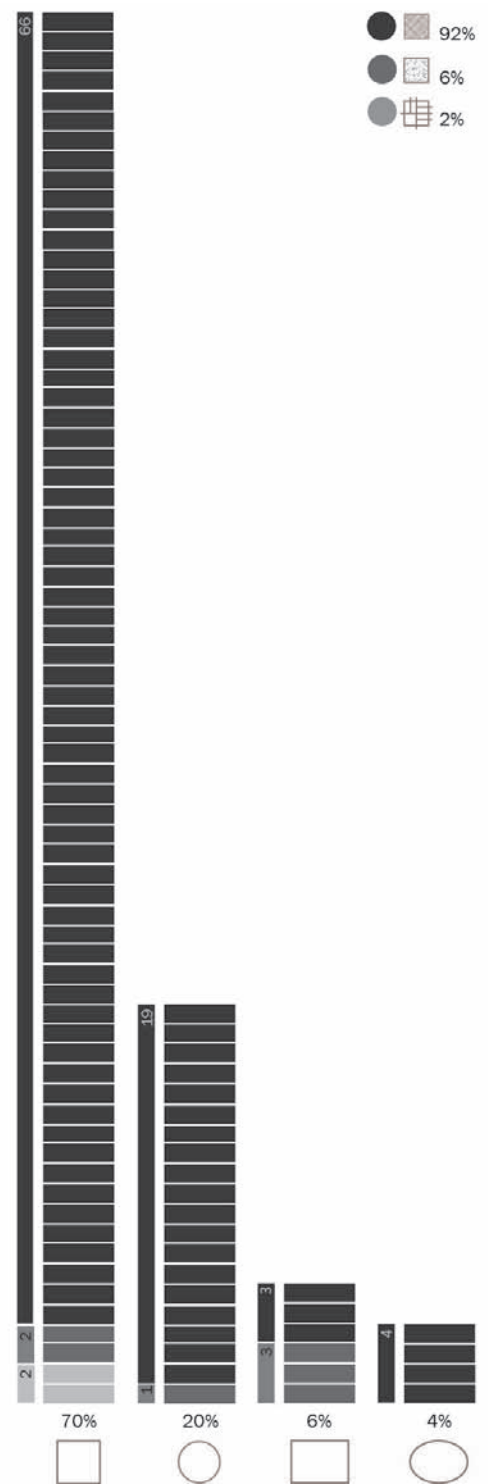


The distribution of the most common characters in each district.

Vane-closing
C=0.208

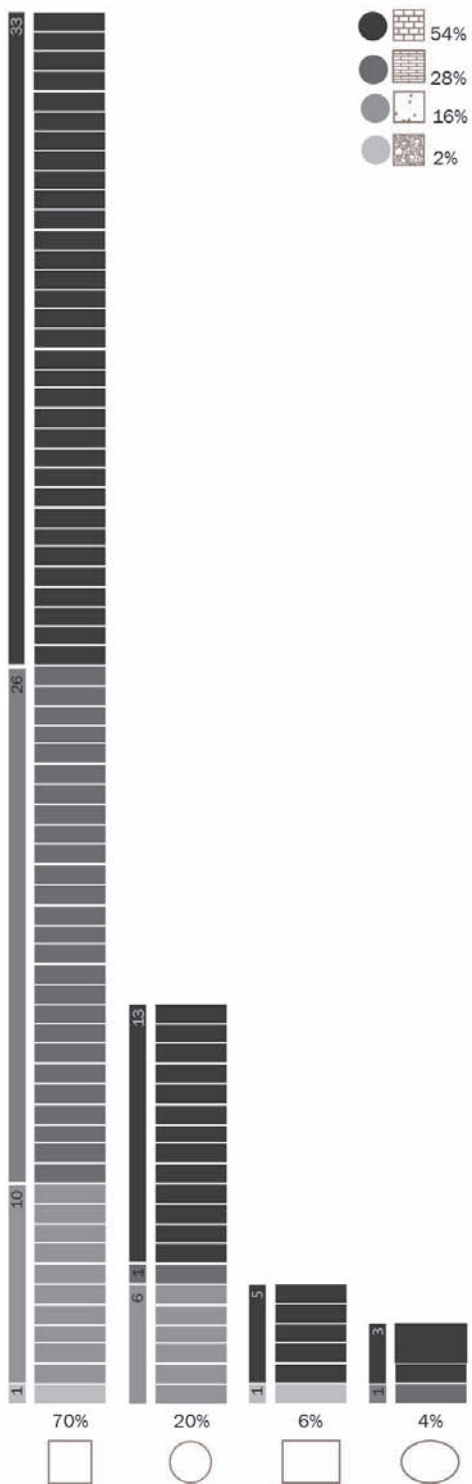


Vane-material
C=0.432



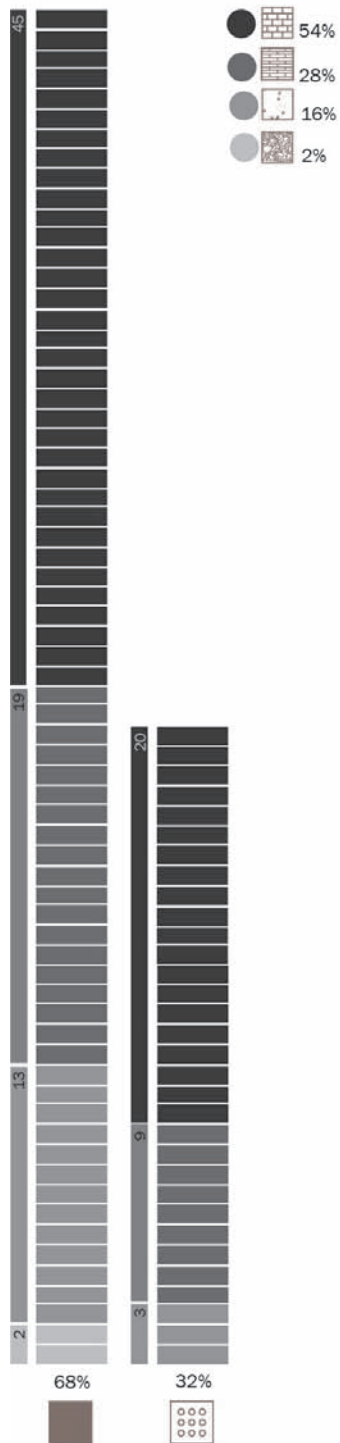
Vane-flooring

C=0.418



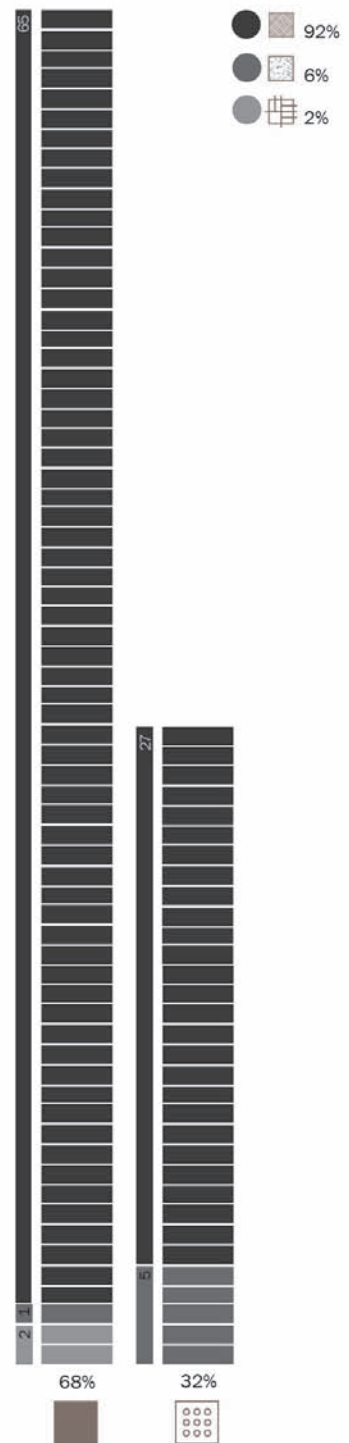
Closing-flooring

C=0.167

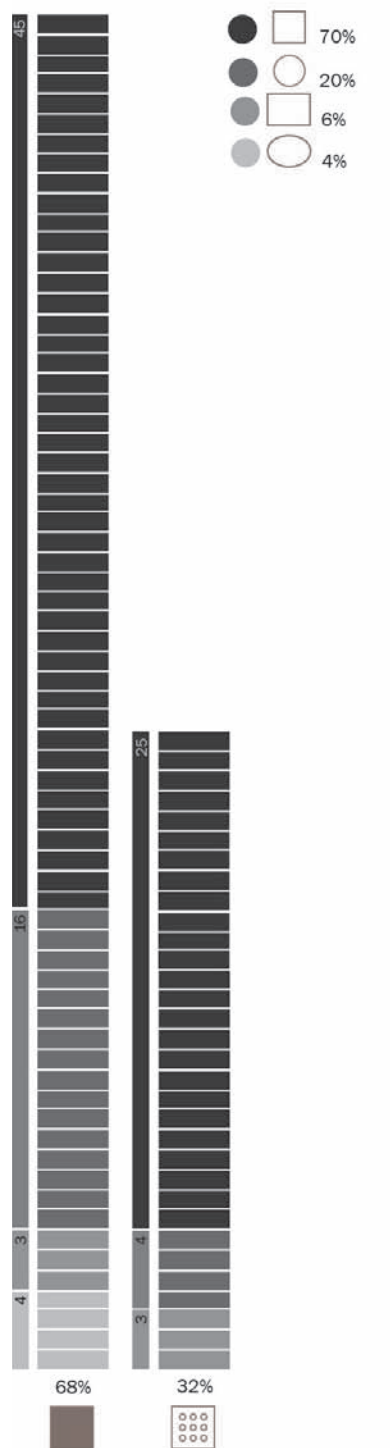


Closing-material

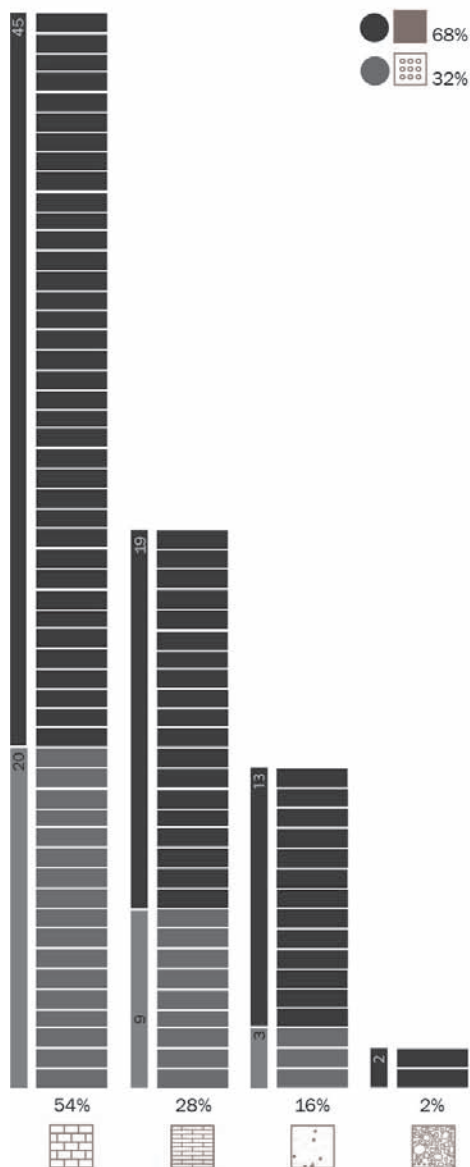
C=0.280



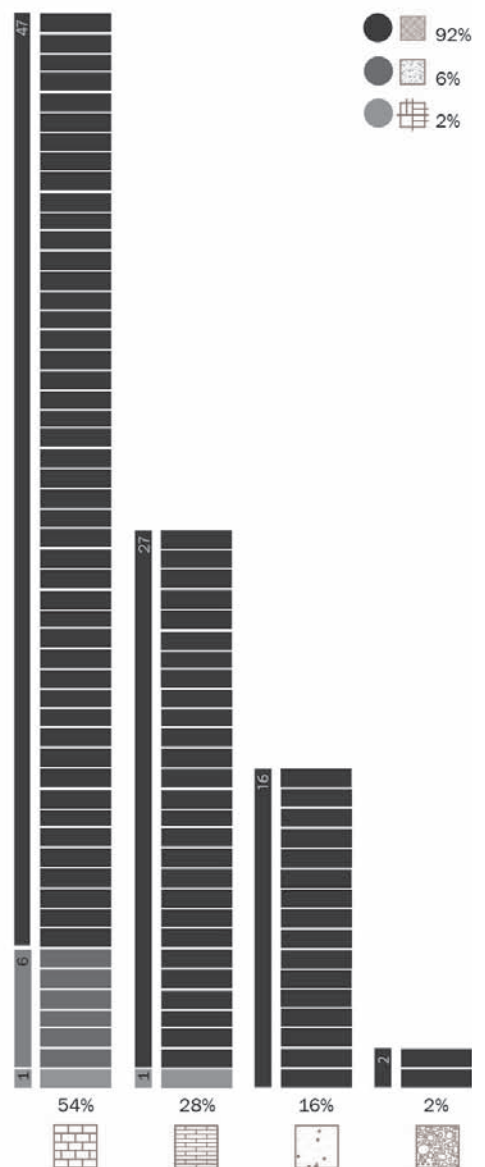
Closing-vane
C=0.208



Flooring-closing
C=0.167

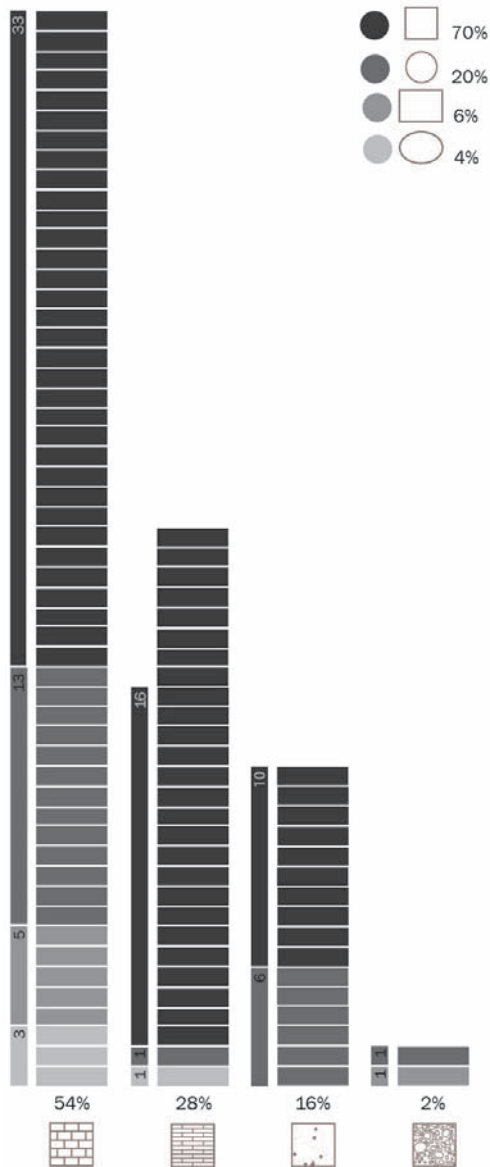


Flooring-material
C=0.241



Flooring-vane

C=0.418



Tendentious glossary

Five immaterial terms

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The decision to introduce the following terms arose from recognition of the multiple meanings attributable to them. With this in mind, the definitions proposed do not assume a conclusive value, but are rather configured as the result of survey activities, in an attempt to bring out the most appropriate meaning within the specific framework of the research being carried out.

Historic centre. The need to specify this term derives from the ambiguity linked both to the analytical rigour required by any intervention concerning historical centres, as well as their evocative character. From this perspective, it is interesting to note that the German language uses different expressions with varied nuances of meaning: *Altstadt* (which identifies the old city in opposition to the new city, through a *a posteriori* recognition), *Stadtzentrum* (defined as the geographical centre of the city around which the urban agglomeration has developed), *Historisches Zentrum* (literal translation of the analogous Italian term *centro storico* or historic centre, which is mainly used in the scientific fields of conservation and restoration) and *Innstadt* which extends the idea of centrality to areas of functional and representative importance, regardless of their historical origin). In this sense, the term assumes the meaning of a homogenous context (in the sense of unity of relationships) with a recognisable identity produced through successive layers. On the one hand, the notion of the historic centre

concerns an unchanging origin (in Greek *kéntron* means fulcrum, the point from which a circle is drawn), surrounded by an enclosed area that may be expanding but nevertheless retains its place of origin (referring to regulatory issues related to protection of historic areas in the Italian context). At the same time, it is precisely by starting from the awareness of a centre that it is possible to orient interventions that are respectful of the identity of the existing heritage¹.

Comparison. “In the same essay, Eliot addresses analysis and comparison as tools of literary criticism. These methods of criticism are also valid in the field of architecture. Architecture, like any other aspect of experience, is susceptible to analysis and is made more incisive by comparison. An analysis of architecture implies the decomposition thereof into elements, a technique that I often adopt even though goes against integration, the ultimate aim of the art form. As paradoxical as it may seem, and despite the doubts of many modern architects, this disintegration is present in every creative process, and is essential for understanding it”². The comparative method is based on confrontation, and the opportunity to establish a relationship of equality or difference (in terms of quality and/or quantity) between attributes assigned to persons or things³. In this case, the comparison concerns the relationships between formal qualities (that are markedly morphological and material) made possible by the use of drawing. The usefulness of this type of taxonomic operation lies in the fact that it facilitates the interpretation of the city system, ensuring the connection between the juxtaposed and compared components thanks to the homogeneity of the approach adopted.

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Simple element. Proceeding through the disarticulation of the historical city (defined as a homogeneous entirety) into its components, simple elements are identified as the elementary parts in relation to the overall organism of the city. This aspect of the relationship with the whole is necessary in order for a simple element to acquire value. Entrances, windows, wall textures, external flooring and manhole covers are interpreted as unitary and significant elements in defining the genetic code of the city. The element is simple in that it is acknowledged as unique by the art of perception, meaning that subdividing it into parts or components that can enjoy their own autonomy from the whole and constitute independent partial units is rendered inappropriate at the cognitive level. This does not negate the fact that the element may consist of the assemblage of differentiated parts that, although endowed with a certain autonomy, would lose their meaning if split from the whole (for example, the window element constitutes a strongly cohesive whole - on the visual, structural and functional level, the cornice, the grate etc. comprise one sole organism, the parts of which are be much more coherent if identified in relation to the greater entity of reference)⁴.

Identity. While extremely broad and abstract when considered in its totality, this concept acquires a real value if applied to urban areas where the identity of a city is closely linked to the recognition of its characters, which express its peculiarity and uniqueness. From an architectural point of view, this definition presupposes the application of an analytical

approach dedicated to the existing physical elements, considered as concrete forms of objectification of identity. However, the consequence of this statement cannot be limited to the repetition of identical actions with the sole aim of maintaining that which already exists (giving rise to a mechanism described by Gianni Rodari in *C'era due volte il barone Lamberto*⁵, in which a group of workers repeat the name of the elderly and sick protagonist over and over again, until he is rejuvenated). The conservation of the urban identity is instead configured as the implementation of actions that are able to transmit an image consistent with it. In this context, the knowledge, in the specific form of the architectural survey, assumes a necessary part in that, with its diagnostic role, it makes it possible to understand the relationship between objects in the context of apparent overall heterogeneity, providing the basis for the critical evaluation of the legitimacy (or illegitimacy) of a transformative action, which is therefore also design-related⁶.

Type. “Zoological and botanical systems basically teach the same things, namely that organisms present a huge variety of forms and functions and that no individual is identical to another, even though the organisms can be classified. Indeed, it is not possible to arrange all the passing forms into a series, but they can be grouped according to their similarities and differences. [...] Types are the broader systematic categories within which an organisational plan can be recognised, however the differences between one type and another are such that they make comparisons impossible or largely fruitless, at least at the level of anatomical research”⁷. Therefore, the definition of type as general form, shared by a certain number of individuals, substantially depends on the criterion used in the classification, shifting the interpretation of the concept to the terms of bias and arbitrariness that are part of the architectural survey.

Five material terms⁸

Although potentially repeatable in other contexts, the method conceived with the research was specifically applied to the context of the historic city of Perugia. In this respect, the selection of terms set out below is intended to highlight the specificity of the main variety of materials found in the area being analysed.

Carnagione di Lacugnana. In the context of Perugia, the presence of buildings with facades characterised by a decorative white and red two-tone effect is particularly interesting. This is achieved by the combination of white travertine (or limestone) elements, and elements in carnagione rosa di Lacugnana. This latter is a carbonate rock from a quarry located near the village of Lacugnana (Perugia).

Serena stone (or arenaria di Tuoro sul Trasimeno). The use of this material is extremely common in the historical centre of Perugia, both in the creation of floor coverings and as a component of the wall textures. It is a type of sandstone predominantly consisting of quartz granules. Specifically, the kind used in Perugia came from the quarry in Tuoro sul Trasimeno (Perugia). Its compositional characteristics confer qualities of uniformity and workability on the material, making it easily to carve.

Travertine. The presence of numerous travertine quarries around the city of Perugia has allowed it to be used continuously throughout the historical-architectural evolution of the city. Characterised by yellow tones when extracted, it assumes greyish shades as a result of exposure to weather conditions. Usually, its use involves ashlar of modest dimensions that are perfectly squared with smoothed surfaces, making them suitable for being easily transported and laid in perfectly horizontal, regular rows.

Tuff. Although not a stone originating from the territory of Perugia, it has been found to have been used in the historical centre of Perugia, especially in relation to the construction of mixed masonry. The stone is of volcanic origin, and is extracted from quarries in the area of Orvieto.

Cobblestone. These are limestone pebbles of different colours used for the construction of external flooring. They are elements with a rounded shape and irregular faces, commonly found both in the river bed of streams and rivers and in alluvial soils. Although extremely poor, the lithic material acquires value thanks to its high strength and aesthetic appeal.

notes

¹ See AYMUNINO 2000, p. 207, CUTOLO, PACE 2016, pp. 18-19.

² “Eliot tratta nello stesso saggio dell’analisi e della comparazione come strumenti della critica letteraria. Tali metodi di critica sono validi anche nel campo dell’architettura: l’architettura, come ogni altro aspetto dell’esperienza, è suscettibile di analisi ed è resa più incisiva per comparazione. Un’analisi dell’architettura ne implica la scomposizione in elementi, tecnica che spesso adopero, benché opposta all’integrazione, scopo finale dell’arte. Per quanto paradossale possa apparire, e nonostante i dubbi di molti architetti moderni, tale disintegrazione è presente in ogni processo creativo, ed è essenziale per la sua comprensione”. See VENTURI 2005, p. 14.

³ See DEVOTO-OLI 2014, word *Comparativo*.

⁴ See CANIGGIA, MAFFEI 2008; VASCO ROCCA 2002; PAPALDO 1992. For further information about this topic see the paragraph *The study of simple elements*.

⁵ See RODARI 1978.

⁶ See CUTOLO, PACE 2016; TOPPETTI 2011; ASSMANN 1997; RAMBALDI 1979.

⁷ “La sistematica zoologica e botanica insegnano fundamentalmente le stesse cose, e cioè che gli organismi ci si presentano con un’enorme varietà di forme e di funzioni, che nessun individuo è identico ad un altro, e che pur tuttavia gli organismi si possono classificare. Non si possono, infatti, disporre in un’unica serie con tutte le forme di passaggio, ma si possono raggruppare in base alle loro somiglianze e differenze. [...] I tipi sono appunto le più ampie categorie sistematiche nell’ambito delle quali è riconoscibile un piano di organizzazione; mentre tra tipo e tipo le differenze sono tali da rendere i paragoni impossibili o poco fruttuosi, almeno a livello di ricerca anatomica”. See PADOA 2002, pp. 17-18.

⁸ See SPERANDIO 2014, PAGANO 1934.

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