

The Synthetic Hand. Design Research Through Hand Drawing

Eliana Martinelli

Abstract

*Starting from Henri Focillon's famous essay *Eloge de la main* [1939] and, more recently, Tim Ingold's book *Making: Anthropology, Archaeology, Art and Architecture* [2013], with the support of philosophical and anthropological considerations, the paper aims to investigate the present relevance of hand drawing, not as a mere method of representation but more properly as a method of design. The argument focuses, in the first instance, on three questions of correspondence: the hand as action and knowledge; the hand as expression and language; and the hand as a synthesis of architectural making. The aim is to demonstrate how research on and of the project is directly influenced by research on drawing, taking as case studies three master theses in architectural and urban design carried out from 2019 to 2023 at the Department of Architecture, University of Florence, through hand drawing, both in the investigation and restitution phases. The project is here intended as the result of a sequence of choices oriented toward the interpretation of places. Hand drawing has the characteristic of being able to reflect and, at the same time, control this process, according to continuous learning, always being aware of the real facts.*

Keywords: hand drawing, architectural composition, design as research, language, place.

Introduction

"I am about to undertake this praise of the hand as one fulfills a duty of friendship. The moment I begin to write, I see my own hands urging and stimulating my mind. Here they are, tireless companions that for many years have fulfilled their task, one holding the paper steady and the other multiplying those small, dark, dense, persistent marks on the blank page. Through them, man makes contact with the hard texture of thought and comes to force its blockage. It is the hands that impose a form [...] [Focillon 2002, p. 105].

Starting from Henri Focillon's famous incipit to the essay *Eloge de la main*, which first appeared in 1939, we aim to investigate the extremely close relationship between ideational hand and ideated form in the spe-

cific field of architectural and urban composition. The issues of drawing, on the one hand, and design, on the other, as tools of knowledge, have been the subject of long reflection, going on to form the basis, notably, of the Italian school of architecture.

Today, hand drawing is relegated, in the most fortunate cases, to the initial ideational phase of the design process. The sketch is rightly considered the decisive moment for unveiling an idea, or even its DNA [Purini 1996, p. 42], as a "rapid, available, dense, self-generative, and, above all, extraordinarily communicative notational system" [Belardi 2015, p. 46]. However, in the practice of both students and professionals, this foundational role is increasingly lost, coming to repre-

sent the idea immediately through the digital medium without really conceiving it.

Taking an alternative stance to the common practice, which restricts hand drawing to the sketch phase, the contribution intends to reflect on hand drawing as the basis of a real design experimentation, avoiding a digital representation from the idea conception to the final elaboration of the project. This is a seemingly anachronistic proposal, but one that actually takes on entirely experimental meanings and opens up new (old) possibilities for design research in an era in which the instrumentality of the hand organ has been gradually lost. To argue this research methodology, it will be necessary to explore, in the first instance, three questions of correspondence: the hand as action and knowledge; the hand as expression and language; and the hand as a synthesis of architectural making.

The hand between action and knowledge

“The hand is action: it grabs, creates, and, at times, one might say, thinks. In a state of rest, it is not a soulless utensil, a tool abandoned on the table or allowed to hang lifeless along the body; instinct and the will for action remain in it in a state of reflection, and one does not have to rest long to realize the gesture it is about to perform” [Focillon 2002, p. 106].

The correspondence between hand and action is certainly the most obvious, and it has been a source of great fascination throughout the history of Western art. The hand, as the primary means of artistic creation, has always been an icon of acting: from the carnal hands sculpted by Gian Lorenzo Bernini in *The Rape of Proserpine* (1621-22), to the divine hands, intent in the action immediately preceding *The Creation of Adam* (1511), painted by Michelangelo Buonarroti, and even to the hands as instruments of verifying reality in Michelangelo Merisi da Caravaggio's *The Incredulity of Saint Thomas* (1600-01), where touch is sight. The latter relationship between senses is precisely the one that interests us the most.

As we all know, the hands create all forms of art, but the creative act also affects the inner life. “The mind makes the hand, and the hand makes the mind” [Focillon 2002, p. 130], although the relationships between these two organs are anything but simple, built on a

continuous coming and going, which we might call “constructive”, because it allows for a gradual awareness of measure, whether in terms of extension, weight, or density. Practice enables the development of capacities of “feeling”, in which the mnemonic aspect of technicality lies. Therefore, even before being instruments of creation, hands are the organs of knowledge [Focillon 2002, p. 114] in a double sense: to know and to know how. Precisely this gestural knowledge enables the development of technical intelligence, necessary for any creative craft, in which practical experience is improved [Ingold 2019, pp. 194-195].

In the Cueva de las Manos (Argentina), rock engravings dating back between nine thousand and thirteen thousand years ago have been discovered, featuring hundreds of handprints. They remind us that the hand created humanity, connecting it to the universe: “taking possession of the world demands a kind of tactile instinct. [...] The action of the hand defines the emptiness of space and the fullness of the things that occupy it. [...] Space is not measured by sight but by the hand and the step. [...] Gestures, thus, multiplied knowledge” [Focillon 2002, p. 110].

As Georges Perec states in *Species of Spaces*, “space begins like this, only with words, as signs traced on the blank page” [Perec 2020, p. 19]. The primordial space is the emptiness of the page; the page is where the hand begins to measure space and the gesture to understand it. But once solid knowledge is established, the hand is also the tool to express it and transfer it through drawing, establishing a language.

The hand between expression and language

“It is a fact, as Michael Polanyi states in the introduction to a series of lectures entitled *The Tacit Dimension*, ‘that we can know more than we can express’ [Polanyi 1966, p. 4]. Polanyi was referring to those modes of knowledge and action that develop through experience and practice within an art but are so firmly anchored in the person practicing them that any attempt at explanation or analysis is impossible. [...] If for Polanyi, however, the central point was what it means to know, my interest [...] is focused on what it means to express. [...] We can express what we know through practice and experience” [Ingold 2019, p. 183].

In his recent groundbreaking book, Tim Ingold reflects on the remarkable eloquence of the hand: the more the eyes are intent on expressing, the less they can see (as in the case of eyes blurred by tears); on the contrary, the hand's sensitivity is connected to its gestural vitality [Ingold 2019, p. 188].

If language subtends the hand, the hand subtends, in turn, the human, which is defined by having the world *zuhanden* (at hand), as Martin Heidegger [1999, p. 156] asserts. For the philosopher, the hand is not an instrument but what makes all instrumentality possible. Through it, humans can be world-formers: they can "tell", in the sense of discovering and revealing, but also of narrating what they have learned. Therefore, the hand is language, since its vividness "accurately translates an ancient condition of man, the memory of his efforts to invent a new world" [Focillon 2002, p. 111]. In this sense, it is worth mentioning the famous *Supplement to the Italian Dictionary* by Bruno Munari [1958], who has turned gesture into a non-verbal language that can go beyond the different verbal languages.

Le Corbusier's big *main ouverte*, erected in Chandigarh, India, between 1950 and 1965, stands as a manifesto of this thought: reversing the meaning of the hand as a unit of measurement, in the design sketch the measure of the hand-monument is given by a small *modular* man positioned on it. The monument represents the principle of a way of making architecture rooted in the Renaissance and becoming the great support of a certain modernity upon which humanity rises.

By hand, the architect makes architecture

Consequently, what is the sense of hand drawing for an architect? Or rather, if the role of the sketch in the ideational process is widely recognized, to what extent does it still make sense to develop a project completely by hand? To put it in the words of Franco Purini: "Where does the project begin, and where does the drawing end? Where does the thought begin, and where does the drawing begin? Where does the design end and the construction begin?" [Purini 1996, p. 31].

As we have seen, drawing is expression (telling by hand), but not every line has the purpose of expressing

the gesture that produced it. Non-gestural lines aim to affirm rather than express. In contrast, gestural lines, like sketches, do not intend to state but to "derive" [Ingold 2019, pp. 210-211].

"The meaning of drawing, if there is ever one, is not in my control" [Talbot 2008, p. 56]. This sentence is rather antithetical to the common view, which considers drawing nothing more than the projection of mental images onto a blank page [Ingold 2019, p. 212], in the case of some children's drawings. In fact, we do not want to refer here to drawing as a representation of an image in its phenomenological aspect (the so-called *Darstellung* in German); rather, we are interested in drawing as an eminently intellectual content, the outcome of a critical interpretation, and thus, a form of knowledge that aligns drawing with a text: this is the *Vorstellung* [Hugh 2008, pp. 7, 23].

We are interested in drawing as a trace of a gesture, which is a performative act. Therefore, despite its usual classification among the visual arts, Ingold [2019, pp. 213-214] argues, we could say that drawing comes closest to music and dance as an expression of time and movement. Drawing by hand is, therefore, a transformative act, affecting both the drawer and those who follow the drawing. As we know, the transformation of reality is the basis of architecture, the ultimate goal of design. Consequently, hand-drawing, unlike digital drawing, appears not as a tool of design but as a form of thinking, inseparable from the very idea of design, at every stage. "In this drawing-thinking, one gradually becomes what one draws – not so much in form as in feeling. Through gestures, we bring to life the movement of what we internally know" [Ingold 2019, p. 216]. This statement takes on even greater meaning when we discuss design in educational terms, particularly within the context of the architect's training process, culminating in the dissertation. Knowing how to read and consistently transform reality through drawing is "fundamental to defining the degree of necessity of the project and identifying the questions it must necessarily answer" [Fumagalli, Martinelli, Sansò 2023, p. 5]. The research described here, while reaching full expression in the theses works, finds its origins in the exercises conducted in some first-year workshops of the Architecture program at the University of Florence. In these exercises, students were invited to draw orthogonal projections of their own hands on a blank sheet of

paper to express their ideas of hand and, by extension, of architecture. Afterwards, the drawn hands were projected in the classroom to become part of a shared discussion. During this process, it was discovered that each person's hand became everyone's hand [Pirazzoli, Collotti 2007].

By hand, the architect knows the places

Between 2019 and 2023, a number of master theses in architectural and urban design have been developed at the Department of Architecture, University of Florence [1], through hand drawing in both the research and rendering phases. Actually, these phases appear difficult to distinguish because hand drawing, which, like the project, is the product of a sequence of choices, allows one to ideate and, at the same time, control the design process according to continuous learning, always being aware of the real facts. In the realm of architectural and urban composition, this type of approach to the design process represents research aimed at investigating places through design. Indeed, only the project can simultaneously elaborate on environmental pre-existences, in the meaning of E. N. Rogers [1958], historical and social facts linked to a certain context and time, and human and anthropological facts, even aside from place.

Among the various theses that have followed this research methodology, we are going to present three of them, selected on the basis of the degree of creativity aimed at the interpretation of places. The originality of the works described here lies, on the one hand, in rediscovering a once-established research methodology that has now been lost; on the other, in being themselves "revealing" with respect to the chosen method. The outcomes are not post-project graphical revisions, as is customary in thesis works and, more generally, in final submissions. On the contrary, they are developed during the compositional elaboration, intended to demonstrate the process of approaching the project. The temporal sequence of the three theses corresponds to the depth of the method: in the first case, drawing partially serves as a "design tool"; in the second, this meaning is diminished, reaching in the third thesis a complete equivalence between drawing and project.

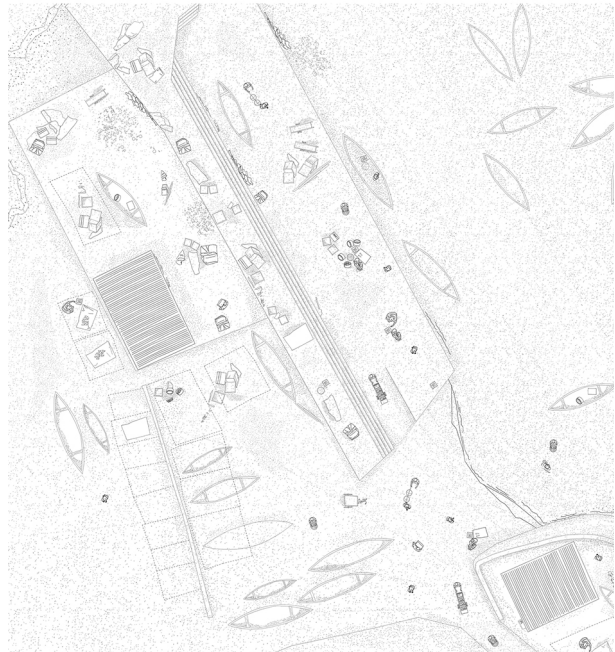
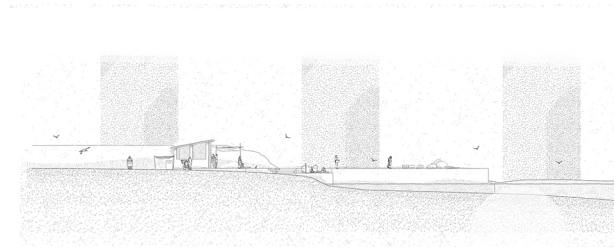


Fig. 1. S. Nembrini, existing condition plan, Worli Koliwada village (Nembrini 2019).

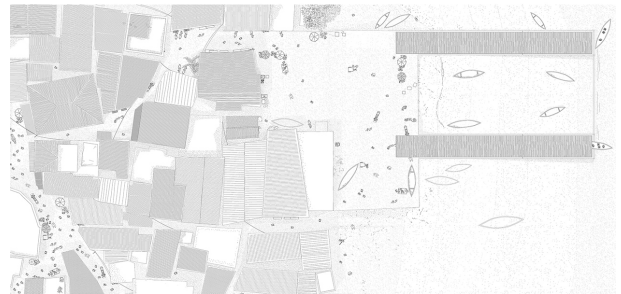
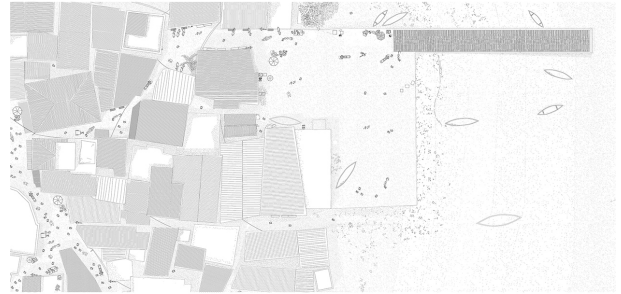


Fig. 2. S. Nembrini, first design phase, Worli Koliwada village (Nembrini 2019).

Fig. 3. S. Nembrini, design phases, Worli Koliwada village (Nembrini 2019).

Worli Koliwada

The first dissertation, in which the embryo of this research appeared, was discussed by Sofia Nembrini [2019]. She took the Worli Koliwada village as a case study, located on one of the seven islands (now peninsulas) that originally made up the Mumbai archipelago in India. In this case, the student had to approach a context as distant as ever from her native one, both geographically and culturally. The only way to get to know it, and thus to elaborate a project in line with the characters and real needs of the place, was to find an appropriate and immediate mode of graphic investigation, carried out steadily throughout her one-month stay in Worli.

This was a difficult-to-read urban context: a fishermen's settlement built in a spontaneous manner, based on the necessities of daily survival. The goal was to survey and, at the same time, communicate a totally temporary and ephemeral settlement mode. Therefore, a careful redrawing of the place was carried out, and human figures inevitably became part of it. Any conceivable future scenario could not ignore its inhabitants, the sole agents of potential transformation. The first design operation inherent in the redrawing was the development of a taxonomy. The student classified the building types of the village, which had never been surveyed before. Second, Nembrini attempted to graphically render the fishing work cycle, thanks to constant interaction with the inhabitants, highlighting how each phase of the work took place in different areas of the village, even quite distant from each other. The site redrawing revealed the impossibility of clearly defining an urban and geographic edge, particularly along the coast, which is subject to continuous and significant changes in water level due to tides. In addition, a paradox was highlighted: the progressive dislocation of fishing-related activities resulting from the village's development and the presence of garbage along the coast had led the inhabitants to no longer have contact with the sea. As a direct consequence of the graphic representation procedure, the area of intervention, located at the most critical point of the peninsula, was determined. The project aims to rediscover the relationship between settlement and the sea by proposing the gradual construction –over ten to fifteen years– of some docks, which can be built using self-construction methods. When the cycle is completed, a court

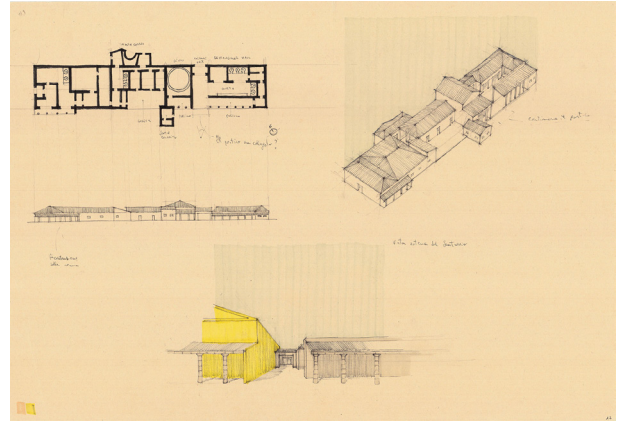


Fig. 4. F. Sami, reconstruction of the Sanctuary of Aphrodite in Paestum (Sami 2021).

on the water would be configured where much of the fishing-related activities could be transferred, also leading to a progressive reclamation of the coastline. In this case, the research made use of the immediacy of hand drawing to probe places and seek the definition of a certain form in a completely informal context. Moreover, the idea of “cycle” and “progression” of the project is reflected in the expressiveness of the drawing, realized through an indefinite repetition of human and architectural types crowding the large blank sheet, gradually saturating it.

Paestum

The second thesis, discussed by Farid Sami [2021], focused on the redevelopment of the archaeological area located near the former Cirio Factory in Paestum. The design operation sought to establish a possibility of coexistence between two architectural pre-existences of totally different character, both in a state of abandonment: the Sanctuary of Aphrodite and the Cirio Factory, partially erected on the archaeological ruins.

In this case, building meant re-building [Collotti 2020, pp. 20-29]. The procedure attempted to reveal a palindromic timeline of the project, which would hold together the architectural events that have been generated and contrasted over the centuries, with the aim

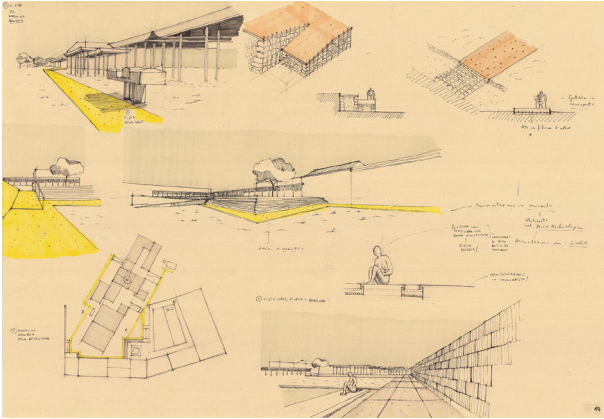


Fig. 5. F. Sami, project for the archaeological museum, Sanctuary of Aphrodite in Paestum (Sami 2021).

of giving unity to the stratifications. The student intervened, on the one hand, to restore a “lifting” reading of the archaeological ruins through a system of roofing; on the other, to renovate and reconvert some factory spaces, considered valuable, into an archaeological museum. The project was developed through in-depth studies involving volumetric reconstructions to reinterpret the buildings that once constituted the Sanctuary of Aphrodite, and in particular the *oikos*, the house of the goddess.

The student chose hand drawing for its intrinsic ability to simultaneously control the compositional and constructive aspects. It proved to be highly necessary to bring to light the gradual process of unveiling and re-composing, moving away from mere representation. Some boards were prepared as if they were large sketchbooks, on which to exemplify the entire process of approaching the project, from the urban scale to the technological detail. The theme of stratification, central to the project, also recurred in the drawing: sketches became text, thanks to the progressive addition of highlights and reworkings on the same sheet. The final result is a set of gestural lines, gradually resumed and redefined to determine form, somewhat similar to what can be observed in the restoration and reconstruction project drawings by Giorgio Grassi – for example, those for the Castle of Abbiategrasso.

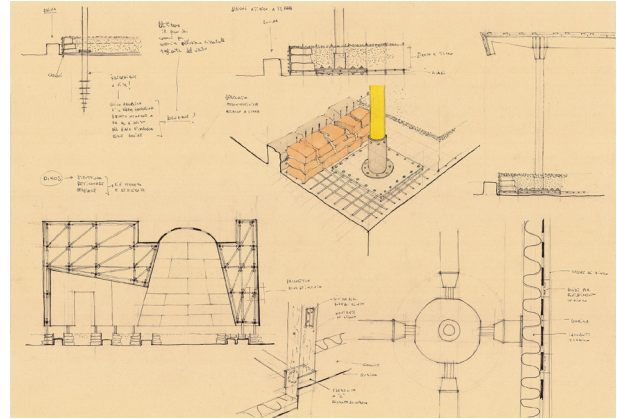


Fig. 6. F. Sami, volumetric reconstruction design of the *oikos*, Sanctuary of Aphrodite in Paestum (Sami 2021).

Isola delle correnti

The last project, in chronological order, was developed as part of Giovanni Marino's dissertation [2023], and it represents the most extreme evolution of the procedure described here: it is a work completely carried out through hand drawing, without the use of any digital tools, from the initial conception phase to the final representation. The case study is the *Isola delle Correnti*, located in the municipality of Portopalo, marking the southernmost point of Sicily. An extreme and uninhabited place with no land connections to Sicily, it houses only one building: a large, abandoned lighthouse. Located just off the coast of Libya, in recent years the island has been the scene of many migrant shipwrecks off its shores.

The main design intervention focuses on the lighthouse, which is renovated and converted into a residence for theater artists, housing dormitories and workshop spaces. Externally, the building becomes a stage, accommodating a large wooden theater in its open courtyard. Not far away, three dramatic installations mark, in different orientations, the geographical coordinates where the largest, most recent shipwrecks in the Mediterranean occurred.

In contrast to Sami's final drawings, Marino's ones do not openly declare doubts or the process as a system of choices. They are the result of continuous control, based on investigations and verifications tested through redrawing. Unlike in the Paestum case, each board corresponds to

a drawing, made in pencil and charcoal on transparent paper, using surveys of the island and building as the basis for the project. This approach allowed for a close adherence to the reality of the place, which is expressed in the obsession with geographical coordinates. However, in this case as well, the goal is not precision in drawing but rather to let the project emerge directly from the act of drawing, achieving complete correspondence between the two activities. At times, the drawing's absolute synthesis refers to the architectural archetype; at other times, space is left for the indeterminacy of drawing to express a plurality of meanings through the project.

Conclusions

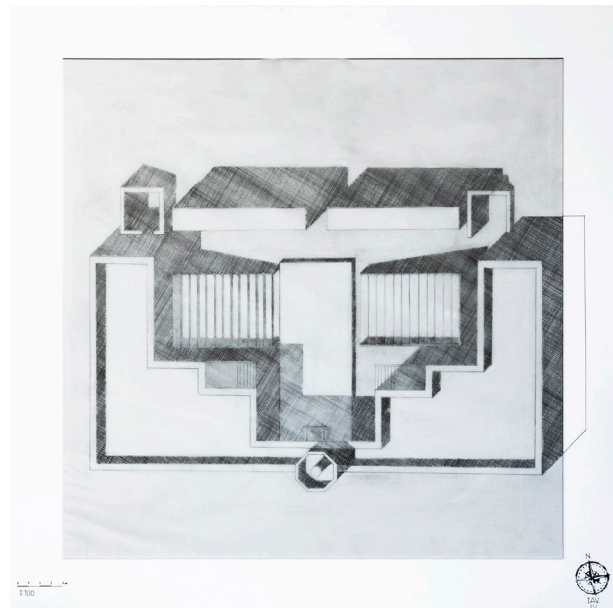
Representation is the most immediate language of communication in the globalized world, and digital drawing is the most common method to communicate architectural designs, especially in the final stage. However, digital drawing, due to its intrinsic precision, cannot reflect the design methods of investigation and approaching [2]. Diagrams and schematics can describe these, but they are often ex-post representations.

The dissertations presented here are field experiments based on the possible declinations of hand drawing. In the first work, the final drawings, while extremely precise, re-compose by pieces the immediate graphic elaborations, necessarily carried out on-site. In the second thesis, the large sheets of yellow paper used for the design investigation are presented as real project boards, alternated with others that display more precise drawings. Finally, in the third thesis, each board is standalone research, the final result of a drawing-project elaborated entirely by hand using a ruler and set square according to a "slow" and measured procedure.

In all three cases, the intention of the final representation is not the "beautiful drawing" but the "sincerity of the drawing", which leaves space for error and doubt and thus allows us to question places and ourselves. Only through hand-drawing does the architect specify, select, and synthesize reality, defining his or her intentions and supporting the reasons for the project as a tool of knowledge.

Fig. 7. G. Marino, territorial plan, Isola delle Correnti (Marino 2023).

Fig. 8. G. Marino, planovolumetric design for the lighthouse theater, Isola delle Correnti (Marino 2023).





TAV.
XI

Fig. 9. G. Marino, design view of an installation, *Isola delle Correnti* (Marino 2023).

Notes

[1] Supervisor: F.V. Collotti; co-supervisor: E. Martinelli.

[2] Clearly, this statement deliberately does not take into account parametric design, which by its nature prefers pure formal elaborations, indif-

ferent to site conditions and environmental pre-existences, as intended in this paper.

Author

Elia Martinelli, Department of Civil and Environmental Engineering, University of Perugia, eliana.martinelli@unipg.it.

Reference List

Belardi, P. (2015). *Why Architects Still Draw. Due lezioni sul disegno di architettura*. Melfi: Libria.

Collotti, F. (2020). *Idea civile di architettura. Scritti scelti 1990-2017*. Siracusa: Letteraventidue.

Focillon, H. (2002). *Vita delle forme – Elogio della mano*. Torino: Einaudi. [First ed. *Vie des Formes suivies de Éloge de la main*. Paris 1939].

Fumagalli, C., Martinelli, E., Sansò, C. (2023). Il progetto di architettura tra didattica e ricerca. In *DAR*, n. 4, pp. 5-7.

Heidegger, M. (1982). *Parmenides*. Frankfurt am Main: Vittorio Klostermann.

Ingold, T. (2019). *Making. Antropologia, archeologia, arte e architettura*. Milano: Raffaello Cortina Editore. [First ed. *Making: Anthropology, Archaeology, Art and Architecture*. London 2013].

Marino, G. (2023). *Tra cielo e mare*. Master's thesis in Architecture. Supervisor Prof. F.V. Collotti, co-supervisor Prof. E. Martinelli. University of Florence.

Munari, B. (1958). *Supplemento al dizionario italiano / Supplement to the Italian Dictionary / Anhang zum italienischen Wörterbuch / Supplement au dictionnaire italien*. Torino: Carpano.

Nembrini, S. (2019). *Redrawing the Edge: between land and sea in Worli Koliwada, Mumbai*. Master's thesis in Architecture. Supervisor Prof. F.V. Collotti, co-supervisor Prof. E. Martinelli. University of Florence.

Perec, G. (2020). *Specie di spazi*. Torino: Bollati Boringheri. [First ed. *Essèces d'espaces*. Paris 1974].

Pirazzoli, G., Collotti, F. (2007). *03d: Da Zero a Tre dimensioni*. Villa San Giovanni (RC): Biblioteca del Cenide.

Polanyi, M. (1966). *The Tacit Dimension*. Chicago: University of Chicago Press.

Purini, F. (1996). *Una lezione sul disegno*. Roma: Gangemi Editore.

Rogers, E.N. (1958). Il problema del costruire nelle preesistenze ambientali. In E. N. Rogers. *Esperienza dell'architettura*. Torino: Einaudi, pp. 311-316.

Sami, F. (2021). *Sator. Architetture palindrome nel tempo*. Master's thesis in Architecture. Supervisor Prof. F.V. Collotti, co-supervisor Prof. E. Martinelli. University of Florence.

Talbot, R. (2008). Drawing connections. In S. Garner (Ed.). *Writing on Drawing: Essays on Drawing Practice and Research*, pp. 43-57. Bristol: Intellect.

Ugo, V. (2008). *Mimesis. Sulla critica della rappresentazione dell'architettura*. Santarcangelo di Romagna (RN): Maggioli Editore.