

Construction History in the Architectural Curricula of Europe

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AN OBSERVATION

In architectural education over the last decade, there seems to have been a reconsideration of the relationship of architectural design and construction. An important characteristic of this reconsideration is that design and construction are no longer perceived as two parallel, unrelated subject areas that passively and uncontrollably will (hopefully) connect up in the architectural students' consciousness. On the contrary, the perception that construction is a necessary and inseparable part of the design process is now generally accepted. As a consequence, the new understanding of the relationship between design and construction, as being central to the education of an architect, constituted a focal point in the recent reconsideration of architectural curricula in the light of the European policies for Higher Education (Bologna Declaration 1999). Theoretical issues supporting this delicate relationship between design and construction, as well as teaching methods for design which can creatively develop a student's consciousness of construction issues are being raised in the contemporary debates on architectural education.

Embracing this relationship and the interdependence of construction and design presupposes associations made between the two subject areas. So far, in schools of architecture, construction has dealt with technical solutions offered as preconceived ideas. This linear confrontation of design as a problem that can be resolved through linear manipulations, instead of as an integrated process that would bridge this gap, only serves to perpetuate it. Moreover, this artificial, clear-cut distinction between the two subjects can be attributed to the fact that teachers of construction, design and history of construction are not always directly involved in the materialization of an idea and, therefore, do not appreciate the importance of such a connection. Only with a fresh look, where tectonics, the poetic aspect of construction and its contribution to the formal expression of an idea (Frampton 1996, Weston 2003), can be an inseparable part of the design process from the conceptual stage, can this connection be made in education. In this context, the history of construction, is a vehicle to facilitate this connection and is a special research area for grasping the relationship between design and construction.

AN INVESTIGATION: SETTING UP THE INQUIRY

What is the position of construction history in contemporary architectural education? How much teaching time is allocated to the teaching of Construction History in schools of architecture? Is the teaching of construction history associated with design teaching? What other subject areas is

construction history teaching associated with in a School curriculum? These are the questions on which the paper is focused. The answers to the above questions are based on the results of an inquiry undertaken recently regarding the content of construction teaching in European schools of architecture, part of which concerned the history of construction. The inquiry was carried out by the European Thematic Network of Construction Teachers (ETNCT), founded in 2002 as part of the Socrates Thematic Network ENHSA (European Network of Heads of Schools of Architecture). Since 2002 the ETNCT has organised four consecutive workshops/conferences (Voyatzaki (ed.), 2002, 2003, 2004, 2005) that give a reliable sample of the views of construction teachers around Europe, and lend credibility and reliability to the responses to the questionnaire, and the light that these shed on the role of construction history in the education of architects.

THE INQUIRY

As coordinator of the ETNCT the author composed a questionnaire, the recipients of which were construction teachers, members of the two aforementioned bodies. The participants in the inquiry were asked to identify their School, country of origin and profession. To the latter they were offered three options: architect, engineer and other. They were also required to state what that other profession was. The first set of questions asked participants if there are any independent and autonomous courses/modules in their School dedicated to construction history exclusively (not incorporated within courses/modules of any other subject area). To a positive response the participants had to give the title of the module(s) offered, to state the periods in architectural history covered by these modules, and to specify what the emphasis was. They were given the following options (from those that had been identified as dominant in the study of various curricula in schools of architecture in Europe): History of Materials; History of Structures; History of Construction, Methods and Systems; Tectonics and the Poetic Dimension of Construction in History; The Relationship between Form and Materials. They were also asked to provide information about the year of studies in which the respective modules were taught, and the curriculum time dedicated to the teaching of these modules, in terms of teaching hours per week and number of weeks of the total curriculum. Finally, in this section, the specialisation of teachers was asked for, with the following options: architect, engineer, historian and other.

When construction history was not taught autonomously, participants were asked to state if it is part of another module such as History of Architecture, Theory of Architecture, Building Technology, Architectural Design Studio, etc. To the positive response to the question, participants of the inquiry had to specify the title and the content of the module(s) as well as the main issues tackled in these modules. The themes offered were the same as those listed above. Similar to the previous section, participants were also asked to provide information about the year of studies in which the respective modules were taught and the time of the curriculum dedicated to the teaching of these modules in terms of teaching hours per week and number of weeks of the total curriculum. Last but not least, in this section the specialisation of teachers was asked for from the options: architect, engineer, historian and other.

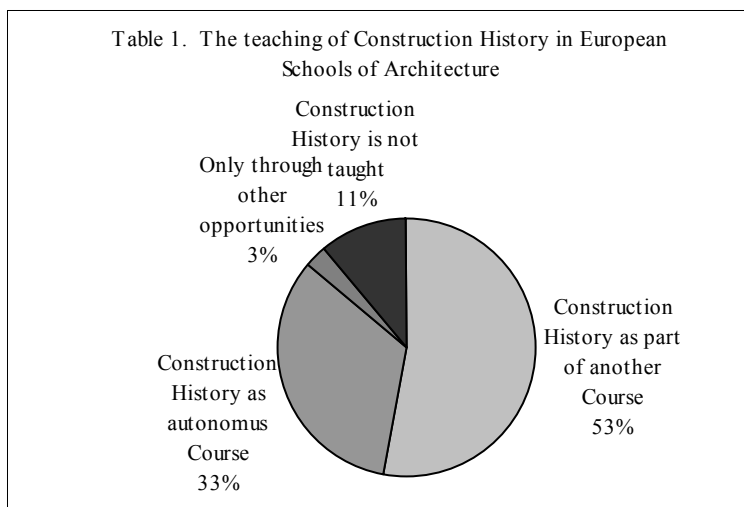
A more general question, relating to other opportunities offered by the School to acquaint its students with issues related to construction history was then posed. Alternatives included field trips, invited lecturers, dissertations, other research programs, etc.

Another qualitative question asked participants whether they felt that it was necessary for construction history to be taught in schools of architecture. To a positive response, participants were asked to state upon what issue they thought the emphasis of an ideal course in construction history should be placed, namely: history of construction materials, history of structures, construction methods and systems, tectonics etc. Finally, participants' were asked for their own perception of construction history.

INSIGHTS GAINED FROM THE INQUIRY

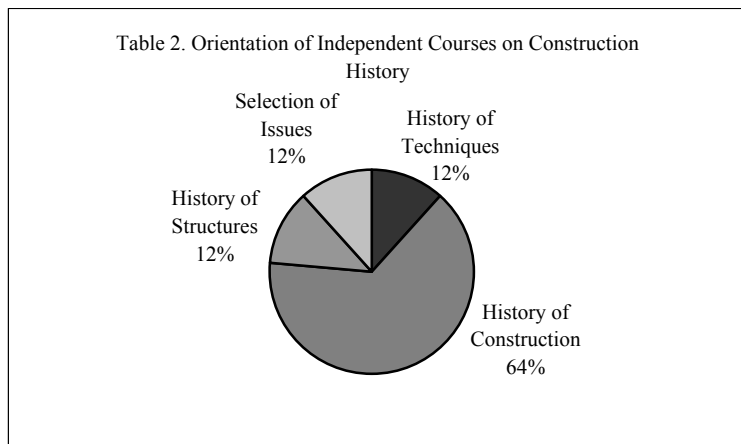
The sample of teachers that responded to the questionnaire ranged from Turkey to Portugal and from Scotland to Southern Greece. Fifty teachers of construction took part and responded to almost all questions. The respondents are construction teachers in schools of architecture. 78% of these are architects, 16% architects and engineers, 2% engineers and only 4% are historians.

Two large categories can be distinguished from the outset. First, Schools that teach construction history as an independent course, at 33%, and, second, those that teach construction history as part of another course, at 67%. This outcome can be linked to one of the conclusions from the inquiry namely, that the necessity of construction history as a course offered in schools of architecture, is not self-evident. Many Schools attributed the dependence of construction history teaching on other modules first to the fact that they already offered too many modules to have space and time for another course, and, second, to the fact that they were understaffed and the School could not afford yet another specialist (**table 1**).



Construction history as an independent course

In the cases where construction history is taught as an independent course in the school curriculum the emphasis of the respective modules varies. Dominant is “construction history”, at 64%, with “history of structures” and “history of techniques” both at 12%, whilst a selection of items and special studies of construction paradigms taught make up the other 12% (**table 2**).



When construction history is taught as an independent course, 75% of participating Schools teach one module only, whereas 25% of them teach more than one. That, at first glance, could mean that even though a great number of schools have an independent course in construction history, this is marginal in terms of the overall school curriculum.

To the question relating to the spectrum of the periods in history covered by the modules offered, the majority (33%) of Schools seem to cover the entire spectrum (from the Antiquity to the present) whereas the rest is split in Schools that teach from the fifteenth century to date (25%), the twentieth century exclusively (25%). Another 17% of Schools teach selected themes with no chronological order. From a second reading of the findings though, it seems that irrespective of the starting point in history, in all cases the common and hence the focal point seems to be the twentieth century (**table 3**).

The emphasis of the modules taught is placed, for the majority (30%) of Schools, on construction methods and systems as a way to learn from precedent and the testing of ideas. The next largest number of Schools (22%) shift the emphasis from history itself to the relationship between form and materials, in other words, to architecture and its materiality. 14% focus exclusively on materials. Quite a large number of Schools understand construction history as meaning “the history of structures” (17%), whilst 11% is dedicated to teach tectonics and the poetic aspect of construction, through construction history (**table 4**).

Table 3. Periods in History Studied

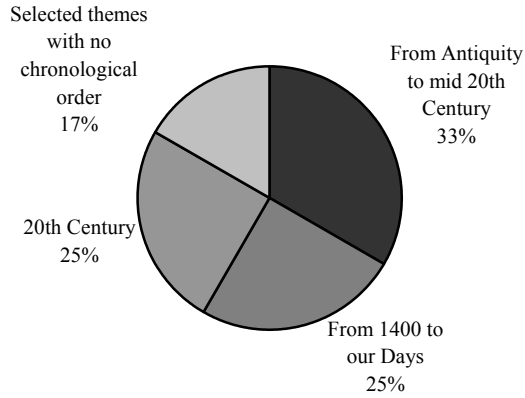
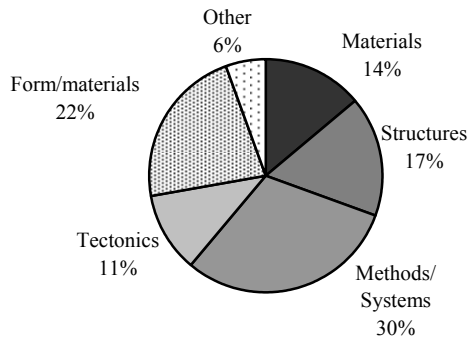
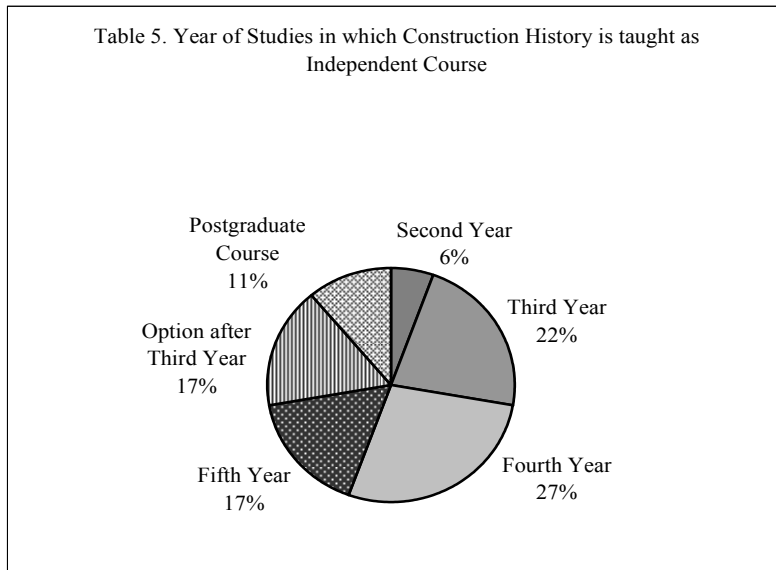


Table 4. Gravity of Themes Taught in the History of Construction Courses



More than half of the Schools teach construction history in the third (22%), fourth (27%) and fifth (17%) year, in compulsory modules, and very few in the first years of education, which could mean that schools believe that construction history needs experience beyond the basics to grasp its content, but also that students can be taught architecture in general for the first two years of their education without any background in construction history. Another interpretation is that this tends

to reinforce the linear model of the design process, which culminates with construction, rather than being an integrated process. Interestingly, however, 17% of Schools offer construction history as an optional module in the third year and 11% at postgraduate level, considering in both cases that construction history is a choice and not a necessity that is left to the arbitrary preferences that students may have (**table 5**).



The majority of Schools (58%) dedicate between 3 and 4 hours per week to the teaching of construction history (40-60 hours in total), whilst less than 40 hours are taught by 21% of Schools. However, the remainder of Schools teach even more. Characteristically, 14% of Schools devote between 60 and 120 hours in total to the subject, and 7% more than that. Given that an average school curriculum in European schools of architecture ranges from 3800-4200 hours, we could argue that for the majority of schools as little as 1-3% of their curriculum is dedicated to construction history (**table 6**).

The background of the majority of teachers teaching construction history is architecture (58%). The rest is split into professionals with two specializations, namely that of architect/engineer (21%), architect/conservationist (14%) and, surprisingly, only 7% architect/historian. A possible interpretation to that is that schools try to exploit the existing resources of architects who have either specialised in construction history, or, who had empirically and idiosyncratically chosen to know more about the subject and, therefore, either volunteer or are selected by the School to teach the subject area (**table 7**).

Table 6. Teaching Hours of Construction History Courses in the entire curriculum

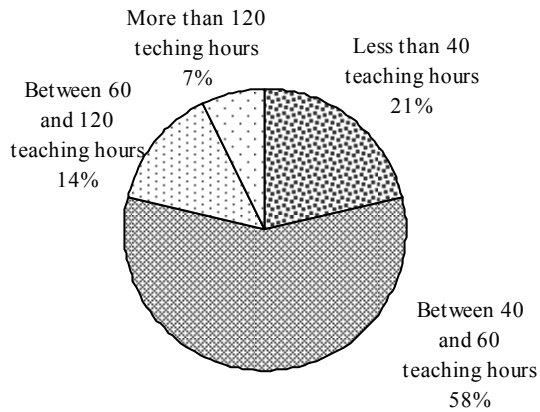
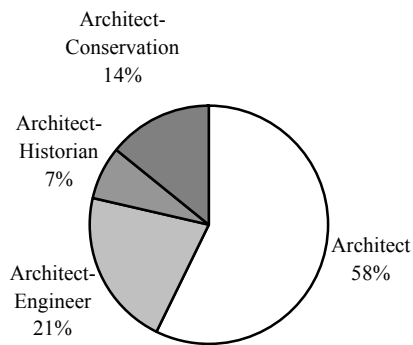


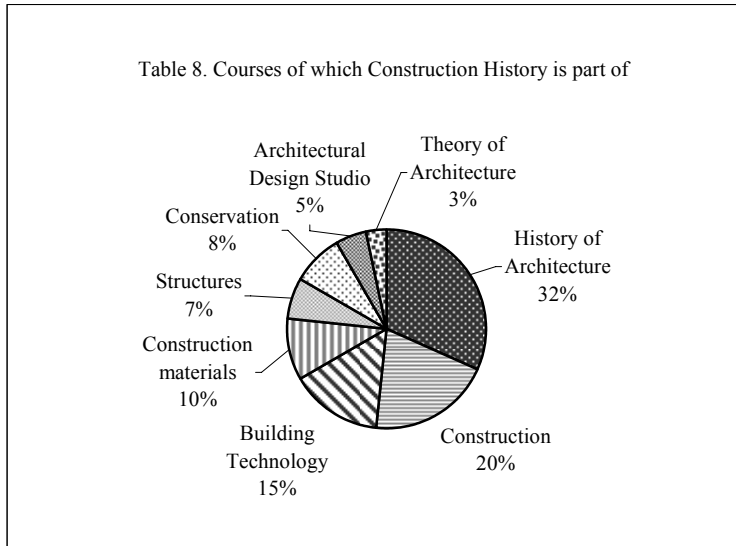
Table 7. Specialisation of teachers of Construction History



Construction history as part of another course

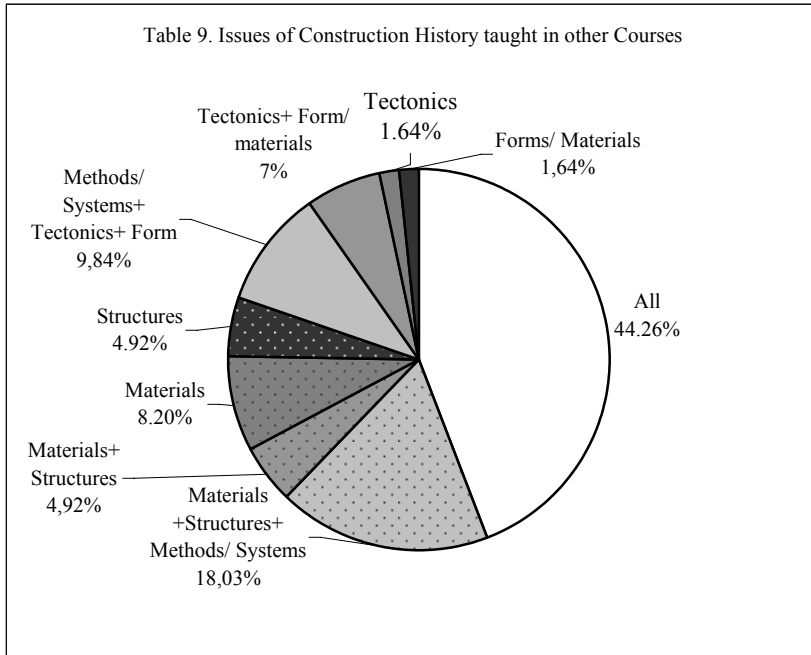
As stated earlier, more than half of the Schools (53%) teach construction history as part of another course, whilst 3% claim to teach it through other opportunities such as field trips (50%), invited lecturers (38%), dissertations (9%), and research programs (3%). Even though, either autonomously or as part of another course, Schools seem to engage with the teaching of construction history, an interesting 11% do not teach the subject at all.

These other courses through which construction history is taught can be classed in two big categories: that of construction related subjects, and that of architectural history (32%). The former, at a collective percentage of 52% appears as construction (20%), building technology (15%), building materials (10%), or structures (7%). The rest is taught in conservation (8%), the architectural studio (5%) or the theory of architecture (3%) (**table 8**).



The content of these “mother” courses and the issues they touch upon are mostly technology and technique oriented (63%). More specifically, they are split between materials (20%), structures (20%), and methods and systems (23%). Only 37% integrate issues of architectural technology with the formal and aesthetic aspects of architecture. Thus the tectonics aspect takes up only 15% of the total, whilst 22% focus on the relationship between form and materials. The integration of architecture and construction has long been debated and only in recent re-evaluations of this relationship is the desire for their merging and interrelationship expressed. Even so, school curricula do not address the issue operationally. Irrespective of the fact that construction history may or may not be taught in a School, to the question of what should the emphasis should ideally be on in a construction history course the answer interestingly is in favour of the integration of architecture and construction (65%), on tectonics (29%), with only a small portion insisting on the purely technological route (6%) (**table 9**).

The emphasis on the technical aspects of construction history may explain the fact that half of the teachers that teach it as part of another course are architects/engineers and only a quarter, architects. The other quarter is split between architects/historians (13%), architects/engineers/historians (8%) and, surprisingly, once again historians at a mere 4% (**table 10**).



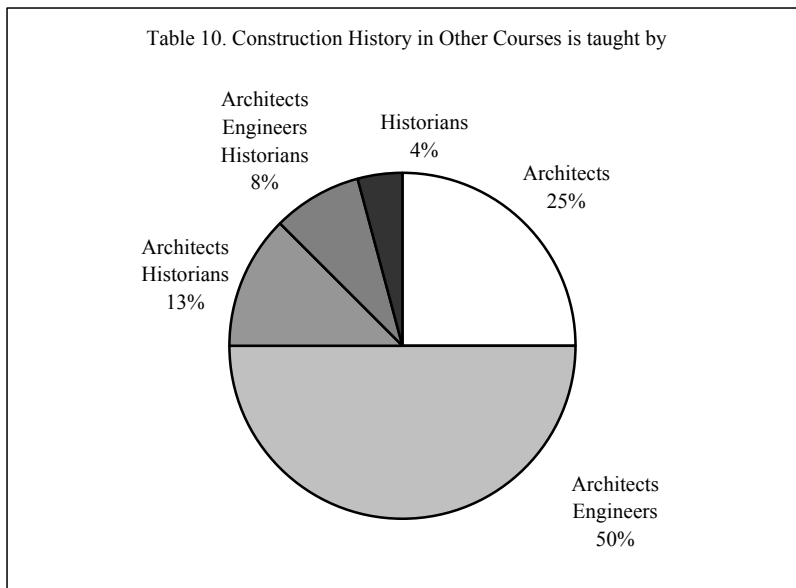
Why construction history necessary?

There was a consensus, with one exceptional case, that fully supports the necessity for construction history being taught in schools of architecture, irrespective of it being autonomous. However, one third of the sample stressed the fact that with under resourced education and curricula packed with modules it is increasingly more difficult to incorporate such an independent course nowadays. Moreover, the incorporation of construction history as part of a more global, integrated construction/architecture course would encourage the notional associations between construction and architecture as a whole.

Nevertheless, countries with a well-rooted history of architecture tradition and where the rehabilitation of historic, listed buildings form the bulk of the work of the architect in practice, appreciate that construction history should be part of a conservation course in schools of architecture, so that their graduates can work effectively and efficiently.

Another observation can be made on the pairing of notional subjects that respondents referred to in order to reinforce their opinion on the necessity of construction history as a course in a School curriculum. It was felt that students taught construction history are better at appreciating the relationship between materials and structures, form and materials, techniques and precedents. This last pairing is quite an intriguing issue for studio teaching. The term “precedent” appeared quite a number of times and it is strongly believed that with the study of history of construction new

innovations can emerge. It is strongly argued that only by having studied the past can students be innovatory in architectural ideas and their materiality.



A notable tendency appeared and underlined the socio-cultural and philosophical aspect of architecture: it is claimed that by understanding construction history one can better appreciate culture as well as current trends or, put another way, the “state of the art” in the realm of architecture. This seems to be the most interesting point made for the necessity of construction history, to be a catalyst for the better understanding of architecture as a whole. Therefore, a school that does not include, one way or another, construction history in its curriculum is incomplete.

Perceptions of construction history

Interestingly, even though perceptions of construction history seem to vary they follow the same lines. Namely, construction history is associated with the social and geographical context that gave rise to certain achievements, which in turn relate to the history of the profession, and accentuate the “heroic” dimension of building masters in “materializing” the impossible. Participants specifically stated that:

“Construction history is part of the history of cultures and knowledge, embedded with social and economical organizations; an essential pole in the dialectic between idea and matter”.

“Construction history can help us appreciate where, why and how new demands, theories,

ideas, materials, and construction methods changed in different societies, climates and cultures”.

“Construction history is the history of changes in the area of materials and technological solutions which answer to changeable needs and actual technical possibilities. It is part of the continually evolving tectonic culture and is dynamically associated with present, past and future”.

“With construction history inventiveness and innovation in design and construction are put in context and teach contemporary designers to follow the traces of the avant-garde of each period in history”.

The pedagogic aspect of this is the associations of these lessons of the past to young people and the possibility they are given to connect the past, the present and the future in order to integrate technique and architecture by appreciating the thinking behind technological advances in building:

“Construction history teaches us the use of comparative methods of past and present, it is an important tool that helps understand the integration of building materials, machines and the society, to understand construction, hence to research, design and build”.

Last but not the least, it is argued that construction history is the type of study which allows us to gain insights into the changes of form and space through the study of construction itself.

“Construction history is the study of the evolution of construction methods, materials, structural systems and all related areas that allows, one way or another, the changes in the conception of form and space”.

EPILOGUE

The fact that a large number of architectural educators perceive the history of construction as a fertile field for understanding architecture is an important finding. This is valid both for those who perceive studies in architecture as an educational process which enables students to develop both analytical and abstract ways of thinking about architecture, as well as for those who perceive studies in architecture as a training process for the generation of competent products with perfectly organised and operational characteristics.

This thesis seems to be well founded in the milieu of people who teach construction nowadays, as the history of construction is not only important for the intrinsic value of the knowledge of history that it offers as background and reference point (in a positive or negative way) of contemporary architectural praxis. It is primarily important for better comprehension of the deepest structures of

architectural thinking and praxis. This way it allows us to comprehend better the strong relationship between culture and construction, that is the way that ideas and values of a certain period in history are “translated” into architectural form with the constructive intervention of construction methods and techniques. It also allows us to realise the intimate relationship between form and the construction process as a creative frame of reference that breeds an architectural idea and drives the design of an architectural proposition. Moreover, it allows us to comprehend the importance of construction innovation in the expression/shaping of new architectural ideas, but also of new attestations and views on architecture, the human being and its social and cultural context. Finally, it allows us to comprehend the materiality of architecture as the “material” for the “construction” of an architectural idea, of a concept.

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