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The Production Process of the Study of Technical Projects and the Cooperation Mode of the Multidisciplinary Study Team

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The study and execution of technical projects is the object of a multiclisciplinary cooperation that is a cooperation among the essential disciplines, each one of which has to exclusively, but not always, deal with its own scientific field.

Therefore, the concept of a study team is a requirement for the "rationalization" of all procedures aiming at the production of technical projects. The Greek reality, in relation to European directive for EEC countries regarding the training of a single system of unification, recognition of vocational skills and qualifications etc, stimulates great interest in the technical world of Greece.

Hence, taking into consideration all these highly significant and urgent issues, candidate engineers should be taught both the mode and the methods of multidisciplinary cooperation, for, as it widely known, everything begins from education.

I should first mention that after completing my studies at the Civil Engineers' Department of the Aristotle University of Thessaloniki, I went on with my studies at the School of Architecture of the same University and also I work as an architect for 25 years.

As a result, I had very well developed the potential to perceive the viewpoint of both the civil engineer and the architect and, in addition, to conjecture more or less the viewpoint of the mechanical engineer.

There has almost always been some kind of debate which is not at all constructive for the study project. And then, at some point, may even come the time when they cross their verbal "swords", in order to have the situation settled.

Furthermore, the *concept architect* does not fully complete his study by integrating it into the implementation stage and it is not himself who supervises his own project. Lastly, the *construction manager* very often entrusts the architectural, static and mechanical implementation study of the project to independent engineers of his own choice, without bringing in contact the involved engineers.

The outcome deriving from this reality is the production of large or small projects without any technical integration and, as a consequence, a lot of them totally lack inspiration, architectural spirit and expression. Furthermore, they are detrimental to the environment and aesthetics of cities and citizens, composing a uniform landscape with numerous structural problems, bad quality constructions and, after all, an environment deprived of any kind of interest and aesthetics.

The harmonious coexistence and cooperation of all disciplines involved in a technical project constitute a top priority for the educational sector.

It is from Technical Universities where should begin the effort for mutual respect among various disciplines and the promotion of the mentality that a "piece of architecture" is based upon the close co-operation among Architects, Civil Engineers and Mechanical Engineers. And this message should be conveyed to competent agents and bodies, so that rules and regulations will be professionally, technically and socially redefined. Only in this way will the essential conditions be created to achieve the "optimal" vocational practice of all engineering branches.

The relationship between architects and civil engineers seems to be in a constant controversy, which significantly stimulates architects' discussions in a number of countries in the world, as well as in our country.

Since the early years of operation of the Technical University in Greece, there has always been the discussion about whether the architect should be taught some Civil Engineering subjects and whether the architect should professionally function as

a civil engineer, too.

However, hardly ever was there any discussion about whether civil engineers should be taught architectural subjects and have the right to practice architecture.

So, multi-disciplinary cooperation aiming at the production of a well designed, well studied and well constructed technical project is a matter of education. This education should not simply include transmission of raw knowledge, so that, after their 5-year studies, engineers-graduates from Technical Universities will be efficiently educated and competent, not only to practice their profession but also to cooperate with engineers belonging to other branches.

Until recently, there has been the impression that the Civil Engineer is the Professional Engineer who renders the building stable and solid, whereas the architect is characterized as the "artist" who is, therefore, not necessary.

The common impression was, and probably still exists today, that the Civil Engineer, i.e. the *engineer*, is a professional who fully satisfies all the needs of the project.

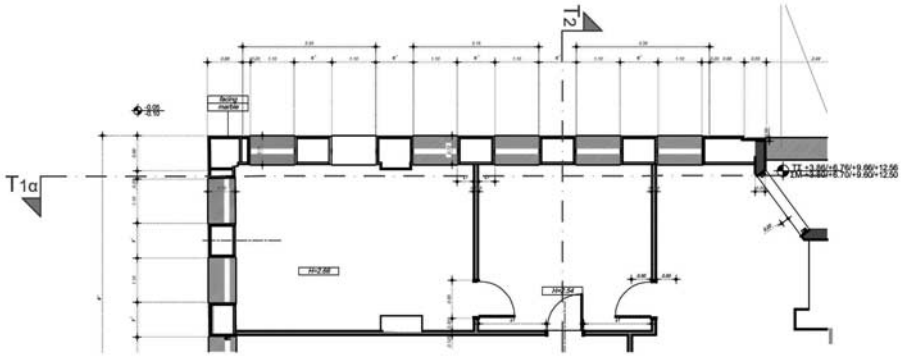
So, this general mentality is expressed in civil engineers' vocational rights, allowing them to practise their vocation in all fields of the construction industry, and mainly architecture, without having clear borderlines set.

However, during the last years the complexity and increased demand for "architecturally designed" buildings have gradually excluded Civil Engineers from designing the architectural parts of a building, mainly in large scale projects.

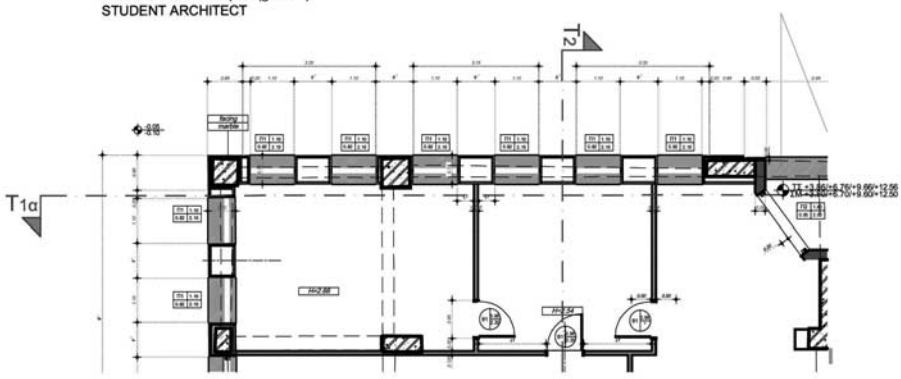
When providing information to future students of echnical Universities, special focus should be placed on determining clearly and accurately the object, vocational activities and borderlines of each distinct discipline, so that future engineers will choose the profession that they really want to follow. Among other objectives to be achieved during their University studies, students should develop a common communication "glossary-code" and undertake trans-departmental assignments (along with their corresponding professors). In the following examples, the various stages for the study of a technical work are presented (part of a plan of the study of an office building). The successive interference of each related disciplines is presented.

It is highly significant for them to become familiar with a kind of *connective* knowledge which will be taught and cultivated during their studies because there is no doubt that this is all a matter of cultivation-culture.

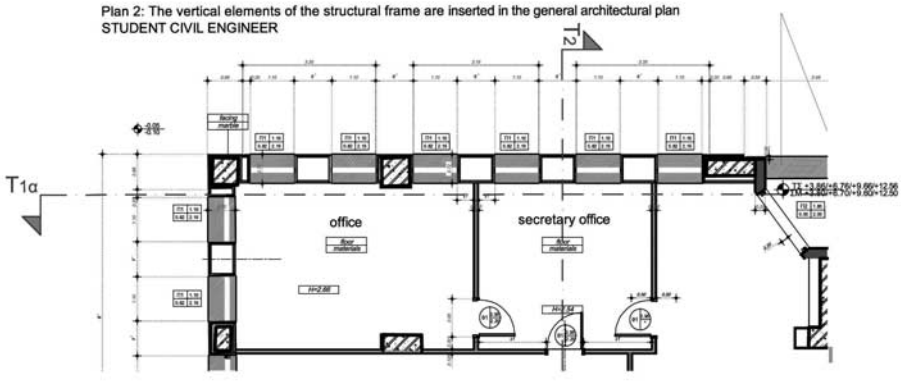
We believe that this will provide liveliness, interest and enthusiasm to all our students and, to some extent, it may give them an idea about what their vocational life will be after their graduation, as well as their relationship with colleagues from other disciplines.



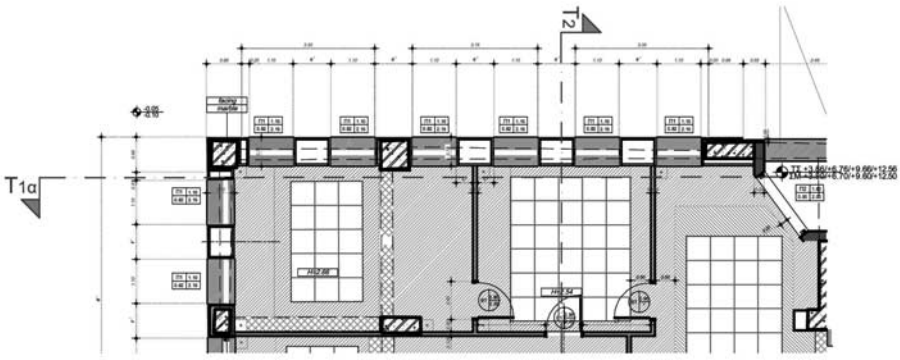
Plan 1: Architectural plan (general)
STUDENT ARCHITECT



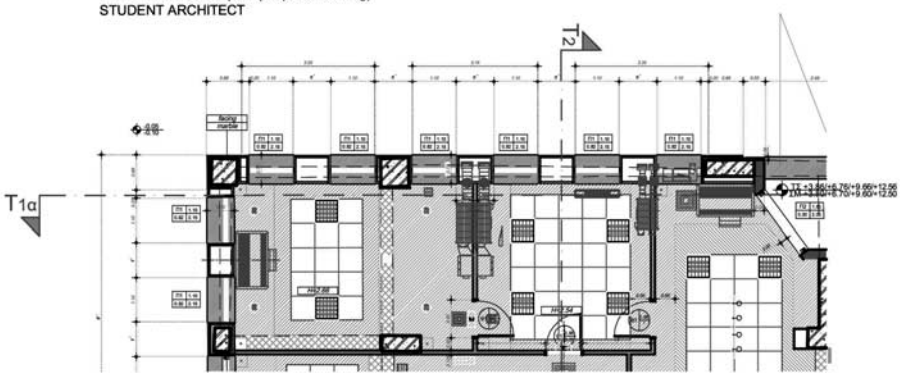
Plan 2: The vertical elements of the structural frame are inserted in the general architectural plan
STUDENT CIVIL ENGINEER



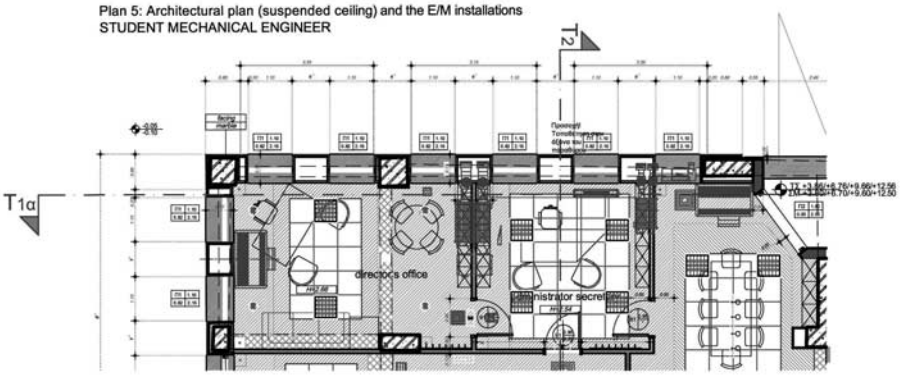
Plan 3: Architectural plan with the list of materials and the different spaces



Plan 4: Architectural plan (suspended ceiling)
STUDENT ARCHITECT



Plan 5: Architectural plan (suspended ceiling) and the E/M installations
STUDENT MECHANICAL ENGINEER



Plan 6: Architectural plan with all the previous and the interior design