

The investments of the Pécs World Heritage and the Reconstruction of PMMK as student project work

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Abstract The University of Pécs (UP) is one of the biggest universities in Hungary, where some thirty-five thousand students study in 10 faculties. Our particular characteristic is that we have an Engineering Faculty, where architects, civil engineers, mechanical engineers, electrical engineers, IT engineers, environmental engineers, etc are trained and excellent professionals are available in the market. The Local Government of the City of Pécs has won €6 m to develop the World Heritage Monuments of Pécs from the European Union. The full realization was carried out by the University of Pécs and lasted from 2004 to 2006. The archaeological work was fulfilled by the Faculty of Humanities, the architectural designing and the investment management were carried out by the Faculty of Engineering, while the implementation was naturally executed by different building companies. This investment was an excellent opportunity for student project work and included the cooperations between Faculties and between the University and industry. On the other hand the Faculty of Engineering is involved in the development (planning, project managing) of the University of Pécs as well. At the moment the reconstruction of the Faculty of Engineering is under way to the value of €12 m in the form of PPP (Public Private Partnership). Designing the reconstruction was also carried out within the frameworks of student project work, under the direction of the senior professors of the Faculty. Both projects prove that the Faculty of Engineering is capable of managing the investment from beginning to end.

INTRODUCTION

There was an integration process based on a parliamentary decision in Hungary some years ago. In consequence, the integration of the University of Pécs (UP) has become one of the biggest universities in Hungary where some 35 000 students study in 10 Faculties. The position of our Faculty is peculiar, because it covers every branch of the Engineering Discipline concerning construction investments. Our particular characteristic is that we have an Engineering Faculty where architects, civil engineers, mechanical engineers and electrical engineers are trained and excellent

professionals are available in these trades. Our Faculty of Architecture provides DLA training. The main issue of the PhD School is building reconstruction and the protection of national heritage. Our paper presents how this “complex” Engineering Faculty of several professions has become a great planning office, competing with outside market leaders also, so as to make students gain “real” experience by solving design problems. We are going to present this special student project work through two, already realized projects, The Investment of The Pécs World Heritage and The Reconstruction of PMMK.

FACULTY OF ENGINEERING AS A PLANNING OFFICE

We founded a firm, named Polytechnic Ltd. (the owner is the University of Pécs) to help professional student project work. On the other hand the Engineering Faculty is involved in the development (planning, project managing) of UP as well.

In the beginning, about 10 years ago there were at least three reasons to establish Polytechnic Ltd.:

- In the first place it helped lecturers without personal firms to legally take up planning, professional and other engineering jobs, with more preferable tax circumstances than having to do these jobs within the bounds of the Faculty.
- In the second place the risks of planning jobs taken by the lecturers were only insured by an Ltd established with a capital of about € 3500. This way we did not risk the property of the founder, the Faculty in any case of harm occurred due to planning mistakes.
- In the third place, the Faculty did not have to pay tax the Government levied on the profit gained from external planning duties as this tax law did not concern the sphere of activities Polytechnic Ltd. under took.

This model worked well in market circumstances boomed by the change of regime, and it has given suitable bounds for market practice to Faculty lecturers. A “real” market adaptation of this student project work developed through

this model since every lecturer and professor drew their talented students into different sorts of work won in the market. These students from different departments (Architecture, Civil Engineering, Building Engineering, Electrical Engineering, etc.) worked together on the same plans.

Today's situation has become different. Leading lecturers have private firms in all professional fields (Limited Liability Companies and Limited Partnerships) through which they may pursue planning practices independent of the Faculty. However, these individual firms are too small to carry out the complex planning of greater projects. They are capable of undertaking tasks within their own professional fields but they have to compete with other partners.

These lecturers, "company owners" soon realized that a different professional field in the neighbouring department of the same building and another professional on the next floor had been striving harder and harder to get a job in the market and that there would be more chance to get a job if they cooperated and founded a complex planning team.

Keeping their own firms but having Polytechnic Ltd as the main stream, they are capable of tendering complex planning projects. They are employees of a great Faculty of Education, but regarding the firm they are subcontractors of the Ltd.

Hereby a group of planners representing different professional fields established an up-to-date business structure embodying an important competitive advantage as opposed to remaining independent, privately-owned firms having to compete single-handedly in the market. The "main contractor" was Polytechnic Ltd by law, but the joint capital was not adequate to cover possible planning mistakes. Today this problem can easily be eliminated by taking out liability insurance for planning projects. Thus the insurance company takes the charges up to € 35.000. The subcontractors pay the insurance costs proportionately.

This way Polytechnic Ltd, which was founded out of necessity ten years ago, has become a major competitive and complex planning office. The speciality of this planning office is that all plans are student project work simultaneously by the cooperation of students from different departments.

This is good for the Faculty because our professors and students from different departments can solve real, current problems. On the other hand it is fruitful for the investment too because the latest technical knowledge of the educational institution (patents, solutions) can be applied in the project.

THE WORLD HERITAGE PROJECT

Pécs, which lies in the south of Hungary, has a history of several thousand years. In the 4th century B.C. –in the Roman era- it was called Sopianae. The Paleo-Christian cemetery of our city was entered onto the World Heritage List by the UNESCO World Heritage Committee in late November 2000, acknowledging it as one of the highly important treasures of the cultural history of mankind, with universal historical value. The first Paleo-Christian find, the

Peter-Paul burial chamber, was unearthed in 1782, while the most was the excavation, begun in 2000, of the architecturally unique octagonal burial chamber. In the intervening 218 years 16 burial chambers and several hundred tombs containing several thousand late-Roman objects were unearthed by archaeologists. The European Union supported the development of tourism allurements of these monuments, the cultural history of which is of great value, within the frameworks of the Regional Operative Programme. The city of Pécs has won a subsidy of € 6 million to develop the World Heritage sites through an EU tender. It is a general rule that only public procurement procedures should be applied in EU tenders. With regard to the fact that the Department of Architecture has been exploring and planning the protection of the Early Christian Cemetery and its exhibition buildings for 30 years, our Faculty was in a special position in the course of the public procurement procedure.

The Departments of Building Construction and Engineering Management submitted a tender and won it for the whole design and the complex management of the development programme. The students of our DLA School of Architecture and the students of the Departments of Mechanical Engineering, Electrical Engineering and Building Construction carried out this design work, which was a great architectural challenge, within the compass of project work. It was supervised by Professor Dr. Zoltán Bachman.

In the course of the complex development the main task was to locate the previously excavated crypt and a newly excavated Paleo-Christian church, the Cella Septichora into a uniform, closed exhibition building of about 2000m².

The Cella Septichora is the largest building of the early Christian cemetery of Pécs that has been found to date. It has received its present name due to its seven-apsed ground-plan that is unique among early Christian structures, originally it was most probably built for burial purposes, although no traces of graves or tombs have been found. It is the task of the future to clarify and specify its exact purpose and use. As for the date of its construction it is most probably the very end of the 4th century.

The east-west orientated longitudinal main axis of the Cella Septichora is surrounded by seven apses. Its entrance can be found on the western side, its terminating apse on the eastern side. Its central area is an extended octagon, which shows a transition between the two basic architectural prototypes of the early Christian period, between buildings with a longitudinal and a central layout respectively. The building is 21.5m long, its widest side is 17.46m, the average wall thickness is 1.1m. Its interior wall surface was found undecorated.

The exhibition building became an architectural sensation. A transparent glass ceiling with a capacity of load-bearing at the level of the relief was fixed onto the steel beam reinforcement of the heat-insulated ferro concrete walls surrounding the ancient monument under the surface. This way we could make visitors perceive that they are at the ground level of the Roman Era 5 meters under the present-day ground level. Outside pedestrians can see and feel the

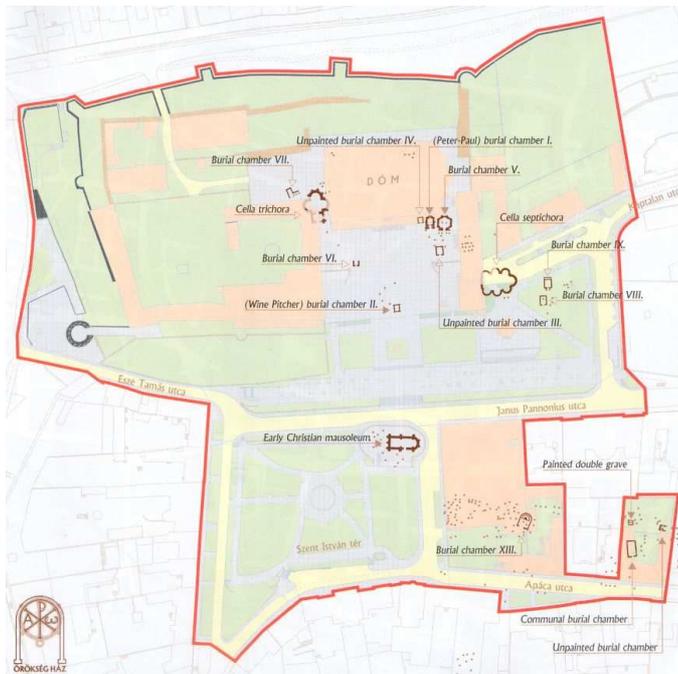
surface edifice of the Roman Era walking on the present-day relief.

It is a very deep archaeological-philosophical thought and the implementation was a great technical sensation. The whole project consisted of further complementary investments (promenades, gardens, cobblestones and previously excavated Paleo-Christian crypts)on the World Heritage site.

This complicated EU project, along with the archaeological excavations, was realized on the money projected within the two-year deadline by the work of the Department of Engineering Management.

The handing over ceremony of this March, which received keen interest by the international media, was a great success for both the City of Pécs and our Faculty.

But, of course, the greatest success for us was that 8 DLA diploma theses sprang up on the subjects of architecture and art management. Besides these, another 6 diploma theses sprang up on the subjects of building engineering and electrical engineering within the compass of student project work related to DLA topics.



Pécs (Sopiana) Early Christian Cemetery

THE RECONSTRUCTION OF OUR FACULTY BUILDINGS

- **About the PPP construction in general:** Citizens around the world confront the world's glaring infrastructure deficit daily. Evidence of the large and growing gap between infrastructure needs and the resources that governments have historically invested in meeting those needs is everywhere: congested roads; bridges in need of repair; poorly maintained transit systems and recreational facilities all in sore need of rehabilitation and repair. These problems in turn impose huge costs on society. Governments are trying to narrow the

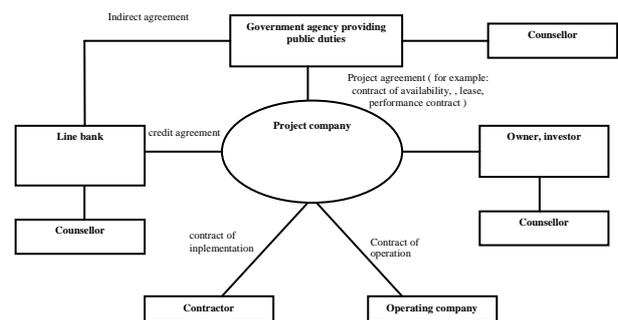
infrastructure deficit partly by turning to the private sector for financing, design, construction, and operation of infrastructure projects. These public-private partnerships (PPPs) have emerged as one of the most important models governments use to close the infrastructure gap.

The Hungarian Government solved the reconstruction of the higher education infrastructure within the framework of a PPP construction in default of funds.

- **The realization forms of Public Private Partnership (PPP)** Depending on the tasks the private sector undertakes (design, construction, operation, financing) the following types of the realization of PPP can be distinguished:

- Design and Build (DB)
- Design, Build and Operate (DBO)
- Design, Build, Finance and Operate (DBFO)
- Concession

The Government applied the DBFO structure in our case.



The DBFO structure

The characteristic of this structure is that the project company, as the winner of the public procurement procedure invited by the Government does not have to invite further tenders for the design, implementation and operation.

Naturally the Department of Architecture had previously made some drafts on the reconstruction of our 40-year old Campus. On the grounds of these and knowing the cooperation of the workshops consisting of renowned professors' talented students, our Faculty was commissioned to carry out the reconstruction of these buildings.

The model of the design work is the same as that of the World Heritage Project. The architectural design is carried out by two talented students of our DLA School of Architecture under the supervision of their professor of course. Professional designs (Building Engineering, Electrical Engineering, Statics, etc.) are carried out by gifted students of

different Engineering Departments in cooperation with each other and the architects in the scope of student project work. The amount of the investment is €1m at present value. Within the framework of this we are going to enlarge the assembly hall, build two auditoria and the main entrance is to get a modern, student-centered architectural emphasis. Generally student places will be larger – with regard to disabled students. The Faculty library will be expanded. There will be an overall reconstruction of Building Engineering, Electrical Engineering and Architecture. The management of the whole construction project will be carried out by the investor, while the inside coordination of student work and the reconciliation with the contractors as construction management will be conducted by a DLA student of Architecture whose doctoral thesis is this project at the same time. This student project work – just like the investment – is under way at present. Our plan is that 3 diploma theses in Architecture and Architectural Management and 4-5 (1-2 in each profession) diploma plans in Engineering should be prepared this year.

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The visual plan of the Faculty

CONCLUSION

According to all the above illustrated procedures you may realize that a complex of all the necessary professional fields of the Faculty of Engineering, organized in the proper structure to undertake, is capable of managing investment projects from beginning to end. Professors' (designers') experience is continuously enriched with the most recent industrial applications and all this knowledge can be passed on to students straight away. Timely, real investments, DLA masterpieces based on architectural and engineering management plans and numerous diploma works of high standard connected with these are prepared in our DLA School of Architecture.