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### **FLEXIBLE PREFABRICATED SYSTEM MORAVAMONT 2000**

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#### **Abstract**

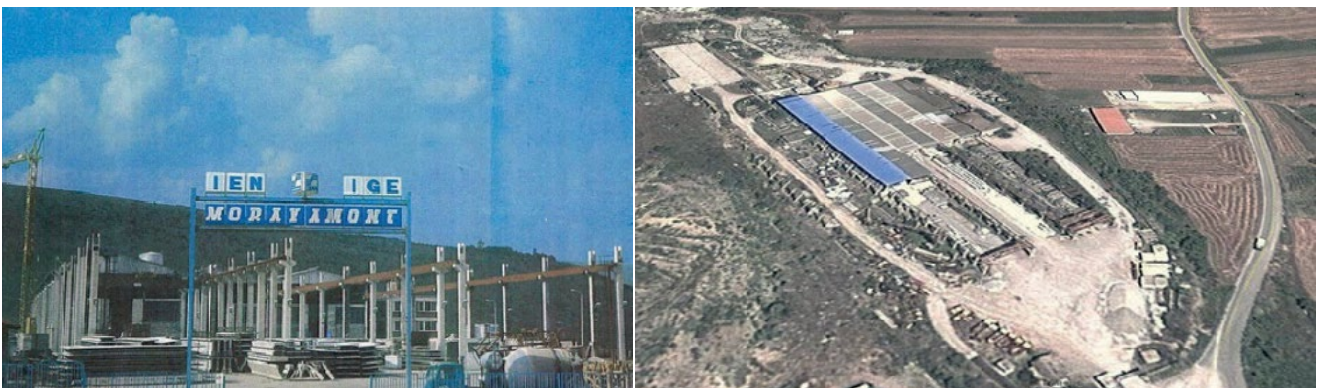
At the end of a decade-long research work at the Moravamont plant in Gnjilane, a new completely prefabricated building system was created from reinforced concrete and prestressed precast elements on the track, which was called Moravamont 2000. Presented in paper final results demonstrates that the construction is well and rationally designed, that the construction behaviour for the maximum expected

earthquake effects with a return period of 500 years, according to the criterion of regulation, is resistant and resistant to an earthquake without major damage. The idea is to present through new system moravamont 2000 its flexible side along with the possible development using 3D technology.

**Keywords:** prestressed precast element, seismic action, structural system, 3D.

## 1 Introduction

Moravamont Factory from Gnjilane (Figure 1) is one of the four factories in the Vemont system in the former Yugoslavia. In addition to the Vemont system, the factory Adrijamont and the IMS system of professor Branko Žeželj also have a factory. The factory owns its raw material base – quarry, concrete base, as well as modern mold hydraulics (flares), reinforcement, internal transport and all necessary contents, which can be seen from the attached documentation. In addition to adhesion pre stressing, it also has the possibility of expanding the basic product range by applying universal pre-precision on the track, as well as innovation within the system, as well as possible combinations. This idea of the combination was supported in 1982 by my professor Momir Krastavcevic in postgraduate studies in Nis. The factory's position allows expansion of production capacities, which the author started in 1989, at the time he was at the head of Binačka Morava, but, unfortunately, the built structure was not put into operation, although the feasibility studies are still good for all new products today. The complex itself enables the creation of a universal concept of construction according to the system: concrete, metal, wood, which practically provides a leading position in the construction industry in the Balkans.



*Figure 1 – Moravamont complex in Gnjilane*

## 2 Methods

The idea to make Moravamont 2000 a flexible one came as a need to resolve construction projects on different locations, both in constructing houses and apartments, business halls and other public buildings.

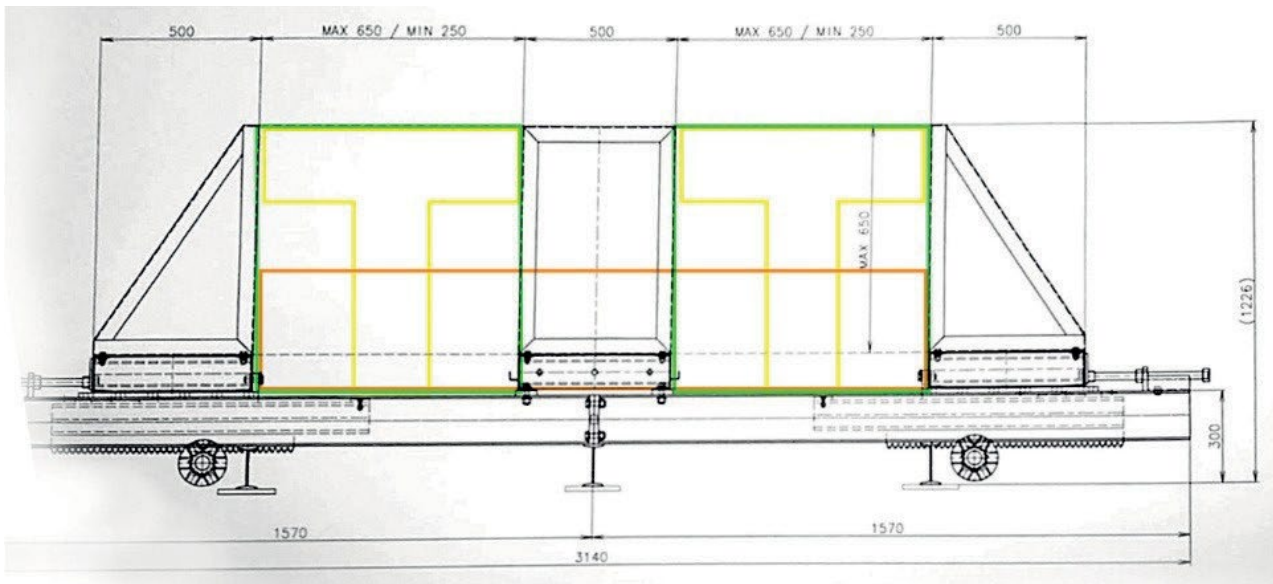
The solution lies in merging elements, their easy transport and quick creation of technical line for constructing elements for each construction site. The fundamental models for the construction of apartments and halls have been presented for this occasion (figure 2), along with the fundamental model for the transport of all elements (figure 3), and Moravamont 2000 system technology together with Elematic from Finland (figure 4).



Housing program

Hall program

*Figure 2 – Housing program and Hall program*



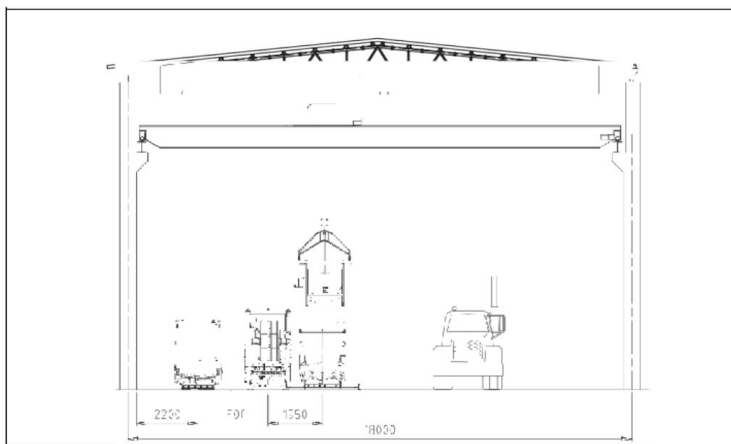
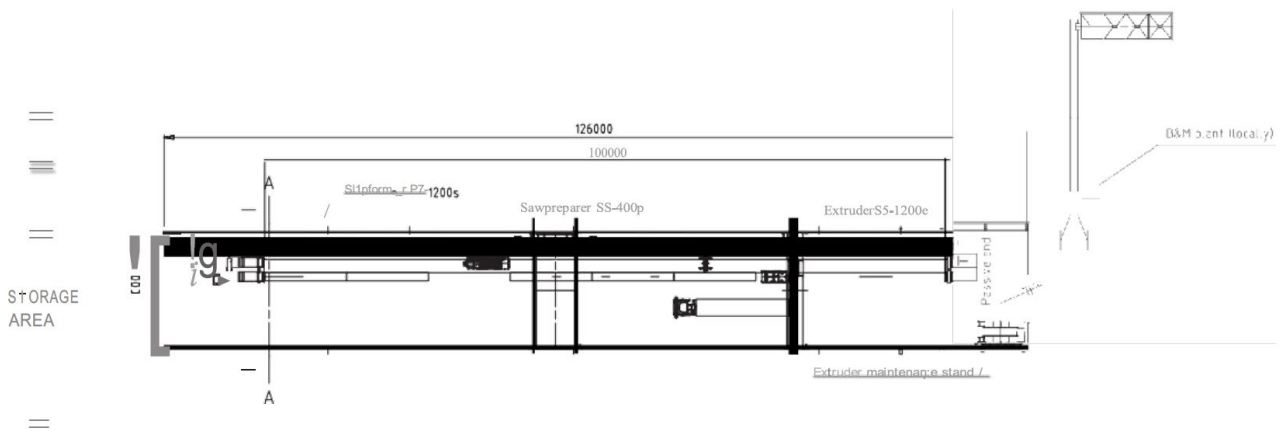
*Figure 3 – Complete transport technology (2,8 × 12) m*

### 3 Result and discussion

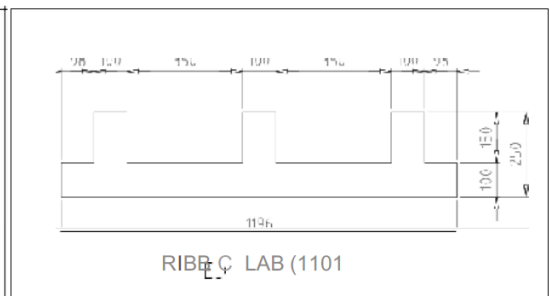
The results coming out of this flexible system Moravamont 2000 do not fall behind in terms of quality with fabricated ones, what is more, they allow better construction organization as well as the possibility to mix with local materials. The idea resulted from the project of building around 10 000 apartments in Africa, which was postponed for 2021 due to the pandemic caused by corona virus. In this case, the energy reduces the price for 15 per cent.

### 4 Conclusions

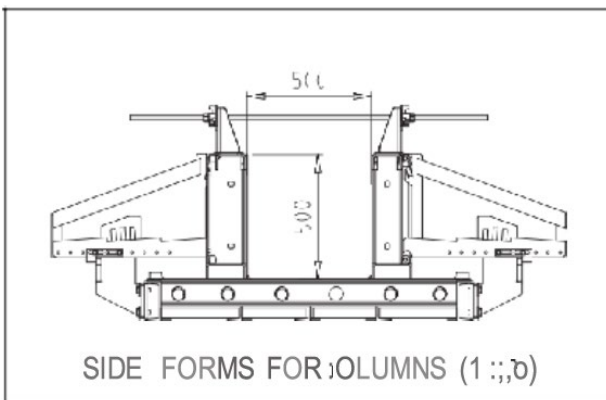
Besides achieving good results when it comes to the strength and resistance of the structure as well as its duration in the areas with seismic activities, suggested flexible variation of the system Moravamont 2000. Additionally, it brings the rigidity of the prefabricated structure closer to the monolithic one. All of this provides great possibilities for further research regarding the increase of the structure's span and its optimality.



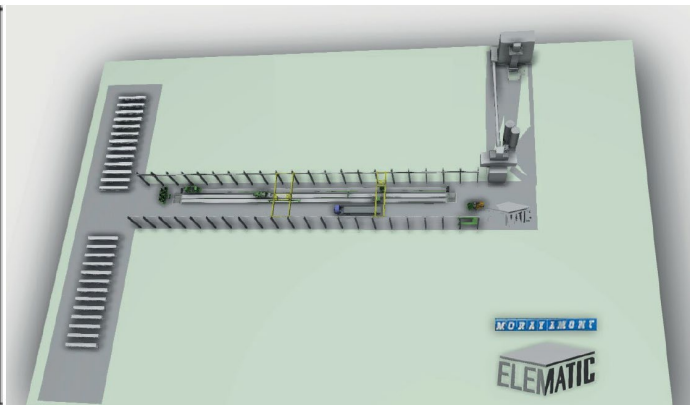
A-A (11001, rotated 90°)



RIBBON LAB (1101)

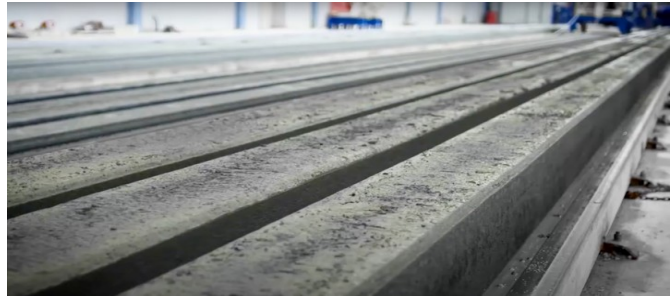


SIDE FORMS FOR COLUMNS (1:10)



**Figure 4** – Elements system Moravamont 2000

3D technology starts with resolving the element layers, but it is planned to be used for the elements' construction too. Thanks to that the whole automatization of the process of manufacturing elements will be achieved. In addition, the whole process of construction will be automatized as well (the whole process starting with the idea till the realization of the project will be computerized) figure 5 and figure 6.



*Figure 5 – Modles*

*Figure 6 – The process of constructing the elements using 3D technology*

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