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Precast concrete elevator shafts

In Japan, housing featuring 6 floors or more is considered high-rise housing and in such cases it is required by law to install elevators. Most residential construction erected between the 1960's and 1970's features less than 6 floors and is without elevators. For residents of such housing living on upper floors it is a physically strenuous task to reach their living quarters and it is precisely for this reason that the rate of vacancies in such buildings increases, especially with an ever increasing aging population. Meanwhile, also the aging of the buildings themselves is becoming another significant problem. However, all these problems can be solved by deciding on an "Assembly Precast Concrete Elevator Shaft" which is introduced in this article.

There are numerous old medium-sized public apartment buildings having less than 6 floors throughout Japan.

It will involve enormous investments to rebuild this housing and, in addition, additional costs will arise for payment of moving residents and providing temporary living quarters before any refurbishing can be carried out. Also, the plots needed for the buildings is almost fully used up in most cases and their physical space will be insufficient to completely rebuild apartments, if that is to be intended at all. Accordingly, it is more realistic to prolong the usable lifetime of these buildings rather than reconstructing them in their entirety. Although the presence of elevators is indispensable, it is almost impossible to install a new elevator in an existing building. This problem can be

solved by an Assembly Precast Concrete Elevator Shaft which can be installed outside a building.

Generally speaking, there are 2 traditional construction methods for elevator shafts.

- 1) Assembling the steel frame on site, inserting the elevator car, finally carrying out the walling
- 2) Assembling the entire set comprising steel frame, elevator car and walling all in advance, transporting the set horizontally, erecting it on site.

However, both construction methods have their demerits. The first one requires an extended construction period by commencing assembly with the outside scaffolding on site. The second method can be carried out in shorter periods of time, however, in

this case it is necessary to be provided with enough space to set up the assembly involving risks during operation.

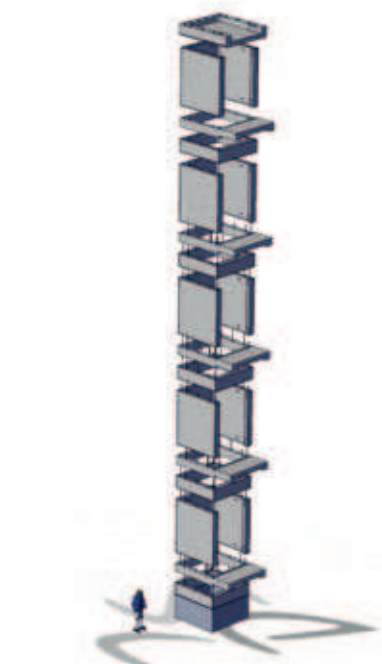
On the other hand, the precast elevator shaft is transported to the construction site divided into subassemblies. Installation takes about 5 days with the exception of the foundation work. In comparison with conventional construction methods, this is much faster than the first method and safer than the second. Setting up the scaffolding is performed inside the shaft and simultaneously with the installation of the concrete

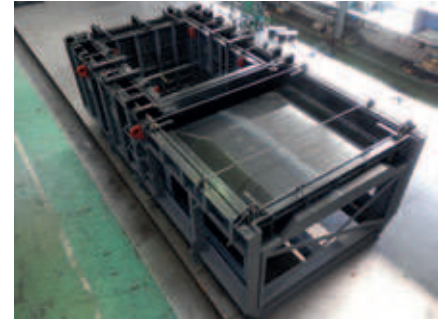


Elevator shafts can be installed outside buildings



Precast elevator shaft subassemblies transported to the construction site.





Products and moulds of Yamau CO., LTD. The company boasts the execution of numerous construction projects, this way rendering significant contributions to society.

elements. This provides better safety conditions for personnel, a salient characteristic of this product. In addition, only one day is necessary for crane operation when setting up the subassemblies onto one another. During the entirety of operations, residents are able to continue their daily life during construction.

The construction method which mainly employs a steel framework consists in setting up the steel frame outside the elevator car. Subsequently, the wall cladding is carried out. Compared to the assembly precast elevator shaft method, a larger cross-section for the base area is required. Since the concrete wall itself has sufficient structural strength, the cross-section of the base area can be smaller in this case. In fact, the cross-section amounts to only 65 % of the one needed in the case of the steel framework method. The use of pre-stressed steel allows for the rigid structure obtained to freely stand on its own, hence avoiding any negative loads on the building. Since the entire product is completely manufactured including its paint coating in the factory, an excel-

lent product quality can be guaranteed and residents will not be harmed by hazardous odours. Added value can be achieved by easily installing a first-floor accessibility ramp.

Furthermore, the elevator shaft can not only be used in housing, but also with elevated walkways.

Even though the product boasts an excellent quality and substantial added value, its manufacture needs to be carried out efficiently. Since the shaft subassemblies are used for high rises that are exposed to strong forces, product tolerances must be strict and rigidly adhered to. Special consideration must be given to the faultless execution of joints. Toyotaforms contributes to enhanced productivity by providing high dimensional accuracy and easy handling.

Since the height of this product depends on the floor heights of the apartments in question, adjustable moulds are required at all times. When designing the moulds, a reduction in time and manpower for assembly was in the focus of attention. The moulds

provide a high dimensional accuracy and are also designed in such a fashion that they ensure a high rigidity to maintain their robust structure over a number of years. Furthermore, since the moulds feature a high stiffness, the use allows for products to be manufactured without any distortions in their shape.

The excellent dimensional accuracy of these moulds makes them watertight and mortar leakages are prevented. For these reasons, the necessity for repairs is reduced to a minimum and complaints regarding product quality and corresponding costs are virtually non-existent.

FURTHER INFORMATION



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