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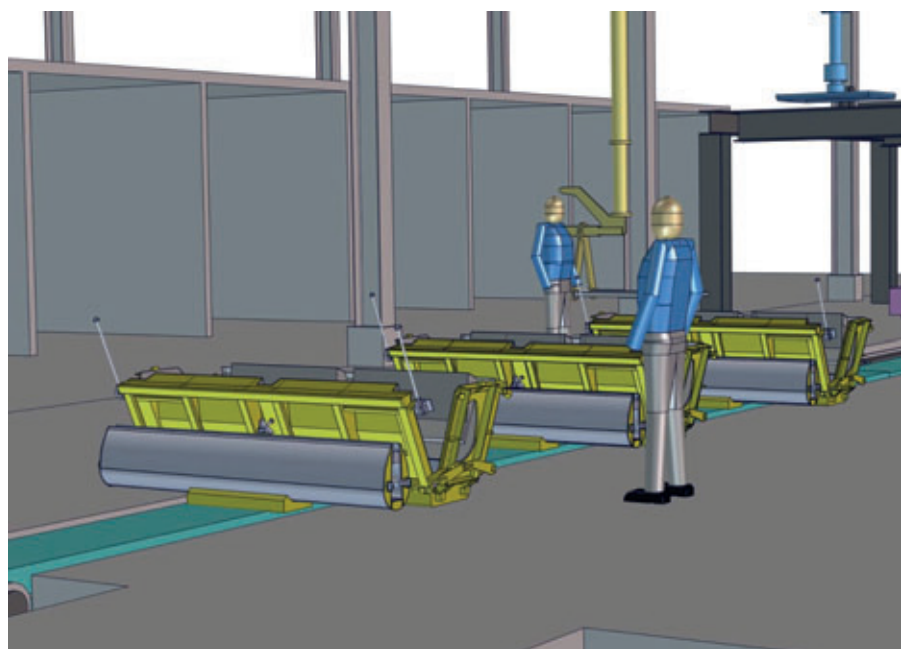
# Effective and flexible manufacturing system for the fabrication of various precast concrete products

There are various types of production lines for manufacturing different sizes, weights, shapes and production volumes of products in the Japanese precast concrete industry. Since the infrastructure in Japan is almost fully furnished, production of precast concrete goods has been moving for some time from the large-lot production of narrow ranges of products to the small-lot production of wider-ranging products. The market for precast concrete blocks designed with complex shapes, taking into consideration the rich natural environmental function, has grown in recent years. It has become a business challenge to produce this kind of the product efficiently with short lead times. In this issue, an effective production system called FMS (Flexible Manufacturing System) will be presented.

The remarkable feature of this line is that almost no machines can be seen on the floor for conveying the moulds and there is a wide space for operators to work freely and safely around the moulds. The moulds are lined up every 3 metres on the floor and they are just "placed" on the production line. The length of the line is designed on the basis of the customer's needs and is normally 30 metres long for the placement of 10-11 moulds. Generally, this line is suitable for products with a total weight (mould with concrete) of up to 3 tonnes. It is mostly used for the production of medium-sized products. There is no particular limit to the size. Therefore, any type of mould can be placed on this line.

There is a moveable, long, narrow table in the centre of the line. It lifts up all the moulds sitting on the line and conveys them forwards. Then the table itself moves downwards and backwards to the original position. The moulds are moved forward by the cyclic movement of the table. The structure of the system is simple, safe, easy to maintain and highly durable.

The system is very safe because the table is flat. It prevents operators from tripping or



*In the case of moulds which have an inner core, for example egg-shaped drainpipes, the inner core needs to be removed from the mould itself while demoulding. The FMS line is able to keep the inner core close to the mould and move them forwards together.*

catching their foot between the mould and the ground because the lifting height of the moulds is designed to be just a few millime-

tres. Operators can walk anywhere around the moulds and the moulds can easily be cleaned .



Examples of the Flexible Manufacturing System



*It is possible to reduce the number of fork-lift trucks by installing a monorail concrete distributor (technology from Dudik®-Germany called the TMD-Toyota Monorail Distributor), between the batching plant and the pouring machine.*

After pouring, the moulds are normally moved into the curing room using a fork-lift truck. Compared with a traverse, a fork-lift truck is much more flexible for changing

/adding different types of the moulds into the line or for changing the order of the moulds for pouring.

Moreover, the output of the FMS line could be increased if some necessary equipment is added.

The line can be optimized to meet the customer's different needs, for example, by adding a turnover device, by attaching a separate short line to move the concrete product away from the demoulding station or by adding a demoulding crane with large vacuum pads for heavy products.

The large-scale FMS Line is also available for producing large products such as box culverts.

The biggest advantage of this line system is its flexibility for the manufacture of various products. It helps those customer who do not know what kinds of the product have to be produced in the future or who want to manufacture a wider range of products.

Toyotaforms have been designing and constructing precast plants for the last 50 years and provide not only moulds but also total

solution services for manufacturers of wet-cast concrete products.

Toyotaforms offer moulds and equipment manufactured using production methods based on their know-how and wealth of experience. The important thing is to consider the balanced productivity of mould and equipment. ■

FURTHER INFORMATION



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- All custom-made
- Highest Quality
- Efficiency
- Productivity
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