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Hollow core slabs in new widths

The standard width of prestressed hollow core flooring slabs used in the building industry is 1200 mm. However there are several countries in the world that use element widths different from this international standard. For example in CIS and Baltic countries hollow core slabs of 1500 mm wide are widely used whereas in Brazil the standard width of both hollow core slabs for floors and walls is 1250 mm.

It is also possible to find cases where elements of 900 mm and 1100 mm widths are required. A good example of this would be in Saudi Arabia on certain government projects with particular architectural narrow hollow core slabs have been required.



The Extruder machine during the casting phase of a narrow 900 mm wide hollow core slab on a standard 1500 mm wide production bed.

In recent years, countries such as CIS and Baltic countries have also seen production of 800 mm and 1000 mm narrow hollow core slabs as a growing trend.

Usually, elements in these special widths have been obtained by cutting down an element longitudinally, either before or after curing, with special cutting machines with diamond blades. This manufacturing method, although widely used can quickly become un-economic as the volume of these types of non-standard width elements increases. For example cutting an element 900 mm wide from a standard 1200 mm gives rise to about 25 % wastage, a 1000 mm element has approximately 16 % wastage and a 1200 mm element can create up to 9 % wastage.

Increased costs using this method include the time required to make the longitudinal cuts, especially in the case of cutting on dry concrete. Consideration must also be given to the special equipment required to lift and handle narrow elements as well as the extra costs incurred for the management and disposal of the waste material.

In case the amount of these special slabs is relatively high, best solution avoiding afore mentioned problems is to form the precast elements directly with required design widths. It must be considered that during



View showing the high quality finish of the side profile achieved by Nordimpianti's Extruder machine on 900 mm wide hollow core slabs.



900 mm wide hollow core slabs produced by a Nordimpianti Extruder.



1100 mm wide hollow core slabs produced by a Nordimpianti Extruder.



Detail of the innovative side edge rail developed by Nordimpianti.

the production of standard width elements the quality of bottom and side surfaces is assured by the presence of dedicated side edges acting as side formers with chamfers. This situation does not happen if the width of elements does not match the casting line width. In fact, the side edges cannot be shifted time to time according to required width.



Longitudinal cutting on a cured hollow core slab carried out by Nordimpianti's multi-angle saw.



Longitudinal cutting on a hollow core slab, still in its fresh concrete state, using Nordimpianti's fresh concrete saw.



Removal of a hollow core slab from the production bed using a lifting beam.



Lifting of a 900 mm hollow core slab using dedicated clamps.

In this case, the function of the side edges of the casting bed is undertaken by the side formers of the casting machine that will be equipped with side edges with same internal shape. A potential problem of this solution is that after the machine left the formed slab during its normal proceeding, the restraint effect of the moving side former is missing and the quality of side surface of the concrete elements could be compromised.

In order to avoid this problem, Nordimpianti has developed a system of side support with edges that don't move forward and backward even if they're connected with casting machine; in such way the replication of fixed side edges is simulated much better.

On the other hand, as additional advantage, the side formers that form the site pro-

files, has got the normal oscillating movement, sliding on the afore mentioned bottom profiles: in this way the quality of the finishing of lateral side of hollow core slabs is the same of standard width elements.

Overcoming the variety of elements required and in some cases the inherent complexity, Nordimpianti has developed a series of machines and equipment easily capable of producing hollow core slabs in many widths: 600 mm (in this case the machine is capable of producing two 600 mm elements side by side), 800 mm, 900 mm, 1000 mm, 1100 mm, 1200 mm, 1500 mm and 2400 mm wide (or two 1200 mm elements side by side).

This tendency towards the production of non-standard elements is not due to stop. The R & D department at Nordimpianti is already working on a new Extruder

machine capable of producing hollow core slabs with widths of 650 mm, 700 mm and 750 mm for a major future project where the quantity of elements with these particular widths justifies the investment and the purchase of a machine with the flexibility to meet these new production requirements.

FURTHER INFORMATION

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