



PRECAST CONCRETE SOLUTIONS

# Prestressed Hollowcore Slabs

# HOLLOWCORE: THE CONCEPT

Hollowcore slabs are prestressed concrete elements that have a constant cross section. They are manufactured using high tensile strength prestressed strands or single wires which are embedded within the element. The production of these elements is achieved using our Extruder and Slipformer machines that cast in one phase along a production bed without the need of any formworks.

Hollowcore slabs are highly developed structural elements and are used all over the world due to their many advantages and diverse applications.

Today they are one of the most well known prefabricated elements because of their technical and economic characteristics.

Hollowcore slabs are widely used for flooring and wall panels in industrial, commercial, residential and infrastructure construction.

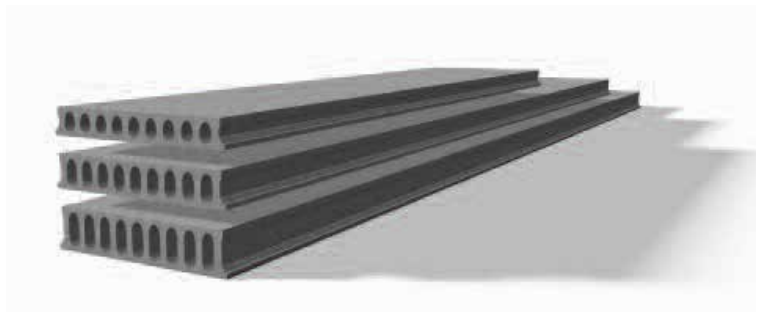
Hollowcore slabs can be used with different supporting structures: concrete constructed walls, brick built walls, steel structures, on-site concrete cast structures, prefabricated beams etc. For infrastructure Hollowcore slabs are used extensively to protect roads from natural dangers. They are used to construct anti-landslide and avalanche guards as well as the road decking itself, all elements requiring high loading specifications. Hollowcore slabs possess certifiable fire resistances and offer an economic solution to construct fire stop walls for warehouses, industrial buildings and car parks.



# SLABS INSTALLATION GUIDE

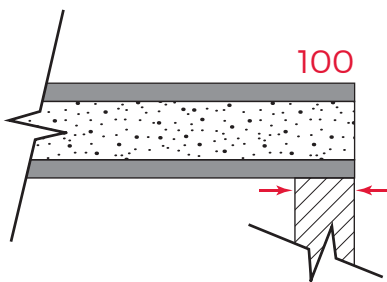
Prefabricated slabs are placed directly on the walls or steel structures. The minimum depth of Bearing on the wall is 90 mm and 75mm steel. Spaces between slabs are filled with concrete mix with the addition of increasing its strength.

A precamber of approximate length/300 (+/-50%) can be expected on all prestressed slabs and the camber may vary between adjoining slabs. Allowance for this should be in conjunction with finishes and finished floor levels.

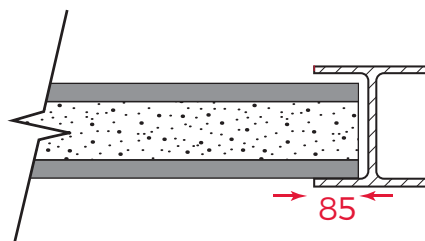


Hollowcore Units

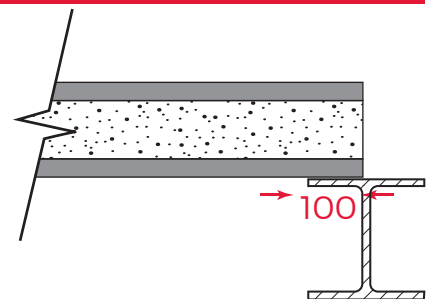
## Three Varieties of slabs bearing



Slabs bearing on block wall



Slab fitted in steel beam



Slab bearing on steel beam



Example of slabs bearing on block on flat wall and steel beam



# HOLLOWCORE ADVANTAGES

**Prestressed hollowcore units are the most useful elements of floor construction in multi-storey buildings and residential apartments.**

Hollowcore slabs provide considerable benefits to builders and house owners. They are the ideal choice for constructing floors in individual homes, both at ground level and upper level. Hollowcore floors are used due to their lower cost and quick erection installation time.

Hollowcore concrete slab is a versatile precast element. Hardly any building materials available today offer the economy, flexibility and reliability of precast, prestressed concrete.



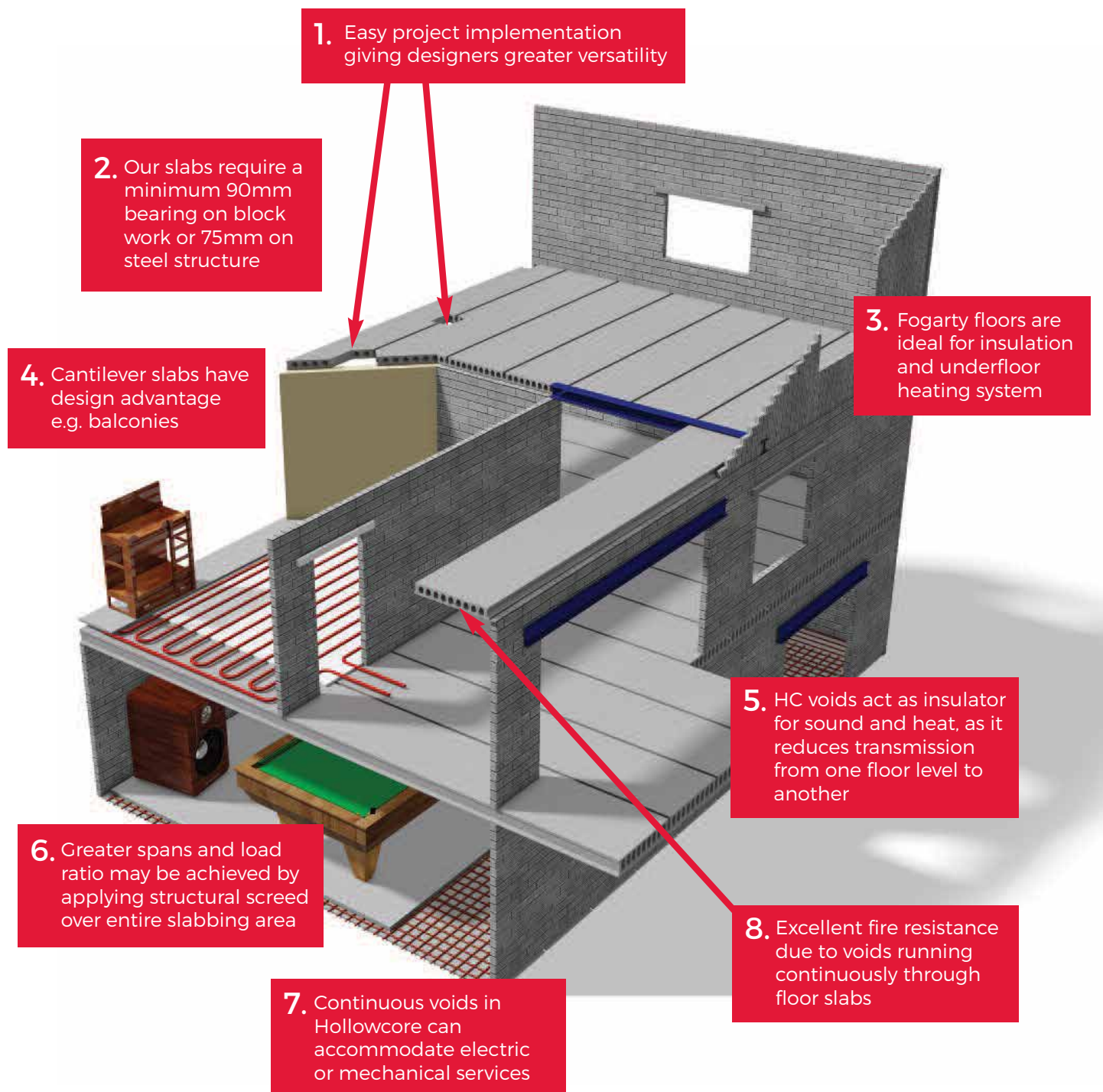
There are several advantages of the precast hollowcore slab or prestressed hollowcore slab such as:

1. Easy project implementation giving designers greater versatility,
2. Only 100mm two sided bearing.
3. Suitable for insulation & underfloor heating system,
4. Cantilever slabs have design advantages e.g. balconies,
5. Superior acoustic insulation and thermal properties,
6. Improvement in span and loading ratio by structural screed application,
7. Continuous voids in Hollowcore slabs can accommodate electrical or mechanical services,
8. Exceptional fire resistance,
9. Quick installation time,
10. Cost-efficient construction solution,
11. Heavy weight capacity,
12. Lower self-weight,
13. Assured quality,
14. Excellent lower surface finish ready to paint,
15. Easy project implementation giving designers greater versatility,
16. Easily adapted to enable mounting on ancillary building system,
17. High durability and load resistance,
18. Long spans without the need of temporary supports,
19. Green product reduces use of raw material.

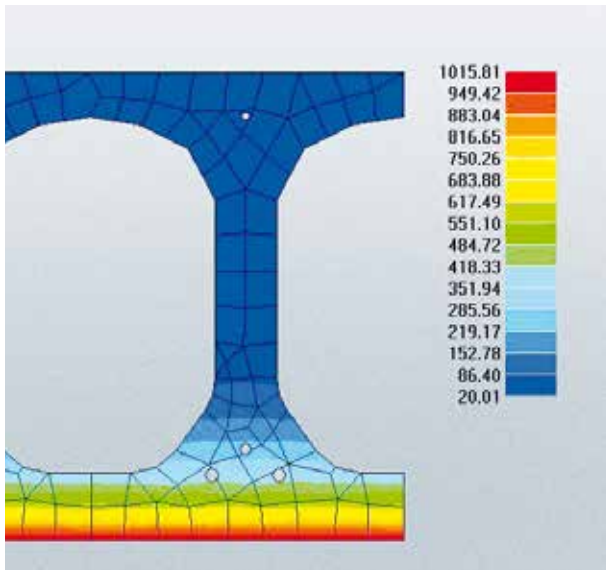
# HOLLOWCORE ADVANTAGES

Typical Insallation Time 1-3 Hours

Anatomy of a concrete built structure



# HOLLOWCORE ADVANTAGES



## 8. Excellent fire resistance

Through the choice of the different thicknesses of the lower part of the element, floors can be produced with a high fire resistance up to 180 minutes.



## 9. Quick Installation Time



## 10. Cost efficient construction solution

With only 3-4 workers it is possible to install more than 500-600 m<sup>2</sup> of floor per day.

Large production volumes with uniform cross sections even with different cable reinforcement configurations. Once the concrete elements have been produced they can be removed from the casting beds after just 6-8 hours. Hollowcore slabs have minimal deformation even with high slenderness ratios due to the transversal load distribution and even when the elements do not have any concrete topping.



## 11. Heavy weight capacity

The produced elements have high load resistances thanks to a low water/cement ratio of concrete from 0.25 to 0.35. Higher water/cement ratios cannot be employed for the production of desired cross sections without the use of expensive formworks.



# HOLLOWCORE ADVANTAGES



## 12. Lower self-weight

The presence of longitudinal voids in the crosssection leads to approx. 50% saving in concrete compared with a plain cast in-situ reinforced slab, and at the same time cuts the amount of prestressing steel by 30% because of the lower self-weight.



## 14. Excellent lower surface finish ready to paint

The lower surface of the element is smooth having a steel formwork finish. Generally this surface can be left as seen or can be simply painted.



## 13. Assured quality

By using specific equipment for the manufacture of the concrete elements and a high end quality control system.



## 15. Easy project implementation giving designers greater versatility

Hollowcore slabs have a wide range of applications. They can be produced up to 25m long. They are very common in the residential, healthcare, education, industrial and commercial markets and also in seismic zones. It is possible to manufacture elements with end openings that are then filled on-site in an orthogonal direction to the floor creating solid ends to increase shear resistance.

# HOLLOWCORE ADVANTAGES



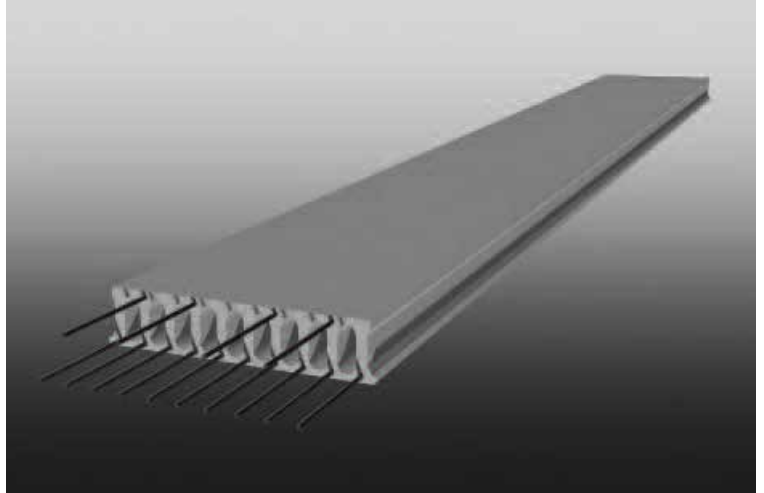
## 16. Easily adapted to enable mounting on ancillary building system.

Hollowcore slabs are ideal for the mounting of ancillary plant such as electrical trays, water sprinkler and HVAC systems.



## 18. Long spans without temporary supports.

Applicable to all loads and spans meaning that there is no need for supports during installation. It is possible to load the floor immediately after installation, even without any in-situ concrete casting.



## 17. High durability and load resistance.

Prestressing technology ensure the long lasting and exceptional loading. Multiple metal wires (strands) prestressed and casted in our slabs giving them extreme strength and very long design life.



## 19. Green product reduced use of raw material.

Hollowcore slabs are economic with their use of materials. One reason is that the precaster normally uses fairly high concrete and steel grades, consequently the products use less materials to achieve the same load bearing capacity as cast in-situ structures. The presence of longitudinal voids in the crosssection leads to about 45% saving in concrete compared with a plain in-situ cast reinforced slab and at the same time cuts the amount of prestressing steel by 30% because of its lower intrinsic weight.



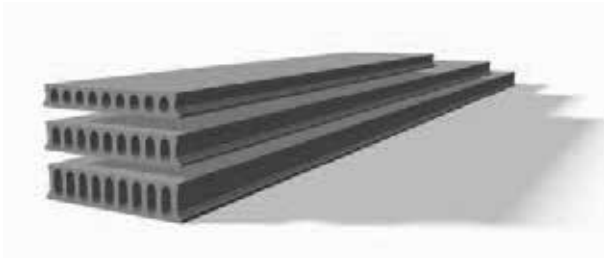
# PRODUCT DETAILS

## RANGE OF APPLICATIONS:

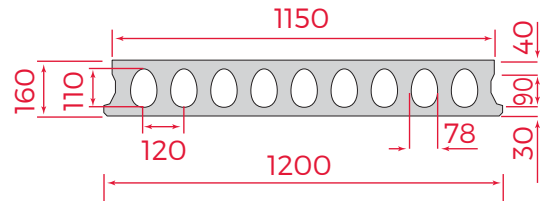
Floors, ceilings and flat roofs

### Material data:

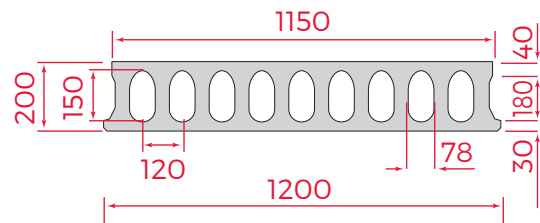
- ▶ Prefabricated prestressed hollowcore slabs
- ▶ Upper surface smooth or rough.
- ▶ Soffit smooth surface does not require additional treatments
- ▶ Precast concrete class C40/50
- ▶ Prestressing strand up to 14 number wires, from 9.3; 12.5 and 15.7mm
- ▶ Nominal tensile strength of 1860 MPa.



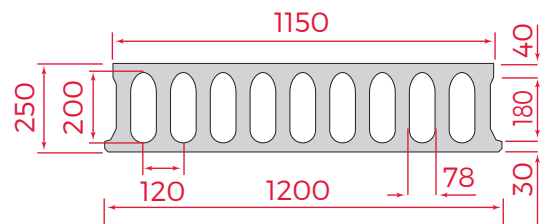
160, 200 and 250mm slabs



160mm deep Hollowcore slab



200mm deep Hollowcore slab



250mm deep Hollowcore slab



# PRECAST CONCRETE STAIRS

## Croom Concrete Stairs are an ideal solution

Concrete stairs provide a safe means of escape in event of fire and can be installed instantly, they are used in every development type where there is a requirement for access and egress.

## BENEFITS OF USING PRECAST CONCRETE STAIRS:

- ▶ Faster erection - Manufactured in our facility, the product arrives on-site ready for immediate installation
- ▶ High fire resistance.
- ▶ Higher quality finish - The precast stairs or landing is cast upside down, giving a very good smooth finish to the going and riser - allowing a carpet or any other finish to be placed directly on top.
- ▶ Minimal site labour
- ▶ Savings in construction time.
- ▶ Can accommodate progressive collapse requirements.
- ▶ Installation is not affected by adverse weather conditions.
- ▶ Croom Concrete standard steel moulds can produce cost effective precast stairs.
- ▶ Fixings for hand rails can be accommodated.
- ▶ Anti-slip strips can be accommodated.

Croom Concrete Stairs and Landings are designed to BS 8110. Our precast stairs and landings can be designed to suit almost any stair layout.



# DESIGN ASPECTS

We are certified in NSAI standards I.S. EN 1168:205+A3:2011 and our design is regulated by EUROCODE 2.

Our set of software packages ensure the safest top quality product and eliminate any chance of human error.

## NOTES:

- ▶ Calculations include 1.5 kN/m<sup>2</sup> load for finishes
- ▶ The self-weight of the slab has been taken into account. Greater span may be achieved by applying structural screed over entire slabbing area.
- ▶ Bearing of 100mm at each end has been assumed.



Croom Concrete	Safe Imposed Load vs Clear Span Data for Prestressed Hollowcore Slabs						
Hollowcore slab depth (mm)	Live Load 9kN/m <sup>2</sup>	1.5	2.0	2.5	3.0	4.0	5.0
		Maximum allowable Clear span (m) <sup>1</sup>					
150mm	Non-Structural Screed <sup>2</sup>	7.1	6.8	6.5	6.3	5.9	5.6
	75mm Structural Screed (No Props) <sup>3</sup>	7.7	7.5	7.3	7.1	6.8	6.6
200mm	Non-Structural Screed <sup>2</sup>	8.0	7.6	7.3	7.0	6.6	6.2
	75mm Structural Screen (No Props) <sup>3</sup>	8.5	8.3	8.1	7.9	7.5	7.2

## Notes:

1. Maximum allowable clear spans are based on our standard configurations of prestressing strands. Longer spans are achievable using alternative strand configurations.
2. Includes allowance for 75mm deep non-structural screed as an additional dead load.
3. Longer spans are achievable with a simple arrangement of props.

Our Hollowcore slabs can also support blockwork walls constructed on them.


Please contact our team of experienced chartered structural engineers to discuss your specific requirements such as:


- ▶ increasing spans beyond those indicated above using alternative strand configurations or by introducing props when casting a structural screed;
- ▶ allowing for greater live loads than those indicated above;
- ▶ allowing for line loads from blockwork walls constructed on the hollowcore slabs;
- ▶ allowing for openings and service penetrations in the hollowcore slabs;
- ▶ providing support to precast concrete stair flights;
- ▶ using hollowcore slabs as landings or half-landings.




# OUR CONTACT INFO



 Croom Concrete,  
Off Church Rd.,  
Croom, Co. Limerick.


 +353 (0)61 397479

 +353 (0)61 600719

 sales@croomconcrete.ie

 www.croomconcrete.ie

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 Croom Concrete Ltd,  
96 Godolphin Road, Shepherds Bush,  
London W12. United Kingdom

 mike@croomconcrete.co.uk

 www.croomconcrete.co.uk

If you should require any further information about our Prestressed Hollowcore Slabs or Precast Concrete Stairs or any of our other products, please contact one of our expert team members who will be happy to help you.

