









# PRECAST CONCRETE FLOORS IN HOUSING

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-  Precast Flooring Federation
-  Housing Applications
-  Floor Types
-  Design and Installation
-  Typical Details for Precast Upper Floors
-  Benefits of Precast Concrete Upper Floors



## Precast Flooring Federation (PFF)






-  Represents leading manufacturers of hollowcore, beam and block, and lattice girder flooring
-  Part of British Precast
-  Produces technical guidance related to design, H&S and installation

[www.precastfloors.info](http://www.precastfloors.info)



## Housing Applications



-  Floors over basement
-  Ground floors
-  Internal floors



## Floor Types

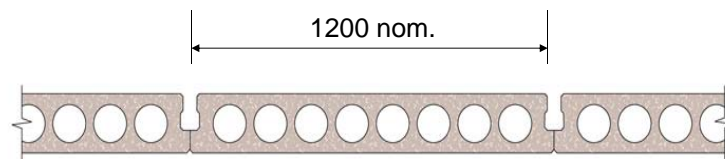
 Hollowcore




 Beam and block

 Lattice girder



## Hollowcore

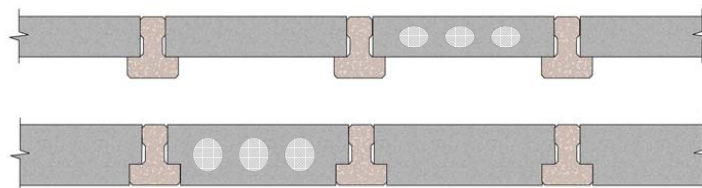





-  Precast concrete element with continuous voids
-  Depths vary from 100mm to 400mm depending on the required span and loading conditions
-  Most systems are prestressed

## Hollowcore



## Beam and Block



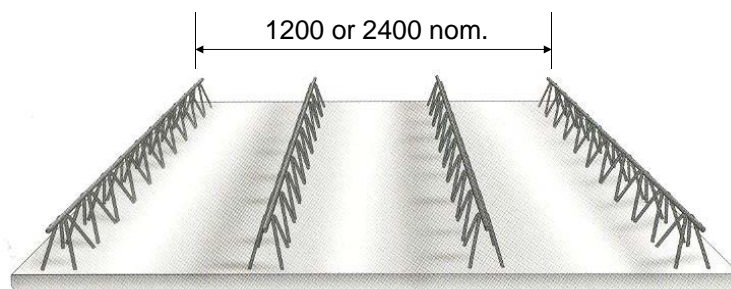
-  Different types of infill blocks can be used
-  Beam depths range from 150mm to 225mm
-  Spans up to 8m are achievable





## Beam and Block





## Lattice Girder



-  Plank depths typically range from 50mm to 100mm
-  Finished overall depth between 115mm to 250mm







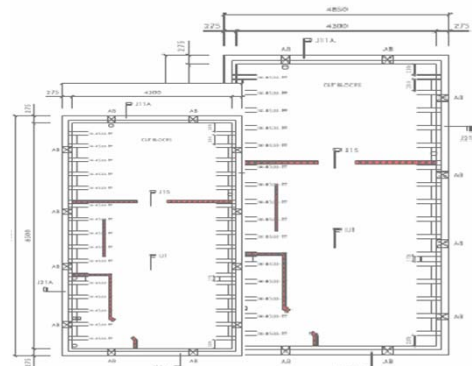
## Lattice Girder

-  Composite floor:  
permanent concrete formwork  
with in-situ concrete topping
-  Visual concrete soffit provided



## Design

-  Technical advice pre-tender
-  Scheme rationalisation
-  Detailed layout drawings
-  Calculations





## Installation

 Health and safety

 Quality

 Programme coordination



## Typical Details for Precast Upper Floors

 Bearings

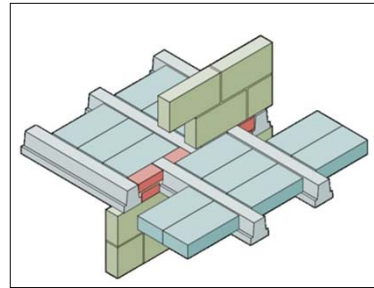
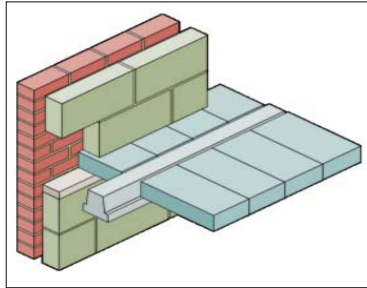
 Wall Support

 Holes

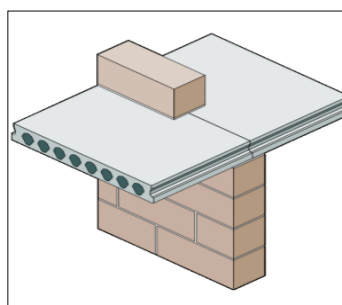
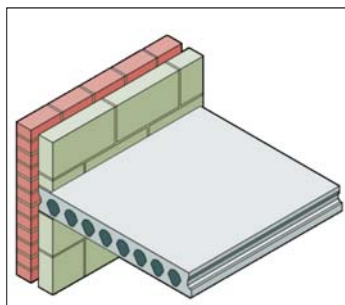
 Services



## Bearings

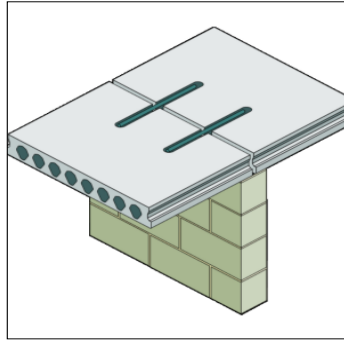



## Bearings



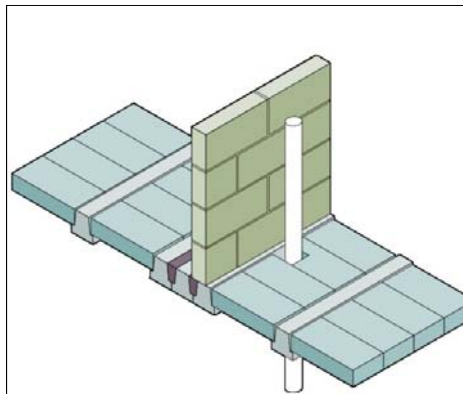


## Bearings

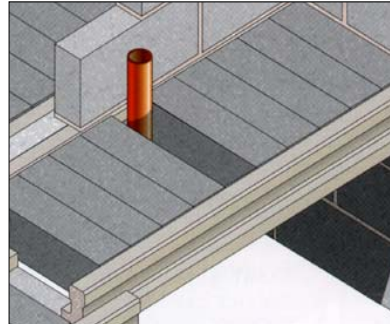
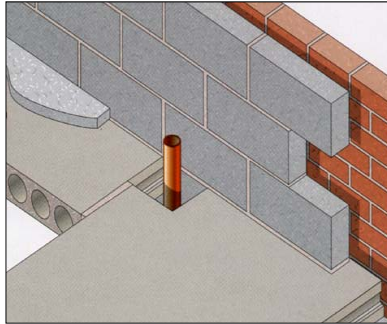


 On reduced width shared bearing, slabs must be propped until concreted joint is fully cured

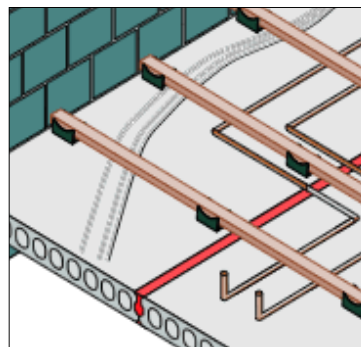
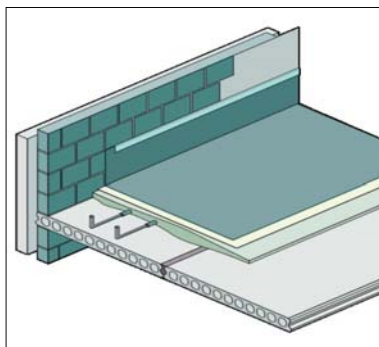
## Wall Support



## Holes



## Services





## Key Benefits of Precast Upper Floors

 Fire Resistance

 Acoustic Separation

 Thermal Mass



## Other Benefits of Precast Upper Floors

 Locally manufactured

 Factory produced quality

 Rapid construction on site

 Working platform

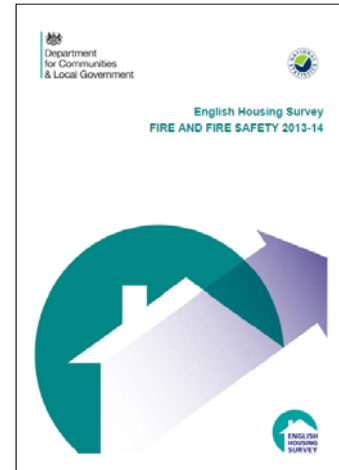
 Durability








## Fire Resistance

*"Statistically fires in the home are more likely to start inside the property than from outside"*

*"Although occupier behaviour is a major reason for fires starting, the design and characteristics of a building will affect the potential for a fire to spread or to be undetected and, therefore, impact on the likelihood of the fire causing harm."*



## Fire Resistance

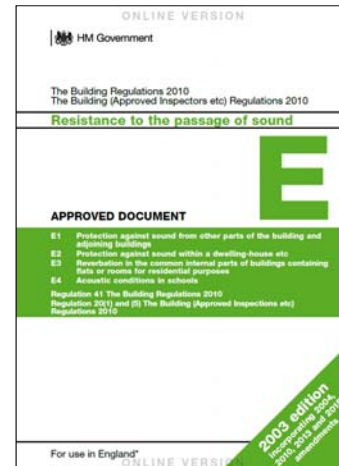
-  Non-combustible - does not burn
-  Inherently fire resistant - no spread of fire
-  Slow rate of heat transfer - making it an effective fire shield
-  Does not produce any smoke, toxic gases or emissions in a fire situation
-  Retains most of its strength under typical fire conditions




## Acoustic Separation

Protection against sound within a dwelling-house, etc.

*"Dwelling-houses ... shall be designed and constructed in such a way that ... internal floors ... provide reasonable resistance to sound."*



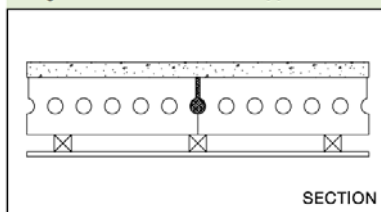
## Acoustic Separation

 Requirement E2 states that internal walls and floors must achieve the sound insulation values set out below.

	Airborne sound insulation $R_w$ dB (Minimum values)
Walls	40
Floors	40

## Acoustic Separation

Diagram 5.5 Internal floor type A







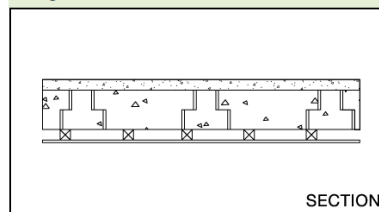





-  Concrete planks
-  Min. mass per unit area 180kg/m<sup>2</sup>
-  Screed optional
-  Ceiling finish is optional

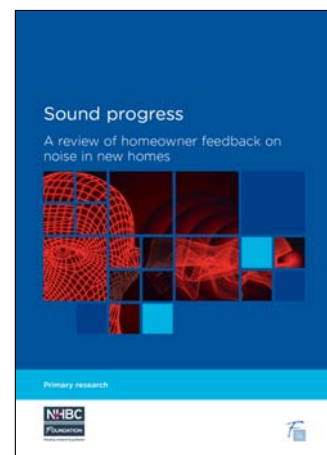
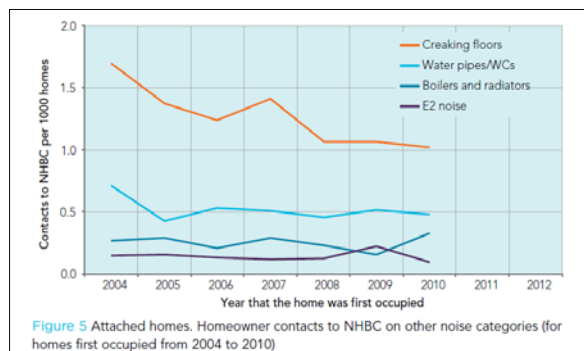
Diagram 5.6 Internal floor type B



-  Concrete beams with infill blocks
-  Min. mass per unit area 220kg/m<sup>2</sup>
-  Bonded screed (min. 40mm for sand)
-  Ceiling treatment C (or better)



## Acoustic Separation

-  Established that 'squeaky floors' is now a major complaint in new homes





## Thermal Mass

-  Concrete presents an opportunity to use thermal mass to reduce energy use for heating and cooling
-  Excellent thermal performance is possible using concrete floors

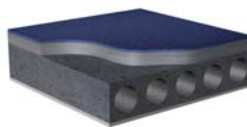
[www.Concretecentre.com/publications](http://www.Concretecentre.com/publications)



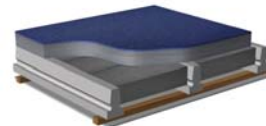
## Thermal Mass



-  Timber upper floor, up to 9-18 kJ/m<sup>2</sup>K



-  Hollowcore upper floor, up to 120-160 kJ/m<sup>2</sup>K



-  Beam & block upper floor, up to 120-140 kJ/m<sup>2</sup>K





Thank you for your attention