Beam & Block Floors

The complete guide
A complete and seamless beam and block flooring solution

ReadyFloor provides a highly practical yet easy to install suspended flooring system. With over 20 years’ experience, from design and specification through to after sales support, CEMEX has leveraged its technical knowledge and expertise to develop ReadyFloor as a market leading solution.

For commercial and domestic use

Beam and block construction overcomes many onsite difficulties such as costly excavation and consolidation of backfill prior to the placing of oversite concrete. ReadyFloor 155mm is ideal for the domestic market and is extensively used in housing developments whilst ReadyFloor 225mm is designed for more demanding commercial applications such as flats, care homes, offices, schools, light industrial and retail developments allowing for increased load bearing and larger spans.

Equally effective on ground and subsequent floors

Ease of installation and greatly improved sound and thermal insulation properties as well as enhanced fire protection, means that ReadyFloor is a convenient and effective option for ground, first and all subsequent floors.

The fast and simple installation doesn’t require highly specialised skills and can be carried out in adverse weather conditions. When completed and brush grouted ReadyFloor provides an immediate working platform for progressing construction reducing costs significantly through reduced preparation and speed of installation.

ReadyFloor can be delivered from stock on vehicles equipped with special beamgrabs for mechanical off-loading. Infill blocks from the ReadyBlock range can all be dealt with electronically. Adding value through enhanced customer service

Great customer service is at the heart of everything we do. Our technical and design teams provide a detailed and personal service every step of the journey from initial enquiry and estimate through to individual advice and recommendations. Detailed CAD drawings and calculations are produced by our technical department and with installation and after sales support it all add up to a seamless end to end solution. ReadyFloor, trust our expertise to give you peace of mind.

CEMEX Collateral Warranty

CEMEX ReadyFloor allows you to build with confidence in the safe knowledge we not only manufacture to strictly controlled quality guidelines but can also provide Collateral Warranty if required.

In-house Engineer

Our in-house engineer can discuss structural issues with your designers first hand so all loads can be provided for, allowing our team to provide an economic floor solution.

Detailed CAD layout drawing.

All contracts are provided with detailed CAD layout drawings and a schedule of individual components.

Structural Calculations

Full detailed calculations are provided to support our design and these are more than adequate to meet the requirements of Building Control.

Design and Sales Offices

Both departments have facilities to send and receive AutoCad drawings, giving you greater flexibility. Enquiries, quotations and orders can all be dealt with electronically.

Sustainability

Sustainable Solutions

Under the Code for Sustainable Homes, floors constructed using CEMEX ReadyFloor beams can achieve a Green Guide rating of A+. Further points can also be achieved as CEMEX ReadyFloor beams are rated “Very Good” under BES6001, qualifying as the highest tier level of MAT2 Responsible Sourcing of Materials.

Code for Sustainable Homes

By using CEMEX ReadyFloor under table 3 the product qualifies for 1.5 points as all materials certified EMS BES 6001 Accredited Responsible Sourcing for Construction Product

Green Guide rating

ISO 14001

Accredited Environmental management System

All the materials used in the production are from recognised environmentally managed sources

ISO 9001 Accredited Quality Management System

CEMEX Floors controlled manufacturing tolerances and quality management system allows the production of a high quality wet cast prestressed beam, which provides the contactor the fire tolerances and accuracies required for the ease of laying.

All ReadyFloor beams are manufactured and tested in accordance with the requirements of BS8810 – 1 1997 and BSEN 1992-1-1 2004

Quality Assurance Random samples of finished beams are subject to tests for dimensional accuracy, strength and stiffness of the beams under load. Our technical department prior to dispatch individually inspects all beams. All raw materials comply with the relevant British Standard and are only purchased from suppliers who have satisfied our quality assurance and environmental procedures.


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BBA Agrement Certificate

Certificate No. 93/2941

British Board of Agrement certification ensures the integrity of our product and satisfies the requirements of the NHBC.
1. Partition across the span
   - Block partition built off floor
   - Cut blocks or insitu concrete infill
   - 100mm nominal bearing
   - 50mm thick concrete screed grade 25N/mm², reinforced 1 layer A98 mesh

2. Difference in adjacent levels
   - 100mm difference of level shown
   - Use multiple beams as necessary for partition support and span requirements.

3. External garage wall*
   - Blocks to garage floor 7N/mm² minimum strength
   - Insitu concrete infill 30N/mm² strength with 10mm maximum sized aggregate
   - Blocks supporting wall to have same strength as wall or greater

4. Internal Cavity Wall
   - Concrete infill
   - Damp proof course
   - Blocks to garage floor 7N/mm² minimum strength

5. Internal staggered bearing
   - 100mm nominal bearing

6. Partition Parallel to span
   - Chipboard & insulation
   - Double beams under partition with insitu concrete infill 30N/mm² strength with 10mm maximum sized aggregate

7. External supporting wall

8. External wall parallel to plan

*Garage application. In order that any excessive loads such as point loads caused by the jacking of a car be distributed more evenly, it is recommended that an A98 steel mesh in a minimum finishing screed of 50mm thickness grade 25N/mm² concrete be incorporated. Damp proof courses should be placed according to normal building practice and site conditions. The void between the underside of the beam and ground level should be minimum of 75mm or 150mm for clay. Use multiple beams as necessary for partition support and span requirements.

**NOTE:** There are situations where we would recommend some internal load bearing walls be constructed in 215mm blocks up to the underside of the floor to alleviate possible ‘clashing’ of beams where heavy partitions are to be supported in adjacent rooms or where large spans occur.
Domestic First Floor and subsequent floors

Readyfloor® has additional benefits when used at first and subsequent floor levels, these include:

- Considerably enhanced fire protection
- Improved sound insulation
- Concrete floors do not ‘squeak’ with movement
- Greater floor span capability allows improved design flexibility
- Allows for block partitions to be built at first floor level
- Allows for flexibility of room layout
- Ideally suited for underfloor heating
- Floors independently tested to achieve 40dB as required by Approved Document E.
- Ceiling clips: 5 per m²
- Suitable cost-effective alternative to Hollowcore

Domestic Ground and First Floors

First Floor: Part E Separating Floor

Full Robust Detail status has been achieved for beam and block for use in separating floors. These details can be used as an alternative to Pre Completion Testing, as required under the Part E Approved Document.

The specifications include both a screed finish and a timber floating floor finish. Full technical details are available from Robust Details Ltd upon registration.

CEMEX Floors is able to supply a profile block to be used in the Robust Detail specification.

### Load Span Tables

**Load / Span Charts for 155mm deep beams at varying centres**

<table>
<thead>
<tr>
<th>Condition No.</th>
<th>Condition at 520c/c</th>
<th>5.900</th>
<th>5.750</th>
<th>5.500</th>
<th>5.250</th>
<th>5.000</th>
<th>4.750</th>
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<tbody>
<tr>
<td>A Beams</td>
<td></td>
<td>4.150</td>
<td>3.975</td>
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<td>B Beams</td>
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<td>5.900</td>
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<tr>
<td>C Beams</td>
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<td>6.250</td>
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<td>5.350</td>
<td>5.075</td>
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<tr>
<td>D Beams</td>
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<tr>
<td>F Beams</td>
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<td>Condition No.</td>
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<td>6.250</td>
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**Notes:**
1. Load span tables based upon finishes of 1.56 kN/m² (65mm screed).
2. No allowance made for partitions.

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</tbody>
</table>

**Notes:**
1. Load span tables based upon finishes of 1.56 kN/m² (65mm screed).
2. No allowance made for partitions.
ReadyTherm®
Insulation flooring system.

CEMEX floors provide a complete design service with all the necessary structural calculations and drawings to submit for building control.

ReadyTherm® flooring system combines the ReadyFloor® T beam and high-strength EPS panels. These panels are manufactured by an industry leader and independently certified. ReadyTherm® provides both the total floor insulation and a formwork on which to lay the structural screed.

Increased insulation
The ReadyTherm® Platinum EPS panel incorporates a graphite component called Neopor® to provide significantly improved thermal insulation performance, for example, to achieve higher levels of the Code for Sustainable Homes or just to improve SAP ratings.

The insulation used to produce ReadyTherm® insulation panels has a thermal resistance up to five times greater than lightweight thermal blocks, eliminating the need for additional insulation. The shape of the panels has been carefully developed to minimise thermal bridging at the T Beams; when installed, ReadyTherm® panels form an unbroken layer of insulation below the beams.

Indicative U-values of suspended concrete ground floor with ReadyTherm® insulation system

<table>
<thead>
<tr>
<th>Parameter: Area ratio P/A</th>
<th>0.1</th>
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</table>

Values as low as 0.1 can be achieved with increased thickness of ReadyTherm®

Structural Screeds/Toppings
For a typical specification with a designed UDL (Uniformly Distributed Load) of 5kNm² or point load of 4.5kN the contractor has the choice of the following structural floor screeds:

**Domestic and residential**
Min 60mm thick C25/30 concrete reinforced with A142 mesh

**Commercial**
Min 60mm thick C25/30 screed with Fibrin 23 polypropylene fibres at a density of 0.81kg/m²

Sustainability
The environmental integrity of a ReadyTherm® insulation panel is exceptional:
- Zero ODP (Ozone Depletion Potential)
- 5 GWP (Global Warming Potential)
- BRE green code rating A+ for suspended floors with an EPS infill
- Boards are 100% recyclable
- CFC, HFC and HCFC free
- Contains recycled content

ReadyTherm® Insulation panel is exceptional:
- Contains recycled content
- CFC, HFC and HCFC free
- Boards are 100% recyclable
- 5 GWP (Global Warming Potential)
- BRE green code rating A+ for suspended floors with an EPS infill
- Zero ODP (Ozone Depletion Potential)
**Tetris®**

### Tetris® Installation Guide

**Benefits of the Tetris Flooring System**
- Faster floor construction (up to 16% less blocks to install)
- Supplied to site in floor specific quantities
- Reduces the amount of concrete required
- Produces a floor with zero cold bridging
- Is a BRE Green Guide A+ rated system
- 100% recyclable
- Cost effective

- Fixes floor height above the beams at 150mm
- Easily incorporates underfloor heating system
- Able to withstand foot traffic during the construction process
- Insulation integrity guaranteed
- Accredited construction detail
- 2010 Part L solution
- U-values as low as 0.10 W/m2K

### Preparation

The use of ReadyFloor® considerably reduces site preparation and thus only the removal of top soil and any vegetable matter is required. No oversite concrete or additional surface seal is necessary. Provision of a void between the underside of the floor and the ground level of at least 75mm (150mm for clay) and 150mm in Scotland. If the site is liable to flooding then subvoid drainage may be required.

**ReadyFloor®** seldom requires an increase in foundation size, however if the ground condition is very poor, specialist advice should be sought.

**Handling**

ReadyFloor® beams should only be lifted when supported near the ends of the units, taking particular care with beams over 3m in length. Beams must only be lifted in an upright position. The approximate self weights of beams are: 155mm - 36kg/m; 225mm - 60kg/m.

**Stacking**

In order to prevent damage to beams, they should be stacked on battens on a hard level surface. Battens must be placed near the ends of the beams and in line with each other throughout the height of the stack.

**Installation**

The beams for the beams should be clean, level and free from debris. The mortar in the masonry must be cured and have sufficient strength to support the floor. A continuous damp-proof course should be laid along the support wall below the floor in accordance with CP 102 : 1973.

For masonry construction the beams should have a nominal bearing of 100mm. Where supported by steel the nominal bearing can be reduced to 75mm. In cavity construction, beams should not project into the cavity.

**Fire Resistance**

ReadyFloor® is capable of achieving a half hour fire rating with 155mm beams and one hour with 225mm beams.

**Floor Finishes**

The three alternatives below are typical of various finishes which can be applied. The quality of materials, and workmanship are set out in the appropriate British Standards.

- **A. Sand Cement Screed finish**
  - Screed and insulation finish
  - 50mm Sand/Cement Screed
  - Pre-stressed concrete floor beam
  - Galvanised hangars in 1st floors for ceiling attachment

- **B. Chipboard and Insulation finish**
  - 10 tongued and grooved Chipboard
  - Vapour barrier
  - Suitable insulation

- **C. Screed and insulation finish**
  - Screed and insulation finish

Vapour barrier

18mm tongue and grooved Chipboard

### Floor Finishes

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<thead>
<tr>
<th>Element</th>
<th>Code number</th>
<th>BRE Green Guide rating</th>
<th>U-value</th>
<th>Code credit</th>
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<td>&lt;0.15</td>
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* Code credits quoted are subject to an approximate weighted value
Beam and Block laying process

General guidance on the laying procedure for ground level and upper floors.
When laying beam and block at upper floor levels care must be taken with regard to Health and Safety Regulations and in particular Working at Height.

Walls taken up to dpc level. Top soil and vegetable matter removed. Void to be provided to underside of floor.

First beam is positioned using contract layout drawings supplied by CEMEX Floors technical office. Split course blocks to be provided under infill blocks where built into support wall.

Beam centres may be closed up by re-orientating infill block, as indicated on the contract layout drawings.

Beam and Block laying process

Air bricks installed. Requirement for 1500mm² of free air flow per metre run of wall, or 500mm² per square metre of floor area, whichever is greater.

Infill blocks may be omitted to allow service penetrations through the floor. The void may be shuttered and filled with in situ concrete to complete the floor.

DPC to be provided under bearing ends of floor beams. The bearings for the beams should be clean, level and free from debris. The mortar in the masonry must be cured and have sufficient strength to support the floor.

Infill blocks installed to whole of floor area. On completion a sand/cement (4:1) slurry grout to be applied to whole of floor area. Floor does not form a stable working platform until this has been carried out.

Infill blocks to be fully bedded onto split course blocks. Split course to be bedded onto support wall below.

The floor may be installed using the infill block as spacers between the ends of the floor beams. Spacings will be indicated on contract layout drawings supplied by CEMEX Floors technical office.

Infill blocks installed to whole of floor area. On completion a sand/cement (4:1) slurry grout to be applied to whole of floor area. Floor does not form a stable working platform until this has been carried out.

Beams may be doubled up if required by the contract layout drawing. The space between the beams above the flanges must be filled with in situ concrete of minimum compressive strength 20N/mm² with 10mm sized aggregate.

Beams may be doubled up to support block partitions. The space between the beams above the flanges must be filled with in situ concrete of minimum compressive strength 30N/mm² with 10mm sized aggregate before partitions are built.
## Commercial Ground and First Floor

CEMEX ReadyFloor® manufacture a purpose-made 225mm deep beam which provides the ideal solution for commercial use for both ground floor and first floor situations, providing spans of up to 8.0 m. Installation is fast and uncomplicated and services can be accommodated within ceiling voids or ducts within floor finishes.

CEMEX also supply pre-cast staircases which can be designed to suit, allowing rapid installation and providing safe access between floors when suitable protected.

CEMEX ReadyFloor have been supplying beam and block solutions to many commercial sectors including care homes, schools and offices. Our design team will be able to assist in the design process and will provide fully detailed layout drawings in AutoCad format. All contract drawings are supplied with full detailed calculations and our in-house engineer will provide any assistance that might be required.

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ReadyFloor 225mm beams have BBA Agreement Certification, which includes:

- factors relating to compliance with building regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- design considerations
- installation guidance
- regular surveillance of production

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### Load / Span Tables

#### Commercial Ground and First Floors

**Load / Span Charts for 225mm deep beams at varying centres**

With 100mm thick blocks (max density = 1900 kg/m³)

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<th>2.5</th>
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<td>5.525</td>
<td>5.175</td>
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<td>No. 3 Beams</td>
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<td>2.98</td>
<td>6.825</td>
<td>6.550</td>
<td>6.325</td>
<td>6.100</td>
<td>5.750</td>
</tr>
<tr>
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<td>at 692c/c (equiv. to 346c/c)</td>
<td>3.27</td>
<td>7.300</td>
<td>7.125</td>
<td>6.950</td>
<td>6.725</td>
<td>6.325</td>
</tr>
<tr>
<td>No. 5 Double Beams</td>
<td>at 468c/c (equiv. to 234c/c)</td>
<td>3.96</td>
<td>7.900</td>
<td>7.850</td>
<td>7.700</td>
<td>7.525</td>
<td>7.275</td>
</tr>
<tr>
<td>No. 6 Beams</td>
<td>at 152c/c</td>
<td>5.16</td>
<td>7.900</td>
<td>7.900</td>
<td>7.900</td>
<td>7.900</td>
<td>7.900</td>
</tr>
</tbody>
</table>

*Note:
1. The above table is provided as a guide only. Please consult ReadyFloor® calculation sheets for further information or contact CEMEX floors for additional technical data and advice where required.

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**Load / Span Charts for 225mm deep beams at varying centres**

With 100mm thick blocks (max density = 650 kg/m³)

<table>
<thead>
<tr>
<th>Condition No.</th>
<th>Beams</th>
<th>1.5</th>
<th>2</th>
<th>2.5</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 1 Beams</td>
<td>at 540s</td>
<td>1.75</td>
<td>6.800</td>
<td>6.475</td>
<td>6.200</td>
<td>5.950</td>
<td>5.525</td>
</tr>
<tr>
<td>No. 2 Beams</td>
<td>at 315s</td>
<td>2.54</td>
<td>7.800</td>
<td>7.575</td>
<td>7.400</td>
<td>7.225</td>
<td>6.875</td>
</tr>
<tr>
<td>No. 3 Beams</td>
<td>at 540 &amp; 315c/c* (equiv. to 428c/c)</td>
<td>2.04</td>
<td>7.300</td>
<td>7.075</td>
<td>6.800</td>
<td>6.525</td>
<td>6.075</td>
</tr>
<tr>
<td>No. 4 Double Beams</td>
<td>at 692c/c (equiv. to 346c/c)</td>
<td>2.50</td>
<td>7.625</td>
<td>7.425</td>
<td>7.225</td>
<td>7.075</td>
<td>6.625</td>
</tr>
<tr>
<td>No. 5 Double Beams</td>
<td>at 468c/c (equiv. to 234c/c)</td>
<td>3.39</td>
<td>7.900</td>
<td>7.900</td>
<td>7.875</td>
<td>7.700</td>
<td>7.425</td>
</tr>
<tr>
<td>No. 6 Beams</td>
<td>at 152c/c</td>
<td>5.16</td>
<td>7.900</td>
<td>7.900</td>
<td>7.900</td>
<td>7.900</td>
<td>7.900</td>
</tr>
</tbody>
</table>

*Note:
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Ventilation and C-Clips

ReadyFloor® normally recommend ventilation of the space below a suspended floor. This can easily be achieved using telescopic air vents and bricks which can be supplied on request. Vertical extension sleeves are also available where required.

Note: Floor beams should not bear directly onto an air vent where built into the internal cavity masonry.

In areas where there might be landfill gas or methane contamination the recommended minimum area of opening (from the BRE guidance document Construction of new buildings on gas contaminated land) of 1500mm² per metre run of wall or 500mm² per square metre of floor area, whichever is the greater, should be used. In areas where full radon precautions are taken the minimum open area of 1500mm² per metre run should be used.

The building designer should consider the positioning of gas membranes and dpc at building design to avoid conflict.

Details of Ventilation of Void under Ground Floor

**Beams parallel to External Wall**
- Cavity tray d.p.c to extended for 25mm past each side of ventilator
- Proprietary stepped ventilator & vermin proof grill
- Void to be increased to 150mm minimum if ground under is liable to heave.
  - Overfilled concrete not necessary
  - Level can be lower than external ground level providing that the soil is free draining or if drainage is provided
  - No organic material under floor
  - Surface treated with approved weed killer

**Beams bearing to External Wall**
- Proprietary ventilator in outer leaf under d.p.c.
- (Radon requirements may alter the vent type)
- External wall to be designed as a retaining wall if necessary where inner level is lower
- Voids are block strutted to allow air flow at ventilator position

The C-Clip system is a quick and speedy method of installing ceilings when ReadyFloor® beams are used at first or subsequent floor levels. C-Clips are simply inserted into position between floor beams and infill blocks, after the blocks are laid but before grouting. Battens are then screwed into position to provide the framework for the finished ceiling. Manufactured from galvanised mild steel sheet C-Clips are available to fit 155mm and 225mm deep beams. Leg sizes are 30mm with two holes per side to suit 38mm battens or 45mm with three holes per side to suit 52mm battens.

20/25mm I.D.

Available with either 30mm or 45mm deep foot

L
To suit beam profile
55mm (155)
125mm (225)

D
51mm I.D.

D
20/25mm I.D.

Voids are block strutted to allow air flow at ventilator position

Vertical extension sleeves are also available where required.
What is the fire rating of the beams?
The 155mm beam is rated as 30mins and the 225mm beam has 60mins fire rating. If required the fire rating of the overall floor can be increased for upper floors with the addition of a fire rated ceiling below the floor.

Do the floor beams require a dpc under the bearing ends?
We do recommend that the bearing wall be protected by a suitable dpc at some point below the bearing level of the floor beams. This is a requirement of our BBA certificate and is to protect the pre-stressed steel within the beam.

At what centres do you recommend placing the air vents?
As a general guide, one vent every two metres, but the exact location of the vents needs to be determined on site. Ventilation to be provided to floor void, approx 1 No 215mm x75mm vent per 2m run of wall.

Do you supply standard section details for the positioning of floor beams, dpc, air vents, dpm and radon barriers?
The position of these items is always site specific and needs to be determined by the site architect before works commence.

Can you issue your drawings in colour and design calculations electronically?
Yes, we provide drawings in AUTO CAD format or as PDF if required.

Do the ends of the floor beams need to be coated to prevent the wire corroding?
Generally, no. The natural alkalinity of the concrete protects the wire from significant corrosion and any slight corrosion that does occur is not detrimental to the lifetime performance of the floor beam. However, in areas subject to extreme exposure conditions, e.g. coastal properties, Local Building Control may recommend this.

Can your floor beams be used in a cantilever situation?
Yes, but the cantilever is limited, please contact our in house engineer to discuss further.

What blocks do I use to infill?
Any 7N block or flooring grade block may be used as infill between the ReadyFloor beams.

What is the minimum bearing required?
A nominal end bearing of 100mm on masonry and 75mm on steelwork is required.

At what stage should I grout the blocks?
ReadyFloor beam and block system should be slurry grouted before any finishes are applied. Slurry should be 1:4 cement / sand mix. Please note the floor does not provide a safe working platform prior to grouting.

Can I notch the beams to accommodate services?
To maintain the structural integrity beams may not be notched or drilled without approval.

At what stage do I install the ceiling clips?
Ceiling clips should be installed prior to grouting of the floor, allow approx 5No per m².

Can I stack my pallets on the floor?
Floor beams must not be overloaded during construction works by placing pallets of blocks on the floor. Further advice on the safe installation of ReadyFloor can be obtained from our sales office.

“ The CEMEX Floors people were excellent, providing a professional service and working well to our programme.”

Neil Dowding of Bristlewand Limited,
groundworks contractor for Barratt Homes