

## HANDLING & SAFETY

### LEGISLATION

The Manual Handling Operations Regulations places duties on employers to carry out a risk assessment on all manual handling tasks.

The Construction (Design & Management) Regulations places duties in the form of a mandatory Health & Safety system on contractors.

### INTERPRETATION OF LEGISLATION

In an attempt to provide practical guidance for meeting the requirements of these two Regulations the Health & Safety Executive (HSE) has issued Construction sheet 37 'Handling Building Blocks' which advises that there is a risk of injury in the single-handed repetitive manual handling of blocks heavier than 20kg. The guidance given in Construction sheet 37 is not mandatory, but gives a method of meeting the requirements for the Regulations.

Units of greater than 20kg should be handled mechanically.

The HSE guidance does not prevent an individual handling manually a small number of units greater than 20kg. In particular, ancillary units such as quoins or reveals would fall into this category and it would not be expected that these would be handled mechanically.

### BLOCKS AND CONSTRUCTION OPTIONS

Units of greater weight than 20kg are essential in many situations, as they offer specific benefits for:

- **Structural Performance**
- **Fire Resistance**
- **Sound Insulation**
- **Thermal Insulation**

and their use should create no problems provided that appropriate handling methods are used.

For users who, for design reasons, would otherwise select units of greater than 20kg but would prefer not to, a number of options exists. The appropriate choice from the options available will depend on the units or wall properties dictated by the application.

### CHOICES INCLUDE:

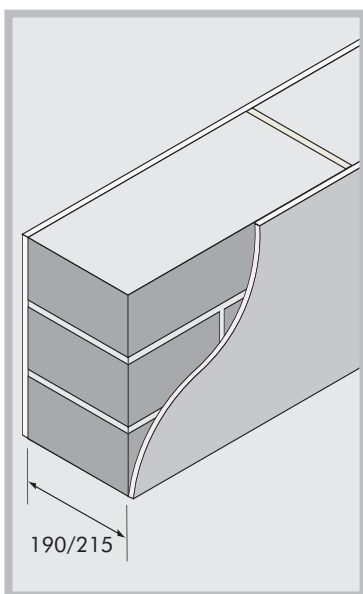
- Using HI-LIGHT units instead of solid units (having almost identical properties to solid units)
- Using metric units having sufficiently similar properties
- Using hollow units instead of solid units
- Using alternative construction techniques such as
  - i) laying units flat to form a 190 or 215mm width wall (suitable for finishes such as plastering or drylining)
  - ii) collar jointing\* units to form a 190 or 215mm width wall (particularly suited to facing applications)

**N.B. Whenever making the choice of units it is essential to ensure that the desired performance characteristics of the finished wall are not compromised.**

\*Collar jointing is laying units back to back in normal aspect with a 10-15mm space between the adjoining faces of the units. The two leaves may be tied together. If tied, either normal ties or bed joint reinforcement may be used. Collar jointed walls are not suitable for separating walls in dwellings.

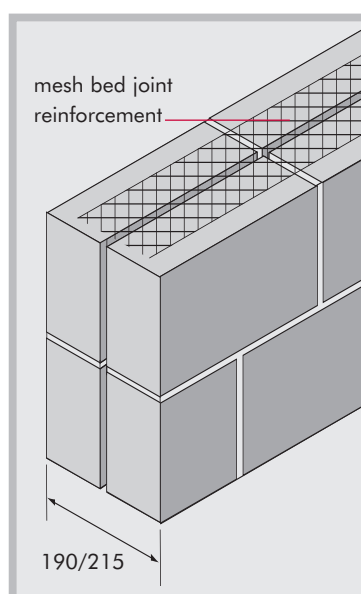
**helpful hint...**

*Large Precast units can have sockets cast into them or they can be made in smaller units for ease of handling.*



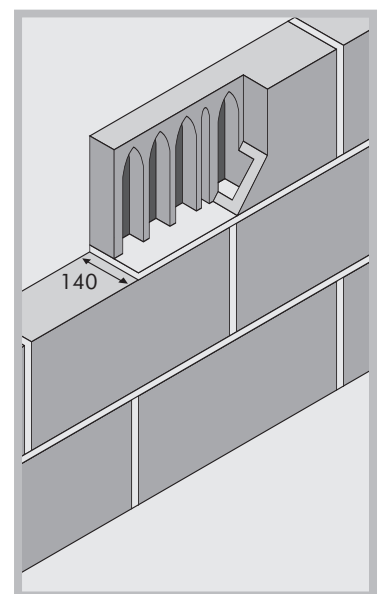
### LAYING UNITS FLAT

Suitable for plastering or drylining e.g. party walls.



### COLLAR JOINTING

Suitable for fairface work (not party walls)



### HI-LIGHT MASONRY

**STORAGE**

Care should be taken to store the blocks separately according to type to allow easy and accurate identification when needed. They should be stored as close as possible to the place of work keeping rehandling to a minimum.

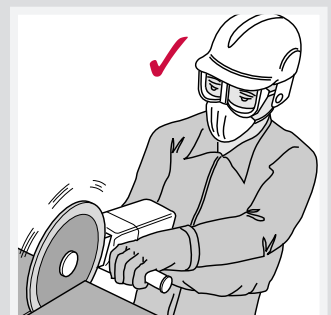
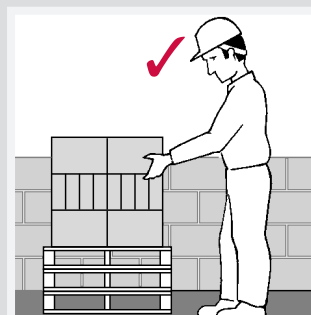
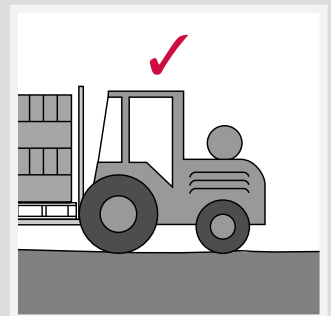
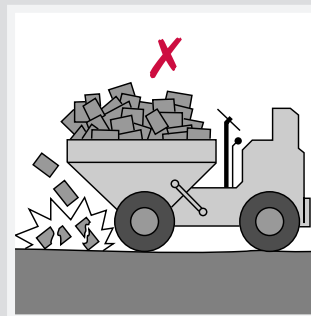
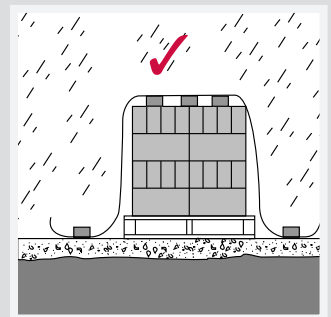
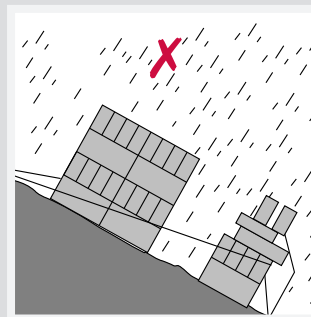
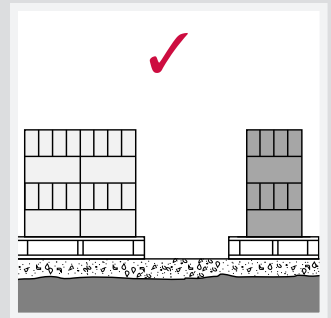
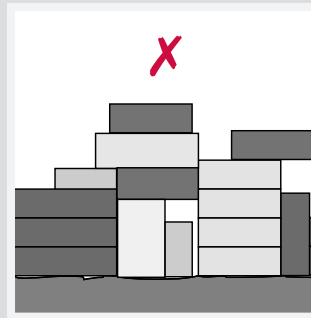
Consideration should be given at an early stage as to the method of handling on site and mechanical means, e.g. forklift, is encouraged. The packs should be stored on firm, level ground away from areas of high traffic or where mud splashes may occur. It is important that blocks are stored under cover, such as polythene or tarpaulin to prevent saturation prior to laying.

Much can be done to improve the safe handling and use of concrete blocks by following simple and straight forward good working practices and giving adequate consideration to health and safety aspects at the appropriate stage in the construction programme.

Careful consideration of the block layer's working area can also contribute significantly to safe working.

Points to take into consideration include:

- Move units in packs and by mechanical means whenever possible
- Load units out to above knee height
- Ensure that normal protective equipment appropriate to construction sites is both provided and used
- Ensure that appropriate eye protection and dust suppression or extraction measures are provided when mechanically cutting or chiseling units



## PROTECTION

All blockwork, Cast Stone and Precast units should be protected from rain as much as possible. At the end of each day blockwork should be covered, this is particularly important in the case of hollow blocks to avoid saturation. Prevention of excessive moisture will reduce the risk of efflorescence or lime bloom which is generally attributable to a build up of moisture somewhere within the wall.

Consideration should also be given to propping high or long walls where they are not properly restrained until completion of the walls. This could also apply to internal walls, originally not designed for wind loads, being constructed before the envelope of the building is complete.

Good protection should be maintained throughout the construction of the project, including the use of toe boards on scaffolding and polythene sheeting to plinths and cills to prevent staining from mortar splashes. Sheeting should be left in place until completion and further protection given to areas exposed to site traffic or following trades.

Unless the work is protected when proceeding there is always the risk that sudden frosts or showers will cause damage.

**N.B The appearance of finished masonry may be affected by failure to protect the work during construction.**

## USE BELOW DPC

All Forticrete Masonry Products are suitable for use below dpc and below ground level up to DS-3 conditions.

## USE BELOW GROUND IN SULPHATE BEARING CONDITIONS

Sulphates can occur naturally, mainly in London or Oxford clay or can be as a result of industrial pollution. Sulphates attack cement and can result in a breakdown or expansion of the concrete causing considerable damage. In order to determine which blocks can be used it is essential to establish the level of sulphates in the ground. This is carried out by soil mechanics within a site investigation.

Recommendations for the use of aggregate concrete blocks in sulphate bearing ground conditions are given in BRE Special Digest 1, as follows:

Where Design Sulphate class DS-2 or DS-3 conditions are encountered, confirmation should be sought from the site investigation findings that sulphate levels apply to the depth of soil against which the blocks will be placed.

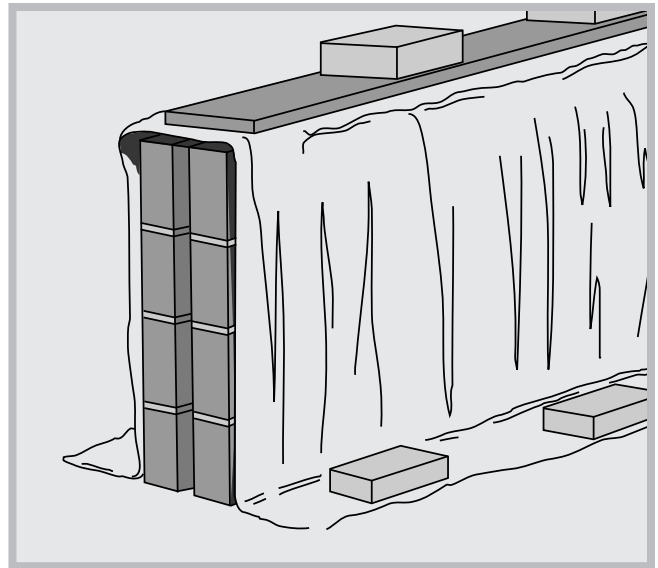
### DESIGN RECOMMENDATIONS:

#### For Design Sulphate Class DS-1 conditions:

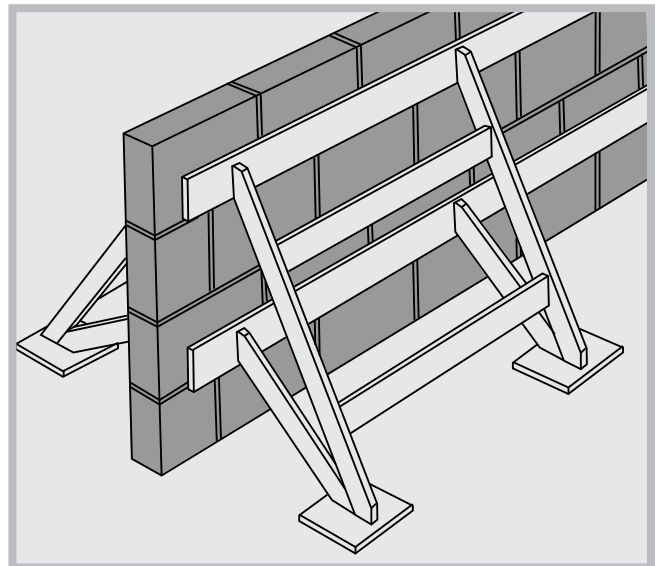
Blocks conforming to BS EN771-3:2003 and with BS 5628:Part 3 for use below ground will be satisfactory.

#### For Design Sulphate Class DS-2 and DS-3 conditions:

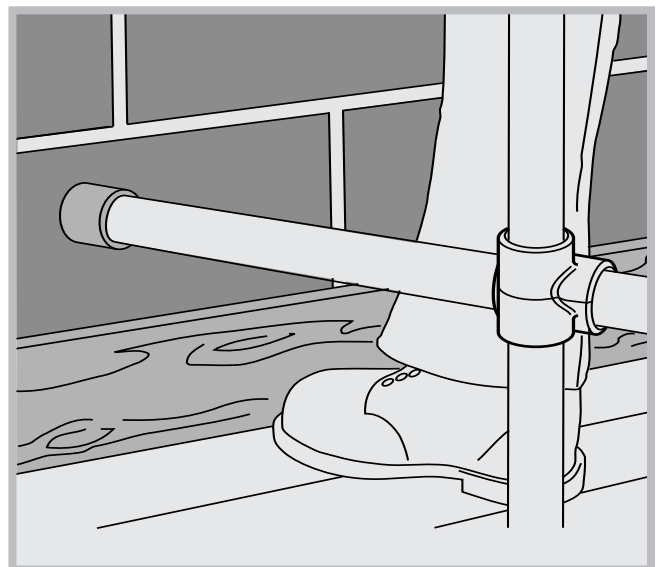
Blocks conforming to BS EN771-3:2003 and BS 5628 Part 3 for use below ground, with more than 20% of their cross-sectional area carbonated may be used. The carbonated area may be estimated by breaking a block and applying phenolphthalein as described in BRE information paper 6/81.



OVERNIGHT PROTECTION



TEMPORARY PROPPING OF HIGH OR LONG WALLS



TOE BOARDS AND SCAFFOLDING CAPS WILL PREVENT DAMAGE

## SETTING OUT

Selection of the correct grade of mortar is an important factor in tGuidance for the use and workmanship relating to masonry units is given in BS 5628 Part 3 and BS 8000: Part 3.

## BUILDING TOLERANCES

The standard of the completed facing masonry will largely depend on the skill of the blocklayer and the attention to adequate site supervision.

Care must be taken to ensure accuracy of initial setting out and it is important to maintain uniformity of joint thickness and alignment of vertical joints. As masonry units are larger in size than bricks there are fewer joints to take up discrepancies, however, the reliability of Forticrete dimensional tolerances minimises this factor. A table of permissible deviations in the finished construction is available within BS 8000 Part 3.

The most specified form of walling is stretcher bond and care should be taken to ensure accuracy in the initial setting out to half length bond. In cases where stack bonding is applied, attention should be given to the need for inclusion of bed joint reinforcement where appropriate.

When setting out masonry, care should be taken to reduce the cutting of masonry units to a minimum and to avoid irregular or broken bond, particularly at openings or in piers. Great care should be taken to ensure accuracy in the setting out of the first course of masonry units in order to avoid subsequent inaccuracies in the finished work.

**TABLE 3. DIMENSIONAL TOLERANCES CAST STONE & PRECAST MASONRY TO BS 1217**

Unit Length	Tolerance
0-600mm	±2mm
601-1000mm	±3mm
1001-2500mm	±4mm
2501-4000mm	±5mm
>4000mm	±6mm

## DIMENSIONAL TOLERANCES

Below are dimensional tolerances allowed by British Standards for blockwork.

**TABLE 4. BS EN771-3 TOLERANCES**

	Height	Thickness	Length
<b>Allowable tolerance in mm</b>	+3, -5	+3, -5	+3, -5

All Forticrete Masonry Products are manufactured to the required tolerances of BS EN 771-3: 2003, Class D2; Walling Stone to BS EN 771-5: 2003 and Cast Stone to BS EN 1217. However, in conjunction with the company's Quality Assurance registration, Forticrete has targeted an improvement on the British Standard tolerances, as shown in Table 5.

**TABLE 5. FORTICRETE TARGET TOLERANCES**

Product	Length	Thickness	Height
<b>Specification Masonry</b>			
Textured	+2,-2	+2,-2	+2,-2
Fairface	+2,-2	+2,-2	+2,-2
Twinbloc	+2,-2	+2,-2	+2,-2
Ribloc	+2,-2	+2,-2	+2,-2
Sparstone,	+2,-2	+2,-2	+2,-2
Novastone	+2,-2	+2,-2	+2,-2
<b>Polished Masonry</b>			
Florentine	+2,-2	+1,-3	+2,-2
Venezia	+2,-2	+1,-3	+2,-2
Medici	+2,-2	+1,-3	+2,-2
<b>Splitface Masonry</b>			
Splitface	+2,-2	N/A	+2,-2
Ribloc	+2,-2	N/A	+2,-2
Sparstone	+2,-2	N/A	+2,-2
<b>Glazed Masonry</b>			
Astra-Glaze-SW	To ASTM C90- Type 1		
<b>Walling Stone</b>			
Anstone	To BS EN 771-5: 2003		
Shearstone	To BS EN 771-5: 2003		
<b>Cast Stone</b>			
Dressings (see table 2)			
Regency Ashlar	+2,-2	+2,-2	+2,-2
<b>Standard Masonry</b>			
Arenabloc	+2,-2	+2,-2	+2,-2
Painting Quality	+2,-2	+2,-2	+2,-2
Commons	+3,-5	+3,-5	+3,-5