

# External finishes to insulated concrete formwork (ICF)

(April 2022)



## Question

What external finishes to insulated concrete formwork (ICF) are acceptable to NHBC?

## Considerations

- ICF systems can be used to form both internal and external walls, but when used externally they must be protected by a suitable weatherproofing envelope or alternate protection system.
- Key issues in this respect are details for preventing water penetration and air leakage, particularly around openings.
- When directly applied, the external finishes must also be compatible with the ICF substrate.

## Answer

Acceptable finishes may be identified in an ICF systems appropriate independent technical approvals authority assessment. However, where they are not, this Technical Guidance identifies acceptable approaches for solutions of brick/stone claddings, render systems, timber cladding and other curtain walling and cladding systems as follows (Note: in all relevant cases the provision of cavity barriers must be in accordance with NHBC Standards Technical Requirements; intent must be that cavities will be closed between the inner cavity face of the external leaf and outer cavity face of the ICF concrete core):

### Brick/stone claddings

Brick or dressed stone cladding should maintain a nominal 50mm clear drained cavity between the ICF system and brick/stone outer leaf.

### Render systems

Render systems applied directly onto the polystyrene face of an ICF system may be treated the same as an externally insulated render system applied direct to a solid masonry wall in accordance with PD 6697:2019 Clause 6.2.8.4.2.3 and Tables 13 and 14, which limits their use to sites with an exposure to wind driven rain of up to, and including, Zone 3 (Severe). However, the render manufacturer/supplier must have an appropriate independent technical approvals authority accepted by NHBC assessment for their product that shows it is appropriate for use on the proposed ICF substrate.

When a render system is proposed for application in a wind driven rain Zone 4 (Very severe) or where the render system has not been satisfactorily assessed for direct application on to an ICF substrate, consideration may be given to a render system applied onto a carrier board with a nominal 25mm drained and vented cavity between the board and ICF wall. In such cases the carrier board must be compatible with the render system and approved by the render manufacturer. Treated battens (and possibly counter battens) used to form the drained cavity must be of adequate depth to suit the length of fixings required to resist wind loads and suitably preservative treated in accordance with NHBC Standards Chapter 3.3.

Careful attention must be given to the detailing around penetrations and the interface between the render and window/door frames to ensure weathertightness and prevent air leakage. Also see NHBC Standards Chapter 6.11.

### Timber cladding

Timber for use as cladding over ICF systems must satisfy the requirements of NHBC Standards Chapter 3.3.

A nominal 50mm drained and vented cavity between the cladding and ICF wall/s is required. Treated battens (and possibly counter battens) should be used per for render systems with the additional consideration that fixings should limit the potential for movement due to moisture variation in the timber (i.e. be preferably screwed for hardwoods and modified nails for softwoods).

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Careful attention must similarly be given to detailing around penetrations, interface between the timber cladding and window/door frames and around corners to ensure weathertightness and prevent air leakage.

## Other curtain walling and cladding systems

These systems will be considered on a site-specific basis but must initially satisfy the requirements of NHBC Standards Chapter 6.9 and be identified by the system manufacturer/supplier as being suitable for use with an ICF system.