

FUNCTIONAL REQUIREMENTS

7.7 CLADDING

Workmanship

- i. All workmanship must be within the tolerances defined in Chapter 1 of this Manual.
- ii. All work is to be carried out by a technically competent person in a workmanlike manner.
- iii. Certification is required for any work completed by an approved installer.

Materials

- i. All materials should be handled and stored correctly in a manner that will not cause damage or deterioration of the product.
- ii. All materials, products and building systems shall be appropriate and suitable for their intended purpose.
- iii. The structure shall, unless specifically agreed otherwise with the Warranty provider, have a life of not less than 60 years. Individual components and assemblies that can be inspected and replaced and which are not integral to the structure may have a lesser durability, but not in any circumstances less than 15 years.

Design

- i. The design and specifications shall provide a clear indication of the design intent and demonstrate a satisfactory level of performance.
- ii. The cladding materials, design and construction must meet the relevant Building Regulations, British Standards, Eurocodes and other statutory requirements.
- iii. The design of primary framing members (e.g. mullions and transoms, backing wall framing sections, etc.) and the connections of these members/panels to the structure must be supported by structural calculations provided by a suitably qualified professional.

7.7.1 Render

Rendering should be in accordance with BS 5262 and workmanship in accordance with BS 8000. In particular, the following should be considered:

- Abutments between cement render and other cladding materials or components should be weather tight and allow for differential movement.
- Any joints in the wall where movement may occur should be continued through the rendering.
- Render should not bridge the Damp Proof Course (DPC) and be finished onto a durable render stop.
- External rendering should comply with BS 5262.
- Sand for rendering should be stored separately from other building and concreting sands.
- For bellcasts, a galvanised steel bead is acceptable.
- For other beads and stops, an epoxy or PVC-coated galvanised steel is acceptable.
- Render systems that include a cavity as a secondary defence system should also incorporate cavity barriers within the cavity to prevent the spread of fire through the cavity. The cavity barriers should not obstruct more than 50% of the cavity. The cavity must retain its ability to drain. The cavity barrier must activate and fully close the cavity when exposed to fire.
- Renders will be reinforced at corners and penetrations.

- Renders installed between pedestrian level and 6.0m above ground level will be designed to accommodate higher maintenance and impact loads in accordance with Table 2 of BS 8200.

7.7.1.1 Timber frame background

A drained and vented cavity should be provided behind render on timber frame construction. The mesh or metal lathing used should be approved by an independent authority and fixed to vertical battens at stud centres. The minimum size of the cavity should be 19mm when the mesh or metal lathing is backed by a water-resistant membrane, and 50mm when the mesh or metal lathing is unbacked. A DPC should be provided between unbacked render and timber battens.

Battens should be either 25mm x 38mm or 50mm x 50mm, preservative treated (BS 8417, or equivalent, hazard class 2) and fixed at spacings recommended in BS 5262. Fixings and preservatives should be compatible.

Battens should be fixed to each stud with annular ring nails of length at least twice the batten thickness plus the sheathing thickness. Nails should be hot dipped galvanised stainless steel or equally durable. Where cavity barriers are required, they should be correctly fitted without gaps, fill the cavity and be fixed with stainless steel staples or equally durable fixings. Maintain settlement joints below external frames and soffits.

Where cement render spans across an intermediate floor zone in timber frame construction, allow for differential movement due to timber shrinkage by incorporating a movement joint. Vertical movement joints should also be provided at maximum 5m horizontal centres.

7.7.1.2 Masonry background

Walls should be examined for excessive moisture content prior to rendering. This is particularly important where the masonry background has no upper limit on its soluble salts content, e.g. N designation clay bricks. Sulphate-resisting cement should be employed in the render and mortar used for parapets, chimneys, retaining walls and walls below DPC level with this background.

It is recommended that:

- The backs and exposed horizontal surfaces of parapets are not rendered.
- Throats or drips to copings of parapets and chimneys should project beyond the finished faces to throw water clear.
- Rendering to chimneys should only be carried out where brickwork contains little or no sulphates. Splatterdash treatment should be used.
- As before, horizontal DPC and Damp Proof Membranes (DPM) must not be bridged.
- Rendering is not used below DPC. However, where this is not practical, the render must still not be allowed to bridge the DPC. A bellcast must be formed in the render above the DPC.

7.7.1.3 Other construction detailing

Ensure that drips and throating to sills, coping, etc. project beyond the face of the finished render above the DPC.

Notwithstanding wind loadings, the larger the eaves overhang the better. This will provide protection to the top joint and prevent rain water percolating behind the render.

Angles, stop beads and jointing sections should be secured with drilled or shot-fired fixings, and not with gypsum plaster.

Check whether the rendering can be applied directly onto the wall, or whether any preparatory treatment is required in accordance with the manufacturer's instructions.

The surface should be checked for suction by dampening the wall with clean water.

7.7.1.4 Vertical and horizontal flatness

Rendering should have a maximum vertical and horizontal deviation from flatness of +/-10mm in 5m, and is measured in a similar way to straightness on plan and plumb of masonry.

7.7.2 Curtain walling

7.7.2.1 General

Curtain walling systems should have third-party certification confirming satisfactory assessment, and comply with the requirements of the CWCT

Standard for Systemised Building Envelopes, including the following sections:

- Part 1: Scope, terminology, testing and classification.
- Part 2: Loadings, fixings and movement.
- Part 3: Air, water and wind resistance.
- Part 4: Operable components, additional elements and means of access.
- Part 5: Thermal, moisture and acoustic performance.
- Part 6: Fire performance.
- Part 7: Robustness, durability, tolerances and workmanship.
- Part 8: Testing.

The CWCT Standard provides detailed guidance on performance and testing.

Dead and live loads should be transferred safely to the building structure without undue permanent deformation or deflection of any component.

Imposed loads should be calculated in accordance with BS EN 1991. Movement should be accommodated without any reduction in performance.

Fixings and supports should be designed to accommodate specified loads and take account of the product manufacturer's recommendations.

CE marking is to be provided for all curtain walling covered by EN 13830 in buildings constructed after July 2013, and will therefore include the following curtain wall types:

- Stick construction
- Unitised construction
- Double skin walls
- Structural sealant glazing
- Bolted glazing

Cavity barriers and fire stops should be provided in accordance with relevant Building Regulations.

7.7.2.2 Testing

The curtain wall system will have been tested and provided with a classification given in BS EN 13830.

Pull-out or destructive testing of anchors should be carried out in accordance with BS 5080 and the Construction Fixings Association Guidance Note, Procedure for Site Testing Construction Fixings.

Packing of brackets to achieve surface tolerance should be permitted only in accordance with the manufacturer's recommendations, and should not exceed the maximum depth stated in the Designer's calculations.

All packers for brackets supporting or restraining the curtain wall must be metal.

The completed curtain wall system should resist the passage of water to the inside of the building, allowing free drainage and not trapping water, and should have:

- External and internal air and water seals.
- Drained and ventilated glazing rebates.

CHAPTER 7: Superstructure

Sealants should be specified in accordance with BS 6213 or BS EN 15651, and the performance determined by BS EN 11600 and the manufacturer's recommendations.

The system should be designed to minimise the risk of surface and interstitial condensation by the use of thermal breaks and a continuous Vapour Control Layer. It should be designed to resist the passage of airborne and impact sound within the building, and particular attention should be given to flanking transmission at:

- The edges of separating floors.
- The outer edges of separating walls.
- The outer edges of partition walls.
- The junctions with roof constructions and parapets.

Where curtain wall members run uninterrupted past floor slabs and partition walls, consideration must be given to structure-borne sound (impact sound).

It should comply with BS 7671 Requirements for electrical installations for electrical continuity and earth bonding, and where it is required to form part of a lightning protection system it must be designed to comply with the requirements of BS 6651.

The risk of bimetallic corrosion should be avoided through the isolation of dissimilar metals.

The curtain wall system should not include materials liable to infestation attack by micro-organisms, fungi, insects or vermin.

7.7.2.3 Tolerances

Design should allow for the line, level, plumb and plane of the completed curtain wall to be within the acceptable tolerances of:

- Line: +/-2mm in any one storey height or structural bay width, and +/-5mm overall.
- Level: +/-2mm of horizontal in any one structural bay width, and +/-5mm overall.
- Plumb: +/-2mm of vertical in any one structural bay width, and +/-5mm overall.
- Plane: +/-2mm of the principle plane in any one storey height or structural bay width, and +/-5mm overall.

7.7.3 Insulated render systems

These are systems applied to the exterior walls of existing or new buildings, comprising of an insulant and a weather protective finish, of which there are three main types:

- Traditional renders and finishes.
- Thin coat renders and synthetic finishes.
- Pre-formed cladding materials.

All insulated render systems must have appropriate third-party certification.

7.7.4 Timber cladding

Timber and boards for exterior use should be of a durable species, with sapwood excluded, or preservative treated by pressure impregnation using preservatives suitable for use in hazard Class 3 in compliance with BS 8417: 2003, or

equivalent. Further guidance on the durability of timber is provided in Chapter 2 – Materials.

Where timber boarding or plywood spans across an intermediate floor zone in a timber frame construction, allow for differential movement caused through timber shrinkage by incorporating a movement joint.

Where cavity barriers are required, they should be correctly fitted without gaps, fill the cavity and be fixed with stainless steel staples or equally durable fixings.

Abutments between cladding and other weather-resisting elements should be neatly made, weather tight and allow for differential movement. Workmanship should comply with BS 8000: 5.

7.7.4.1 Timber boarding

Timber boarding should be at least 16mm thick and allowance for moisture movement in boarding should be made by making tongues, joints or overlaps at least 10% of the board width.

Timber boarding should be battened off the supporting background to provide a minimum 19mm cavity for draining and venting.

Battens should be a minimum 38mm wide, preservative treated and at maximum 600mm centres. A breather membrane should always be installed when horizontal battens are located against the sheathing. Battens on timber frame should be fixed to each stud (and not to the sheathing) with annular ring nails of length at

CHAPTER 7: Superstructure

least twice the batten thickness plus the sheathing thickness (or plain shank nails of length 2.5 times the batten thickness plus the sheathing thickness).

Boards should be fixed to battens by face or secret nailing with annular ring nails at least twice the board thickness or plain shank nails at least 2.5 times the board thickness.

Butt joints at board ends should occur at battens. Nails should be either hot dipped galvanised, stainless steel or equally durable. Aluminium nails should not be used with copper containing preservative treated timber and galvanised nails should not be used with Western Red Cedar.