



TECHNICAL MANUAL

VERSION 11

APPENDIX B

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Appendix B

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Functional Requirements

B.1 Coastal Locations

Coastal location definition

For the purposes of this Technical Manual, this means any building works on:

- Any site within 500m of the shoreline;
- Other sites up to 5km Inland from the shoreline;
- Sites located in 'tidal' estuarine areas where they are within 5km of the general UK coastal shoreline.

Limitations of Functional Requirements

1. These Functional Requirements do not and will not apply to create any policy liability for any remedial works carried out by the contractor or otherwise, nor to any materials used in those remedial works.
2. The guidance provided in this Section, is guidance that provides a suggested solution to meeting the Functional Requirements. If an alternative solution is selected, then this must still meet the Functional Requirements.

Workmanship

1. All workmanship must be within the tolerance requirements set out in this Technical Manual.
2. All work is to be carried out by a technically competent person in a workmanlike manner.
3. Concreting shall not take place during cold weather periods where the working temperature is below 2°C or where ground conditions are frozen.

Materials

1. Materials should be suitable and appropriately durable for the aggressive environment that the building is located.
2. All materials should be stored, installed and protected correctly in a manner that will not cause damage or deterioration of the product.
3. All materials, products and building systems shall be appropriately tested and approved for their intended purpose.
4. All load bearing structural elements providing support to the Home will have a service life of not less than 60 years, unless specifically agreed otherwise with us. All other parts of the Home will have a lesser durability and need planned maintenance, repair or replacement during that reduced period.
5. Whilst there is and can be no Policy responsibility and/or liability for any roof covering, window/ door or 'Decorative external cladding' (i.e. Cladding which is decorative only and the substrate wall provides the main weather proof barrier) to achieve a performance service life of 60 years or less, such elements shall be designed and constructed so they have an intended service life of not less than where stipulated within this Manual.
6. Timber should be adequately treated or finished to resist insect attacks and be suitable for the position used within the structure. All timber treatment should be in accordance with relevant British standards and Codes of Practice.

Design

1. For shoreline, sea front developments and developments within 500m of the shoreline: The design team must provide specifications and detailing to demonstrate the durability, suitability and weather tightness of the construction for its location, with particular attention to the externally exposed structural frame, window and door openings, balcony/roof abutments (particularly at balcony window openings), exposed lintels, claddings and roof fixings. The choice of materials and coatings must be appropriate for the aggressive environment.
2. For developments that are between 500m to 5km from the coastal shoreline; The design team must provide evidence from manufacturers that the materials used which are externally exposed are appropriate for use in the construction in this environment.
3. The design and specifications shall provide a clear indication of the design intent and demonstrate a satisfactory level of performance.
4. Damp proofing works should prevent any external moisture passing into the internal environment of the building.
5. Projects consisting of Non-standard/Modern methods of construction must be supported with evidence of valid independent third party product conformity certification before an offer of Warranty is provided. These types of constructions must be declared before commencement.

B.

Appendix B

B.1

Coastal Locations

Additional requirements where the development is within a coastal location

Coastal location definition

For the purposes of this Technical Manual, we are considering any building works on:

- The shoreline and sites within 500m of the shoreline.
- Other sites up to 5km inland from the shoreline.
- Sites located in 'tidal' estuarine areas where they are within 5km of the general UK coastal shoreline.

Shoreline means:

- The foreshore.
- Land adjacent to the foreshore including in particular any cliff, bank, barrier, dune beach or flat which is adjacent to the foreshore.

Developments within coastal locations

A coastal location is considered as having an aggressive environment particularly with regard to environmental corrosion conditions as well as other risks.

Key risks to construction in coastal locations

Coastal locations are at risk from a combination of one or more of the following:

Wind speed

Coastal regions particularly in the South West, West and North Western areas of the UK are at greater risk of exposure to higher wind speeds than inland areas. Gust wind speeds in combination with rain from offshore can create particular design issues for buildings sited in shoreline locations, particularly for cladding and roof coverings and their associated fixtures and fittings.

Aggressive environment

Materials and fixings need to be protected from the saline rich environment particular in wind driven rain. This can effect and reduce the durability (and life expectancy) of materials and finishes compared to those located inland and non coastal locations.

UV

Higher levels of UV are to be expected in coastal locations which have an impact on durability and longevity of finishes. This has the effect of reducing the durability of a material or finish and requiring maintenance at more frequent periods than would otherwise be expected inland.

Rain penetration

Walls, claddings, external openings including windows and doors, construction junctions and roofs exposed to the prevailing wind driven rain are vulnerable to rain penetration unless correctly designed and constructed for the conditions of the site and orientation of the elevations. The level of exposure to rain penetration in coastal locations should be determined by using the calculation method in BS 8104. This determines the wind blown rain category for a specific site.

It should be noted that not all coastal locations are classified in BS 8104 as severe or very severe. Nonetheless, a coastal and shoreline location is at much greater risk of exposure to higher wind speeds and driving rain than inland areas.

BS 8104 and the wind driven rain maps found in BR 262 must not be used as a means to solely identify exposure to all the environmental factors associated with a coastal location.

There are numerous publications providing good practice guidance on methods of preventing rain penetration to internal surfaces of buildings in very severe exposure locations e.g. BRE publication: Thermal insulation: avoiding risks.

Maintenance

It is the designer's responsibility to ensure that exposed components forming part of the structure or waterproof envelope must perform to meet the Functional Requirements within this Technical Manual.

Certain materials and particularly the finishes may, due to the environment, require an on-going planned maintenance requirement in order to keep a satisfactory finish. In these circumstances it will be the building owner's responsibility to ensure that regular maintenance of exposed components and finishes is undertaken to ensure they perform correctly. Maintenance plans will need to be in place during the lifetime of the building to ensure premature failure of coatings or components is avoided. Typically dark coloured finishes will fade much sooner.

Debris build up, e.g. wind-blown sand, must be managed, particularly to balconies. These can lead to leaks and overflowing of blocked outlets which in turn cause damage to other parts of the structure and concentrate the potential for water ingress. Bi fold and patio type doors are known for the seals, mechanisms and drainage holes being affected by wind-blown sand if not regularly maintained.

Material Specification

A high number of failures of the building envelope in coastal environments are directly related to the incorrect specification of materials i.e. using materials that are not suited to the environment leading to premature failure or corrosion. This can include:

- Lack of adequate preparation and protective finishes to external window frames whether they be timber or metal. The coatings may have a shorter durability due to the high UV or saline environment.
- Exposed metal surfaces not provided with the correct protection or grade.

A defect due to the incorrect specification for the environment will manifest itself sooner and to a greater extent in a coastal location than one not in such a location.

Masonry walls

The guidance in BS EN 771 for masonry walls of bricks and/or blocks incorporating damp-proof courses and flashings may be adopted.

Masonry walls of natural stone or cast stone blocks should be constructed in accordance with the relevant recommendations of BS EN 771 and to suit the degree of exposure.

External masonry walls in severe and very severe categories of exposure will benefit from having additional protective features to avoid excessive wetting of the masonry. Features such as deep overhanging eaves, verges and projecting sills should be incorporated into the design.

The following architectural detailing should be avoided:

- Flush sills.
- Inadequate or non existent overhangs at verges.
- Large expanses of glazing or impermeable cladding with no effective means to shed run off water, clear of the masonry below.
- Areas of rendering abutting masonry with no effective seal at the junction to prevent water penetration to the rear of the render.

Insulated concrete formwork (ICF) structures

ICF structures rely on a suitable external cladding to provide the waterproof envelope. The external cladding, if masonry, should be constructed as described earlier in this guide. Direct render applications in a very severe exposure location are not recommended unless the render system has a third party product approval for installation directly applied to the ICF in these conditions, and:

- A full design specification for the render system is provided by the render manufacturer and installed by the manufacturers approved contractors.
- Detailing of all the window, door and roof junctions is provided as part of the design specification by the render manufacturer.

Rendering in coastal locations

External rendering to external masonry walls should conform to the relevant recommendations of BS EN 13914-1:2005, and follow the guidance in the 'External Walls - Render' of this Technical Manual. However, the following points should be followed when constructing a render cladding finish in a coastal location.

Render angle beads should be appropriate for the environment when installed. Non corrosive render beading e.g. PVC or marine grade stainless steel should be specified. Any other products used must have a current third party product approval stating they are suitable for the environmental conditions proposed.

Fixings to render angle beads must be suitable to prevent corrosion occurring.

The durability of the rendering will also be dependent upon the type of background, the type of rendering, mix proportions and the method of application.

The 'background' or substrate which is to support the render must be suitable for bonding the render and be dry in condition. Materials of differing densities should be avoided in the substrate, if this latter point cannot be avoided, the render manufacturer must provide a specification for the render application over these areas to avoid future cracking.

The choice of render and render carrier boards (if used) must be correctly specified for the location proposed.

Wherever possible, whatever the conditions of exposure, advantage should be taken of architectural features which protect the rendering. Such protective features become more important as conditions become more severe, adequate overhangs and drips will reduce the risk of frost damage.

Whilst traditional renders are applied in several layers and normally are 20 to 25mm thick to provide a cladding in a severe location, a detailed specification of a factory made render system from the render manufacturer will be required to justify it is suitable for the proposed conditions and the overall thickness.

Polymer modified, ready to use factory produced renders contain high quality raw materials and a range of admixtures (notably water repellents) which reinforce the waterproofing properties of the renders. The thickness of these renders may vary depending upon the particular application and guidance should be sought from the render manufacturer.

Note: adding additional water repellent which is not within the render manufacturer's specification into the mix on the worksite should not be carried out, it may even be harmful to pre-prepared render systems as it can lead to faults in the finish.

For more guidance for the suitability of Render construction, please see the guidance in the 'External Wall - Render' section of this Technical Manual'.

External cladding systems including rain screens

The materials used within the construction should be capable of withstanding weathering, atmospheric pollution and potential chemical attack for the intended design life.

The system must have a current third party product approval confirming the specification is suitable for a coastal environment.

The supplier and designer should provide evidence to satisfy the following:

- Evidence of the minimum design life of the enclosure as a whole for the particular environment location (with maintenance considered to allow for components that may have a lesser design life but are expected to be periodically replaced).
- Confirmation of what routine maintenance, repair and replacement is likely during the design life and who will be responsible for this.
- Details to confirm that the potential for electrolytic corrosion will be avoided within the system.
- The surfaces of the cladding system should be capable of resisting the action of chemicals with which it is likely to come into contact during its design life.

Components should have a design life as stipulated in the Functional Requirements, see the service life table in 'Appendix C - Materials, Products, and Building Systems' for further information:

- Secondary framing and its fixings.
- Panels and their fixings.
- Thermal-insulating components and materials.
- Vapour barriers.
- Flashings.
- Window sub frames.
- Door frames.
- Fixed window frames.
- Opening windows.
- Doors.

- External shading devices.
- Window and door equipment.
- Glazing.
- Gaskets and compression seals.
- Sills and closure pieces.
- Inlet and extract grilles.

Components which are likely to have a shorter design life of only a few years and will need to be periodically replaced as part of a planned maintenance programme are:

- Gun and knife-applied sealants.
- Site-applied external finishes.

The cavity behind a rain screen is deemed to be a moist zone and materials selected must not corrode, deteriorate or affect the performance of the cavity barrier during its design life.

Corrosion protection

All external metals (included embedded fixings/wall ties etc, in external wall claddings) must have suitable corrosion protection for the intended environment. Further guidance can be found in 'Appendix C - Materials, Products, and Building Systems'.

Windows and doors

The choice of windows and doors must be supported by the manufacturer's certification to confirm they meet the design weather conditions and be classified and tested in accordance with the following weather performance standards:

- BS 6375-1 Weather tightness.
- Air permeability - BS EN 12207 - Classification & BS EN 1026 - Test method.
- Water resistance - BS EN 12208 - Classification & BS EN 1027 - Test method.
- Wind resistance - BS EN 12210 - Classification & BS EN 12211 - Test method.

Site testing for water penetration of the joints to windows and doors in accordance with the CWCT test methods is recommended to check the site workmanship of the building envelope as constructed. See CWCT Technical Note No. 41 for guidance on site hose testing.

In addition to the above, workmanship should follow the recommendations of BS 1186-2. The design and construction of factory assembled windows must meet BS 644. Non factory assembled units and 'bespoke' units are also expected to meet the same standard.

Window and door furniture and fittings must be resistant to the effects of the saline environment.

Where back ground ventilators (trickle vents) are installed, they must be correctly specified for the location and should be installed so as not cause potential damage to render finishes or restrict the ability to open the window/door.

Balconies

The following guidance is to be read in addition to the guidance found in the 'Roof Terraces and Balconies' section.

Balcony construction

The materials used in balcony construction must comply with the relevant Building Regulations.

An adequate step or raised threshold must be provided to avoid the risk of penetrating moisture created by the high wind driven rain. A minimum of 75mm upstand between the highest point of the balcony roof waterproof surface and the underside of the door sill should be provided, 150mm in all other situations.

In all locations:

- A flush fitting balcony floor finish abutting any door unit in the external wall of the dwelling must not occur as this could lead to a concentration of water against the window frame. A minimum gap of at least 10mm will be required which should be maintainable to ensure build up of any silt or other debris is avoided.
- Where a decorative walking surface deck is installed above; the balcony roof waterproof covering must be designed to fall away from any external doors opening into the building to prevent water pooling against the door units due to lack of fall.
- Drainage outlets must be easily accessible and maintainable even if decking/balcony floor finishes are applied.
- Fixings used in balcony decking or guarding must be appropriately specified to prevent adverse reaction with certain timbers.
- Regular maintenance of balcony floors will be required to avoid wind blown sand clogging up drainage outlets and balcony door seals and tracks.
- Balcony steelwork must be adequately protected against the potential for corrosion ('Appendix C - Materials, Products, and Building Systems').

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