

LABSS INFORMATION PAPER INFOP39 – Version 2 - November 2023
(Version 1 issued March 2023)

Changes to Technical Handbooks from June 2022
Guidance clause 2.6.4 External wall cladding

Information for verifiers

PURPOSE

The purpose of this information paper is to highlight the changes to guidance clause 2.6.4 External wall cladding, in support of Mandatory Standard 2.6, which came into force on 1 June 2022, including outlining background information to these changes as advised by the BSD.

This updated version includes a range of example scenarios.

RISKS ASSOCIATED WITH SMALL OPENINGS

Prior to the changes on 1 June 2022, guidance clause 2.6.4 within both the Domestic and Non-Domestic Handbooks noted that:

However combustible cladding need not be included in the calculation of unprotected area where:

- the combustible cladding is attached to the structure of the [building](#) and the [external wall](#) contains no openings other than the small openings described in clause 2.6.2b, and
- the wall behind the cladding (or the cladding itself) has the appropriate fire resistance duration from the inside.

The Technical Handbooks from 1 June 2022 have omitted this wording.

The BSD confirmed that as part of the recent amendments the risk of fire spread onto external wall cladding via small openings was reviewed (2.6.2). The BSD also confirmed that post Grenfell Tower and with the review to tighten fire safety around cladding it was considered that small openings, such as those permitted in 2.6.2b, posed a significant means of fire spread onto the cladding.

For reference, guidance clause 2.6.2b covers unprotected openings of an area of not more than 0.1m², which are at least 1.5m from any other unprotected area in the same wall, which are permitted in a wall between 500mm and 1m from the boundary.

Where an elevation contains combustible cladding, it is at risk of being ignited through a fire on another elevation of the building, this scenario, by default, is also considered by this information paper.

BACKGROUND INFORMATION

The intent of the Domestic and Non-Domestic Handbook guidance is for all combustible cladding (i.e. not A1/A2), more than 1 mm thick, to be included in the calculation of unprotected area (except for houses, as outlined in the last paragraph within clause 2.6.4 of the Domestic Technical Handbook).

Approved Document B in England and Wales (ADB) allows this calculation of unprotected area to be equal to half of the actual area of combustible cladding where small openings can be ignored as unprotected area and sprinklers can double the permissible unprotected area or half the boundary distance to minimum 1.0 m.

For situations where the simple method cannot be applied, methods in BRE 187 can be referred to. All the calculation methods in the Handbooks, ADB and BR 187 are based on a number of assumptions (which may or may not be the same for fire engineered approaches) including notably the following:

- The fire involves only one compartment which is fully involved.
- All unprotected areas have failed.
- An exposed surface on an adjacent building should not receive an incident heat flux greater than 12.6 kW/m² (this figure is based on historic extensive research on the ignition of wood by thermal radiation)
- The boundary is considered to be a symmetry plane and the adjacent building is assumed to be a mirror image of the burning building an equal distance from the boundary. The separation distance between buildings is therefore assumed to be twice the boundary distance.

While based on a domestic compartment fire temperature of 800°C, BRE research 'external fire spread: building separation and cladding' 2009 confirms:

Based on the experimental data from the earlier report⁶, it is conservative to represent the cladding as an unprotected area equal to the actual area of cladding. Further, if the unprotected area is equal to half the actual area of cladding the outcome is still conservative.

BR 187 'External fire spread building separation and boundary distances' suggests that halving the area of actual cladding area is an engineering judgement that considers the reduced duration of a cladding fire compared to the duration of a compartment fire and goes on to confirm the following in its calculation methods:

Combustible surface materials more than 1 mm thick are also considered to be unprotected areas. However, the fire duration of a burning area of surface material would usually be much less than a compartment, therefore the effective area of the surface material is reduced by a half for the purposes for boundary distance calculations.

CONSIDERATION FOR VERIFIERS

Taking cognisance of these changes, any cladding, which is more than 1m from a boundary and is constructed from products more than 1mm thick with a European Classification B, C, D or E, should be included in the calculation of unprotected area.

Note - Except for a house with European Classification B cladding and no storey over 11m, as outlined in the last paragraph within clause 2.6.4 of the Domestic Technical Handbook.

Following discussion with the BSD and taking cognisance of BRE report 'External fire spread: Building separation and cladding' 2009 and BRE 187 External fire spread Building separation and boundary distances, it is considered reasonable to apply a 50% rule to the full area of relevant combustible cladding on the elevation for the unprotected area calculation.

Clause 2.6.3 from the DTH & NDTH provides clarity on the plane of reference measurements as does BR 187 and confirms that a wall at 90 deg (or perpendicular) to the wall / plane of reference under consideration is generally excluded and each elevation is generally assessed separately for distance to boundary. This approach is considered conservative and therefore appropriate for most situations.

Should a particular layout or design be considered complex or high risk, for example where radiation intensity is expected to be non-standard due to a high fire load, an approach from first principles may be more appropriate, such as through the methodology outlined in BS 7974:2019 Application of fire safety engineering principles to the design of buildings. Further information on such an approach can be found in section 4 of BR 187.

Fixings – Guidance in the handbooks outline the meaning of an external wall cladding system and includes reference to 'fixings'. Verifiers should note that 'battens' are considered to be a more integral part of a cladding system and are not simply a fixing and on this basis should achieve at least the same reaction to fire performance as other elements of the cladding system.

Note - This information paper does not have the status of guidance issued under Section 4 of the Building (Scotland) Act 2003 and does not preclude consideration, by the verifier, of any other design approach.

Example	Openings	Fire reaction of cladding	Unprotected area calculation
1. Traditional masonry, cavity, masonry wall.	No openings	Cladding has a rating of A1, A2 or if a house with no storey over 11m, a rating of B	No distance to boundary calculation needed.
2. Traditional masonry, cavity, masonry wall.	No openings	Cladding has a rating of B, C, D, or E (other than a house with no storey over 11m having a B rating)	A distance to boundary calculation requires to be undertaken with the smallest enclosing rectangle including the entire wall.
3. Traditional masonry, cavity, masonry wall.	Small openings as defined by Guidance Clause 2.6.2 b) and c)	Cladding has a rating of A1, A2 or if a house with no storey over 11m, a rating of B	No distance to boundary calculation needed
4. Traditional masonry, cavity, masonry wall.	Small openings as defined by Guidance Clause 2.6.2 b) and c)	Cladding has a rating of B, C, D, or E (other than a house with no storey over 11m having a B rating)	A distance to boundary calculation requires to be undertaken with the smallest enclosing rectangle including the entire wall.
5. Traditional masonry, cavity, masonry wall.	Openings larger than small openings as defined by Guidance Clause 2.6.2 b) and c)	Cladding has a rating of A1, A2 or if a house with no storey over 11m, a rating of B	A distance to boundary calculation requires to be undertaken with the smallest enclosing rectangle including the openings only and not the entire wall.
6. Traditional masonry, cavity, masonry wall.	Openings larger than small openings as defined by Guidance Clause 2.6.2 b) and c)	Cladding has a rating of B, C, D, or E (other than a house with no storey over 11m having a B rating)	A distance to boundary calculation requires to be undertaken with the smallest enclosing rectangle including the entire wall.
7. Brick/block, cavity, timber frame wall.	No openings	Cladding has a rating of A1, A2 or if a house with no storey over 11m, a rating of B	No distance to boundary calculation needed.
8. Brick/block, cavity, Timber frame wall.	Small openings as defined by Guidance Clause 2.6.2 b) and c)	Cladding has a rating of A1, A2 or if a house with no storey over 11m, a rating of B	No distance to boundary calculation needed.
9. Brick/block, cavity, Timber frame wall.	Small openings as defined by Guidance Clause 2.6.2 b) and c)	Cladding has a rating of B, C, D, or E (other than a house with no storey over 11m having a B rating)	A distance to boundary calculation requires to be undertaken with the smallest enclosing rectangle including the entire wall.
10. Timber/steel frame wall with no specified fire resistance.	Small openings as defined by Guidance Clause 2.6.2 b) and c)	Cladding has a rating of A1, A2 or if a house with no storey over 11m, a rating of B	A distance to boundary calculation requires to be undertaken with the smallest enclosing rectangle including the entire wall.

			Note in this situation, the 50% reduction for the cladding is not applicable as the wall behind the cladding with no fire resistance must be considered as a 100% unprotected area. This principle would apply to a portal frame style building with infill panels which do not have the required fire performance.
11. Timber/steel frame wall with no specified fire resistance.	Small openings as defined by Guidance Clause 2.6.2 b) and c)	Cladding has a rating of B, C, D, or E	<p>A distance to boundary calculation requires to be undertaken with the smallest enclosing rectangle including the entire wall.</p> <p>Note in this situation, the 50% reduction for the cladding is not applicable as the wall behind the cladding with no fire resistance must be considered as a 100% unprotected area. This principle would apply to a portal frame style building with infill panels which do not have the required fire performance.</p>

Note 1 - All examples are more than 1m from a boundary.

Note 2 - Unless otherwise stated, the fire resistance of the wall and any element of structure that provides support to the wall is deemed to meet the relevant requirements within the relevant mandatory standard.

Note 3 - For these examples, cladding is assumed to cover the entire elevation, where this is not the case the enclosing rectangle position would be adjusted accordingly.

Note 4 - The 50% reduction factor applies to the area of cladding only and should not be applied to any opening area.

FURTHER INFORMATION:

Where the examples noted above require a distance to boundary calculation to be undertaken, the principle of the 50% approach relates to the unprotected area size, not a 50% reduction on the minimum distance to boundary requirement (50% of unprotected area gives a slightly further distance from boundary requirement)

For example, where the whole of an elevation has cladding of classification B (except for houses with no storey over 11m) C, D or E is proposed, and the wall has the required fire resistance, the 50% principle should be applied to the cladding area as noted below (based on Table 2.8 – B within the Non Domestic Handbook))

Size of wall adjacent to boundary – 3.5m high by 10m long = 35m², apply 50% = 17.5m². Relevant enclosing rectangle 6m high by 12m long = 72m². Unprotected percentage – 17.5/72 = 24%, therefore minimum distance would be approx. 2m.

Taking this example further and introducing 8m² of openings, the calculation would be as noted below:

Area of cladding (3.5m x 10m) - 8m² openings = 27m². Unprotected area (27m x 0.5) + 8m² = 21.5m². Relevant enclosing rectangle 6m high by 12m long = 72m². Unprotected percentage – 21.5/72 = 30%, therefore minimum distance would be 2.5m.

SIMPLE GEOMETRY METHOD

The simple geometry method may still be used to determine the minimum distance to boundary in line with the limitations noted within the guidance to that method. However, due to the lack of conservativeness of this approach, in particular for boundary distances up to 2m, where this method is used, the 50% reduction rule would not apply.