

# NHBC Standards 7.1 and BS 8579 Design of balconies and terraces with edge drainage

(Withdrawn – January 2024)

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## Applicable sites

Warranty and Building Control / Building Control Sites Registered with NHBC.

## Applicable regions

This Technical Guidance Note applies to England and Wales.

## Background

NHBC Standards Chapter 7.1 refers to BS 8579 Code of Practice as the reference document for technical compliance in the design of balconies and terraces. Issues have been raised by NHBC Technical Operations in relation to compliance with BS 8579 requirements for effective drainage of balconies designed with open edge drainage. This has highlighted a problem where drainage outlet slots located beneath the soffit edge will cause rainwater to flow straight down from one balcony onto another. When water is allowed to cascade from any balcony above onto another below it will cause excess wetting affecting balconies located one beneath another in the vertically 'stacked' installations typically designed for multi storey apartment buildings. This problem has affected NHBC Major Projects 'Risk Level-4' high-rise residential apartments and similar design issues have arisen on 'Risk Level-3' building schemes with low-rise multi storey apartments that have edge drained vertically stacked balconies.

## Scope and key technical issues

The scope of this Technical Guidance Note is to clarify on current requirements for effective edge drainage of balconies and terraces as detailed in BS 8579 and referred to in NHBC Standards Chapter 7.1 for compliance.

## Specific technical considerations

Technical guidance is currently provided in NHBC Standards Chapter 7.1 with reference to BS 8579 for drainage of balconies and terraces. This includes outlet provisions and specific design requirements for effective drainage. The design of balcony types can be based on any of the following generic arrangements:

- i. **inset fully recessed balcony deck** – with balustrade and edge fascia usually flush in-line with the external wall.
- ii. **Partially recessed balconies** – semi-projecting balcony deck, including staggered layouts running across the elevation.
- iii. **Fully projecting cantilever balcony and deck** with conventional balustrade/rail edges or decorative screens and matching edge fascia cladding around the perimeter structural edges.

Any balconies regularly exposed to water that freely runs down screens and edge fascia surfaces will usually develop accelerated weathering effects, surface discolouration and corrosion of fixings when this occurs repeatedly over time. The access for cleaning, maintenance and necessary repairs for multi-storey buildings always requires careful safety planning especially where it affects places of building entry/exit and continued safe use for residential occupants. This work involves additional operational costs and may be temporarily disruptive to building users. Therefore, it is important for designs to prevent staining and weathering effects on exterior surfaces wherever it is avoidable. This includes the provisions for edge drained balconies.

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The Standard **BS 8579 Guide to the Design of Balconies and Terraces** provides this key explanation for designers:

- edge drainage is a form of non-piped drainage and needs particular care in design. To prevent nuisance to persons and the risk of damage or staining of surfaces below, edge drainage should only be used where appropriate and be carefully designed.

For any elevated balcony it is necessary to consider the possible effects on people below and there are important design requirements in **BS 8579 Section 11.2** including the following:

*'Balconies should be fitted with a soffit, tray or impervious layer designed to prevent liquids or solids from falling onto the occupants of balconies below, or onto public areas (see BS 8579 12.2 and 15.2)'. In section 15.2 it provides a clear explanation on the design approaches for drainage:*

**15.2 The design of balconies should incorporate some form of controlled drainage to prevent water ingress into the building, unsightly detrimental staining of the building and/or nuisance to people or damage to landscaping below.** There are two methods of draining a balcony or a small terrace in a controlled way:

- edge drainage** – incident water is collected on a surface and directed to an edge where it is thrown clear of the building;
- or
- piped drainage** – incident water is collected on a surface and directed via gutters and/or outlets to pipes in the building drainage system.

**BS 8579 section 15.2** further explains that a soffit tray designed to function as the principal water collecting surface should be **set to falls** so that it is **self-cleansing**. This part of the standard also provides various illustrations to show drainage e.g. figure 8 shows designs for drainage related to the above listed options **(a)** and **(b)**. There is also one variation in this series of drawings which gives a single illustration showing a rainwater outlet draining down vertically from beneath a balcony soffit edge. This option is illustrated for a **single edge drained balcony** that is located without any other balconies, fascia's or vertical surfaces positioned directly below i.e. **one balcony with only the finished ground level surface situated directly beneath**.

NHBC Standards Chapter 7.1 recognises that balconies can be designed with a rainwater collecting surface that is edge drained where the outlets will throw water clear of any other vertical surfaces beneath. Also, as explained in **BS 8579 section 15.6**, there is clear design guidance and various drawing illustrations to show how rainwater should be directed outwards from edge drained balconies e.g.

## **BS 8579 section 15.6 Edge Draining of balconies and small terraces**

- **Figure 11** – Edge drainage characteristics for effective discharge
- **Figure 12** – Proximity of edge drainage to vertical surfaces
- **Figure 13** – Limitation of projection for edge drainage

**Note:** BS 8579 Figure 11 shows a projecting lip that extends at least 30mm beyond the line of the balcony fascia.

Both NHBC Standards and BS 8579 include technical explanations for the function of a '**drip edge**' which is a projecting profile along the base of any vertical, horizontal or sloping surface that prevents water from tracking down onto walls and fascia's or back into the soffit. This drip edge should be formed to project beyond a fascia or any vertical surface located directly below so that rainwater will discharge outwards to effectively prevent water from tracking back under a soffit or any other similar reveal. The drawings in Appendix 1 of this note show design options for effective drainage to reflect BS 8579 guidance.

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## Recommendations

The recommendations in this section refer to how the technical guidance should be used and interpreted by relevant groups in the areas of manufacturing, design/specification, consultancy and building inspection. Each area is listed in table 1 below. Also, the drawings provided in **Appendix 1** [figures 1–5] reflect those illustrated in BS 8579 sect. 15 showing design options for balcony edge drainage.

### Manufacturers / Suppliers

- Manufacturers of balcony systems that include any edge drainage designs should include an option for stacked balconies that complies with the requirements of BS 8579 to prevent nuisance to persons and avoid risk of damage or staining to any surfaces that will exist on other balconies located below.

### Designers / Specifiers

- Balcony designers/specifiers should be aware of the requirements in NHBC Standards Chapter 7.1 and as set out in BS 8579 Guide to the design of balconies and terraces. (See drainage examples as outlined in this note)
- Designs for rainwater drainage of balconies and terraces should take account of the exposure, prevailing wind direction and windborne rain. Particularly for high-rise buildings, the airflow patterns around buildings can affect wind driven rain. Designers of tall buildings should take into account exposure of balconies and terraces.

### NHBC Technical Operations – Technical Consultants

- NHBC Technical Consultants should read the technical information provided by Manufacturers of Balcony Systems and check project specific proposals, including the design drawings, to confirm that balcony design types incorporate systems for effective drainage in compliance with NHBC Standards Chapter 7.1 and BS 8579 Guide to the Design of Balconies and Terraces.

### NHBC Technical Operations – Building Control Surveyors

- NHBC building control surveyors should ensure compliance with the relevant parts of Building Regulation Document-H e.g. H3-Rainwater Drainage and confirm that balcony designs incorporate systems for effective drainage in compliance with NHBC Standards Chapter 7.1 and BS 8579.

### NHBC Inspection

- NHBC inspectors should confirm, by site inspection and advice from the project technical consultant, that construction of balconies includes the correct provisions for effective drainage.
- NHBC inspectors would benefit from training based on this technical guidance to better understand good practice, design and detailing that should be followed for edge drained balcony installations.

**Table 1:** Industry sectors and building practitioners with responsibility for awareness of drainage in design

## Transitional arrangements

Currently, many balcony system manufacturers and designers are already meeting requirements for providing edge drainage that throws water clear of the building and other vertical or balconies below. It is also possible to improve balconies with soffit drainage outlets by fitting a simple flashing deflector strip to ensure that rainwater is thrown clear of the balcony directly below. This remedial improvement involves neither disruption to the build programme nor excessive cost. Building schemes with stacked balcony arrangements normally have bespoke balcony designs to suit the many sizes and configurations required. Therefore, at the project design stage, it is always possible for manufacturers to meet the requirement for edge drainage to throw water clear of the building and the surfaces of each balcony beneath. So, from 1st-January-2024, all newly installed balconies will need to comply fully with BS 8579 requirements for edge drainage to ensure that designs will not deliberately drain water

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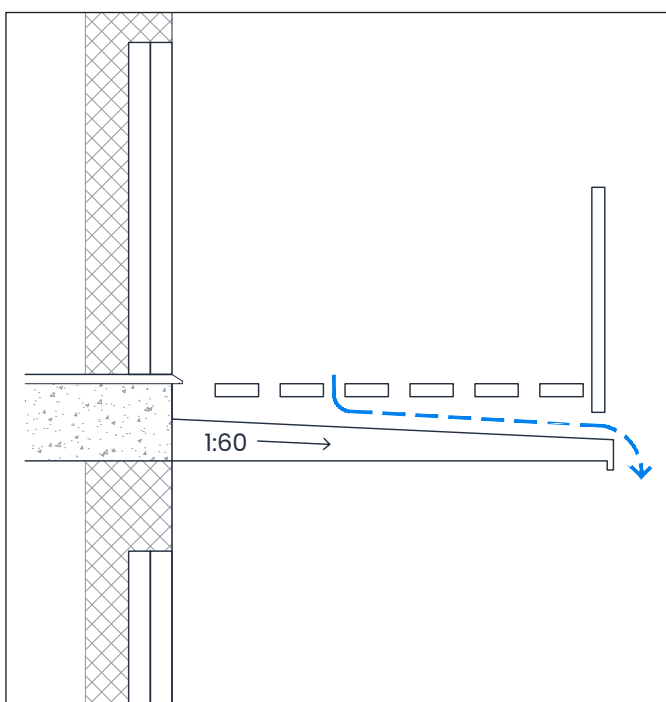
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onto any other balcony decks, edge rails or facias that are situated below. However, for building projects registered in the remaining quarter of 2023, it is allowed that balconies already designed with downward facing soffit outlets may be installed to retain this feature.

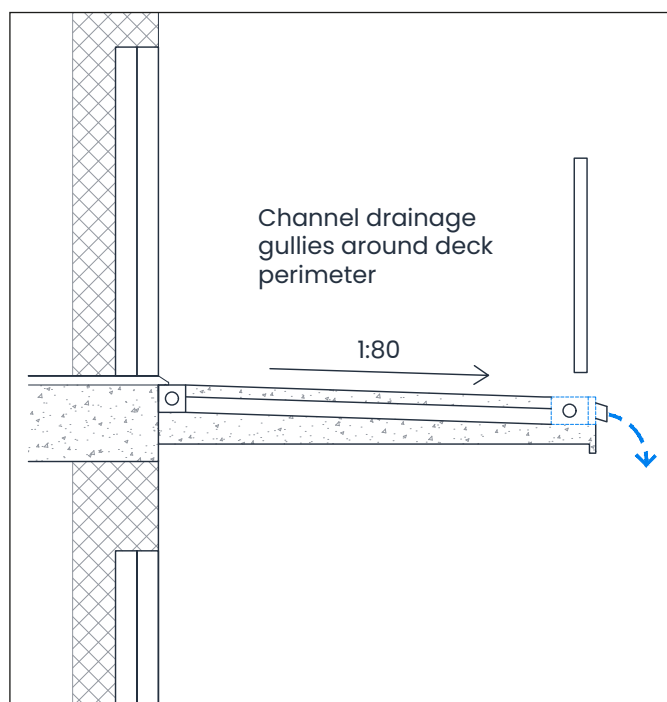
## References

- Building Regulation Document H3 Rainwater Drainage
- NHBC Standards Chapter 7.1
- BS 8579: 2020 Guide to the Design of Balconies and Terraces

## Appendix 1 - Design Options for Effective Drainage



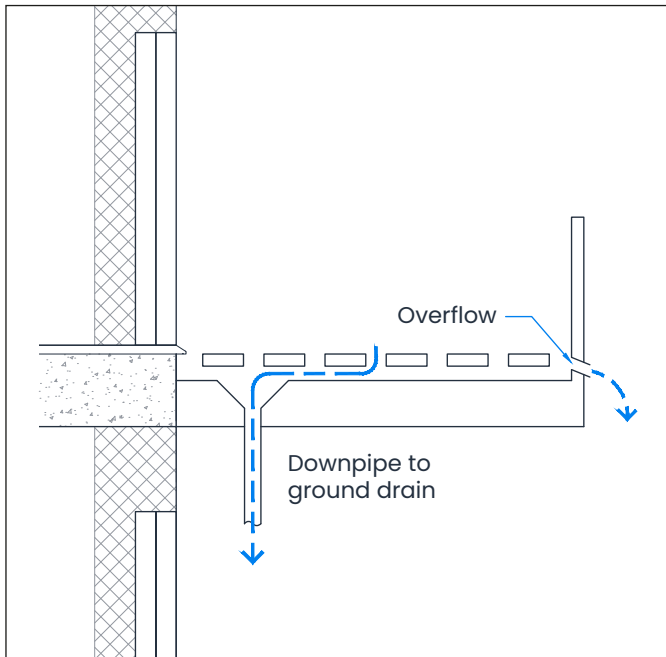
**Figure 1:** Edge drainage via soffit tray with projecting drip edge.



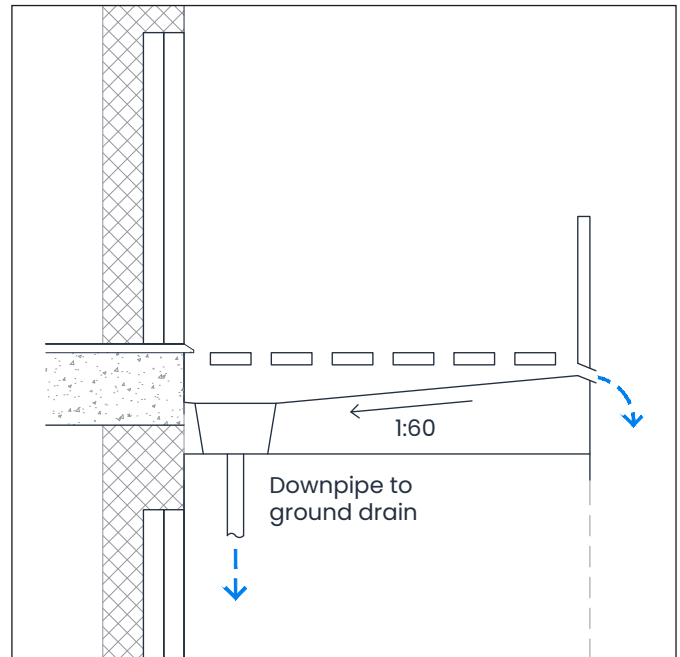
**Figure 2:** Precast deck built to falls with cast-in gullies and projecting drainage outlets with suitably sized openings.

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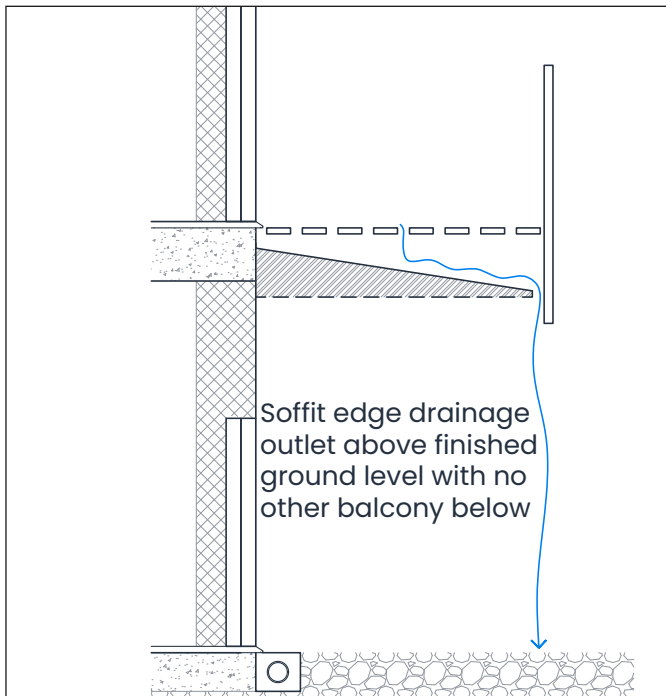
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**Figure 3:** Deck rainwater catchment surface nominally 'zero falls' (min 1:80) with main gully and downpipe plus overflow via a projecting edge piped outlet..



**Figure 4:** Deck rainwater catchment surface built with falls (min 1:60) into a main gully and downpipe with overflow provision via a projecting edge piped outlet.



**Figure 5:** Single cantilever balcony draining via soffit edge directly to ground level with no other balconies or edge fascias directly beneath.



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