



HIGHWAYS DEPARTMENT

**GUIDELINES ON
DESIGN OF RAILINGS**

Research & Development Division

**HQ/GN/12
March 2008**

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Guidelines on Design of Railings

The design of pedestrian railings should generally comply with BS 7818. To help frontline staff in actual design, it is considered advisable to outline the principal design requirements including safety provisions taking into account the local experience. With regard to precautions on prevention of children entrapment, certain provisions in BS EN 1176 are also relevant.

2. Deviations from these Guidelines for a particular design should be justified and approved by the relevant authorities. These Guidelines are also applicable to the design of non-standard railings proposed by private developers.

3. Principal Requirements

The following principal requirements should be considered in the design of railings:

- (a) To control pedestrians on footpath against jaywalking, climbing through or over and spilling onto carriageway;
- (b) To guide pedestrians on footpath in particular near pedestrian crossing points and roadside pick-up points;
- (c) To avoid creating a visibility hazard;
- (d) To allow roadside servicing such as pick-up and drop-off, serving requirement of frontage development;
- (e) To prevent illegal/unauthorized parking onto footpath;
- (f) To withstand envisaged loading;
- (g) To contain railing elements which should not become easily detached on impact when they are placed adjacent to a carriageway;
- (h) To minimize the risk of railing components, when struck, presenting a hazard to occupants of impacting vehicles or pedestrians. In particular, the design should alleviate two specific hazards:
 - detachment of horizontal rails, particularly at the end of guard rails, which could impale vehicles; and
 - detachment of infill bars or other components, which could become dangerous projectiles.

The provision of a top rail with rigidity substantially higher than other members of the railing panel shall be strictly avoided unless the railing has no chance of crash by a vehicle;

- (i) To be free from burrs and sharp edges; and
- (j) To avoid entrapment of children's heads/limbs in gaps. Accordingly, openings or gaps in the railings shall either:
 - do not allow passing of a 110mm diameter rigid sphere; or
 - allow passing of a 230mm diameter rigid sphere.

If whole or part of a railing panel essentially consists of vertical infill, the width of all gaps between infill bars shall not exceed 110mm.

4. Classification of Pedestrian Railings by Functional Objectives

Railings could be broadly classified into the following 3 categories in terms of site specific and functional objectives:

- (a) Cat A - railings to prevent pedestrians from trespassing vehicular traffic lanes, and inadvertently stepping onto adjacent steep downhill slopes or adjacent areas with substantial level difference;
- (b) Cat B - railings at junctions and pedestrian crossings, and individual short sections not longer than 20m; and
- (c) Cat C - railings solely for deterring unauthorized parking, loading and unloading.

Depending on the objectives of each category, safety provisions, including but not limited to the followings, should be considered in the design process.

5. Safety Provisions Specifically Applicable to Cat A

Cat A railings are used to guide pedestrians to walk along a footway until a crossing point or an access opening is reached. The design should discourage pedestrians from climbing through or over the railings. To that effect, all openings in the railing panels shall not allow passing of a 310mm diameter rigid sphere and there should be no foothold or projections above the bottom rail.

6. Safety Provisions Specifically Applicable to Cat B

Since unobstructed sightline at junctions, pedestrian crossings, and pedestrian access points between short railing sections is important, the design must not hinder the sightline of the road users.

Whilst pedestrians in general will have no incentive to climb through or over this category of railings near pedestrian crossings or openings, it is still necessary to limit the size of the openings to avoid easy penetration by children. To that effect, all openings in the railing panels shall not allow passing of a 310mm diameter rigid sphere.

7. Safety Provisions Specifically Applicable to Cat C

Cat C railings are usually made up of discrete sections and pedestrians are allowed to cross a road via the clear space between the sections. The design must therefore not hinder the sightline of the road users.

8. Design Loading of Railings

If the designer is not sure on the adequacy in strength of the designed railing, he/she should refer to the relevant provisions in BS 7818.

9. Enquiries

Enquiries on the uses of railings should be directed to the Road Safety and Standards Division of Transport Department, whereas enquiries on the design of railing details should be directed to the Research and Development Division of Highways Department.

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Note: Similar guidelines will also be promulgated by the Transport Department for internal use.