

Aide-Memoire

Handrails - Barriers.

Various parameters (dictated by the Codes) have to be determined.

- Overall height
- Balustrades (infill panels below the top rail)
- Loads/stiffness

These are dictated mostly by

- Building Code of Australia
- Walking Tracks Part 2: Infrastructure AS 2156.2
- Design for access & mobility AS 1428.2
- Bridge Design AS 5100
- Guide to Traffic Engineering Practice - Pedestrians Part 13 Austroads SAA HB69.13
- Guide to Traffic Engineering Practice - Bicycles Part 14 Austroads SAA HB69.14
- structural design actions Part 1 AS/NZS 1170.2

Building Code of Australia should apply to all buildings and appurtenances attached to these buildings. There are 3 heights ranges based on consequence of falling.

When low fall height	no rail required
When reasonably low	rail with climbable balustrading permitted
When high	rail with balustrading to prohibit climbing by small children

Loads depend on use. Commercial use or crush loading situations require larger loads on both the railing and the balustrading.

Walking Tracks should apply to all footpaths types including those of **Pedestrians Part 13 Austroads**. The aim of the code is to have all the attributes of the path consistent with the expectation of users. An innovation in that Code is to derive an *effective fall height* considering the consequences of falling. An increased fall height without railing is permissible if the ground is soft. Conversely railing is required at a lesser fall height if the impact is onto rocks or fast flowing water.

Additionally the risk is assigned to the capacity of the users in that persons using say a class 3 track are assumed to be more capable and don't need the level of protection required for the population as a whole. Facility owners do not need to produce the same quality of construction to give the same grade level of risk for the different users.

Design for Access and Mobility provides for facilities for the infirm, partly disabled and poorly sighted. These facilities are required for public buildings. Some councils and developers require this level of service for new footpath and boardwalk construction as well. This can mean a lower grab rail to steady one's self. This is mandatory on ramps. Even for level boardwalks, kerbs are required for wheelchair users and the poorly sighted even when the fall height is low. Low rails or kerbs are required to be of such a size and location to prevent entrapment of foot plates on wheel chairs. There may be a need to have additional rails for other users (e.g. bridge rail at 1100mm in addition to a grab rail at 870mm).

Bridge Design specifies railing heights of 1100 - 1200mm for normal use and 1300-1400 for cycle use. Balustrading complying with the most stringent of the systems from the Building Code is also required. Railings that can be impacted by vehicles are another consideration for footways attached to a trafficable bridge. Stiffness requirements in the bridge code are demanding.

Bicycles Part 14 Austroads specifies a rubbing rail offset 150mm from the standards (posts) to prevent pedal fouling. Partial barriers (one mid-height rail) are possible in low fall height situations.

Posts (Standards) are best located at 2000mm centres so the whole variety of handrailing, including domestic, can be used. For economy in certain circumstances (such as boardwalks) this is extended to 3000mm. Then the rail size and fixings are larger than normal.