5.2.8 Contact wire heights

5.2.8.1 General

The contact wire height of a line is measured at the support, at each dropper and at the lowest point of the contact wire.

In defining the contact wire height, the minimum swept envelope height of the vehicle is the most important factor in calculations.

5.2.8.2 Variation in contact wire height

If, due to local conditions, e.g. tunnels, a variation in height is necessary, this shall be achieved with as small a gradient as possible and it shall not exceed the values given as a function of speed in Table 8.

Changes of gradient shall be kept as small as possible and shall also be within the limits shown in Table 8.

For high speed lines, where speeds are greater than 250 km/hr, the contact wire height at the supports shall be designed to a constant height over the rail.

Table 8 — Contact wire gradients

Speed up to (km/hr)	**Maximum gradient** (per thousand)	**Maximum change** in gradient (per thousand)
10	60	30
30	40	20
60	20	10
100	6	3
120	4	2
160	3,3	1,7
200	2	1
250	1	0,5
> 250	0	0

5.2.8.3 Minimum contact wire height

The minimum height of the contact wire shall always be greater than the swept envelope of the limiting gauge of the vehicle, also taking into consideration the electrical clearance in air and the minimum working height of the pantograph, to avoid arcing between the grooved contact wire and the vehicles.

5.2.8.4 Minimum design contact wire height

The minimum design contact wire height is calculated by adding all movements of the contact wire downwards to the minimum height. Consideration shall be given to:

- the levelling tolerance of the track;