

VII. MAINTAINED HEADROOM

VII.1. Comparison of guidelines

Table 7-1 gives a list of the maintained headrooms and allowances as applied in a number of countries. The letters C, D, E, F and G refer to figures 2.4 and 2.5.

Table 7-1 : International comparison of Maintained Headroom, etc.

Country and name of guidelines or other source	Minimum Headroom above Carriageway (m)	Maintained Headroom C above Carriageway (m)	Additional allowance E as safety zone for signs, luminaries, fans etc. [m]	Allowance G for signs, luminaries, fans etc. [m]	Allowances D and F for later pavement and construction [m]
Austria RVS 9.232		4.70	n.s.	min. 0.20	n.s.
Denmark (practice)	n.s.	4.60	0.20	n.s.	n.s.
France CETU		4.50 (roads in international network) 4.75 (highest order roads)	0.10	n.s.	0.05 - 0.10
Germany RAS-Q1996/RABT 94	4.20	4.50	n.s.	n.s.	n.s.
Japan Road Structure Ordinance		4.50	n.s.	n.s.	n.s.
the Netherlands ROA	4.20	4.50	0.20	0.30	n.s.
Norway Design Guide Road Tunnels	n.s.	4.60	0.10	n.s.	0.10
Spain Instruction 3.1		5.00			
Sweden Tunnel 99		4.50	0.20	0.40	
Switzerland (rectangular tunnels)	n.s.	4.50	0.20	0.40	
Switzerland (oval tunnels)	n.s.	4.50			
UK TD27(DMRB 6.1.2)	5.10	5.35	0.25	0.40	n.s.
USA AASHTO	n.s.	4.90 (free ways) (other highways)	n.s.	n.s.	n.s.

n.s. = not specified

VII.2. Functional aspects

1. The **minimum headroom** above the carriageways is at least equal to the maximum (design) height of heavy good vehicles (HGV) that is allowed on the road increased with a space necessary to allow for rocking movements of the vehicles due to irregularities of the pavement and the vehicle. This extra space is equivalent to the difference between the width of traffic lanes and the width of cars. In the European Community the maximum **height of heavy good vehicles** is 4.00 m. If to this maximum height a **margin** of 0.20 m is added to absorb vertical movements of the HGV the **minimum height** required is 4.20 m.
2. Above this minimum an extra space is necessary for drivers of HGV's to feel comfortable. This comfort margin is equivalent with the object distance. The minimum height plus the comfort margin yields the maintained headroom. If for this comfort margin or object distance a value of 0.30 m is taken the **maintained headroom** is 4.50 m.
3. To prevent damage of equipment mounted above the carriageway by for instance loose tarpaulins an additional allowance often is applied.
4. Finally allowance has to be made for inaccuracies in the construction, bending of the roof and possible later paving overlays.

VII.3. Recommendations

- The maintained headroom is the sum of the height of a design HGV, assumed space necessary for the rocking movements of the HGV and a comfort distance.
- This height has to be increased with allowances to prevent damage of equipment and to allow inaccuracies in the construction.