



**DRAFT ENERGY CONSERVATION BUILDING
CODE
(ROOF INSULATION)**

4.3 Prescriptive Requirements

4.3.1 Roofs

Roofs shall comply with either the maximum assembly U-factor or the minimum insulation R-value in Table 4.3.1. R-value is for the insulation alone and does not include building materials or air films. The roof insulation shall not be located on a suspended ceiling with removable ceiling panels.

Table 4.3.1 Roof assembly U-factor and Insulation R-value Requirements*

Climate Zone	24-Hour use buildings Hospitals, Hotels, Call Centers etc.		Daytime use buildings Other Building Types	
	Maximum U-factor of the overall assembly (W/m ² -°C)	Minimum R-value of insulation alone (m ² -°C/W)	Maximum U-factor of the overall assembly (W/m ² -°C)	Minimum R-value of insulation alone (m ² -°C/W)
Composite	U-0.261	R-3.5	U-0.409	R-2.1
Hot and Dry	U-0.261	R-3.5	U-0.409	R-2.1
Warm and Humid	U-0.261	R-3.5	U-0.409	R-2.1
Moderate	U-0.409	R-2.1	U-0.409	R-2.1
Cold	U-0.261	R-3.5	U-0.409	R-2.1

*See Appendix 12.3 for typical complying roof constructions.

Appendix 12.3

12.3 Typical Roof Constructions

For calculating the overall U-factor of a typical roof construction, the U-factors from the typical wall construction type and effective U-factor for insulation shall be combined according to the following equation:

$$U_{TotalRoof} = \frac{1}{\frac{1}{U_{TypicalRoof}} + \frac{1}{U_{TypicalInsulation}}}$$

where

$U_{TotalRoof}$

Total U-factor of the roof with insulation

$U_{TypicalRoof}$

U-factor of the roof from Table 12.3-1

$U_{TypicalInsulation}$

U-factor of the effective insulation from Table 12.3-2.

Table 12.3-1 Defaults for Typical Roof Construction Types

Type	U-factor (W/m ² -°K)	U-factor (Btu/h-ft ² -°F)
RCC slab with mud phuska and clay tiles	2.797	0.493
RCC slab with foam concrete or perlite	0.069	0.012
Inverted clay/pots with mud phuska	2.244	0.396

Table 12.3-2 Defaults for Effective U-factor for Exterior Insulation Layers

Thickness	R-value	U-factor (W/m²-°K)	U-factor (Btu/h-ft²-°F)
15 mm (0.5")	0.70 (4)	1.420	0.250
20 mm (0.75")	1.06 (6)	0.946	0.167
25 mm (1.0")	1.41 (8)	0.710	0.125
40 mm (1.5")	2.11 (12)	0.568	0.100
50 mm (2.0")	2.82 (16)	0.406	0.071
65 mm (2.5")	3.52 (20)	0.284	0.050
75 mm (3.0")	3.70 (21)	0.270	0.048