

A2.2.3 Rigid Pipes (Concrete)

The load carrying capacity of a rigid pipe is its crushing strength multiplied by the pipe bedding factor. The design is complex and for a full description reference should be made to BS 9295 and BS EN 1295. However, using the assumptions of a 'wide trench' and 'incomplete projection' the required bedding factor is given by:

$$F_m \geq W_e F_{se} / W_t$$

Where:

F_m = required minimum bedding factor (refer to the Standard Drawings for options)

W_e = total external load

W_t = crushing strength of pipe (from BS 5911 / ASTM C76M or manufacturer)

F_{se} = minimum factor of safety (1.25 except for reinforced concrete pipes where it is 1.5)

Figure A2-2 shows the different bed and surround details and the corresponding K_x values. In summary these are:

Bedding Class	Bedding Factor (K_x) Provided
F	1.5
B	1.9
S	2.2
A	2.6 Unreinforced Concrete 3.4 Reinforced Concrete

Table A2-11: Bedding Classes for Rigid Pipes

The total external load is given by:

$$W_e = W'_c + W_{csu} + W_w$$

$W'_c = C_c \gamma B_c^2$ (where C_c is from Table NA.2 in BS EN 1295; γ = soil density (kN/m³); B_c = pipe outside diameter (m))

$W_{csu} = P_s B_c$ (where P_s is from Table A2-5 above)

W_w = equivalent weight of water in the pipe per metre length (kN/m), taken as 75% of the pipe full weight

The crushing strengths of standard Class 120 pipes to BS 5911 are: