Type of building		Typical range of weight per unit volume kg/m^3	Typical range of weight per unit area kg/m^2
Hangars and Grandstands			
Aeroplane hangars	without overhead cranes	4.7 to 8.5	47 to 85
	with overhead cranes	6.0 to 11.5	60 to 115
Grandstands		5.1 to 10.5	51 to 105
Multi-storey Buildings			
Low rise (2 to 6 storeys)		9.0 to 12.8	36 to 51
Medium rise (7 to 12 storeys)		11.5 to 17.5	46 to 70
Car parks		8.9 to 16.3	31 to 57
Industrial Plant Buildings			
Plant buildings	without steel flooring	7.8 to 10.9	70 to 98
	with flooring	9.3 to 12.4	84 to 112
Heavy plant buildings (e.g. BOS plants)		11.1 to 21.7	100 to 195

NOTES: Weights above include cold-formed and hot-rolled steelwork.
Weight comparisons per unit volume are more reliable indicators than weight per unit area, hence the weights per unit area are simply derived from those per unit volume using the typical heights.
Design studies can underestimate the weight of steel in the completed building by as much as 30%.

A.3 Case study references

It is not possible to reproduce in this document the depth of information that is required for a comprehensive number of case studies. This Section, therefore, identifies sources of case study material, with a brief description of the types of building considered. References are listed in Table A.2.

Table A.2 *Case study references*

Title		Reference
Offices - High Rise		
Flexibility on-site at Peterborough Court		Steel Construction Today, Vol. 4, No. 6
Beaufort House		Steel Construction Today, Vol. 4, No. 6
Grand buildings, Trafalgar Square, London, WC2	Using "Christmas tree" columns	Steel Construction Today, Vol. 4, No. 6
Lee House Development	Spanning a road	Steel Construction Today, Vol. 4, No. 6
Westminster & Chelsea Hospital		Steel Construction Today, Vol. 4, No. 6
Embankment Place	Suspended over a station	Steel Construction Today, Vol. 5, No. 5
Offices - Other		
British Gas Research Centre	Medium rise	New Steel Construction, Vol. 1, No. 2
Civil Aviation Authority Centre	Large span	New Steel Construction, Vol. 1, No. 6
The Cable & Wireless College, Coventry	Modern design & build development	New Steel Construction, Vol. 2, No. 3
Doctors' Surgery, Chipping Ongar	Glass facade, single storey on stilts	Framed in Steel, No. 2
Guardian Royal Exchange Complex	Range of buildings	Framed in Steel, No. 3
BMW Headquarters, Bracknell	Using the parallel beam approach	Framed in Steel, No. 5
Genesis Centre, Warrington	Low rise portal	Framed in Steel, No. 7
Cutlers Court, London	Medium rise	Framed in Steel, No. 10
Lloyds Chambers, London	Medium rise with atrium	Framed in Steel, No. 11
Bury Court House, London	High tech	Framed in Steel, No. 12
Embassy House, Birmingham	11 storey	Framed in Steel, No. 13
No. 1 Finsbury Avenue	Medium rise	Framed in Steel, No. 14
Cavern Walks, Liverpool	Retail & offices, atrium	Framed in Steel, No. 15
Billingsgate redevelopment	Medium rise	Framed in Steel, No. 16
London Bridge City	Medium rise with a galleria	Framed in Steel, No. 18