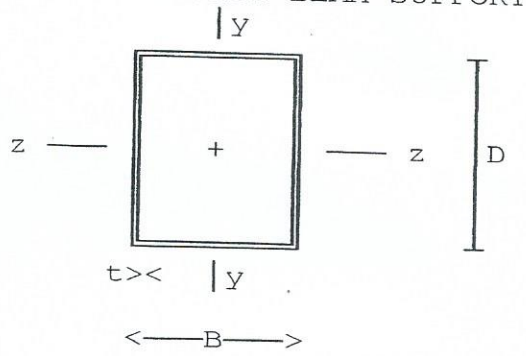
Location: LOUNGE BEAM SUPPORT POST



RHS Column

Calculations in accordance with DESIGN IN SHS to BS449 published by BSC Tubes Division.

Maximum design BM about axis zz	Mzz'=3.03 kNm
Maximum design SF in y direction	V'=0 kN
Design load (comp. positive)	F'=61 kN
Length of member	L=2.7 m
Design BM about yy axis	Myy'=3.03 kNm

Steel section properties

100 x 100 x 10 SHS - Hot finished.
Properties (cm): A=34.9 ry=3.64 Zx=92.4 Sx=116 Ix=462 J=761 C=133
Grade of steel 43

Slenderness ratios

Effective length about yy axis	lyy=2700 mm
Effective length about zz axis	lzz=2700 mm
Slenderness ratio about zz	l'rz=lzz/(rz*10)=2700/(3.64*10) =74.176
Slenderness ratio about yy	l'ry=lyy/(ry*10)=2700/(3.64*10) =74.176
Greatest slenderness ratio	l'r=l'ry=74.176

Axial compression

Calculated compressive stress	fc=F/(A*100)=61000/(34.9*100) =17.479 N/mm^2
Allowable compressive stress	pc=TABLE 17 for l'r=74.176, Grade=43 =117.15 N/mm^2

Since fc <= pc (17.479 N/mm^2 <=117.15 N/mm^2) compressive stress within that given in BS449 Table 17, therefore OK.

Bending and local flange instability

Structural hollow sections in the range produced by BSC Tubes Division are not subject to lateral torsional instability, and therefore the full allowable bending stress can be used irrespective of the length of the RHS member.
However, some RHS, where the compression flange width/thickness parameter (B/t)/K^0.5 exceeds 19.1 and 16.3 for grades 43 and 50 respectively may suffer local instability before reaching full elastic moment, defined by the extreme fibres reaching yield stress.
The following check is in accordance with 'DESIGN IN SHS'.

Allowable bending stress	pbc=180 N/mm^2