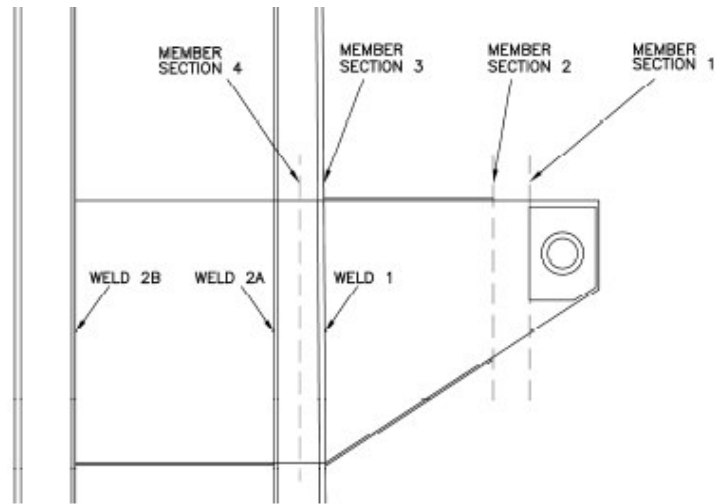


**Table 5.23 Summary of End Link Bracket Overstress Indices****Main Span End Link Bracket Overstresses**

Load Case	OI (Section 1)	OI (Section 2)	OI (Section 3)	OI (Section 4)	OI Max
Dead + BSALL + BSFLL ULS	1.03	1.20 (See Note below)	0.98	0.95	1.20
Dead + HA	> 1.0	2.47	> 1.0	> 1.0	2.47

Note (Main Member Main Span): The OI is based on BD 56 which uses the yield stress of material at 16mm thickness and a gamma m factor of 1.20. If the approach from BS 5400 Part3: 2000 is used, in which the yield stress is reduced to 232 N/mm<sup>2</sup> and gamma m reduced to 1.05, the OI reduces slightly to 1.15.

**Main Span End Link Bracket Weld Overstresses**

Load Case	OI (Weld 1)	OI (Weld 2A)	OI (Weld 2B)	OI Max
Dead + BSALL + BSFLL ULS	1.82	0	2.18	2.18
Dead + HA	3.2	0	3.84	3.84

### Side Span End Link Bracket Overstresses

Load Case	OI (Section 1)	OI (Section 2)	OI (Section 3)	OI (Section 4)	OI Max
Dead + BSALL + BSFLL ULS	1.0	0.98	0.64	< 1.0	1.0
Dead + HA	> 1.0	1.93	> 1.0	> 1.0	1.93

### Side Span End Link Bracket Weld Overstresses

Load Case	OI (Weld 1)	OI (Weld 2A)	OI (Weld 2B)	OI Max
Dead + BSALL + BSFLL ULS	1.40	0	1.50	1.50
Dead + HA	2.37	0	2.54	2.54

## 5.8

### Rockers at Side Towers

The vertical reaction from the stiffening truss at the side towers is transferred via rockers which are welded I sections with steel slab ends with spherical bearing surfaces at the top and bottom. The top and bottom are connected to the stiffening truss and the side tower respectively by 2 No screwed rods tensioned to 55 tons. The contact stresses were calculated using BS5400 Part 9.

**Table 5.24 Summary of Overstress Indices at Side Tower Rockers**

Link Element	Loadcase	Overstress Index
Main Members	Dead + BSALL	0.72
	Dead + HA	1.27
Welds	Dead + BSALL	0.32
	Dead + HA	0.57
Contact Stress	Dead + BSALL	0.67
	Dead + HA	1.19

## 5.9

### Lateral Bearings at Side Towers

The lateral thrust bearing at the side towers consists of a steel block which is welded to the top laterals. This bears against a convex-shaped surface of a welded bracket which is cast into the concrete side tower. The steel block is anchored to the side tower by 3 screwed rods 64.4mm in diameter to EN 15Q to BS 970. These bars pass through the tower, post-tensioned to 80 tons and clamped against the concrete face. The rods pass through mild steel tubes and it is assumed that the rods have not been grouted in.

The bearings are subject to longitudinal load and shear loads. The most critical longitudinal load is tension as a result of longitudinal wind from wind blowing at 50 degrees as stated in the University of Glasgow Wind Tunnel tests. It is noted that the maximum longitudinal wind load coefficient is 0.1327. The equivalent coefficient used for the original design was 0.1028 and it is therefore 29% higher.

The maximum ULS loads applied to the Side Towers are;

- Maximum longitudinal load (wind at 50 degrees) 4570 kN
- Associated transverse load 2170 kN