

Survey Results for LICK Ring Beam

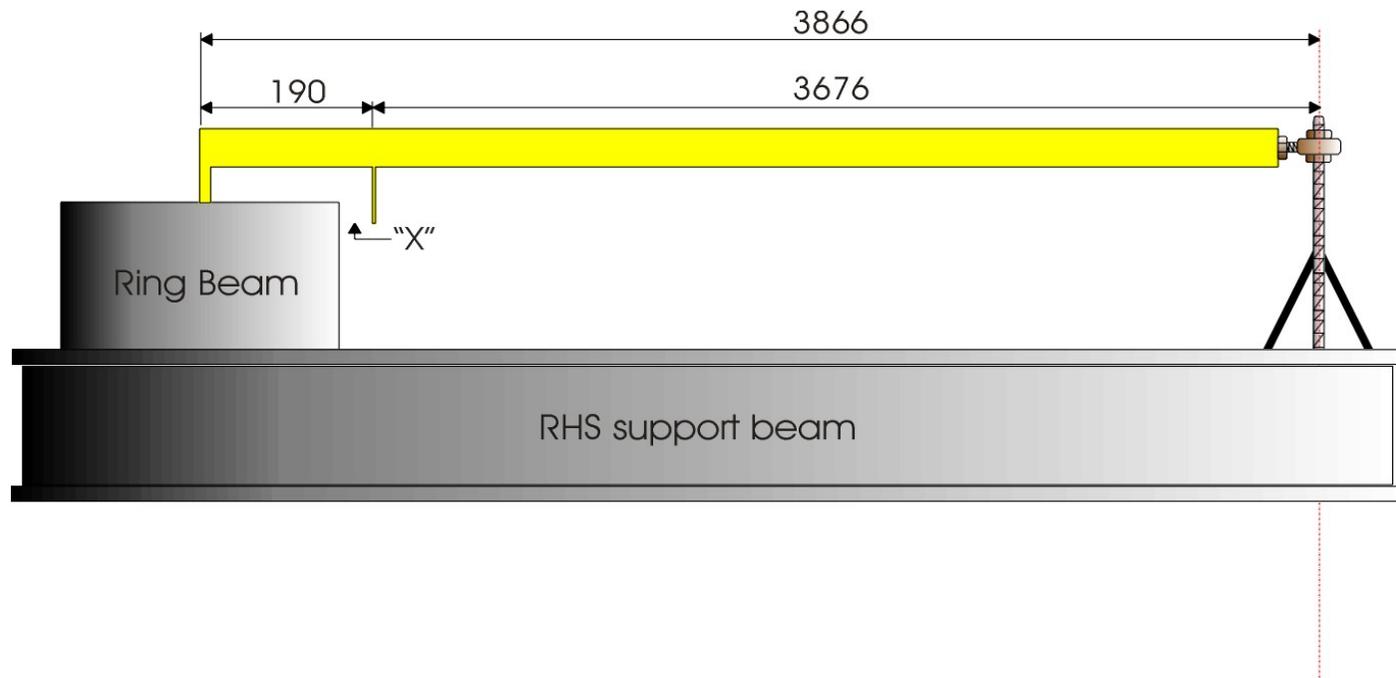
Conducted at Goulburn Railway workshops on the 24/11/2004

Circularity and Concentricity Measurements

Design Spec radius inner edge of ring beam = **3680**

Column	Distance Tramel tab to center of all thread (mm)	Distance Tramel tab to inside edge of ring beam (mm)	Distance to center of all thread (mm)	Difference design spec-measured
1	3676	6.5	3682.5	2.5
2	3676	5.4	3681.4	1.4
3	3676	6	3682	2
3A	3676	5.6	3681.6	1.6
4	3676	7	3683	3
5	3676	6.6	3682.6	2.6
6	3676	6.7	3682.7	2.7
7	3676	7.3	3683.3	3.3
7A	3676	7.7	3683.7	3.7
8	3676	6.9	3682.9	2.9
9	3676	8.4	3684.4	4.4
10	3676	9.9	3685.9	5.9
11	3676	9.5	3685.5	5.5
11A	3676	9.2	3685.2	5.2
12	3676	7.2	3683.2	3.2

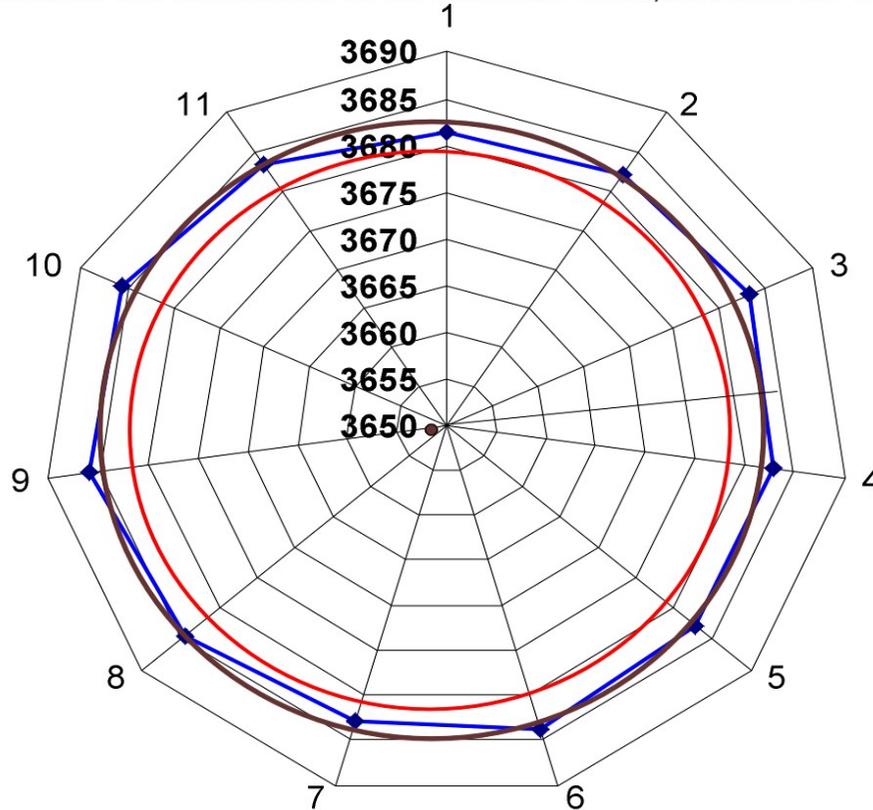
Ring Beam Concentricity Measurements



Measurements are in millimeters

Lick Ring Beam Circularity and Concentricity

Measurements conducted at UEA Goulburn NSW, Australia on Wednesday 24th of November 2004



Radius (mm)

- 1. 3682.5
- 2. 3681.4
- 3. 3682
- 4. 3683
- 5. 3682.6
- 6. 3682.7
- 7. 3683.3
- 8. 3682.9
- 9. 3684.4
- 10. 3685.9
- 11. 3685.5
- 12. 3683.2

Specification radius (red)= 3680

Radius theoretical (brown) circle=3683

Maximum deviation of theoretical circle (Brown) to erected ring is + 2mm and -1.5. Equating to max outside radius of 3685mm and minimum inside radius of 3681.5mm.

Center of true circle is -2mm in X and -1mm in Y away from the assumed and observed center.

NOTE: the assumed center is the middle of the all thread rod in the center of the ring beam support plinth.

The columns are numbered clockwise from the door.

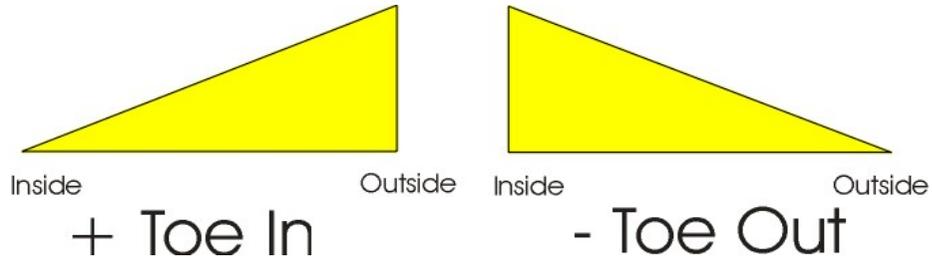


Initial Ring Beam Levels

Column	Observed Height	Reduced Height (mm)-relative to column 6	Geometric tolerance (6mm allowable)
1	1.0562	2.1	0.4
2	1.0558	2.5	1.9
3	1.0577	0.6	1.2
3A	1.0589	-0.6	0
4	1.0589	-0.6	0.1
5	1.0588	-0.5	0.5
6	1.0583	0	2.3
7	1.0606	-2.3	0.3
7A	1.0603	-2	2.9
8	1.0574	0.9	1.6
9	1.059	-0.7	1.4
10	1.0604	-2.1	1.8
11	1.0586	-0.3	0.9
11A	1.0577	0.6	1.4
12	1.0563	2	2

NOTE: The center of the ring beam at column 6 was adopted as the RL for the survey. The camber at column 6 was negligible and should be used as the calibration column should shimming be required an any of the bogies.

Camber Profiles



Observed Values

Column	Ring Beam			C-Channel	Toe in-Toe Out(mm)	Comments
	Inside(meters)	Center(meters)	Outside(meters)	Center		
1	1.1056	1.1052	1.1056	1.1059	0	Fixed
2	1.1054	1.1046	1.1047	1.1037	0.7	Fixed
3	1.1064	1.1066	1.1072	1.1077	-0.8	Join
3A	1.1073	1.1076	1.1085	1.1092	-1.2	Join
4	1.108	1.1078	1.1083	1.1089	-0.3	
5	1.1079	1.108	1.1084	1.1094	-0.5	
6	1.1076	1.1074	1.1075	1.1077	0.1	
7	1.1096	1.1097	1.1105	1.1109	-0.9	Join
7A	1.1095	1.1091	1.1098	1.11	-0.3	Join
8	1.107	1.1064	1.1063	1.106	0.7	
9	1.1079	1.108	1.1082	1.1092	-0.3	
10	1.1089	1.109	1.1099	1.1109	-1	
11	1.1069	1.1073	1.1082	1.1102	-1.3	Join
11A	1.1063	1.1061	1.1071	1.1084	-0.8	Join
12	1.1053	1.1051	1.1057	1.1061	-0.4	Door

Reduced Levels Relative to Column 6

Column	Ring Beam			C-Channel	Ring Beam			C-Channel
	Inside	Center	Outside	Center	Inside(mm)	Center(mm)	Outside(mm)	Center(mm)
1	1.1056	1.1052	1.1056	1.1059	1.8	2.2	1.8	1.5
2	1.1054	1.1046	1.1047	1.1037	2.0	2.8	2.7	3.7
3	1.1064	1.1066	1.1072	1.1077	1.0	0.8	0.2	-0.3
3A	1.1073	1.1076	1.1085	1.1092	0.1	-0.2	-1.1	-1.8
4	1.108	1.1078	1.1083	1.1089	-0.6	-0.4	-0.9	-1.5
5	1.1079	1.108	1.1084	1.1094	-0.5	-0.6	-1.0	-2.0
6	1.1076	1.1074	1.1075	1.1077	-0.2	0.0	-0.1	-0.3
7	1.1096	1.1097	1.1105	1.1109	-2.2	-2.3	-3.1	-3.5
7A	1.1095	1.1091	1.1098	1.11	-2.1	-1.7	-2.4	-2.6
8	1.107	1.1064	1.1063	1.106	0.4	1.0	1.1	1.4
9	1.1079	1.108	1.1082	1.1092	-0.5	-0.6	-0.8	-1.8
10	1.1089	1.109	1.1099	1.1109	-1.5	-1.6	-2.5	-3.5
11	1.1069	1.1073	1.1082	1.1102	0.5	0.1	-0.8	-2.8
11A	1.1063	1.1061	1.1071	1.1084	1.1	1.3	0.3	-1.0
12	1.1053	1.1051	1.1057	1.1061	2.1	2.3	1.7	1.3

Ring Beam Profiles

The profiles are valid on the ring beam atop each ring beam column

