

## Engineering and Load Test Results



**Hardy BBT Limited**  
CONSULTING ENGINEERING & PROFESSIONAL SERVICES



### Assembly Description

The test assembly is illustrated below. As shown the test sunroom consisted of three curved rafter sections joined together by acrylic panels. The assembly was supported at the top end by fastening the ledge angle into a timber 2 x 6 which was bolted to the concrete block wall and at the bottom end by an angle fastened to a timber 6 x 6 fixed to the asphalt pavement.

The load was applied by stacking bricks onto a plywood sheet which was supported on six 2 x 4's on the aluminium rafters. The weight of a representative sample of bricks and the plywood was measured before load application. The test assembly deflection was measured at five locations:

- three vertical movement monitors at the approximate centrepont of each horizontal span
- one vertical movement monitor at the curved end of the middle rafter
- one horizontal movement monitor at the curved end of the middle rafter

The test assembly construction and load application was performed by Skyview Industries Ltd personnel. The load and deflection monitoring was performed by Hardy BBT Limited personnel.



**Unloaded Test Assembly**



**Dial Gauge for Horizontal Deflection**



**Loaded Test Assembly**



**Loaded Test Assembly**

### Load Test Results

The test results are listed in [Table 1](#). Loading was continued until it was observed that deflection occurred under constant load. For this test assembly it was undesirable to apply load to destruction thus when creep deflection was observed, unloading was initiated. The test assembly and loading are illustrated above. For convenience the test results have been summarized below.

Subject: Results for the full-scale load test performed on the 10 ft. span.

#### Notes:

1. T5 architectural grade aluminium rafter 1½ inches depth
2. Nominal span: 10 feet
3. Test assembly constructed with three rafters 25 inches on centre

Load * psf	Equiv. Load ** per lineal foot per rafter	Deflection (inches)	
		Vertical	Horizontal
<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>11.42</b>	<b>23.8</b>	<b>0.71</b>	<b>0.16</b>
<b>18.8</b>	<b>39.2</b>	<b>1.34</b>	<b>0.26</b>
<b>28.6</b>	<b>59.6</b>	<b>2.22</b>	<b>0.40</b>
<b>36.0</b>	<b>76.0</b>	<b>3.01</b>	<b>0.49</b>
<b>40.9</b>	<b>85.2</b>	<b>3.58</b>	<b>0.55</b>
<b>45.8</b>	<b>95.5</b>	<b>4.22</b>	<b>0.60</b>
<b>50.7</b>	<b>105.7</b>	<b>5.08</b>	<b>0.64</b>

- Load calculated for a 50 sq. ft. area (i.e. that area supported by three rafters)

\*\* - Load on per beam basis as shown in sketch

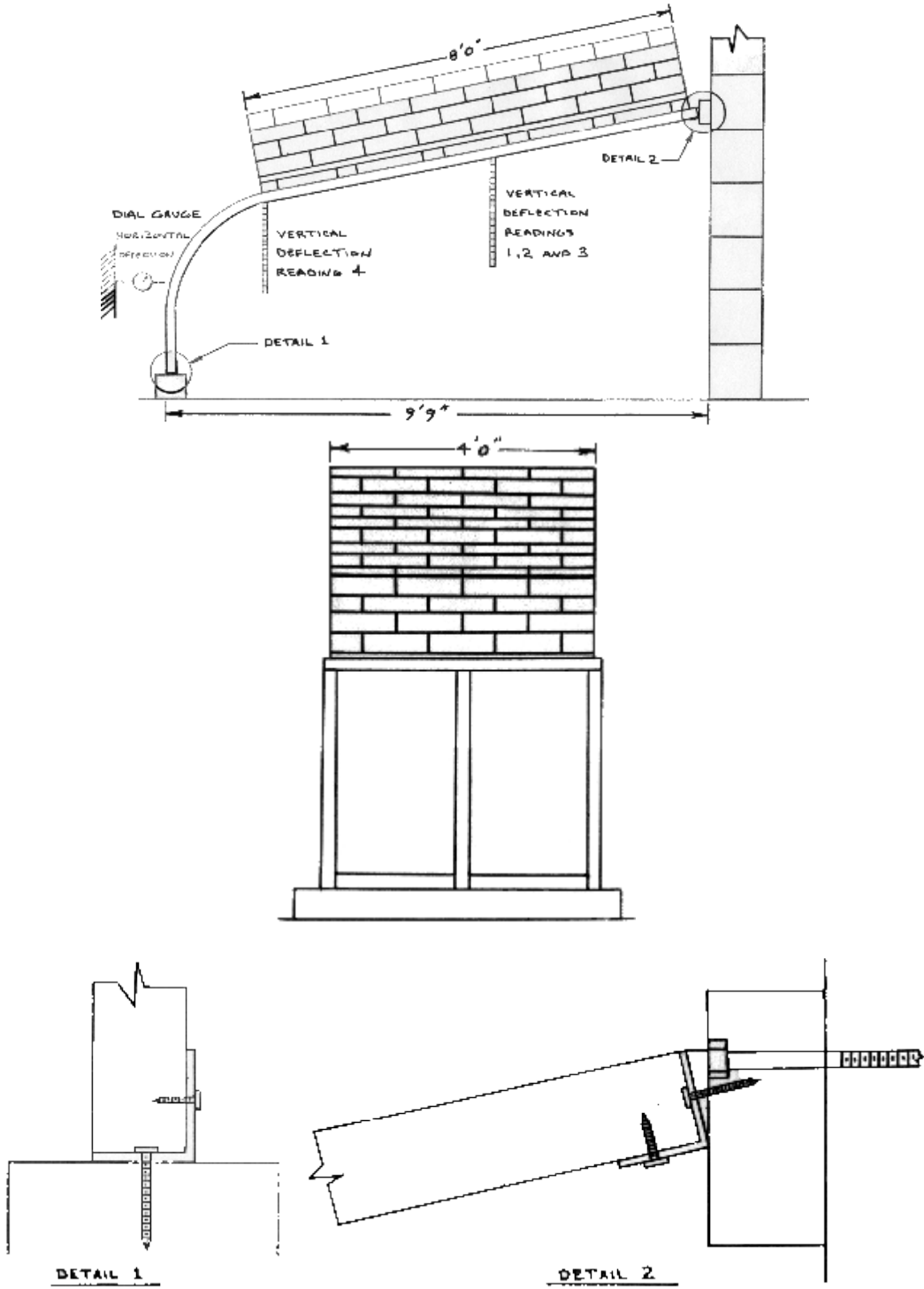


TABLE 1  
LOAD TEST DEFLECTION DATA

LOAD												
LBS/LINFT (1)	0.00	3.30	13.54	18.66	23.78	28.91	34.03	39.15	44.27	49.39	54.51	59.63

PSF-50SF (2)	0.00	1.59	6.50	8.96	11.42	13.87	16.33	18.79	21.25	23.71	26.16	28.62
PSF-32SF (3)	0.00	2.48	10.16	14.00	17.84	21.68	25.52	29.36	33.20	37.04	40.88	44.72
1 (4)	0.00	0.09	0.34	0.50	0.69	0.88	1.09	1.28	1.47	1.69	1.91	2.09
2 (4)	0.00	0.03	0.31	0.47	0.66	0.88	1.09	1.31	1.50	1.75	2.00	2.19
3 (4)	0.00	0.06	0.38	0.59	0.78	1.00	1.22	1.44	1.63	1.91	2.13	2.38
AVE (4)	0.00	0.06	0.34	0.52	0.71	0.92	1.14	1.34	1.53	1.78	2.01	2.22
4 (5)	0.00	0.00	0.13	0.16	0.19	0.25	0.31	0.38	0.44	1.00	0.56	0.63
DG (6)	0	0.018	0.086	0.12	0.155	0.19	0.227	0.264	0.299	0.333	0.365	0.396

LOAD (continued)												
LBS/LINFT (1)	64.75	69.87	74.99	77.55	80.11	85.23	90.35	95.47	100.59	105.71	105.71	0.00
PSF-50SF (2)	31.08	33.54	36.00	37.22	38.45	40.91	43.37	45.83	48.28	50.74	50.74	0.00
PSF-32SF (3)	48.56	52.40	56.24	58.16	60.08	63.92	67.76	71.60	75.44	79.28	79.28	0.00
1 (4)	2.34	2.63	2.88	3.00	3.09	3.41	3.66	3.97	4.31	4.69	4.81	0.53
2 (4)	2.47	2.72	3.00	3.16	3.31	3.56	3.91	4.22	4.56	4.94	5.03	0.69
3 (4)	2.63	2.68	3.16	3.31	3.47	3.78	4.09	4.47	4.88	5.28	5.41	0.88
AVE (4)	2.48	2.74	3.01	3.16	3.29	3.58	3.89	4.22	4.58	4.97	5.08	0.70
4 (5)	0.69	0.75	0.88	0.91	0.91	1.03	1.09	1.19	1.31	1.44	1.47	0.09
DG (6)	0.431	0.462	0.493	0.503	0.518	0.549	0.572	0.602	0.623	0.645	0.644	NA

1. Load calculated as lbs/lineal ft/beam
2. Load calculated as lbs/ft<sup>2</sup> on a 50 ft<sup>2</sup> area
3. Load measured as lbs/ft on a 32 ft<sup>2</sup> area
4. Midspan certical deflection gauges
5. Vertical deflection gauge at curve
6. Horizontal deflection gauge at curve