31 July 2019

Mr. John Theron
Bris Aluminium
PO Box 862,
SPRINGWOOD
QLD 4127

Re: JCE A275 - LETTER OF ADVICE – INTERNAL PARTITION FRAMING REVIEW

Dear John,

This letter details advice regarding the existing Bris Aluminium internal partition framing products in relation to the Australian Standard for Seismic movement, AS1170.4 – 2007. The following products have been reviewed in this letter:

- Supreme 64 System
- Supreme 76 System
- Supreme 92 System
- Econo 64 System
- Econo 76 System
- Supreme 64 Settings Slimline System
- Light Duty Shopfront

The following industry standards have been referenced in this letter:

- AS 1170.0 - 2002
- AS 1170.4 – 2007

REVIEW OF PRODUCTS

The capacity of the aluminium framing systems has been summarised in Tables 1 & 2 when considering the following Seismic Parameters;

- Importance Level, 4
- Probability factor, kp (ULS), 1.8
- Probability factor, kp (SLS), 0.25
- **Hazard factor, Z, 0.22 (i.e. Cunderdin Area)**
- Spectral Shape Factor, Ch (0), 1.3
- Height amplification factor, ax, 3
- Component importance factor, Ic, 1
- Component amplification factor, ac, 1
- Component ductility factor, Rc, 1

Table 1: Summary of Results for Hazard Factor 0.22

Framing Type	Critical Panel Area			Weight	Horizontal EQ Force	Horizontal EQ Force
	Width (mm)	Height (mm)	Thickness (mm)	(kN)	Feq ULS (kN)	Feq SLS (kN)
Supreme 64 System	900	3600	12	0.95	1.47	0.20
Supreme 76 System	900	3700	12	0.98	1.51	0.21
Supreme 92 System	900	3700	12	0.98	1.51	0.21
Econo 64 System	900	4000	12	1.06	1.64	0.23
Econo 76 System	900	4000	12	1.06	1.64	0.23
Supreme 64 Settings	900	3700	12	0.98	1.51	0.21
Light Duty Shopfront Components	900	3700	12	0.98	1.51	0.21

SAMPLE

J.C. Engineers Pty. Ltd.
Level 13, 50 Cavill Ave
SURFERS PARADISE
QLD 4217

Table 2: Summary of Results for Hazard Factor 0.22 Continued

Modulus of Elasticity	Bending Strength	Bending Section Capacity	Actual Bending Moment	Allowable Deflection	Actual Deflection	Utilization	
E (MPa)	Alloy 6063 T6 (MPa)	kNm	Meq* (kNm)	L/250 (mm)	(mm)	Bending	Deflection
70000	160	2.208	2.386	14.4	5.0	1.1	0.34
70000	160	2.624	2.590	14.8	4.2	1.0	0.28
70000	160	3.296	2.590	14.8	3.0	0.8	0.20
70000	160	2.016	3.273	16	8.8	1.6	0.55
70000	160	2.416	3.273	16	6.6	1.4	0.41
70000	160	0.698	2.590	14.8	35.5	3.7	2.40
70000	160	2.237	2.590	14.8	5.5	1.2	0.37

Under the above Seismic parameters, all systems besides the Supreme 76 and Supreme 92 framing systems are inadequate.

Reducing the Hazard factor only produces the results shown in Tables 3 & 4;

- Importance Level, 4
- Probability factor, kp (ULS), 1.8
- Probability factor, kp (SLS), 0.25
- **Hazard factor, Z, 0.08 (i.e. Sydney Area)**
- Spectral Shape Factor, Ch (0), 1.3
- Height amplification factor, ax, 3
- Component importance factor, Ic, 1
- Component amplification factor, ac, 1
- Component ductility factor, Rc, 1

Table 3: Summary of Results for Hazard Factor 0.08

Framing Type	Critical Panel Area			Weight	Horizontal EQ Force	Horizontal EQ Force
	Width (mm)	Height (mm)	Thickness (mm)	(kN)	Feq ULS (kN)	Feq SLS (kN)
Supreme 64 System	900	3600	12	0.95	0.54	0.07
Supreme 76 System	900	3700	12	0.98	0.55	0.08
Supreme 92 System	900	3700	12	0.98	0.55	0.08
Econo 64 System	900	4000	12	1.06	0.60	0.08
Econo 76 System	900	4000	12	1.06	0.60	0.08
Supreme 64 Settings	900	3700	12	0.98	0.55	0.08
Light Duty Shopfront Components	900	3700	12	0.98	0.55	0.08

Table 4: Summary of Results for Hazard Factor 0.08 Continued

Modulus of Elasticity	Bending Strength	Bending Section Capacity	Actual Bending Moment	Allowable Deflection	Actual Deflection	Utilization	
E (MPa)	Alloy 6063 T6 (MPa)	kNm	Meq* (kNm)	L/250 (mm)	(mm)	Bending	Deflection
70000	160	2.208	0.868	14.4	1.8	0.4	0.13
70000	160	2.624	0.942	14.8	1.5	0.4	0.10
70000	160	3.296	0.942	14.8	1.1	0.3	0.07
70000	160	2.016	1.190	16	3.2	0.6	0.20
70000	160	2.416	1.190	16	2.4	0.5	0.15
70000	160	0.698	0.942	14.8	12.9	1.4	0.87
70000	160	2.237	0.942	14.8	2.0	0.4	0.14

Under the above Seismic Parameters, Supreme 64 Settings Slimline System is inadequate, and all other systems are adequate.

SAMPLE

J.C. Engineers Pty. Ltd.
Level 13, 50 Cavill Ave
SURFERS PARADISE
QLD 4217

Reducing the Hazard factor and Importance Level only produces the results shown in Tables 5 & 6;

- Importance Level, 3
- Probability factor, kp (ULS), 1.8
- Probability factor, kp (SLS), 0.25
- **Hazard factor, Z, 0.05 (i.e. Brisbane Area)**
- Spectral Shape Factor, Ch (0), 1.3
- Height amplification factor, ax, 3
- Component importance factor, Ic, 1
- Component amplification factor, ac, 1
- Component ductility factor, Rc, 1

Table 5: Summary of Results for Hazard Factor 0.05

Framing Type	Critical Panel Area			Weight	Horizontal EQ Force	Horizontal EQ Force
	Width (mm)	Height (mm)	Thickness (mm)	(kN)	Feq ULS (kN)	Feq SLS (kN)
Supreme 64 System	900	3600	12	0.95	0.24	0.05
Supreme 76 System	900	3700	12	0.98	0.25	0.05
Supreme 92 System	900	3700	12	0.98	0.25	0.05
Econo 64 System	900	4000	12	1.06	0.27	0.05
Econo 76 System	900	4000	12	1.06	0.27	0.05
Supreme 64 Settings	900	3700	12	0.98	0.25	0.05
Light Duty Shopfront Components	900	3700	12	0.98	0.25	0.05

Table 6: Summary of Results for Hazard Factor 0.05 Continued

Modulus of Elasticity	Bending Strength	Bending Section Capacity	Actual Bending Moment	Allowable Deflection	Actual Deflection	Utilization	
E (MPa)	Alloy 6063 T6 (MPa)	kNm	Meq* (kNm)	L/250 (mm)	(mm)	Bending	Deflection
70000	160	2.208	0.392	14.4	1.2	0.2	0.08
70000	160	2.624	0.425	14.8	1.0	0.2	0.07
70000	160	3.296	0.425	14.8	0.7	0.1	0.05
70000	160	2.016	0.537	16	2.0	0.3	0.13
70000	160	2.416	0.537	16	1.5	0.2	0.10
70000	160	0.698	0.425	14.8	8.3	0.6	0.56
70000	160	2.237	0.425	14.8	1.3	0.2	0.09

Under the above Seismic Parameters all systems are adequate.

Figure 1 provides a breakdown of the Hazard Factors by locality for Australian regions, from AS 1170.4-2007.

SAMPLE

J.C. Engineers Pty. Ltd.
Level 13, 50 Cavill Ave
SURFERS PARADISE
QLD 4217

TABLE 3.2

HAZARD FACTOR (Z) FOR SPECIFIC AUSTRALIAN LOCATIONS

Location	Z	Location	Z	Location	Z
Adelaide	0.10	Geraldton	0.09	Port Augusta	0.11
Albany	0.08	Gladstone	0.09	Port Lincoln	0.10
Albury/Wodonga	0.09	Gold Coast	0.05	Port Hedland	0.12
Alice Springs	0.08	Gosford	0.09	Port Macquarie	0.06
Ballarat	0.08	Grafton	0.05	Port Pirie	0.10
Bathurst	0.08	Gippsland	0.10	Robe	0.10
Bendigo	0.09	Goulburn	0.09	Rockhampton	0.08
Brisbane	0.05	Hobart	0.03	Shepparton	0.09
Broome	0.12	Karratha	0.12	Sydney	0.08
Bundaberg	0.11	Katoomba	0.09	Tamworth	0.07
Burnie	0.07	Latrobe Valley	0.10	Taree	0.08
Cairns	0.06	Launceston	0.04	Tennant Creek	0.13
Camden	0.09	Lismore	0.05	Toowoomba	0.06
Canberra	0.08	Lorne	0.10	Townsville	0.07
Carnarvon	0.09	Mackay	0.07	Tweed Heads	0.05
Coffs Harbour	0.05	Maitland	0.10	Uluru	0.08
Cooma	0.08	Melbourne	0.08	Wagga Wagga	0.09
Dampier	0.12	Mittagong	0.09	Wangaratta	0.09
Darwin	0.09	Morisset	0.10	Whyalla	0.09
Derby	0.09	Newcastle	0.11	Wollongong	0.09
Dubbo	0.08	Noosa	0.08	Woomera	0.08
Esperance	0.09	Orange	0.08	Wyndham	0.09
Geelong	0.10	Perth	0.09	Wyong	0.10
Meckering region				**Islands**	
Ballidu	0.15	Meckering	0.20	Christmas Island	0.15
Corrigin	0.14	Northam	0.14	Cocos Islands	0.08
Cunderdin	0.22	Wongan Hills	0.15	Heard Island	0.10
Dowerin	0.20	Wickepin	0.15	Lord Howe Island	0.06
Goomalling	0.16	York	0.14	Macquarie Island	0.60
Kellerberrin	0.14			Norfolk Island	0.08

Figure 1: Hazard Factors by Locality for Australian Regions, from AS 1170.4-2007

J.C. Engineers Pty. Ltd.
Level 13, 50 Cavill Ave
SURFERS PARADISE
QLD 4217

CONCLUSIONS

Based on the abovementioned details, the following conclusions are made:

1) Supreme 76 and Supreme 92 systems are adequate for Importance Level 4 structures and a maximum hazard factor of 0.22.
2) All framing except for Supreme 64 Settings Slimline System are adequate for Importance Level 4 and a maximum hazard factor of 0.08.
3) All framing systems are adequate for Importance Level 3 and a maximum hazard factor of 0.05.
4) All framings have been reviewed under an SLS1 Seismic event only.
5) This review does not take into account the glass wall or doors to be secured by the framing systems.
6) Figure … provides a breakdown of the Hazard Factors by locality for Australian Regions from AS 1170.4-2007.

Therefore, the proposed works detailed in this letter are in accordance with AS 1170.0 – 2002 and AS 1170.4 – 2007, once the application guidelines detailed in this letter are followed.

The attached Form 15 provides engineering certification for the application of the systems detailed in this letter.

We would like to thank you for your business and wish you the best for your future works. Please do not hesitate to contact me to discuss, if needed.

Kind regards,

Brendan Nielsen
RPEQ 18317
Director
(07) 5635 4367

BEng (Civil/Structural), MEng (Management), GCert (Advanced Engineering), APEC Engineer, CPEng, IntPE (Aus), RPEQ (Civil & Management), NER, RPEng, PEng, MIEAust, MAIPM
On behalf of J.C. Engineers Pty.Ltd.

SAMPLE