

Petima Pty Ltd  
Factory 52, 37-39 East Street  
Daylesford VIC 3460

## **RE: SPA and Tridek SIPs Structural Assessment Report**

### **Appendix D SPA SIPs (EPS/XPS/PUR core)**

### **Floor Loading Capacity and Span Tables For CLASS 2 TO 9 BUILDINGS For Non-Cyclonic Areas**

#### **Assessment Items**

The items have been checked are as listed below:

- Floor framing and flooring: SPA SIPs with LVL timber splines of 2.0kPa LIVE LOAD
- Floor framing and flooring: SPA SIPs with LVL timber splines of 3.0kPa LIVE LOAD

Note:

The maximum allowed concentrated load of 2.7KN is allowed over an area of 0.025 m<sup>2</sup> for calculation of punching or crushing.

Additional floor boards would be required due to the concentrated loads punching effect. It must be further assessed by the project engineer according to the project loading.

SIPs like all timber products will creep under the action of long term loads. It is recommended that long term deflections should be estimated using a factor of 4 TO 7 times the initial deflections for SIPs Panels. Timber joining spline deflections should use a factor of 2 for long term creep effect.

This appendix must be used in conjunction with the SPA and Tridek SIPs Structural Assessment Report, prepared by Metroeng Pty Ltd, dated 9 June 2021

Yours Faithfully,



Huade He  
B.Eng, MIEAust, CPEng, NER, APEC Engineer, IntPE(Aus), RBP, RPEQ, BSP TAS  
Principal Civil/Structural Engineer  
For and on behalf of Metroeng Pty. Ltd.

## Building Code of Australia Compliance

The Loading Capacity and Span Tables complies with the following provisions of Building Regulations 2018 (Victoria):

- NCC 2019 Building Code of Australia - Volume One
  - BP1.1(a)
  - BP1.1(b)(i) to (iv)
  - BP1.2(a) to (d)
  - B1.0(a) to (b)
  - B1.1(a) to (b)
  - B1.2(a) to (b)
  - B1.2(c) (i) to (ii)
  - B1.4(f)
  - B1.0(a) to (b)
- Relevant Australian Standards
  - AS/NZS 1170.0-2002 Structural design actions Part 0: General principles
  - AS/NZS 1170.1-2002 Structural design actions Part 1: Permanent, imposed and other actions
  - AS/NZS 1170.2-2011 Structural design actions Part 2: Wind for non-cyclonic areas only
  - AS1170.4-2007 Structural design action Part 4: Earthquake actions in Australia
  - AS4055-2012 Wind loads for housing for non-cyclonic areas only
  - AS1720.1-2010 Timber structures Part 1: Design methods
  - AS1684.2-2010 Residential timber-framed construction Part 2: Non-Cyclonic Areas
  - AS1684.4-2010 Residential timber-framed construction Part 4: Simplified Non-Cyclonic Areas

**Floor framing Span Table: SPA SIPs with LVL timber splines of 2.0kPa LIVE LOAD  
 Hyspan LVL or equivalent**

| Panel Thickness | EPS/XPS CORE                             |                 |                                      |                 |  |                 |                                      |                 | SINGLE LVL spline |
|-----------------|--|-----------------|--------------------------------------|-----------------|--|-----------------|--------------------------------------|-----------------|-------------------|
|                 | CARPET/TIMBER FLOORING                   |                 |                                      |                 | TILE FLOORING                            |                 |                                      |                 |                   |
|                 | Maximum span (m) for Span/300 deflection |                 | Maximum span (m) for 12mm deflection |                 | Maximum span (m) for Span/300 deflection |                 | Maximum span (m) for 12mm deflection |                 |                   |
|                 | single span                              | continuous span | single span                          | continuous span | single span                              | continuous span | single span                          | continuous span |                   |
| 115             | 2.5                                      | 2.6             | 2.6                                  | 2.6             | 2.1                                      | 2.2             | 2.2                                  | 2.2             | 90 x 45           |
| 145             | 2.8                                      | 3.3             | 2.9                                  | 3.3             | 2.3                                      | 2.9             | 2.6                                  | 2.9             | 120 x 45          |
| 165             | 3.5                                      | 3.8             | 3.5                                  | 3.8             | 2.9                                      | 3.3             | 3.1                                  | 3.3             | 140 x 45          |
| 215             | 4.4                                      | 5.1             | 4.2                                  | 5.0             | 3.7                                      | 4.4             | 3.7                                  | 4.4             | 190 x 45          |
| 265             | 5.3                                      | 6.3             | 4.8                                  | 5.8             | 4.5                                      | 5.4             | 4.3                                  | 5.1             | 240 x 45          |
| 315             | 6.2                                      | 7.6             | 5.4                                  | 6.5             | 5.3                                      | 6.5             | 4.8                                  | 5.8             | 290 x 45          |

| Panel Thickness | PUR CORE                                 |                 |                                      |                 |  |                 |                                      |                 | SINGLE LVL spline |
|-----------------|--|-----------------|--------------------------------------|-----------------|--|-----------------|--------------------------------------|-----------------|-------------------|
|                 | CARPET/TIMBER FLOORING                   |                 |                                      |                 | TILE FLOORING                            |                 |                                      |                 |                   |
|                 | Maximum span (m) for Span/300 deflection |                 | Maximum span (m) for 12mm deflection |                 | Maximum span (m) for Span/300 deflection |                 | Maximum span (m) for 12mm deflection |                 |                   |
|                 | single span                              | continuous span | single span                          | continuous span | single span                              | continuous span | single span                          | continuous span |                   |
| 115             | 2.2                                      | 2.6             | 2.5                                  | 2.6             | 1.8                                      | 2.4             | 2.2                                  | 2.6             | 90 x 45           |
| 145             | 2.8                                      | 3.3             | 2.9                                  | 3.3             | 2.3                                      | 2.9             | 2.6                                  | 3.1             | 120 x 45          |
| 165             | 3.1                                      | 3.8             | 3.2                                  | 3.8             | 2.6                                      | 3.3             | 2.8                                  | 3.3             | 140 x 45          |
| 215             | 4.0                                      | 5.1             | 3.9                                  | 4.6             | 3.3                                      | 4.2             | 3.4                                  | 4.0             | 190 x 45          |
| 265             | 4.8                                      | 6.1             | 4.5                                  | 5.4             | 4.0                                      | 5.1             | 3.9                                  | 4.7             | 240 x 45          |
| 315             | 5.7                                      | 7.2             | 5.1                                  | 6.1             | 4.7                                      | 6.0             | 4.4                                  | 5.3             | 290 x 45          |

**Floor framing Span Table: SPA SIPs with 2/LVL timber splines of 2.0kPa LIVE LOAD  
 Hyspan LVL or equivalent**

|                    |   | EPS/XPS CORE           |   |                    |   |                    |   |                    |            | 2/LVL<br>splines |
|--------------------|---|------------------------|---|--------------------|---|--------------------|---|--------------------|------------|------------------|
|                    |   | CARPET/TIMBER FLOORING |   |                    |   | TILE FLOORING      |   |                    |            |                  |
| Panel<br>Thickness | Maximum span<br>(m)<br>for Span/300<br>deflection |                        | Maximum span<br>(m)<br>for 12mm<br>deflection |                    | Maximum span<br>(m)<br>for Span/300<br>deflection |                    | Maximum span<br>(m)<br>for 12mm<br>deflection |                    |            |                  |
|                    | single<br>span                                    | continuous<br>span     | single<br>span                                | continuous<br>span | single<br>span                                    | continuous<br>span | single<br>span                                | continuous<br>span |            |                  |
| 115                | 2.6   | 2.6                    | 2.6   | 2.6                | 2.2   | 2.2                | 2.2   | 2.2                | 2/90 x 45  |                  |
| 145                | 2.8   | 3.3                    | 2.9   | 3.3                | 2.3   | 2.9                | 2.6   | 2.9                | 2/120 x 45 |                  |
| 165                | 3.8   | 3.8                    | 3.8   | 3.8                | 3.3   | 3.3                | 3.3   | 3.3                | 2/140 x 45 |                  |
| 215                | 5.0   | 5.1                    | 4.6   | 5.1                | 4.2   | 4.4                | 4.1   | 4.4                | 2/190 x 45 |                  |
| 265                | 6.2   | 6.3                    | 5.4   | 6.3                | 5.2   | 5.4                | 4.8   | 5.4                | 2/240 x 45 |                  |
| 315                | 7.3   | 7.4                    | 6.1   | 7.3                | 6.2   | 6.5                | 5.4   | 6.5                | 2/290 x 45 |                  |

|                    |   | PUR CORE               |   |                    |   |                    |   |                    |            | 2/LVL<br>splines |
|--------------------|---|------------------------|---|--------------------|---|--------------------|---|--------------------|------------|------------------|
|                    |   | CARPET/TIMBER FLOORING |   |                    |   | TILE FLOORING      |   |                    |            |                  |
| Panel<br>Thickness | Maximum span<br>(m)<br>for Span/300<br>deflection |                        | Maximum span<br>(m)<br>for 12mm<br>deflection |                    | Maximum span<br>(m)<br>for Span/300<br>deflection |                    | Maximum span<br>(m)<br>for 12mm<br>deflection |                    |            |                  |
|                    | single<br>span                                    | continuous<br>span     | single<br>span                                | continuous<br>span | single<br>span                                    | continuous<br>span | single<br>span                                | continuous<br>span |            |                  |
| 115                | 2.4   | 2.6                    | 2.6   | 2.6                | 2.0   | 2.2                | 2.2   | 2.2                | 2/90 x 45  |                  |
| 145                | 2.8   | 3.3                    | 2.9   | 3.3                | 2.3   | 2.9                | 2.6   | 2.9                | 2/120 x 45 |                  |
| 165                | 3.5   | 3.8                    | 3.5   | 3.8                | 2.9   | 3.3                | 3.1   | 3.3                | 2/140 x 45 |                  |
| 215                | 4.6   | 5.1                    | 4.3   | 5.1                | 3.8   | 4.4                | 3.8   | 4.4                | 2/190 x 45 |                  |
| 265                | 5.7   | 6.3                    | 5.1   | 6.1                | 4.7   | 5.4                | 4.4   | 5.3                | 2/240 x 45 |                  |
| 315                | 6.8   | 7.4                    | 5.8   | 6.9                | 5.7   | 6.5                | 5.1   | 6.1                | 2/290 x 45 |                  |

**Floor framing Span Table: SPA SIPs with LVL timber splines of 3.0kPa LIVE LOAD**  
**Hyspan LVL or equivalent**  
**Results are generally governed by strength**

| Panel Thickness | EPS/XPS CORE                             |                 |                                      |                 |  |                 |                                      |                 | SINGLE LVL spline |
|-----------------|--|-----------------|--------------------------------------|-----------------|--|-----------------|--------------------------------------|-----------------|-------------------|
|                 | CARPET/TIMBER FLOORING                   |                 |                                      |                 | TILE FLOORING                            |                 |                                      |                 |                   |
|                 | Maximum span (m) for Span/300 deflection |                 | Maximum span (m) for 12mm deflection |                 | Maximum span (m) for Span/300 deflection |                 | Maximum span (m) for 12mm deflection |                 |                   |
|                 | single span                              | continuous span | single span                          | continuous span | single span                              | continuous span | single span                          | continuous span |                   |
| 115             | 1.8                                      | 1.8             | 1.8                                  | 1.8             | 1.6                                      | 1.6             | 1.6                                  | 1.6             | 90 x 45           |
| 145             | 2.4                                      | 2.4             | 2.4                                  | 2.4             | 2.1                                      | 2.1             | 2.1                                  | 2.1             | 120 x 45          |
| 165             | 2.7                                      | 2.7             | 2.7                                  | 2.7             | 2.4                                      | 2.4             | 2.4                                  | 2.4             | 140 x 45          |
| 215             | 3.6                                      | 3.6             | 3.6                                  | 3.6             | 3.2                                      | 3.2             | 3.2                                  | 3.2             | 190 x 45          |
| 265             | 4.5                                      | 4.5             | 4.5                                  | 4.5             | 4.0                                      | 4.0             | 4.0                                  | 4.0             | 240 x 45          |
| 315             | 5.3                                      | 5.3             | 5.2                                  | 5.3             | 4.8                                      | 4.8             | 4.7                                  | 4.8             | 290 x 45          |

| Panel Thickness | PUR CORE                                 |                 |                                      |                 |  |                 |                                      |                 | SINGLE LVL spline |
|-----------------|--|-----------------|--------------------------------------|-----------------|--|-----------------|--------------------------------------|-----------------|-------------------|
|                 | CARPET/TIMBER FLOORING                   |                 |                                      |                 | TILE FLOORING                            |                 |                                      |                 |                   |
|                 | Maximum span (m) for Span/300 deflection |                 | Maximum span (m) for 12mm deflection |                 | Maximum span (m) for Span/300 deflection |                 | Maximum span (m) for 12mm deflection |                 |                   |
|                 | single span                              | continuous span | single span                          | continuous span | single span                              | continuous span | single span                          | continuous span |                   |
| 115             | 1.8                                      | 1.8             | 1.8                                  | 1.8             | 1.6                                      | 1.6             | 1.6                                  | 1.6             | 90 x 45           |
| 145             | 2.4                                      | 2.4             | 2.4                                  | 2.4             | 2.1                                      | 2.1             | 2.1                                  | 2.1             | 120 x 45          |
| 165             | 2.7                                      | 2.7             | 2.7                                  | 2.7             | 2.4                                      | 2.4             | 2.4                                  | 2.4             | 140 x 45          |
| 215             | 3.6                                      | 3.6             | 3.6                                  | 3.6             | 3.2                                      | 3.2             | 3.2                                  | 3.2             | 190 x 45          |
| 265             | 4.5                                      | 4.5             | 4.3                                  | 4.5             | 3.9                                      | 4.0             | 3.8                                  | 4.0             | 240 x 45          |
| 315             | 5.3                                      | 5.3             | 4.9                                  | 5.3             | 4.6                                      | 4.8             | 4.3                                  | 4.8             | 290 x 45          |

**Floor framing Span Table: SPA SIPs with 2/LVL timber splines of 3.0kPa LIVE LOAD**  
**Hyspan LVL or equivalent**  
**Results are generally governed by strength**

| Panel Thickness | EPS/XPS CORE                             |                 |                                      |                 |  |                 |                                      |                 | 2/LVL splines |
|-----------------|--|-----------------|--------------------------------------|-----------------|--|-----------------|--------------------------------------|-----------------|---------------|
|                 | CARPET/TIMBER FLOORING                   |                 |                                      |                 | TILE FLOORING                            |                 |                                      |                 |               |
|                 | Maximum span (m) for Span/300 deflection |                 | Maximum span (m) for 12mm deflection |                 | Maximum span (m) for Span/300 deflection |                 | Maximum span (m) for 12mm deflection |                 |               |
|                 | single span                              | continuous span | single span                          | continuous span | single span                              | continuous span | single span                          | continuous span |               |
| 115             | 1.8                                      | 1.8             | 1.8                                  | 1.8             | 1.6                                      | 1.6             | 1.6                                  | 1.6             | 2/90 x 45     |
| 145             | 2.4                                      | 2.4             | 2.4                                  | 2.4             | 2.1                                      | 2.1             | 2.1                                  | 2.1             | 2/120 x 45    |
| 165             | 2.7                                      | 2.7             | 2.7                                  | 2.7             | 2.4                                      | 2.4             | 2.4                                  | 2.4             | 2/140 x 45    |
| 215             | 3.6                                      | 3.6             | 3.6                                  | 3.6             | 3.2                                      | 3.2             | 3.2                                  | 3.2             | 2/190 x 45    |
| 265             | 4.5                                      | 4.5             | 4.5                                  | 4.5             | 4.0                                      | 4.0             | 4.0                                  | 4.0             | 2/240 x 45    |
| 315             | 5.3                                      | 5.3             | 5.3                                  | 5.3             | 4.8                                      | 4.8             | 4.8                                  | 4.8             | 2/290 x 45    |

| Panel Thickness | PUR CORE                                 |                 |                                      |                 |  |                 |                                      |                 | 2/LVL splines |
|-----------------|--|-----------------|--------------------------------------|-----------------|--|-----------------|--------------------------------------|-----------------|---------------|
|                 | CARPET/TIMBER FLOORING                   |                 |                                      |                 | TILE FLOORING                            |                 |                                      |                 |               |
|                 | Maximum span (m) for Span/300 deflection |                 | Maximum span (m) for 12mm deflection |                 | Maximum span (m) for Span/300 deflection |                 | Maximum span (m) for 12mm deflection |                 |               |
|                 | single span                              | continuous span | single span                          | continuous span | single span                              | continuous span | single span                          | continuous span |               |
| 115             | 1.8                                      | 1.8             | 1.8                                  | 1.8             | 1.6                                      | 1.6             | 1.6                                  | 1.6             | 2/90 x 45     |
| 145             | 2.4                                      | 2.4             | 2.4                                  | 2.4             | 2.1                                      | 2.1             | 2.1                                  | 2.1             | 2/120 x 45    |
| 165             | 2.7                                      | 2.7             | 2.7                                  | 2.7             | 2.4                                      | 2.4             | 2.4                                  | 2.4             | 2/140 x 45    |
| 215             | 3.6                                      | 3.6             | 3.6                                  | 3.6             | 3.2                                      | 3.2             | 3.2                                  | 3.2             | 2/190 x 45    |
| 265             | 4.5                                      | 4.5             | 4.5                                  | 4.5             | 4.0                                      | 4.0             | 4.0                                  | 4.0             | 2/240 x 45    |
| 315             | 5.3                                      | 5.3             | 5.3                                  | 5.3             | 4.8                                      | 4.8             | 4.8                                  | 4.8             | 2/290 x 45    |