



Project: Concorde Glass Ltd	Contract: 1983-1
Subject: Alulock Post High Wind Test	Sheet No. 1
Date: 15/04/2024	By: A.N & R.F.&CC

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Alulock Post High Wind Test

Analysis By	Checked By
A.N & R.F. & CC	C.K

0	15/04/2024	T.S.	Issued
Revision	Date	Issued By	Comment



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Introduction/Actions/Assumptions/Result Summary:

Introduction:

TSA was instructed by Concorde Glass Ltd to provide the below Calculations:

1/. This report deals with a typical high design wind loading of 2.5kN/m².

Actions:

Balustrade load = 0.74kN (Table NA.6 IS1991-1-1:2002)

Point load = 0.5kN (Table NA.5 IS1991-1-1:2002)

Typical High Wind load = 2.5kN/m²

Assumption:

Concrete Grade = C30/37

Result Summary:

A. Alu Post – Wind Load Design:

1- **Glass design** 6/6/1.52mm T/L/T Glass analysed, horizontally toughened Laminated

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Glass Strength

Balustrade Loading:

< 5mins duration => $k_{mod} = 0.77$

$$f_{gd} = (k_{mod})(k_{sp})(f_{gk}) / \gamma_{ma} + k_v(f_{bk} - f_{gk}) / \gamma_{mv}$$

$$f_{gd} = (0.77)(1.0)(45) / 1.6 + 1.0(120 - 45) / 1.2$$

$$f_{gd} = \underline{84.2N/mm^2}$$

Wind Loading:

10min duration, Multiple Gust Storm => $k_{mod} = 0.74$

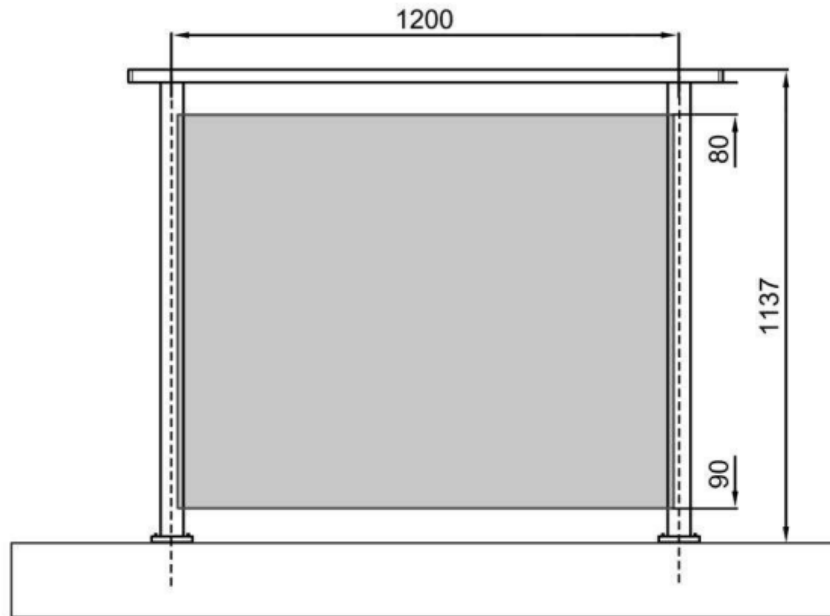
$$f_{gd} = (k_{mod})(k_{sp})(f_{gk}) / \gamma_{ma} + k_v(f_{bk} - f_{gk}) / \gamma_{mv}$$

$$f_{gd} = (0.74)(1.0)(45) / 1.6 + 1.0(120 - 45) / 1.2$$

$$f_{gd} = \underline{83.3N/mm^2}$$

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Glass Analysis for Span of 1200mm – Alulock:
System Sketch:



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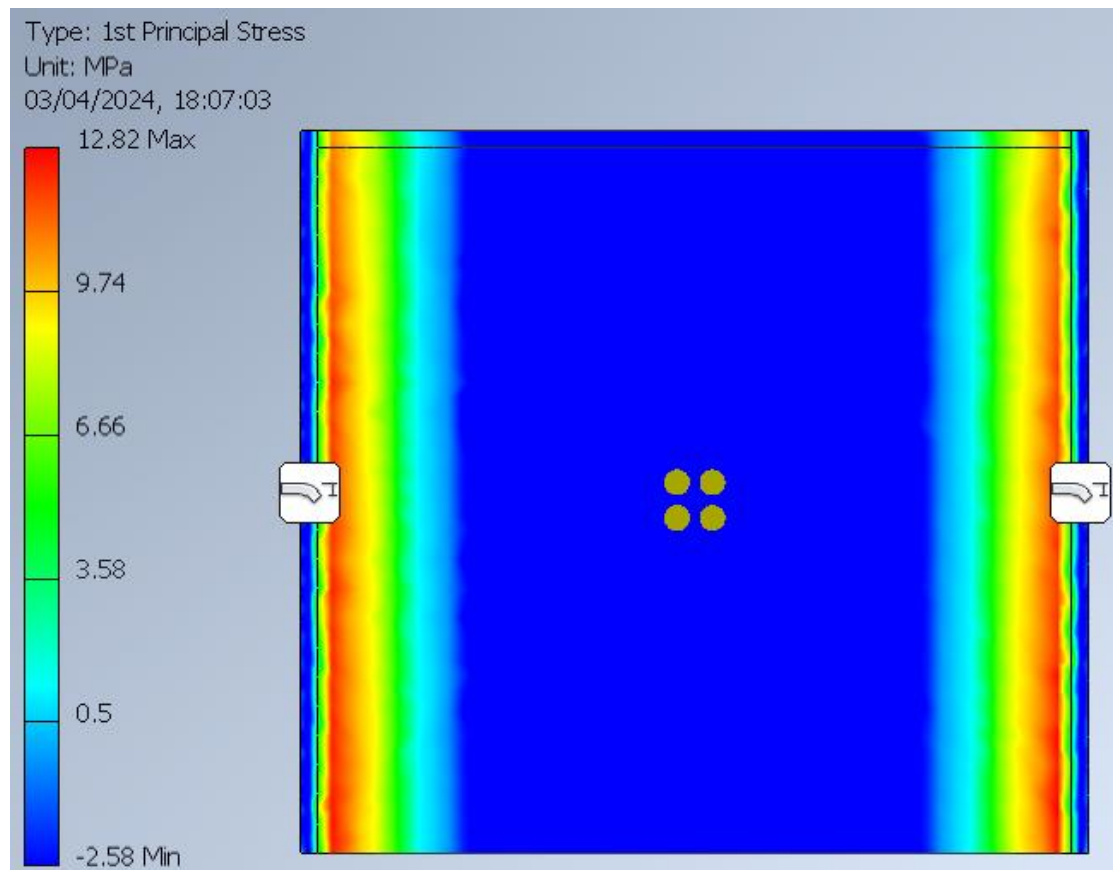
Glass Analysis - Bending Stress of Glass Panel due to 2.5kN/m2 Wind Loading:

- Analysis Software was used to determine maximum bending stress of the glass due to 2.5N/m2 Wind Loading
- 6/6/1.52mm T/L/T Glass analysed, horizontally toughened Laminated
- Interlayer Properties used for analysis, E= 18MPa, G = 6.82MPa EVA
- Bending Stress analysed based on glass panel of 1200 (l) x 1100 (h) mm

Result:

Max. Bending Stress = $12.82\text{N/mm}^2 \times 1.5 = 19.23\text{N/mm}^2 < 83.3\text{N/mm}^2$

OK in Bending



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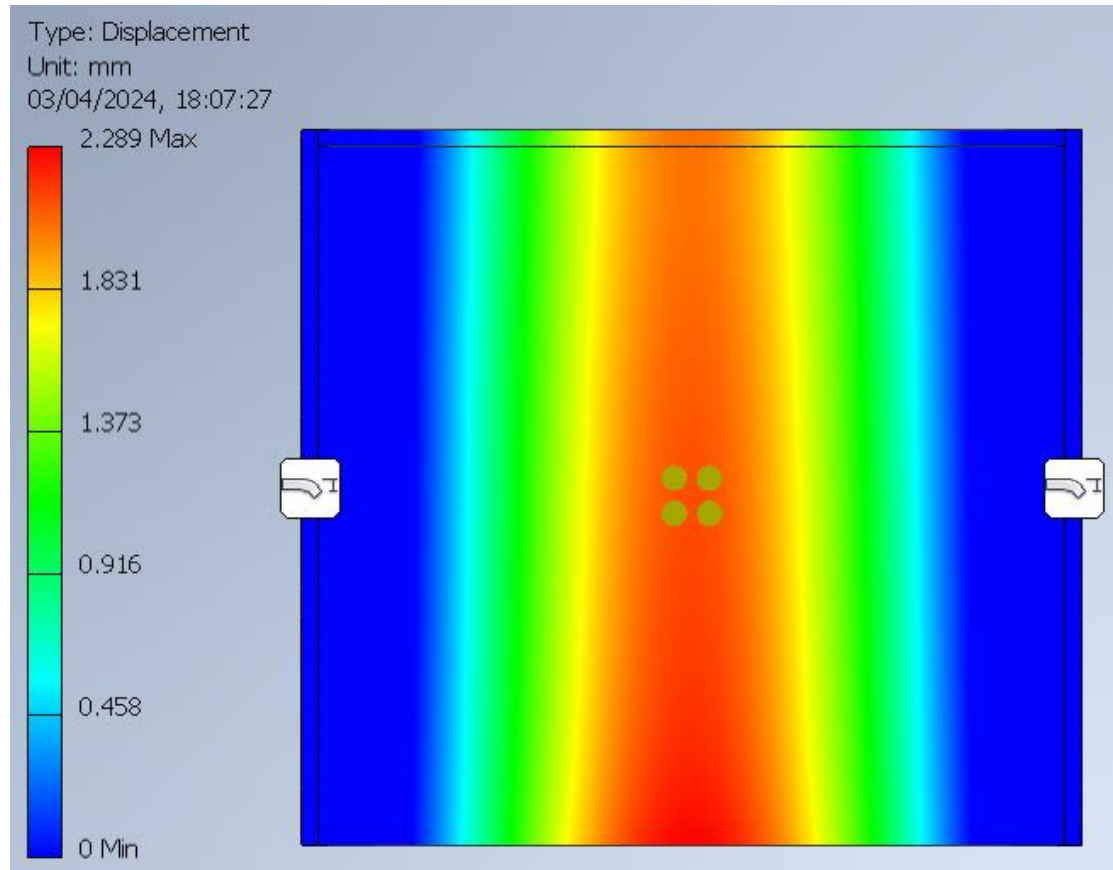
Glass Analysis - Deflection of Glass Panel due to 2.5kN/m² Wind Loading:

- Analysis Software was used to determine maximum deflection of the glass due to 2.5N/m² Wind Loading
- 6/6/1.52mm T/L/T Glass analysed, horizontally toughened Laminated
- Interlayer Properties used for analysis, E= 18MPa, G = 6.82MPa EVA
- Deflection analysed based on glass panel of 1200 (l) x 1100 (h) mm

Result:

Max. Deflection = 2.289mm < 25mm {BS6180:2011 cl. 6.4.1}

OK in Deflection (Glass Only)



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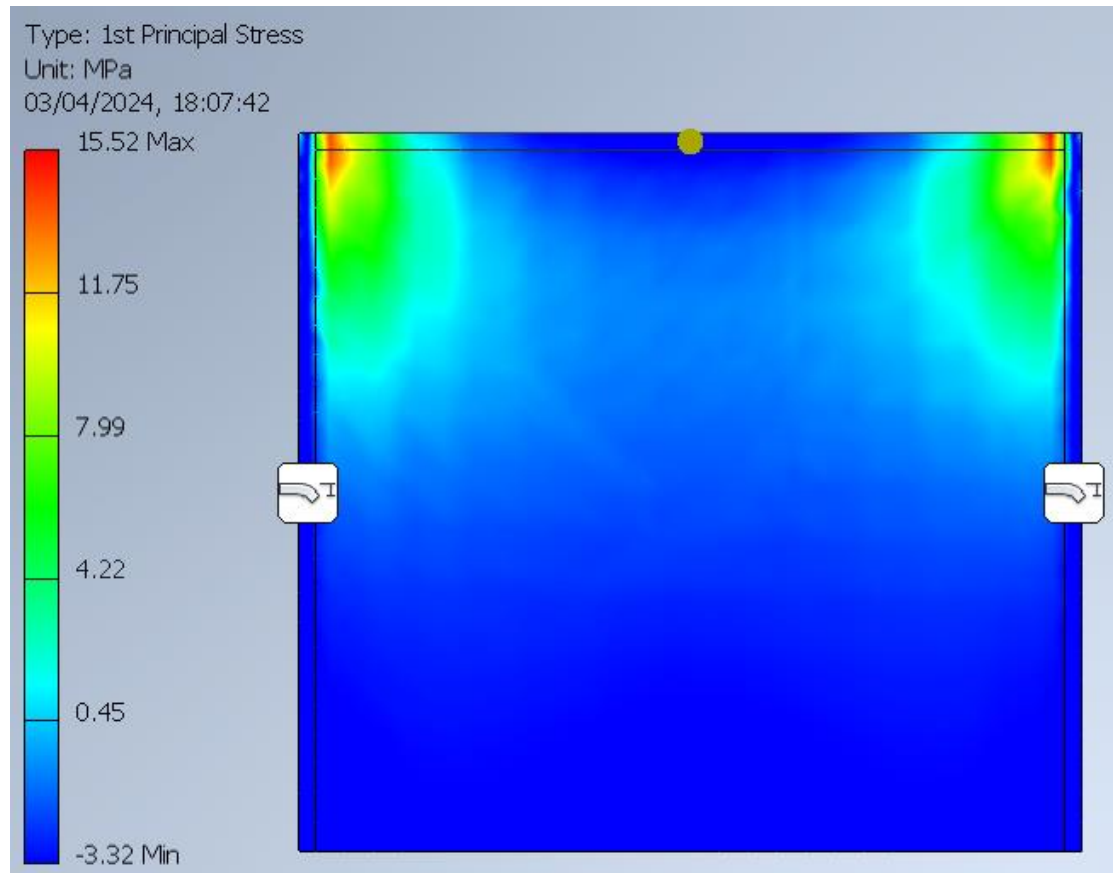
Glass Analysis - Bending Stress of Glass Panel due to 0.74kN/m Balustrade Loading:

- Analysis Software was used to determine maximum bending stress of the glass due to 0.74kN/m Balustrade Loading
- Actual Balustrade Load applied to the glass is 0.89kN (0.74kN/m x 1.2m)
- 6/6/1.52mm T/L/T Glass analysed, horizontally toughened Laminated
- Interlayer Properties used for analysis, E= 18MPa, G = 6.82MPa EVA
- Bending Stress analysed based on glass panel of 1200 (l) x 1100 (h) mm

Result:

Max. Bending Stress = $15.52\text{N/mm}^2 \times 1.5 = 23.28\text{N/mm}^2 < 84.2\text{N/mm}^2$

OK in Bending



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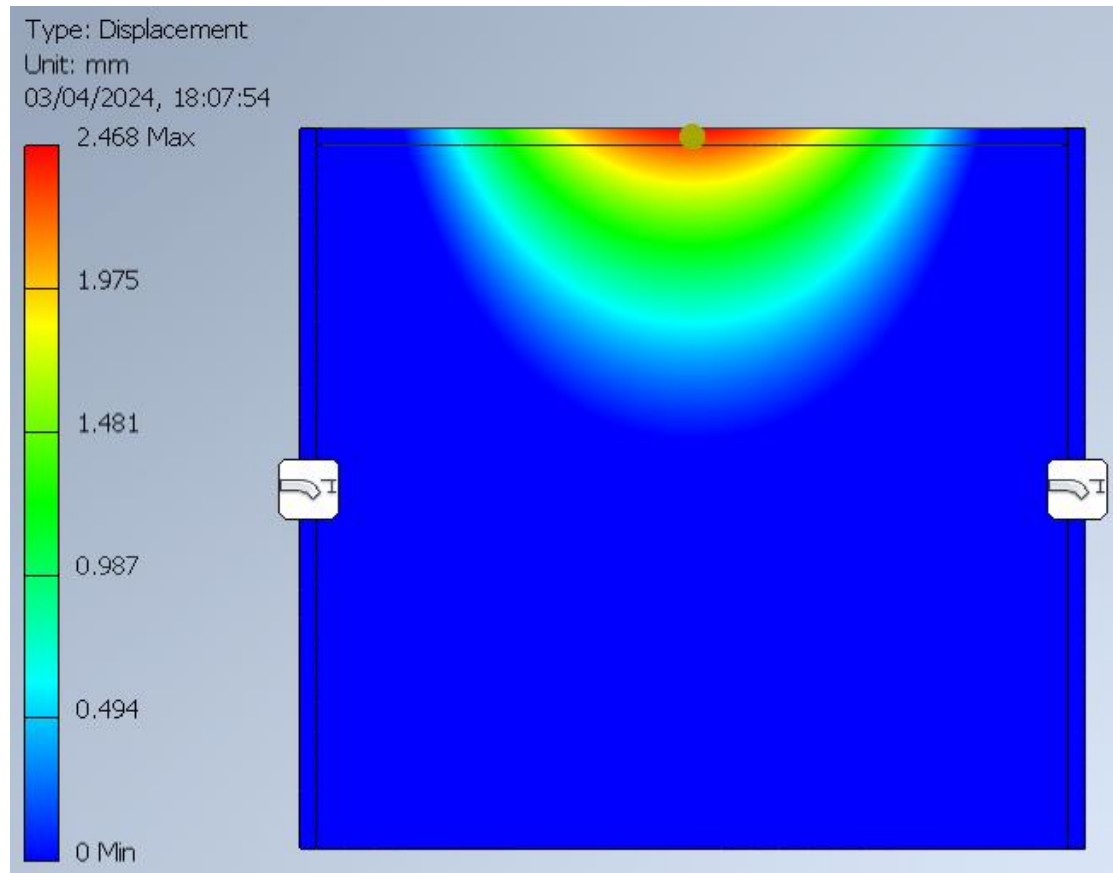
Glass Analysis - Deflection of Glass Panel due to 0.74kN/m Balustrade Loading:

- Analysis Software was used to determine maximum deflection of the glass due to 0.74kN/m Balustrade Loading
- Actual Balustrade Load applied to the glass is 0.89kN (0.74kN/m x 1.2m)
- 6/6/1.52mm T/L/T Glass analysed, horizontally toughened Laminated
- Interlayer Properties used for analysis, E= 18MPa, G = 6.82MPa EVA
- Deflection analysed based on glass panel of 1200 (l) x 1100 (h) mm

Result:

Max. Deflection = 2.468mm < 25mm {BS6180:2011 cl. 6.4.1}

OK in Deflection (Glass Only)



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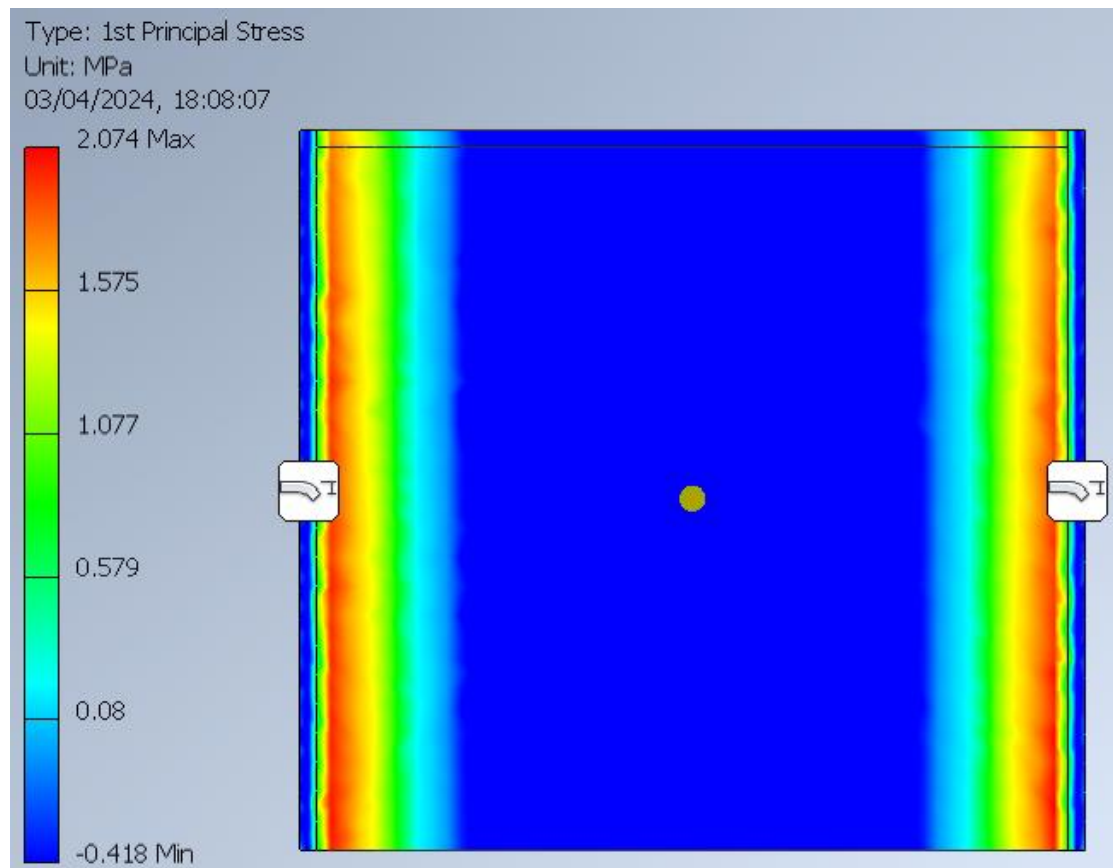
Glass Analysis - Bending Stress of Glass Panel due to 0.5kN Point Load:

- Analysis Software was used to determine maximum bending stress of the glass due to 0.5kN Point Load
- 6/6/1.52mm T/L/T Glass analysed, horizontally toughened Laminated
- Interlayer Properties used for analysis, E= 18MPa, G = 6.82MPa EVA
- Bending Stress analysed based on glass panel of 1200 (l) x 1100 (h) mm

Result:

Max. Bending Stress = $2.074\text{N/mm}^2 \times 1.5 = 3.11\text{N/mm}^2 < 84.2\text{N/mm}^2$

OK in Bending



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Glass Analysis - Deflection of Glass Panel due to 0.5kN Point Load:

- Analysis Software was used to determine maximum deflection of the glass due to 0.5kN Point Load
- 6/6/1.52mm T/L/T Glass analysed, horizontally toughened Laminated
- Interlayer Properties used for analysis, E= 18MPa, G = 6.82MPa EVA
- Deflection analysed based on glass panel of 1200 (l) x 1100 (h) mm

Result:

Max. Deflection = 0.3703mm < 25mm {BS6180:2011 cl. 6.4.1}

OK in Deflection (Glass Only)

