

Vale Consultancy

CONSULTING CIVIL & STRUCTURAL ENGINEERS

STRUCTURAL CALCULATIONS

Intellectual Property Office
Duffryn
Newport
NP10 8YJ

Prepared for: Tersus Group
Project Ref: 20603

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DOCUMENT CONTROL

Project:	Intellectual Property Office, Duffryn, Newport, NP10 8YJ
Client:	Tersus Group
Vale Consultancy Ref:	20603

Issue	Prepared by	Approved by	Date	Status
01	Louis Morgan Beng (Hons)	Matt Jones MEng (Hons) CEng FICE FStructE	27.01.2025	First issue

DESIGN STATEMENT

The design has been completed in accordance with British Standards BS6399, BS5628 (Masonry), BS5268 (Timber) & BS 5950 (Steel).

Information for this has been collated from survey/site visit and information provided by the client.

The design calculation check is for 1no steel frame with the inclusion of weight from the glass roof replacement. The design shows that the existing frame is suitable for the proposed loading from insulation and cladding.

All dimensions, weights, member lengths, member tables, and any other relevant design information contained within this package is for analysis, and design purposes only, for submission to building control, and must not be used for pricing or fabrication purposes. All queries are to be directed to the engineer prior to tendering, pricing or fabrication. All structural members dimensions need to be taken accurately on site by the contractor prior to fabrication.

During any initial site visits performed by our Engineer, assumptions have to be made where structural elements may have been obscured by finishes. Opening up works should be undertaken prior to fabrication or construction of any structural members to confirm that the structural layout as indicated in our proposed sketches/detailed drawings is correct.

If there are any discrepancies, the Engineer MUST be informed immediately, and prior to proceeding with construction works on site.

CDM Comments:

- All temporary propping/support is to correspond to contractor's specification and details.

 Vale Consultancy CONSULTING CIVIL & STRUCTURAL ENGINEERS 29 Bocam Park Old Field Road, Pencoed CF35 5LJ	<u>IPO Glass Roof Replacement</u>				Job Ref. 20603	
	Section				Sheet no./rev. 3	
	Design loadings					
Calc. by LM	Date 27/01/2025	Chk'd by MJ	Date 27/01/2025	App'd by MJ	Date 27/01/2025	

IPO Design Loadings

The design has been completed in accordance with British Standards BS6399, BS5628 (Masonry), BS5268 (Timber) & BS 5950 (Steel). All dimensions stated in the following calculations are for design purposes only and not for use for fabrication or construction purposes. All dimensions must be checked by a competent contractor prior to fabrication or construction and any discrepancies found are to be reported to the design engineer.

Design Loadings

1. Roof 35° Pitch (Max)

Dead Loading:	
Cladding	= 0.10 kN/m ²
Insulation	= 0.10 kN/m ²
Services	= 0.10 kN/m ²

	0.30 kN/m ² / cos (25) = 0.33kN/m ² Total Dead Loading

Imposed Loading:	
Snow	= 0.60 kN/m ² Total Live Loading

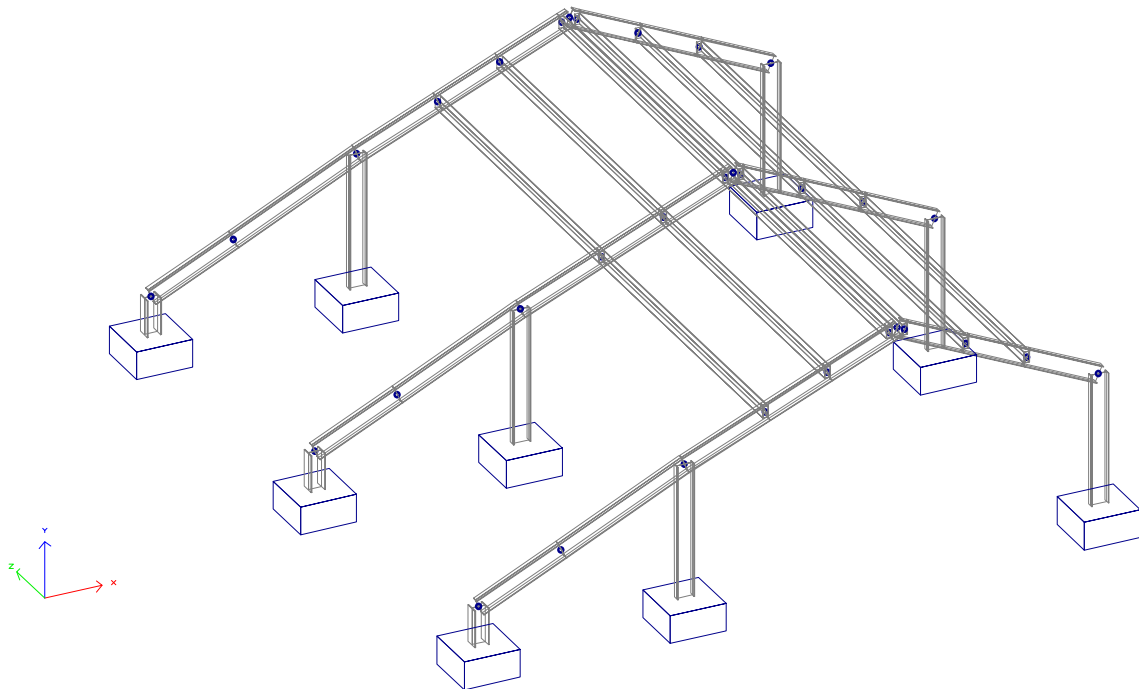


IPO Newport
Glass Roof Replacement

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Current View



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Design Code

Design code	Concrete code	Steel Code	Wind Code
BS	BS8110-Amd.3	BS5950:2000	BS 6399-2

Members

Mbr ref	Member type	Start joint	Start fixity	End joint	End fixity	Orient (°)	Directional behaviour	Length (m)	P-Delta behaviour	Slope (°)
1	254x254 UKC73	1	Fixed	2	Fixed	0.0	Normal	0.660	Normal	90.0
2	305x127 UKB37	2	Fixed	3	Fixed	0.0	Normal	1.628	Normal	25.1
3	305x127 UKB37	3	Fixed	5	Fixed	0.0	Normal	2.438	Normal	25.5
4	305x127 UKB37	4	Fixed	5	Fixed	0.0	Normal	2.400	Normal	90.0
5	305x127 UKB37	7	Fixed	8	Fixed	0.0	Normal	2.350	Normal	90.0
6	305x127 UKB37	6	Fixed	25	Fixed	0.0	Normal	0.150	Normal	-24.6
7	305x127 UKB37	6	Fixed	35	Fixed	0.0	Normal	0.150	Normal	-22.8
8	254x254 UKC73	9	Fixed	10	Fixed	0.0	Normal	0.660	Normal	90.0
9	305x127 UKB37	10	Fixed	11	Fixed	0.0	Normal	1.628	Normal	25.1
10	305x127 UKB37	11	Fixed	13	Fixed	0.0	Normal	2.438	Normal	25.5
11	305x127 UKB37	12	Fixed	13	Fixed	0.0	Normal	2.400	Normal	90.0
12	305x127 UKB37	15	Fixed	16	Fixed	0.0	Normal	2.350	Normal	90.0
13	305x127 UKB37	14	Fixed	28	Fixed	0.0	Normal	0.150	Normal	-24.6
14	305x127 UKB37	14	Fixed	34	Fixed	0.0	Normal	0.150	Normal	-22.8
15	254x254 UKC73	17	Fixed	18	Fixed	0.0	Normal	0.660	Normal	90.0
16	305x127 UKB37	18	Fixed	19	Fixed	0.0	Normal	1.628	Normal	25.1
17	305x127 UKB37	19	Fixed	21	Fixed	0.0	Normal	2.438	Normal	25.5
18	305x127 UKB37	20	Fixed	21	Fixed	0.0	Normal	2.400	Normal	90.0
19	305x127 UKB37	23	Fixed	24	Fixed	0.0	Normal	2.350	Normal	90.0
20	305x127 UKB37	22	Fixed	29	Fixed	0.0	Normal	0.150	Normal	-24.6
21	305x127 UKB37	22	Fixed	36	Fixed	0.0	Normal	0.150	Normal	-22.8
22	305x127 UKB37	25	Fixed	26	Fixed	0.0	Normal	1.200	Normal	-24.6
23	305x127 UKB37	26	Fixed	27	Fixed	0.0	Normal	1.200	Normal	-24.6
24	305x127 UKB37	27	Fixed	8	Fixed	0.0	Normal	1.410	Normal	-24.6
25	305x127 UKB37	28	Fixed	30	Fixed	0.0	Normal	1.200	Normal	-24.6
26	305x127 UKB37	29	Fixed	31	Fixed	0.0	Normal	1.200	Normal	-24.6
27	305x127 UKB37	30	Fixed	32	Fixed	0.0	Normal	1.200	Normal	-24.6
28	305x127 UKB37	31	Fixed	33	Fixed	0.0	Normal	1.200	Normal	-24.6
29	305x127 UKB37	32	Fixed	16	Fixed	0.0	Normal	1.410	Normal	-24.6
30	305x127 UKB37	33	Fixed	24	Fixed	0.0	Normal	1.410	Normal	-24.6
31	305x127 UKB37	34	Fixed	37	Fixed	0.0	Normal	1.200	Normal	-22.8
32	305x127 UKB37	35	Fixed	38	Fixed	0.0	Normal	1.200	Normal	-22.8
33	305x127 UKB37	36	Fixed	39	Fixed	0.0	Normal	1.200	Normal	-22.8
34	305x127 UKB37	37	Fixed	40	Fixed	0.0	Normal	1.200	Normal	-22.8
35	305x127 UKB37	38	Fixed	41	Fixed	0.0	Normal	1.200	Normal	-22.8
36	305x127 UKB37	39	Fixed	42	Fixed	0.0	Normal	1.200	Normal	-22.8
37	305x127 UKB37	40	Fixed	13	Fixed	0.0	Normal	1.573	Normal	-22.8
38	305x127 UKB37	41	Fixed	5	Fixed	0.0	Normal	1.573	Normal	-22.8

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Members(continued)

<i>Mbr ref</i>	<i>Member type</i>	<i>Start joint</i>	<i>Start fixity</i>	<i>End joint</i>	<i>End fixity</i>	<i>Orient (°)</i>	<i>Directional behaviour</i>	<i>Length (m)</i>	<i>P-Delta behaviour</i>	<i>Slope (°)</i>
39	305x127 UKB37	42	Fixed	21	Fixed	0.0	Normal	1.573	Normal	-22.8
40	200x100x5.0 RHS	42	Fixed	40	Fixed	0.0	Normal	6.000	Normal	0.0
41	200x100x5.0 RHS	40	Fixed	41	Fixed	0.0	Normal	6.000	Normal	0.0
42	200x100x5.0 RHS	39	Fixed	37	Fixed	0.0	Normal	6.000	Normal	0.0
43	200x100x5.0 RHS	37	Fixed	38	Fixed	0.0	Normal	6.000	Normal	0.0
44	200x100x5.0 RHS	36	Fixed	34	Fixed	0.0	Normal	6.000	Normal	0.0
45	200x100x5.0 RHS	34	Fixed	35	Fixed	0.0	Normal	6.000	Normal	0.0
46	200x100x5.0 RHS	29	Fixed	28	Fixed	0.0	Normal	6.000	Normal	0.0
47	200x100x5.0 RHS	28	Fixed	25	Fixed	0.0	Normal	6.000	Normal	0.0
48	200x100x5.0 RHS	31	Fixed	30	Fixed	0.0	Normal	6.000	Normal	0.0
49	200x100x5.0 RHS	30	Fixed	26	Fixed	0.0	Normal	6.000	Normal	0.0
50	200x100x5.0 RHS	33	Fixed	32	Fixed	0.0	Normal	6.000	Normal	0.0
51	200x100x5.0 RHS	32	Fixed	27	Fixed	0.0	Normal	6.000	Normal	0.0

Joints

<i>Joint ref</i>	<i>X pos (m)</i>	<i>Y pos (m)</i>	<i>Z pos (m)</i>	<i>Joint ref</i>	<i>X pos (m)</i>	<i>Y pos (m)</i>	<i>Z pos (m)</i>	<i>Joint ref</i>	<i>X pos (m)</i>	<i>Y pos (m)</i>	<i>Z pos (m)</i>
1	0.000	0.000	0.000	2	0.000	0.660	0.000	3	1.475	1.350	0.000
4	3.675	0.000	0.000	5	3.675	2.400	0.000	6	7.475	4.000	0.000
7	11.075	0.000	0.000	8	11.075	2.350	0.000	9	0.000	0.000	6.000
10	0.000	0.660	6.000	11	1.475	1.350	6.000	12	3.675	0.000	6.000
13	3.675	2.400	6.000	14	7.475	4.000	6.000	15	11.075	0.000	6.000
16	11.075	2.350	6.000	17	0.000	0.000	12.000	18	0.000	0.660	12.000
19	1.475	1.350	12.000	20	3.675	0.000	12.000	21	3.675	2.400	12.000
22	7.475	4.000	12.000	23	11.075	0.000	12.000	24	11.075	2.350	12.000
25	7.611	3.938	0.000	26	8.702	3.438	0.000	27	9.793	2.938	0.000
28	7.611	3.938	6.000	29	7.611	3.938	12.000	30	8.702	3.438	6.000
31	8.702	3.438	12.000	32	9.793	2.938	6.000	33	9.793	2.938	12.000
34	7.337	3.942	6.000	35	7.337	3.942	0.000	36	7.337	3.942	12.000
37	6.231	3.476	6.000	38	6.231	3.476	0.000	39	6.231	3.476	12.000
40	5.125	3.010	6.000	41	5.125	3.010	0.000	42	5.125	3.010	12.000

Supports

<i>Joint ref</i>	<i>Support type</i>	<i>X Trans. (kN/mm)</i>	<i>Y Trans. (kN/mm)</i>	<i>Z Trans. (kN/mm)</i>	<i>X Rot. (kNm/Rad)</i>	<i>Y Rot. (kNm/Rad)</i>	<i>Z Rot. (kNm/Rad)</i>	<i>Direction control</i>
1	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Normal
4	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Normal
7	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Normal
9	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Normal
12	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Normal
15	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Normal
17	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Normal

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Supports(continued)

Joint ref	Support type	X Trans. (kN/mm)	Y Trans. (kN/mm)	Z Trans. (kN/mm)	X Rot. (kNm/Rad)	Y Rot. (kNm/Rad)	Z Rot. (kNm/Rad)	Direction control
20	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Normal
23	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed	Normal

Sections

Reference	Area (cm ²)	Ixx (cm ⁴)	Iyy (cm ⁴)	J (cm ⁴)	Elements (mm)				
					No	Width	Height	Vert. off	Lat. off
305x165 UKB40	51.3	8503	764	14.7					
254x254 UKC73	93.1	11407	3908	57.6					
305x127 UKB37	47.2	7171	336	14.8					
305x165 UKB40	51.3	8503	764	14.7					
305x165 UKB40	51.3	8503	764	14.7					
305x165 UKB40	51.3	8503	764	14.7					
200x100x5.0 RHS	28.7	1500	505	1200					

SW Haunch Sections

Reference	Component	Type	Section	Dimension		Web thick (mm)	Flange / wall thick (mm)	Root /inner radius (mm)
				depth (mm)	width (mm)			
305x127 UKB37	Main member	SW Library	305x127 UKB37					
	Left haunch	SW Library	305x127 UKB37					

Materials

Material reference	Elastic modulus (kN/mm ²)	Poisson ratio	Density (kN/m ³)	Thermal expansion (/°Cx10-6)
UK-S275	205.00	0.30	77.00	12.00

Member Types

Reference	Shape	Material	Seg no	Start section	End section	Length (m)	Depth (mm)	Placing rule
254x254 UKC73	SW Library	UK-S275	1	254x254 UKC73				
305x127 UKB37	SW Library	UK-S275	1	305x127 UKB37				
305x165 UKB40	SW Library	UK-S275	1	305x165 UKB40				
305x165 UKB40	SW Library	UK-S275	1	305x165 UKB40				
200x100x5.0 RHS	SW Library	UK-S275	1	200x100x5.0 RHS				

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SW Haunch Types

Reference	Shape	Material	Component	Flange arrangement	Member vertical depth (mm)	Haunch perp'n depth (mm)	Haunch slope length (mm)	End Offset	
								Left	Right
Haunch	Haunch - End 1	UK-S275	End 1 Haunch	3 flange	-	293.70	600.00	0.00	0.00

Self Weights

Mem ref	Self weight (kN)	Mem ref	Self weight (kN)	Mem ref	Self weight (kN)	Mem ref	Self weight (kN)
1	0.473	2	0.592	3	0.886	4	0.872
5	0.854	6	0.055	7	0.055	8	0.473
9	0.592	10	0.886	11	0.872	12	0.854
13	0.055	14	0.055	15	0.473	16	0.592
17	0.886	18	0.872	19	0.854	20	0.055
21	0.055	22	0.436	23	0.436	24	0.512
25	0.436	26	0.436	27	0.436	28	0.436
29	0.512	30	0.512	31	0.436	32	0.436
33	0.436	34	0.436	35	0.436	36	0.436
37	0.572	38	0.572	39	0.572	40	1.326
41	1.326	42	1.326	43	1.326	44	1.326
45	1.326	46	1.326	47	1.326	48	1.326
49	1.326	50	1.326	51	1.326		
Total self weight for selected members : 35.756 kN							

Member Loads

Load reference	Load type	Start pos'n (m)	Start intensity (kN) & (m)	End pos'n (m)	End intensity (kN) & (m)	Direction	Category
Loads on member 2 (Length 1.628m)							
LoadType3	UL		1.800			Vertical (-Y)	Dead
LoadType4	UL		3.600			Vertical (-Y)	Imposed
Loads on member 3 (Length 2.438m)							
LoadType3	UL		1.800			Vertical (-Y)	Dead
LoadType4	UL		3.600			Vertical (-Y)	Imposed
Loads on member 9 (Length 1.628m)							
LoadType3	UL		1.800			Vertical (-Y)	Dead
LoadType4	UL		3.600			Vertical (-Y)	Imposed
Loads on member 10 (Length 2.438m)							
LoadType3	UL		1.800			Vertical (-Y)	Dead
LoadType4	UL		3.600			Vertical (-Y)	Imposed
Loads on member 16 (Length 1.628m)							
LoadType3	UL		1.800			Vertical (-Y)	Dead
LoadType4	UL		3.600			Vertical (-Y)	Imposed
Loads on member 17 (Length 2.438m)							
LoadType3	UL		1.800			Vertical (-Y)	Dead

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Member Loads (continued)

Load reference	Load type	Start pos'n (m)	Start intensity (kN) & (m)	End pos'n (m)	End intensity (kN) & (m)	Direction	Category
LoadType4	UL		3.600			Vertical (-Y)	Imposed
<i>Loads on member 24 (Length 1.410m)</i>							
LoadType3	UL		1.800			Vertical (-Y)	Dead
LoadType4	UL		3.600			Vertical (-Y)	Imposed
<i>Loads on member 29 (Length 1.410m)</i>							
LoadType3	UL		1.800			Vertical (-Y)	Dead
LoadType4	UL		3.600			Vertical (-Y)	Imposed
<i>Loads on member 30 (Length 1.410m)</i>							
LoadType3	UL		1.800			Vertical (-Y)	Dead
LoadType4	UL		3.600			Vertical (-Y)	Imposed
<i>Loads on member 37 (Length 1.573m)</i>							
LoadType3	UL		1.800			Vertical (-Y)	Dead
LoadType4	UL		3.600			Vertical (-Y)	Imposed
<i>Loads on member 38 (Length 1.573m)</i>							
LoadType3	UL		1.800			Vertical (-Y)	Dead
LoadType4	UL		3.600			Vertical (-Y)	Imposed
<i>Loads on member 39 (Length 1.573m)</i>							
LoadType3	UL		1.800			Vertical (-Y)	Dead
LoadType4	UL		3.600			Vertical (-Y)	Imposed
<i>Loads on member 40 (Length 6.000m)</i>							
LoadType1	UL		0.360			Vertical (-Y)	Dead
LoadType2	UL		0.720			Vertical (-Y)	Imposed
<i>Loads on member 41 (Length 6.000m)</i>							
LoadType1	UL		0.360			Vertical (-Y)	Dead
LoadType2	UL		0.720			Vertical (-Y)	Imposed
<i>Loads on member 42 (Length 6.000m)</i>							
LoadType1	UL		0.360			Vertical (-Y)	Dead
LoadType2	UL		0.720			Vertical (-Y)	Imposed
<i>Loads on member 43 (Length 6.000m)</i>							
LoadType1	UL		0.360			Vertical (-Y)	Dead
LoadType2	UL		0.720			Vertical (-Y)	Imposed
<i>Loads on member 44 (Length 6.000m)</i>							
LoadType1	UL		0.360			Vertical (-Y)	Dead
LoadType2	UL		0.720			Vertical (-Y)	Imposed
<i>Loads on member 45 (Length 6.000m)</i>							
LoadType1	UL		0.360			Vertical (-Y)	Dead
LoadType2	UL		0.720			Vertical (-Y)	Imposed
<i>Loads on member 46 (Length 6.000m)</i>							
LoadType1	UL		0.360			Vertical (-Y)	Dead
LoadType2	UL		0.720			Vertical (-Y)	Imposed
<i>Loads on member 47 (Length 6.000m)</i>							
LoadType1	UL		0.360			Vertical (-Y)	Dead
LoadType2	UL		0.720			Vertical (-Y)	Imposed

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Member Loads (continued)

Load reference	Load type	Start pos'n (m)	Start intensity (kN) & (m)	End pos'n (m)	End intensity (kN) & (m)	Direction	Category
<i>Loads on member 48 (Length 6.000m)</i>							
LoadType1	UL		0.360			Vertical (-Y)	Dead
LoadType2	UL		0.720			Vertical (-Y)	Imposed
<i>Loads on member 49 (Length 6.000m)</i>							
LoadType1	UL		0.360			Vertical (-Y)	Dead
LoadType2	UL		0.720			Vertical (-Y)	Imposed
<i>Loads on member 50 (Length 6.000m)</i>							
LoadType1	UL		0.360			Vertical (-Y)	Dead
LoadType2	UL		0.720			Vertical (-Y)	Imposed
<i>Loads on member 51 (Length 6.000m)</i>							
LoadType1	UL		0.360			Vertical (-Y)	Dead
LoadType2	UL		0.720			Vertical (-Y)	Imposed

Load Combinations

Load Category			Partial Safety Factors				
No	Name	Type	Sub type	1	2	3	4
	Combination reference			Comb1	Comb2	Comb3	Comb4
	Limit state			ULS	SLS	SLS	SLS
	Elastic analysis			Linear	Linear	Linear	Linear
	Plastic analysis			No	No	No	No
1	Self Weight	Permanent	Self weight	0.00	0.00	0.00	0.00
2	Dead	Permanent	Permanent	1.40	1.40	1.00	1.00
3	Imposed	Variable	Cat B: office	1.60	1.60	0.00	0.00
4	Other	Other	Other	0.00	0.00	0.00	0.00

Member Deflections (Global) for combination Comb1

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Displacements (mm)			Slopes (°)		
		Axial	Normal	Lateral	Torsion	Normal	Lateral
Member 1							
0	0.000	0.00	0.00	0.00	0.000	0.000	0.000
1	0.165	0.00	0.00	0.00	0.001	0.000	0.000
2	0.330	0.00	0.00	0.00	0.002	-0.002	0.000
3	0.495	0.00	-0.01	0.00	0.003	-0.003	0.000
4	0.660	-0.01	-0.02	0.00	0.004	-0.006	0.000
Member 2							
0	0.000	0.02	-0.02	0.00	0.002	-0.006	0.003
1	0.407	0.01	-0.09	-0.03	0.001	-0.014	0.004
2	0.814	0.00	-0.20	-0.05	0.000	-0.015	0.004
3	1.221	0.00	-0.30	-0.08	0.000	-0.012	0.003
4	1.628	-0.01	-0.36	-0.10	-0.001	-0.006	0.003
Member 3							

 Vale Consultancy CONSULTING CIVIL & STRUCTURAL ENGINEERS	IPO Newport Glass Roof Replacement	Job No	20603
		Job Ref	IPO
		Designed By	LM
		Checked By	MJ
		Date	27/01/2025
		Revision No	1.0
		Calc No	1.0
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Member Deflections (Global) for combination Comb1 (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Displacements (mm)			Slopes (°)		
		Axial	Normal	Lateral	Torsion	Normal	Lateral
0	0.000	-0.01	-0.36	-0.10	-0.001	-0.006	0.003
1	0.609	-0.02	-0.36	-0.13	-0.002	0.005	0.003
2	1.219	-0.02	-0.26	-0.15	-0.003	0.013	0.002
3	1.828	-0.03	-0.12	-0.16	-0.004	0.011	0.000
4	2.438	-0.03	-0.08	-0.16	-0.006	-0.006	-0.001
Member 4							
0	0.000	0.00	0.00	0.00	0.000	0.000	0.000
1	0.600	-0.02	0.01	-0.02	-0.001	0.002	0.003
2	1.200	-0.04	0.03	-0.06	-0.002	0.001	0.005
3	1.800	-0.06	0.03	-0.11	-0.003	-0.001	0.005
4	2.400	-0.08	0.00	-0.16	-0.003	-0.006	0.005
Member 5							
0	0.000	0.00	0.00	0.00	0.000	0.000	0.000
1	0.588	-0.01	-0.15	-0.03	0.004	-0.027	0.006
2	1.175	-0.03	-0.49	-0.11	0.008	-0.036	0.010
3	1.763	-0.04	-0.83	-0.22	0.013	-0.028	0.011
4	2.350	-0.06	-1.00	-0.34	0.017	-0.002	0.011
Member 6							
0	0.000	0.99	-1.04	0.08	0.064	0.005	0.029
1	0.037	0.99	-1.03	0.06	0.089	0.006	0.028
2	0.075	0.99	-1.03	0.04	0.114	0.006	0.027
3	0.112	0.99	-1.03	0.03	0.139	0.006	0.027
4	0.150	0.99	-1.02	0.01	0.165	0.007	0.026
Member 7							
0	0.000	0.09	-1.43	-0.08	-0.065	-0.005	-0.027
1	0.038	0.09	-1.44	-0.06	-0.091	-0.005	-0.026
2	0.075	0.09	-1.44	-0.05	-0.117	-0.005	-0.025
3	0.113	0.09	-1.44	-0.03	-0.143	-0.004	-0.024
4	0.150	0.09	-1.45	-0.02	-0.169	-0.004	-0.023
Member 8							
0	0.000	0.00	0.00	0.00	0.000	0.000	0.000
1	0.165	0.00	0.00	0.00	0.000	0.003	0.000
2	0.330	0.00	0.02	0.00	0.000	0.004	0.000
3	0.495	-0.01	0.03	0.00	0.000	0.004	0.000
4	0.660	-0.01	0.04	0.00	0.000	0.002	0.000
Member 9							
0	0.000	-0.04	0.01	0.00	0.000	0.002	0.000
1	0.407	-0.05	0.00	0.00	0.000	-0.005	0.000
2	0.814	-0.07	-0.05	0.00	0.000	-0.007	0.000
3	1.221	-0.08	-0.09	0.00	0.000	-0.004	0.000
4	1.628	-0.09	-0.10	0.00	0.000	0.000	0.000
Member 10							

 Vale Consultancy CONSULTING CIVIL & STRUCTURAL ENGINEERS	IPO Newport Glass Roof Replacement	Job No	20603
		Job Ref	IPO
		Designed By	LM
		Checked By	MJ
		Date	27/01/2025
		Revision No	1.0
		Calc No	1.0
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Member Deflections (Global) for combination Comb1 (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Displacements (mm)			Slopes (°)		
		Axial	Normal	Lateral	Torsion	Normal	Lateral
0	0.000	-0.09	-0.10	0.00	0.000	0.000	0.000
1	0.609	-0.11	-0.06	0.00	0.000	0.007	0.000
2	1.219	-0.12	0.03	0.00	0.000	0.008	0.000
3	1.828	-0.14	0.08	0.00	0.000	-0.002	0.000
4	2.438	-0.15	-0.07	0.00	0.000	-0.029	0.000
Member 11							
0	0.000	0.00	0.00	0.00	0.000	0.000	0.000
1	0.600	-0.03	0.07	0.00	0.000	0.012	0.000
2	1.200	-0.06	0.21	0.00	0.000	0.011	0.000
3	1.800	-0.10	0.26	0.00	0.000	-0.003	0.000
4	2.400	-0.13	0.10	0.00	0.000	-0.029	0.000
Member 12							
0	0.000	0.00	0.00	0.00	0.000	0.000	0.000
1	0.588	-0.03	-0.40	0.00	0.000	-0.071	0.000
2	1.175	-0.06	-1.30	0.00	0.000	-0.097	0.000
3	1.763	-0.09	-2.23	0.00	0.000	-0.078	0.000
4	2.350	-0.12	-2.74	0.00	0.000	-0.014	0.000
Member 13							
0	0.000	2.72	-2.93	0.00	0.000	0.017	0.000
1	0.037	2.71	-2.92	0.00	0.000	0.018	0.000
2	0.075	2.71	-2.90	0.00	0.000	0.019	0.000
3	0.112	2.71	-2.89	0.00	0.000	0.020	0.000
4	0.150	2.71	-2.88	0.00	0.000	0.022	0.000
Member 14							
0	0.000	0.32	-3.98	0.00	0.000	-0.017	0.000
1	0.038	0.32	-3.99	0.00	0.000	-0.016	0.000
2	0.075	0.32	-4.00	0.00	0.000	-0.015	0.000
3	0.113	0.32	-4.01	0.00	0.000	-0.014	0.000
4	0.150	0.32	-4.02	0.00	0.000	-0.012	0.000
Member 15							
0	0.000	0.00	0.00	0.00	0.000	0.000	0.000
1	0.165	0.00	0.00	0.00	-0.001	0.000	0.000
2	0.330	0.00	0.00	0.00	-0.002	-0.002	0.000
3	0.495	0.00	-0.01	0.00	-0.003	-0.003	0.000
4	0.660	-0.01	-0.02	0.00	-0.004	-0.006	0.000
Member 16							
0	0.000	0.02	-0.02	0.00	-0.002	-0.006	-0.003
1	0.407	0.01	-0.09	0.03	-0.001	-0.014	-0.004
2	0.814	0.00	-0.20	0.05	0.000	-0.015	-0.004
3	1.221	0.00	-0.30	0.08	0.000	-0.012	-0.003
4	1.628	-0.01	-0.36	0.10	0.001	-0.006	-0.003
Member 17							

 Vale Consultancy CONSULTING CIVIL & STRUCTURAL ENGINEERS	IPO Newport Glass Roof Replacement	Job No	20603
		Job Ref	IPO
		Designed By	LM
		Checked By	MJ
		Date	27/01/2025
		Revision No	1.0
		Calc No	1.0
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Member Deflections (Global) for combination Comb1 (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Displacements (mm)			Slopes (°)		
		Axial	Normal	Lateral	Torsion	Normal	Lateral
0	0.000	-0.01	-0.36	0.10	0.001	-0.006	-0.003
1	0.609	-0.02	-0.36	0.13	0.002	0.005	-0.003
2	1.219	-0.02	-0.26	0.15	0.003	0.013	-0.002
3	1.828	-0.03	-0.12	0.16	0.004	0.011	0.000
4	2.438	-0.03	-0.08	0.16	0.006	-0.006	0.001
Member 18							
0	0.000	0.00	0.00	0.00	0.000	0.000	0.000
1	0.600	-0.02	0.01	0.02	0.001	0.002	-0.003
2	1.200	-0.04	0.03	0.06	0.002	0.001	-0.005
3	1.800	-0.06	0.03	0.11	0.003	-0.001	-0.005
4	2.400	-0.08	0.00	0.16	0.003	-0.006	-0.005
Member 19							
0	0.000	0.00	0.00	0.00	0.000	0.000	0.000
1	0.588	-0.01	-0.15	0.03	-0.004	-0.027	-0.006
2	1.175	-0.03	-0.49	0.11	-0.008	-0.036	-0.010
3	1.763	-0.04	-0.83	0.22	-0.013	-0.028	-0.011
4	2.350	-0.06	-1.00	0.34	-0.017	-0.002	-0.011
Member 20							
0	0.000	0.99	-1.04	-0.08	-0.064	0.005	-0.029
1	0.037	0.99	-1.03	-0.06	-0.089	0.006	-0.028
2	0.075	0.99	-1.03	-0.04	-0.114	0.006	-0.027
3	0.112	0.99	-1.03	-0.03	-0.139	0.006	-0.027
4	0.150	0.99	-1.02	-0.01	-0.165	0.007	-0.026
Member 21							
0	0.000	0.09	-1.43	0.08	0.065	-0.005	0.027
1	0.038	0.09	-1.44	0.06	0.091	-0.005	0.026
2	0.075	0.09	-1.44	0.05	0.117	-0.005	0.025
3	0.113	0.09	-1.44	0.03	0.143	-0.004	0.024
4	0.150	0.09	-1.45	0.02	0.169	-0.004	0.023
Member 22							
0	0.000	0.99	-1.02	0.01	0.165	0.007	0.026
1	0.300	0.99	-0.98	-0.07	0.165	0.010	0.005
2	0.600	0.98	-0.92	-0.06	0.165	0.014	-0.006
3	0.900	0.98	-0.84	-0.02	0.166	0.017	-0.007
4	1.200	0.98	-0.73	0.00	0.166	0.022	0.003
Member 23							
0	0.000	0.98	-0.73	0.00	0.166	0.022	0.003
1	0.300	0.97	-0.61	0.00	0.161	0.025	-0.005
2	0.600	0.97	-0.47	0.03	0.156	0.028	-0.005
3	0.900	0.96	-0.32	0.04	0.151	0.030	0.003
4	1.200	0.96	-0.16	-0.01	0.145	0.031	0.018
Member 24							

 Vale Consultancy CONSULTING CIVIL & STRUCTURAL ENGINEERS	IPO Newport Glass Roof Replacement	Job No	20603
		Job Ref	IPO
		Designed By	LM
		Checked By	MJ
		Date	27/01/2025
		Revision No	1.0
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Member Deflections (Global) for combination Comb1 (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Displacements (mm)			Slopes (°)		
		Axial	Normal	Lateral	Torsion	Normal	Lateral
0	0.000	0.96	-0.16	-0.01	0.145	0.031	0.018
1	0.353	0.95	0.03	-0.11	0.105	0.030	0.015
2	0.705	0.94	0.20	-0.20	0.064	0.025	0.013
3	1.058	0.94	0.32	-0.27	0.024	0.014	0.011
4	1.410	0.93	0.36	-0.34	-0.017	-0.002	0.011
Member 25							
0	0.000	2.71	-2.88	0.00	0.000	0.022	0.000
1	0.300	2.70	-2.74	0.00	0.000	0.032	0.000
2	0.600	2.69	-2.54	0.00	0.000	0.043	0.000
3	0.900	2.68	-2.29	0.00	0.000	0.054	0.000
4	1.200	2.66	-1.97	0.00	0.000	0.066	0.000
Member 26							
0	0.000	0.99	-1.02	-0.01	-0.165	0.007	-0.026
1	0.300	0.99	-0.98	0.07	-0.165	0.010	-0.005
2	0.600	0.98	-0.92	0.06	-0.165	0.014	0.006
3	0.900	0.98	-0.84	0.02	-0.166	0.017	0.007
4	1.200	0.98	-0.73	0.00	-0.166	0.022	-0.003
Member 27							
0	0.000	2.66	-1.97	0.00	0.000	0.066	0.000
1	0.300	2.65	-1.60	0.00	0.000	0.076	0.000
2	0.600	2.64	-1.18	0.00	0.000	0.083	0.000
3	0.900	2.63	-0.73	0.00	0.000	0.087	0.000
4	1.200	2.61	-0.28	0.00	0.000	0.087	0.000
Member 28							
0	0.000	0.98	-0.73	0.00	-0.166	0.022	-0.003
1	0.300	0.97	-0.61	0.00	-0.161	0.025	0.005
2	0.600	0.97	-0.47	-0.03	-0.156	0.028	0.005
3	0.900	0.96	-0.32	-0.04	-0.151	0.030	-0.003
4	1.200	0.96	-0.16	0.01	-0.145	0.031	-0.018
Member 29							
0	0.000	2.61	-0.28	0.00	0.000	0.087	0.000
1	0.353	2.60	0.24	0.00	0.000	0.080	0.000
2	0.705	2.58	0.68	0.00	0.000	0.062	0.000
3	1.058	2.56	0.97	0.00	0.000	0.031	0.000
4	1.410	2.54	1.03	0.00	0.000	-0.014	0.000
Member 30							
0	0.000	0.96	-0.16	0.01	-0.145	0.031	-0.018
1	0.353	0.95	0.03	0.11	-0.105	0.030	-0.015
2	0.705	0.94	0.20	0.20	-0.064	0.025	-0.013
3	1.058	0.94	0.32	0.27	-0.024	0.014	-0.011
4	1.410	0.93	0.36	0.34	0.017	-0.002	-0.011
Member 31							

 Vale Consultancy CONSULTING CIVIL & STRUCTURAL ENGINEERS	IPO Newport Glass Roof Replacement	Job No	20603
		Job Ref	IPO
		Designed By	LM
		Checked By	MJ
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Member Deflections (Global) for combination Comb1 (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Displacements (mm)			Slopes (°)		
		Axial	Normal	Lateral	Torsion	Normal	Lateral
0	0.000	0.32	-4.02	0.00	0.000	-0.012	0.000
1	0.300	0.31	-4.06	0.00	0.000	-0.001	0.000
2	0.600	0.29	-4.03	0.00	0.000	0.012	0.000
3	0.900	0.28	-3.93	0.00	0.000	0.027	0.000
4	1.200	0.27	-3.75	0.00	0.000	0.043	0.000
Member 32							
0	0.000	0.09	-1.45	-0.02	-0.169	-0.004	-0.023
1	0.300	0.09	-1.46	0.05	-0.171	0.000	-0.005
2	0.600	0.08	-1.45	0.05	-0.173	0.004	0.005
3	0.900	0.08	-1.42	0.02	-0.175	0.009	0.006
4	1.200	0.08	-1.36	0.00	-0.177	0.014	-0.001
Member 33							
0	0.000	0.09	-1.45	0.02	0.169	-0.004	0.023
1	0.300	0.09	-1.46	-0.05	0.171	0.000	0.005
2	0.600	0.08	-1.45	-0.05	0.173	0.004	-0.005
3	0.900	0.08	-1.42	-0.02	0.175	0.009	-0.006
4	1.200	0.08	-1.36	0.00	0.177	0.014	0.001
Member 34							
0	0.000	0.27	-3.75	0.00	0.000	0.043	0.000
1	0.300	0.26	-3.48	0.00	0.000	0.059	0.000
2	0.600	0.25	-3.14	0.00	0.000	0.072	0.000
3	0.900	0.23	-2.73	0.00	0.000	0.083	0.000
4	1.200	0.22	-2.27	0.00	0.000	0.092	0.000
Member 35							
0	0.000	0.08	-1.36	0.00	-0.177	0.014	-0.001
1	0.300	0.07	-1.27	0.00	-0.172	0.020	0.003
2	0.600	0.07	-1.15	-0.02	-0.168	0.025	0.003
3	0.900	0.06	-1.01	-0.03	-0.164	0.029	-0.002
4	1.200	0.06	-0.85	0.01	-0.159	0.033	-0.012
Member 36							
0	0.000	0.08	-1.36	0.00	0.177	0.014	0.001
1	0.300	0.07	-1.27	0.00	0.172	0.020	-0.003
2	0.600	0.07	-1.15	0.02	0.168	0.025	-0.003
3	0.900	0.06	-1.01	0.03	0.164	0.029	0.002
4	1.200	0.06	-0.85	-0.01	0.159	0.033	0.012
Member 37							
0	0.000	0.22	-2.27	0.00	0.000	0.092	0.000
1	0.393	0.20	-1.61	0.00	0.000	0.097	0.000
2	0.787	0.19	-0.97	0.00	0.000	0.089	0.000
3	1.180	0.17	-0.42	0.00	0.000	0.067	0.000
4	1.573	0.15	-0.08	0.00	0.000	0.029	0.000
Member 38							

 Vale Consultancy CONSULTING CIVIL & STRUCTURAL ENGINEERS	IPO Newport Glass Roof Replacement	Job No	20603
		Job Ref	IPO
		Designed By	LM
		Checked By	MJ
		Date	27/01/2025
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Member Deflections (Global) for combination Comb1 (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Displacements (mm)			Slopes (°)		
		Axial	Normal	Lateral	Torsion	Normal	Lateral
0	0.000	0.06	-0.85	0.01	-0.159	0.033	-0.012
1	0.393	0.05	-0.62	0.07	-0.118	0.035	-0.008
2	0.787	0.04	-0.38	0.12	-0.077	0.032	-0.005
3	1.180	0.04	-0.19	0.15	-0.036	0.024	-0.003
4	1.573	0.03	-0.08	0.16	0.006	0.006	-0.001
Member 39							
0	0.000	0.06	-0.85	-0.01	0.159	0.033	0.012
1	0.393	0.05	-0.62	-0.07	0.118	0.035	0.008
2	0.787	0.04	-0.38	-0.12	0.077	0.032	0.005
3	1.180	0.04	-0.19	-0.15	0.036	0.024	0.003
4	1.573	0.03	-0.08	-0.16	-0.006	0.006	0.001
Member 40							
0	0.000	-0.01	-0.81	0.28	0.033	-0.151	-0.051
1	1.500	0.00	-4.27	1.09	0.047	-0.095	-0.014
2	3.000	0.00	-5.29	1.15	0.062	0.018	0.007
3	4.500	0.00	-3.73	0.86	0.077	0.085	0.012
4	6.000	0.00	-2.18	0.68	0.092	0.000	0.000
Member 41							
0	0.000	0.00	-2.18	0.68	0.092	0.000	0.000
1	1.500	0.00	-3.73	0.86	0.077	-0.085	-0.012
2	3.000	0.00	-5.29	1.15	0.062	-0.018	-0.007
3	4.500	0.00	-4.27	1.09	0.047	0.095	0.014
4	6.000	0.01	-0.81	0.28	0.033	0.151	0.051
Member 42							
0	0.000	0.00	-1.28	0.46	0.014	-0.163	-0.067
1	1.500	0.00	-5.07	1.56	0.021	-0.107	-0.021
2	3.000	0.00	-6.38	1.71	0.028	0.008	0.006
3	4.500	0.00	-5.03	1.42	0.036	0.079	0.013
4	6.000	0.00	-3.56	1.20	0.043	0.000	0.000
Member 43							
0	0.000	0.00	-3.56	1.20	0.043	0.000	0.000
1	1.500	0.00	-5.03	1.42	0.036	-0.079	-0.013
2	3.000	0.00	-6.38	1.71	0.028	-0.008	-0.006
3	4.500	0.00	-5.07	1.56	0.021	0.107	0.021
4	6.000	0.00	-1.28	0.46	0.014	0.163	0.067
Member 44							
0	0.000	0.02	-1.37	0.48	-0.004	-0.165	-0.045
1	1.500	0.01	-5.21	1.26	-0.006	-0.109	-0.017
2	3.000	0.01	-6.58	1.46	-0.008	0.006	0.000
3	4.500	0.00	-5.28	1.36	-0.010	0.077	0.005
4	6.000	0.00	-3.83	1.27	-0.012	0.000	0.000
Member 45							



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Member Deflections (Global) for combination Comb1 (continued)

Analysis Type : Linear elastic

Interval no	Interval pos. (m)	Displacements (mm)			Slopes (°)		
		Axial	Normal	Lateral	Torsion	Normal	Lateral
0	0.000	0.00	-3.83	1.27	-0.012	0.000	0.000
1	1.500	0.00	-5.28	1.36	-0.010	-0.077	-0.005
2	3.000	-0.01	-6.58	1.46	-0.008	-0.006	0.000
3	4.500	-0.01	-5.21	1.26	-0.006	0.109	0.017
4	6.000	-0.02	-1.37	0.48	-0.004	0.165	0.045
Member 46							
0	0.000	0.01	-1.34	0.48	-0.007	-0.160	0.045
1	1.500	0.01	-5.10	-0.07	-0.011	-0.108	0.000
2	3.000	0.00	-6.46	0.28	-0.014	0.006	-0.023
3	4.500	0.00	-5.18	0.92	-0.018	0.076	-0.023
4	6.000	0.00	-3.74	1.27	-0.022	0.000	0.000
Member 47							
0	0.000	0.00	-3.74	1.27	-0.022	0.000	0.000
1	1.500	0.00	-5.18	0.92	-0.018	-0.076	0.023
2	3.000	0.00	-6.46	0.28	-0.014	-0.006	0.023
3	4.500	-0.01	-5.10	-0.07	-0.011	0.108	0.000
4	6.000	-0.01	-1.34	0.48	-0.007	0.160	-0.045
Member 48							
0	0.000	0.00	-1.07	0.58	-0.022	-0.152	0.066
1	1.500	0.00	-4.63	-0.24	-0.033	-0.100	0.001
2	3.000	0.00	-5.80	0.22	-0.044	0.012	-0.031
3	4.500	0.00	-4.39	1.11	-0.055	0.080	-0.032
4	6.000	0.00	-2.90	1.60	-0.066	0.000	0.000
Member 49							
0	0.000	0.00	-2.90	1.60	-0.066	0.000	0.000
1	1.500	0.00	-4.39	1.11	-0.055	-0.080	0.032
2	3.000	0.00	-5.80	0.22	-0.044	-0.012	0.031
3	4.500	0.00	-4.63	-0.24	-0.033	0.100	-0.001
4	6.000	0.00	-1.07	0.58	-0.022	0.152	-0.066
Member 50							
0	0.000	-0.01	-0.54	0.80	-0.031	-0.140	0.044
1	1.500	-0.01	-3.75	0.38	-0.045	-0.087	-0.007
2	3.000	0.00	-4.59	0.95	-0.059	0.023	-0.032
3	4.500	0.00	-2.92	1.81	-0.073	0.087	-0.029
4	6.000	0.00	-1.34	2.26	-0.087	0.000	0.000
Member 51							
0	0.000	0.00	-1.34	2.26	-0.087	0.000	0.000
1	1.500	0.00	-2.92	1.81	-0.073	-0.087	0.029
2	3.000	0.00	-4.59	0.95	-0.059	-0.023	0.032
3	4.500	0.01	-3.75	0.38	-0.045	0.087	0.007
4	6.000	0.01	-0.54	0.80	-0.031	0.140	-0.044



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Joint Displacements for Combination Comb1

Analysis Type : Linear elastic

Joint reference	Displacements (mm)			Rotations (°)		
	Dx	Dy	Dz	Rx	Ry	Rz
1	0.00	0.00	0.00	0.000	0.000	0.000
2	0.02	-0.01	0.00	0.000	0.004	-0.006
3	0.15	-0.33	-0.10	-0.002	0.002	-0.006
4	0.00	0.00	0.00	0.000	0.000	0.000
5	0.00	-0.08	-0.16	-0.005	-0.003	-0.006
6	0.47	-1.36	0.08	0.070	0.000	0.005
7	0.00	0.00	0.00	0.000	0.000	0.000
8	1.00	-0.06	-0.34	-0.011	0.017	-0.002
9	0.00	0.00	0.00	0.000	0.000	0.000
10	-0.04	-0.01	0.00	0.000	0.000	0.002
11	-0.04	-0.13	0.00	0.000	0.000	0.000
12	0.00	0.00	0.00	0.000	0.000	0.000
13	-0.10	-0.13	0.00	0.000	0.000	-0.029
14	1.25	-3.79	0.00	0.000	0.000	0.017
15	0.00	0.00	0.00	0.000	0.000	0.000
16	2.74	-0.12	0.00	0.000	0.000	-0.014
17	0.00	0.00	0.00	0.000	0.000	0.000
18	0.02	-0.01	0.00	0.000	-0.004	-0.006
19	0.15	-0.33	0.10	0.002	-0.002	-0.006
20	0.00	0.00	0.00	0.000	0.000	0.000
21	0.00	-0.08	0.16	0.005	0.003	-0.006
22	0.47	-1.36	-0.08	-0.070	0.000	0.005
23	0.00	0.00	0.00	0.000	0.000	0.000
24	1.00	-0.06	0.34	0.011	-0.017	-0.002
25	0.48	-1.34	0.01	0.160	-0.045	0.007
26	0.58	-1.07	0.00	0.152	-0.066	0.022
27	0.80	-0.54	-0.01	0.140	-0.044	0.031
28	1.27	-3.74	0.00	0.000	0.000	0.022
29	0.48	-1.34	-0.01	-0.160	0.045	0.007
30	1.60	-2.90	0.00	0.000	0.000	0.066
31	0.58	-1.07	0.00	-0.152	0.066	0.022
32	2.26	-1.34	0.00	0.000	0.000	0.087
33	0.80	-0.54	0.01	-0.140	0.044	0.031
34	1.27	-3.83	0.00	0.000	0.000	0.012
35	0.48	-1.37	0.02	0.165	0.045	0.004
36	0.48	-1.37	-0.02	-0.165	-0.045	0.004
37	1.20	-3.56	0.00	0.000	0.000	-0.043
38	0.46	-1.28	0.00	0.163	0.067	-0.014
39	0.46	-1.28	0.00	-0.163	-0.067	-0.014
40	0.68	-2.18	0.00	0.000	0.000	-0.092
41	0.28	-0.81	-0.01	0.151	0.051	-0.033
42	0.28	-0.81	0.01	-0.151	-0.051	-0.033



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Design Results Summary

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
1	2	SW Design	BS5950:2000		Passed
	3	SW Design	BS5950:2000		Passed
	4	SW Design	BS5950:2000		Passed
	5	SW Design	BS5950:2000		Passed
	6	SW Design	BS5950:2000		Passed
	7	SW Design	BS5950:2000		Passed
	8	SW Design	BS5950:2000		Passed
	9	SW Design	BS5950:2000		Passed
	10	SW Design	BS5950:2000		Passed
	11	SW Design	BS5950:2000		Passed
	12	SW Design	BS5950:2000		Passed
	13	SW Design	BS5950:2000		Passed
	14	SW Design	BS5950:2000		Passed
	15	SW Design	BS5950:2000		Passed
	16	SW Design	BS5950:2000		Passed
	17	SW Design	BS5950:2000		Passed
	18	SW Design	BS5950:2000		Passed
	19	SW Design	BS5950:2000		Passed
	20	SW Design	BS5950:2000		Passed
	21	SW Design	BS5950:2000		Passed
	22	SW Design	BS5950:2000		Passed
	23	SW Design	BS5950:2000		Passed
	24	SW Design	BS5950:2000		Passed
	25	SW Design	BS5950:2000		Passed
	26	SW Design	BS5950:2000		Passed
	27	SW Design	BS5950:2000		Passed
	28	SW Design	BS5950:2000		Passed
	29	SW Design	BS5950:2000		Passed
	30	SW Design	BS5950:2000		Passed
	31	SW Design	BS5950:2000		Passed
	32	SW Design	BS5950:2000		Passed
	33	SW Design	BS5950:2000		Passed
	34	SW Design	BS5950:2000		Passed
	35	SW Design	BS5950:2000		Passed
	36	SW Design	BS5950:2000		Passed
	37	SW Design	BS5950:2000		Passed
	38	SW Design	BS5950:2000		Passed
	39	SW Design	BS5950:2000		Passed
	40	SW Design	BS5950:2000		Passed
	41	SW Design	BS5950:2000		Passed
	42	SW Design	BS5950:2000		Passed
	43	SW Design	BS5950:2000		Passed
	44	SW Design	BS5950:2000		Passed

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Design Results Summary (continued)

Group reference	Design object			Comments	Design status
	Reference	Type	Code		
	45	SW Design	BS5950:2000		Passed
	46	SW Design	BS5950:2000		Passed
	47	SW Design	BS5950:2000		Passed
	48	SW Design	BS5950:2000		Passed
	49	SW Design	BS5950:2000		Passed
	50	SW Design	BS5950:2000		Passed
	51	SW Design	BS5950:2000		Passed
	52	SW Design	BS5950:2000		Passed

Steelwork Design Results

Desig object ref	Memb ref	Design parameter	Analysis section	Design section	Utilisation factors				Design status
					Local capacity	Lateral buckling	Torsion	Deflection	
Group Reference - 1									
2	1	defaults	254x254 UKC73		0.030	0.024	n / a	0.007	Passed
3	2	defaults	305x127 UKB37		0.050	0.042	n / a	0.042	Passed
4	3	defaults	305x127 UKB37		0.077	0.067	n / a	0.023	Passed
5	4	defaults	305x127 UKB37		0.026	0.059	n / a	0.013	Passed
6	5	defaults	305x127 UKB37		0.104	0.101	n / a	0.085	Passed
7	6	defaults	305x127 UKB37		0.018	0.041	n / a	0.097	Passed
8	7	defaults	305x127 UKB37		0.021	0.045	n / a	0.087	Passed
9	8	defaults	254x254 UKC73		0.069	0.035	n / a	0.012	Passed
10	9	defaults	305x127 UKB37		0.046	0.054	n / a	0.014	Passed
11	10	defaults	305x127 UKB37		0.109	0.106	n / a	0.013	Passed
12	11	defaults	305x127 UKB37		0.096	0.096	n / a	0.016	Passed
13	12	defaults	305x127 UKB37		0.276	0.275	n / a	0.233	Passed
14	13	defaults	305x127 UKB37		0.058	0.058	n / a	0.068	Passed
15	14	defaults	305x127 UKB37		0.062	0.062	n / a	0.052	Passed
16	15	defaults	254x254 UKC73		0.030	0.024	n / a	0.007	Passed
17	16	defaults	305x127 UKB37		0.050	0.042	n / a	0.042	Passed
18	17	defaults	305x127 UKB37		0.077	0.067	n / a	0.023	Passed
19	18	defaults	305x127 UKB37		0.026	0.059	n / a	0.013	Passed
20	19	defaults	305x127 UKB37		0.104	0.101	n / a	0.085	Passed
21	20	defaults	305x127 UKB37		0.018	0.041	n / a	0.097	Passed
22	21	defaults	305x127 UKB37		0.021	0.045	n / a	0.087	Passed

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Steelwork Design Results (continued)

Desig object ref	Memb ref	Design parameter	Analysis section	Design section	Utilisation factors				Design status
					Local capacity	Lateral buckling	Torsion	Deflection	
23	22	defaults	305x127 UKB37		0.059	0.063	n / a	0.048	Passed
24	23	defaults	305x127 UKB37		0.042	0.050	n / a	0.096	Passed
25	24	defaults	305x127 UKB37		0.100	0.078	n / a	0.074	Passed
26	25	defaults	305x127 UKB37		0.069	0.099	n / a	0.151	Passed
27	26	defaults	305x127 UKB37		0.059	0.063	n / a	0.048	Passed
28	27	defaults	305x127 UKB37		0.071	0.071	n / a	0.283	Passed
29	28	defaults	305x127 UKB37		0.042	0.050	n / a	0.096	Passed
30	29	defaults	305x127 UKB37		0.255	0.255	n / a	0.186	Passed
31	30	defaults	305x127 UKB37		0.100	0.078	n / a	0.074	Passed
32	31	defaults	305x127 UKB37		0.098	0.117	n / a	0.045	Passed
33	32	defaults	305x127 UKB37		0.049	0.064	n / a	0.015	Passed
34	33	defaults	305x127 UKB37		0.049	0.064	n / a	0.015	Passed
35	34	defaults	305x127 UKB37		0.099	0.099	n / a	0.247	Passed
36	35	defaults	305x127 UKB37		0.033	0.054	n / a	0.084	Passed
37	36	defaults	305x127 UKB37		0.033	0.054	n / a	0.084	Passed
38	37	defaults	305x127 UKB37		0.205	0.153	n / a	0.279	Passed
39	38	defaults	305x127 UKB37		0.095	0.071	n / a	0.098	Passed
40	39	defaults	305x127 UKB37		0.095	0.071	n / a	0.098	Passed
41	40	defaults	200x100x5.0 RHS		0.151	0.093	n / a	0.130	Passed
42	41	defaults	200x100x5.0 RHS		0.151	0.093	n / a	0.130	Passed
43	42	defaults	200x100x5.0 RHS		0.147	0.096	n / a	0.135	Passed
44	43	defaults	200x100x5.0 RHS		0.147	0.096	n / a	0.135	Passed
45	44	defaults	200x100x5.0 RHS		0.142	0.092	n / a	0.136	Passed
46	45	defaults	200x100x5.0 RHS		0.142	0.092	n / a	0.136	Passed
47	46	defaults	200x100x5.0 RHS		0.150	0.095	n / a	0.134	Passed
48	47	defaults	200x100x5.0 RHS		0.150	0.095	n / a	0.134	Passed
49	48	defaults	200x100x5.0 RHS		0.158	0.099	n / a	0.130	Passed
50	49	defaults	200x100x5.0 RHS		0.158	0.099	n / a	0.130	Passed
51	50	defaults	200x100x5.0 RHS		0.163	0.095	n / a	0.125	Passed
52	51	defaults	200x100x5.0 RHS		0.163	0.095	n / a	0.125	Passed