



Prime Scaffold and
Structural Designs Limited

DESIGN CALCULATIONS

Date:

24-10-2025

Client:

Industrial Abseiling Ltd

Title:

Scaffold Banner Frame

Site:

Portland House, Manchester

Calculation No.

IA-14542-1-CAL-1 D

Drawing No:

IA-14542-1-DRG-1 D

Prepared By:

Jack Courtney-Morris

Checked By:

Vipin Bariya



Calculation No:	IA-14542-1-CAL-1 D	Date:	24-10-2025	 0204 581 5020 www.psd.uk.com The Beechwood Centre Office Suite 9, 40 Lower Gravel Road Bromley BR2 8GP Prime Scaffold and Structural Designs Limited   
Drawing No:	IA-14542-1-DRG-1 D	Client:	Industrial Abseiling Ltd	
Title:	Scaffold Banner Frame	Prepared By:	Jack Courtney-Morris	
Site:	Portland House, Manchester	Checked By:	Vipin Bariya	

CONTENTS PAGE

Page:

- Contents Page
- Design load information sheet
- Design Risk Assessment
- Design Calculations
 - 1. General Information
 - 2. Wind loadings on banner
 - 3. Banner check
 - 4. Connection Load
 - 5. Structure Summary

Appendix A – Wind data

Calculation No:	IA-14542-1-CAL-1 D	Date:	24-10-2025	 0204 581 5020 www.psd.uk.com The Beechwood Centre Office Suite 9, 40 Lower Gravel Road Bromley BR2 8GP Prime Scaffold and Structural Designs Limited   
Drawing No:	IA-14542-1-DRG-1 D	Client:	Industrial Abseiling Ltd	
Title:	Scaffold Banner Frame	Prepared By:	Jack Courtney-Morris	
Site:	Portland House, Manchester	Checked By:	Vipin Bariya	

DESIGN LOAD INFORMATION SHEET

Scaffold Tube

Tube refers to Type 4 steel galvanised scaffold tube conforming to BSEN39 with a minimum yield stress of 235N/mm², an outside diameter of 48.3mm with a wall thickness of 4.0mm.

Self weight	4.37kg/m	(As NASC TG20:21, Guide to good practice for scaffolding
Moment Capacity	1.12kN.m	with tube and fittings, Table 5.9)

Axial Load

Effective Length (Le) (M)	Safe Axial Load (Pc) (kN)	(As NASC TG20:21, Guide to good practice for scaffolding with tube and fittings, Table 5.10) All Tubes used in this design considered 'As New Tube'
1.20	51.90	
1.40	45.30	
1.60	39.20	
1.80	33.70	
2.00	29.10	
2.20	25.30	
2.40	22.00	
2.60	19.30	
2.80	17.10	
3.00	15.20	
3.20	13.60	

Couplers

Type	SWL (kN)	Self weight (kg)	(As NASC TG20:21, Guide to good practice for scaffolding with tube and fittings, Table 5.15)
Right Angle (Class A)	6.1	1.2	
Right Angle (Class B)	9.1	1.2	
Swivel Coupler (Class A)	6.1	1.2	
Swivel Coupler (Class B)	9.1	1.2	
Sleeve (Class A)	3.6 (Tension)		
Sleeve (Class B)	5.5 (Tension)		

Scaffold Boards

225 x 38mm timber scaffold boards (38-1.2m)	(As NASC TG20:21 Guide to good practice for scaffolding with tube and fittings, Table 5.8)
---	--

Moment Capacity	0.475kN.m	(Load Applied acts on an individual board)
	0.61kN.m	(Load Applied is spread uniformly across min of 4 boards)

The following calculations are completed using Permissible Stress Method.

Calculation No.	IA-14542-1-CAL-1 D	Date:	24-10-2025	 0204 581 5020 www.psd.uk.com The Beechwood Centre Office Suite 9, 40 Lower Gravel Road Bromley BR2 8GP Prime Scaffold and Structural Designs Limited
Drawing No:	IA-14542-1-DRG-1 D	Client:	Industrial Abseiling Ltd	
Title:	Scaffold Banner Frame	Prepared By:	Jack Courtney-Morris	
Site:	Portland House, Manchester	Checked By:	Vipin Bariya	

DESIGN RISK ASSESSMENT

Ref.	Hazard Source	Risk Category	Preventive/Control Measures (See latest revisions/issue for all standards noted)	Residual Risk
1	Working at Height	HIGH RISK	Scaffolders must comply with procedures in NASC guidance SG4: as a minimum precaution. Approved method statement to outline a safe method of erection and dismantling of scaffold. Consider collective fall prevention measures ahead of personal fall arrest equipment. Scaffold Contractor to provide approved RAMS as outlined in NASC guidance SG7:	LOW RISK
2	Competence	HIGH RISK	Only competent, trained persons should erect scaffold materials, this falls under the scaffold contractors area of responsibility.	LOW RISK
3	Manual Handling	HIGH RISK	The working area to be segregated and the manual handling regulations should be adhered to at all times by scaffolders, including correct lifting & lifting aid procedures in NASC guidance SG6:	LOW RISK
4	Erection / Dismantling / Altering	HIGH RISK	Only competent, trained persons should Erect, Dismantle & Alter scaffold materials in accordance with NASC guidance SG4; this falls under the scaffold contractors area of responsibility. Scaffold Contractor to provide approved RAMS as outlined in NASC guidance SG7:	LOW RISK
5	Electricity[man made/natural]	HIGH RISK	Only trained, competent persons are to install, use & maintain electrical equipment. The installation of earthing is also to be carried out by suitably qualified persons.	LOW RISK
6	Environmental Conditions	HIGH RISK	The scaffold contractor should make his own site-specific risk assessment with the client as to whether the scaffold can be used during periods of inclement weather, [wind, rain & snow].	LOW RISK
7	Fire Exposure	HIGH RISK	Ensure all personnel at the site are aware of evacuation procedures/routes off the scaffold, clearly sign the fire escape route and consider erection of an emergency stair tower exit.	LOW RISK

Calculation No.	IA-14542-1-CAL-1 D	Date:	24-10-2025	<div><div>0204 581 5020 www.psd.uk.com The Beechwood Centre Office Suite 9, 40 Lower Gravel Road Bromley BR2 8GP Prime Scaffold and Structural Designs Limited</div><div></div></div>			
Drawing No:	IA-14542-1-DRG-1 D	Client:	Industrial Abseiling Ltd				
Title:	Scaffold Banner Frame	Prepared By:	Jack Courtney-Morris				
Site:	Portland House, Manchester	Checked By:	Vipin Bariya				
8	General Use/Loading	HIGH RISK	The design drawings will clearly indicate the loading limitations of the specific scaffold which should be adhered to at all times, any deviation must be at the consent of the scaffold contractor and/or Prime Scaffold and Structural Designs Ltd. An external assessment to be carried out to approve the existing structure/foundation's suitability.		LOW RISK		
9	Materials	HIGH RISK	All materials must be checked prior to installation and should meet the requirements of TG20: Design has been completed using BSEN Type 4 Steel tubes. Where 3.2mm wall tube is to be used PSD must be informed prior to works being carried out.		LOW RISK		
10	Obstructions	HIGH RISK	A min. width of 600mm should be maintained on the working platform, free of obstacles & in accordance with BS EN 12811-1. Ensure clear and safe access is provided for scaffold erection and dismantling.		LOW RISK		
11	Stability Issues	HIGH RISK	Attention must be given to anchor & kentledge details shown on the design drawings. Inspection of these two areas must be detailed ensuring correct installation & testing in accordance with NASC document TG4.		LOW RISK		
12	Public	HIGH RISK	Sites are to be securely fenced off & appropriately protected to best prohibit access and provide protection to the public at all times. Scaffold Contractor to consider protection to public and others during the scaffold works, see NASC guidance SG34: and TG20: Operational Guide.		LOW RISK		
13	Welfare/First Aid	HIGH RISK	All aspects of Health & Safety should be addressed by the main contractor in accordance with the Health & Safety Act. Site should always have first aiders & kit on site at all times.		LOW RISK		
14	Existing ground & structure capacity	HIGH RISK	The main contractor is responsible for ensuring that the footings and existing structure are capable of withstanding the imposed loads. The design drawing highlights the maximum loads.		MEDIUM RISK		
		The Following symbol is used on Design Drawings to identify where residual risks remain in the scaffold design		HIGH RISK	MEDIUM RISK	LOW RISK	
				TAKEN TO MITIGATE RISK ACTION TO BE	RISK TO BE NOTED WITHIN DESIGN	NO ACTION REQUIRED	

Calculation No:	IA-14542-1-CAL-1 D	Date:	24-10-2025	 0204 581 5020 www.psd.uk.com The Beechwood Centre Office Suite 9, 40 Lower Gravel Road Bromley BR2 8GP Prime Scaffold and Structural Designs Limited
Drawing No:	IA-14542-1-DRG-1 D	Client:	Industrial Abseiling Ltd	
Title:	Scaffold Banner Frame	Prepared By:	Jack Courtney-Morris	
Site:	Portland House, Manchester	Checked By:	Vipin Bariya	

1 **General Information:**

Calculations are to be completed for the proposed banner frame at Portland House, 103A Portland St, M1 6DF

The banner will be fixed to the existing scaffold.
Scaffold to be checked by others.

Banner Frame (BF) – steel tubes connected with Kee Clamps to make an overall frame, attached to existing stand by Load Bearing Couplers.

Banner – a banner material, that wraps around the BF via Bungees and Cable Ties through Eyelets. Both eyelets and banner material are to be built to withstand loads, and affixed, as stipulated in BFD. Banner material is stipulated in BF of PVC.

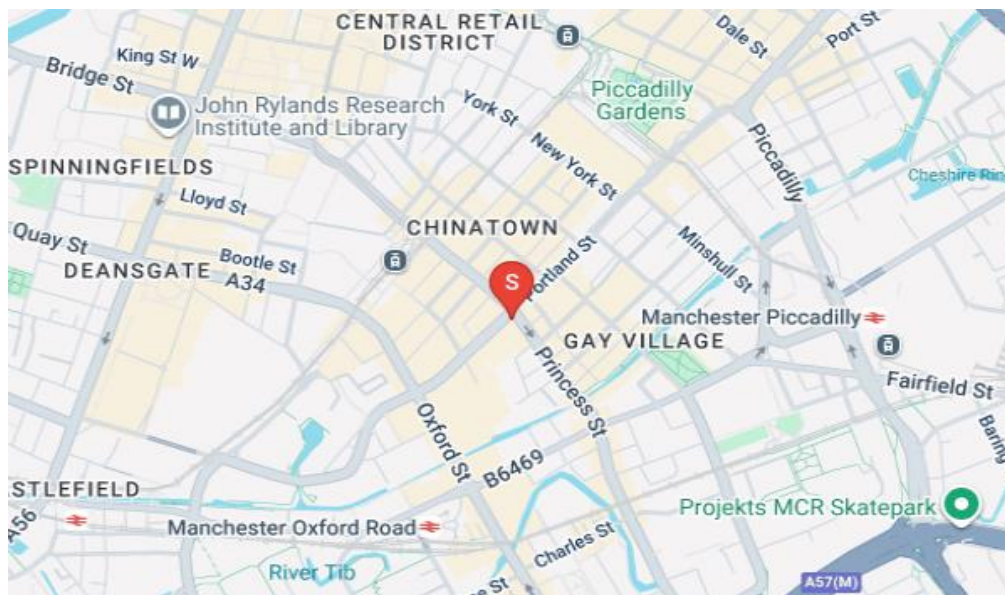
Any alternative to be agreed in advance, with prior consent.

Bungees – 8mm/10mm bungee cords, designed to take those loads stipulated in the BFD, which will give as a fail-safe in event of extreme wind.

Location:

Scaffold Location = Portland House, 103A Portland St, M1 6DF
Grid ref = SJ 84158 97876

Appendix A



Calculation No:	IA-14542-1-CAL-1 D	Date:	24-10-2025	 0204 581 5020 www.psd.uk.com The Beechwood Centre Office Suite 9, 40 Lower Gravel Road Bromley BR2 8GP Prime Scaffold and Structural Designs Limited   
Drawing No:	IA-14542-1-DRG-1 D	Client:	Industrial Abseiling Ltd	
Title:	Scaffold Banner Frame	Prepared By:	Jack Courtney-Morris	
Site:	Portland House, Manchester	Checked By:	Vipin Bariya	

2 Wind loadings on banner

Location: Portland House, 103A Portland St, M1 6DF

Grid Ref: SJ 84158 97876

Max Height (Banner): 9.00 m

Max Height From Ground 13.00 m

Velventi used to determine Peak Velocity Pressure.

Peak Velocity Pressure: = 0.562 kN/m²

C_{pe} = 1

Solidity = 1 (Solid)

Design wind pressure = 0.562 kN/m²

3 Banner check

Banner Length = 32 m

Banner Height = 9 m

3.1 Load in Bungees

Perimeter

Wind load = 0.562 kN/m²

Load area of each bungee = 0.3 m spacing

Width = 4.5 m

Load in each bungee = **0.76 kN**

Calculation No.	IA-14542-1-CAL-1 D	Date:	24-10-2025	 0204 581 5020 www.psd.uk.com The Beechwood Centre Office Suite 9, 40 Lower Gravel Road Bromley BR2 8GP Prime Scaffold and Structural Designs Limited   
Drawing No:	IA-14542-1-DRG-1 D	Client:	Industrial Abseiling Ltd	
Title:	Scaffold Banner Frame	Prepared By:	Jack Courtney-Morris	
Site:	Portland House, Manchester	Checked By:	Vipin Bariya	

3.2 Top & Bottom Rails

Wind load on edges = 0.562 kN/m²

Load area of tube = 4.5 m width

Max UDL = 2.53 kN/m

Span = 2 m

Bending Moment = 1.01 kNm

SWL of 48.3mm Scaffold tube = 1.12 kNm

1.12 kNm	>	1.01 kNm	OK
----------	---	----------	-----------

Connection load = **5.6 kN**

SWL of a class B coupler = 9.1 kN

9.1 kN	>	5.6 kN	OK
--------	---	--------	-----------

3.3 End Frames

Wind load on edges = 0.562 kN/m²

Load area of tube = 4.5 m width

Max UDL = 2.53 kN/m

Span = 2 m

Bending Moment = 1.01 kNm

SWL of 48.3mm Scaffold tube = 1.12 kNm

1.12 kNm	>	1.01 kNm	OK
----------	---	----------	-----------

Connection load = **5.56 kN**

SWL of a class B coupler = 9.1 kN

9.1 kN	>	5.6 kN	OK
--------	---	--------	-----------

Calculation No.	IA-14542-1-CAL-1 D	Date:	24-10-2025	 0204 581 5020 www.psd.uk.com The Beechwood Centre Office Suite 9, 40 Lower Gravel Road Bromley BR2 8GP Prime Scaffold and Structural Designs Limited   
Drawing No:	IA-14542-1-DRG-1 D	Client:	Industrial Abseiling Ltd	
Title:	Scaffold Banner Frame	Prepared By:	Jack Courtney-Morris	
Site:	Portland House, Manchester	Checked By:	Vipin Bariya	

3.4 Corners

$$\begin{aligned} \text{Connection load} &= 0.562 \text{ kN/m}^2 \times 4.5 \text{ m width} / 2 \times 2 \text{ m} / 2 \\ &= \mathbf{1.3 \text{ kN}} \end{aligned}$$

$$\begin{aligned} \text{Connection load} &= 0.562 \text{ kN/m}^2 \times 4.5 \text{ m width} / 2 \times 2 \text{ m} / 2 \\ &= \mathbf{1.3 \text{ kN}} \end{aligned}$$

$$\text{Combined Corner load} = \mathbf{2.5}$$

$$\text{SWL of a class B coupler} = 9.1 \text{ kN}$$

9.1 kN	>	2.5 kN	OK
--------	---	--------	-----------

4 Connection Load:

$$\text{Dynamic pressure from wind} = \text{Velventi wind analysis}$$

$$\text{Location} = \text{SJ 84158 97876}$$

$$\text{Max Connection Load} = 5.56 \text{ kN}$$

$$\text{SWL of a class B coupler} = 9.1 \text{ kN}$$

9.1 kN	>	5.6 kN	OK
--------	---	--------	-----------

BSEN1991-1-4

Calculation No:	IA-14542-1-CAL-1 D	Date:	24-10-2025	 0204 581 5020 www.psd.uk.com The Beechwood Centre Office Suite 9, 40 Lower Gravel Road Bromley BR2 8GP Prime Scaffold and Structural Designs Limited   
Drawing No:	IA-14542-1-DRG-1 D	Client:	Industrial Abseiling Ltd	
Title:	Scaffold Banner Frame	Prepared By:	Jack Courtney-Morris	
Site:	Portland House, Manchester	Checked By:	Vipin Bariya	

5 **Structure Summary:**

All loads indicated should be used to ensure all banner fixing method use suitable components with load bearing coupler capacity indicated.

All bungee fixings and banner details are to be confirmed by supplier / manufactures.

Connection loads have been indicated on drawing / calcs.
Main contractor to ensure the structure is capable of withstanding loads imposed

END OF CALCULATIONS

Calculation No:	IA-14542-1-CAL-1 D	Date:	24-10-2025	 0204 581 5020 www.psd.uk.com The Beechwood Centre Office Suite 9, 40 Lower Gravel Road Bromley BR2 8GP Prime Scaffold and Structural Designs Limited   
Drawing No:	IA-14542-1-DRG-1 D	Client:	Industrial Abseiling Ltd	
Title:	Scaffold Banner Frame	Prepared By:	Jack Courtney-Morris	
Site:	Portland House, Manchester	Checked By:	Vipin Bariya	

Appendix A Wind data

Description	Value
Site location	53.477370°N -2.240161°E
Fundamental basic wind velocity, $V_{b,map}$ (m/s)	22.7
Site altitude, A (m)	49
Seasonal factor is based on all year.	
Probability factor, C_{prob}	0.83 *
Altitude factor, C_{alt}	1.049
Orography	Not significant
The site is in town terrain	
Distance inside town terrain (km)	1.66
Effective height, z_e (m)	13.0
Exposure correction factor, $C_{e,T}$	0.92
Peak velocity, V_p (m/s)	30.3

(Figure NA.1)

(NA.2.8)

(NA.2.5)

(A.5)

(Figure NA.8)

Description	Value
OS grid reference	SJ 84158 97876
Structure height, h (m)	13.00
Structure orientation from North (°N)	0
Seasonal factor, C_{season}	1.00
Directional factor, C_{dir}	1.00
Local effects factor, K_f	1.00
Orography factor, C_o	1.000
Distance to shoreline (km)	32.26
Displacement height, h_{dis} (m)	0.0
Exposure factor, C_e	2.57
Zone for size factor, C_s	C
Peak velocity pressure, q_p (kN/m ²)	0.562

(Table NA.2)

(Table NA.1)

(A.3(4))

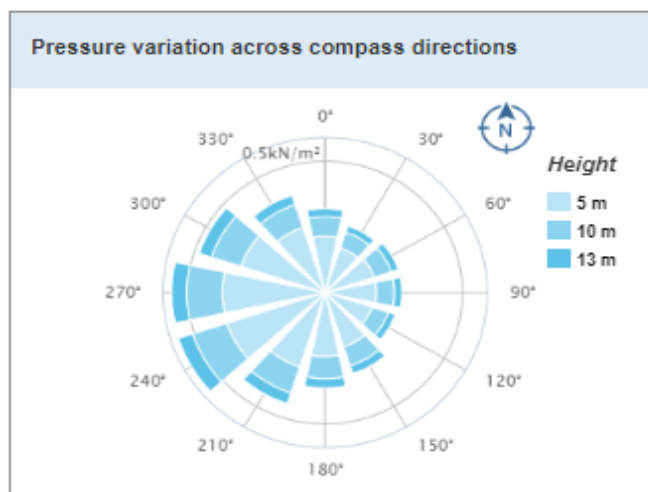
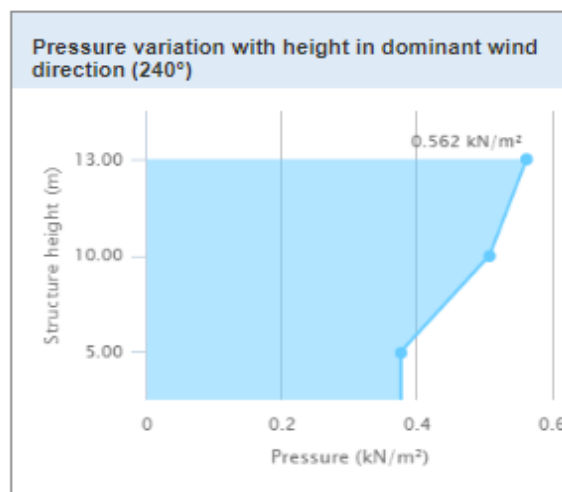
(A.3)

(A.5)

(Figure NA.7)

(NA.8)

(NA.2.17)



Peak velocity pressure variation with height across all wind directions