Prime Scaffold and Structural Designs Limited

DESIGN CALCULATIONS

Date:	10/10/2022
Client:	Titchfield Group
Title:	Scaffold access
Site:	Fraser House, Manchester
Calculation No.	9989-1 G
Drawing No:	9989-1G & 3
Prepared By:	M.Nilforooshan
Checked By:	V.Bariya

Titchfield GROUP

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6 Design Calculations

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9989-1G & 3

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NA

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A *Wind Assessment*

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 with tube and fittings, Table 5.9)*
Moment Capacity	1.12kN.m	

Axial Load

Effective Length (Le) (M)	**Safe Axial Load (Pc)** (kN)
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

(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'

Couplers

Type	**SWL** (kN)	**Self weight** (Kg)
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 (T)	
Sleeve (Class B)	5.5 (T)	

(As NASC TG20:21, Guide to good practice for scaffolding with tube and fittings, Table 5.15)

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)*

Lattice Beams

Ladder Beam *Restraints @ 1.2m Centres*
Moment Capacity 12.5kN.m
Shear Capacity 12.5kN

Steel Unit Beam *Restraints @ 1.2m Centres*
Moment Capacity 27.7kN.m
Shear Capacity 15.6kN

Hakitec 750 Aluminium Beam *Restraints @ 1.0m Centres*
Moment Capacity 41.3kN.m
Shear Capacity 30.6kN
Selfweight 7.5Kg/m

Dessa 780 Aluminium Beam *Restraints @ 1.0m Centres*
Moment Capacity 38.84kN.m
Shear Capacity 23.71kN
Selfweight 8.17Kg/m

Dessa 790 Aluminium Beam *Restraints @ 1.0m Centres*
Moment Capacity 41.92kN.m
Shear Capacity 23.71kN
Selfweight 6.78kg/m

Dessa 1300 Aluminium Beam *Restraints @ 1.0m Centres*
Moment Capacity 102.61kN.m
Shear Capacity 42.1kN
Selfweight 13.33Kg/m

ASP/UBIX 780 Aluminium Beam *Restraints @ 1.0m Centres*
Moment Capacity 36.5kN.m
Shear Capacity 30.7kN
Selfweight 6.5Kg/m

Apollo 750 X Beam Aluminium *Restraints @ 1.0m Centres*
Moment Capacity 37.0kN.m Minimum values
Shear Capacity 35.0kN Minimum values
Selfweight 6.7Kg/m

Layher 750 Aluminium Beam *Restraints @ 1.0m Centres*
Moment Capacity 36.8kN.m V' Arrangement
Shear Capacity 17.0kN
Selfweight 6.5Kg/m

Layher 450 Aluminium Beam *Restraints @ 1.0m Centres*
Moment Capacity 13.94kN.m
Shear Capacity 12.32kN
Selfweight 5.1Kg/m

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FOR ALL BEAM TYPES - REFER TO MANUFACTURERS INFORMATION FOR MORE DETAILS

DESIGN RISK ASSESSMENT

Hazard 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 consider protection to public and others during the scaffold works, see NASC guidance SG34: and TG20: Operational Guide.*	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 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 site are aware of evacuation procedures/routes off the scaffold, clearly sign the fire escape route, consider erection of emergency stair tower exit.*	LOW RISK
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 PSD (south east) Ltd. An external assessment to be carried out to approve existing structure/foundation suitability.*	LOW RISK
9	Materials	HIGH RISK	*All materials must be checked prior to installation and should meet the requirements of TG20:*	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 by the public to site. Scaffold Contractor to provide approved RAMS as outlined in NASC guidance SG7:*	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

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	The Following symbol is used on Design Drawings to identify where residual risks remain in the scaffold design.	HIGH RISK	MEDIUM RISK	LOW RISK	
		ACTION TO BE TAKEN TO MITIGATE RISK	RISK TO BE NOTED WITHIN DESIGN	NO ACTION REQUIRED	

1 General Information:

5-3 Access scaffold to be erected at Fraser House. Scaffold to be erected in accordance with TG20:21 and SG4:15.

Bridgings section by the entrances. All Beams to be laced & braced.

Scaffold to be tied back to the existing brick works.

2 Loading Considerations:

Maximum 2no working levels at any one time on access scaffold.

Load Class	=	4
1No. Working Level	=	3.00 kN/m²
1No. Working Level	=	1.50 kN/m²

Inside boards rated at 3.0kN/m² on 1no working level and 0.75kN/m² on 1no working level.

Loading Gantry rated at 10kN/m² on 1no working levels

Check concentrated load of 1.5kN on area of 500mm x 500mm

Self weight of boards @ 0.25kN/m²

Wind loads will be assessed on the scaffold in accordance with BSEN1991-1-4.

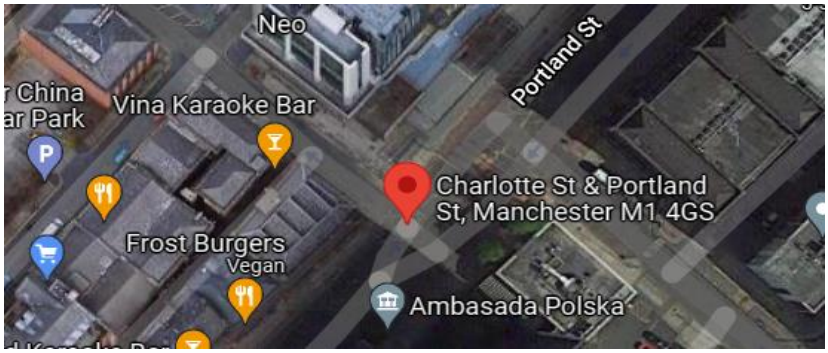
No snow loadings are to be allowed for or checked on the scaffold.

Combined selfweights and live loads will be checked in the supporting scaffold components.

3 Location:

Address: Portland St & Charlotte St corner, Manchester, M1 4GS

Grid reference = SJ842980



4 Scaffold Components

Max imposed load = 3.00 kN/m²

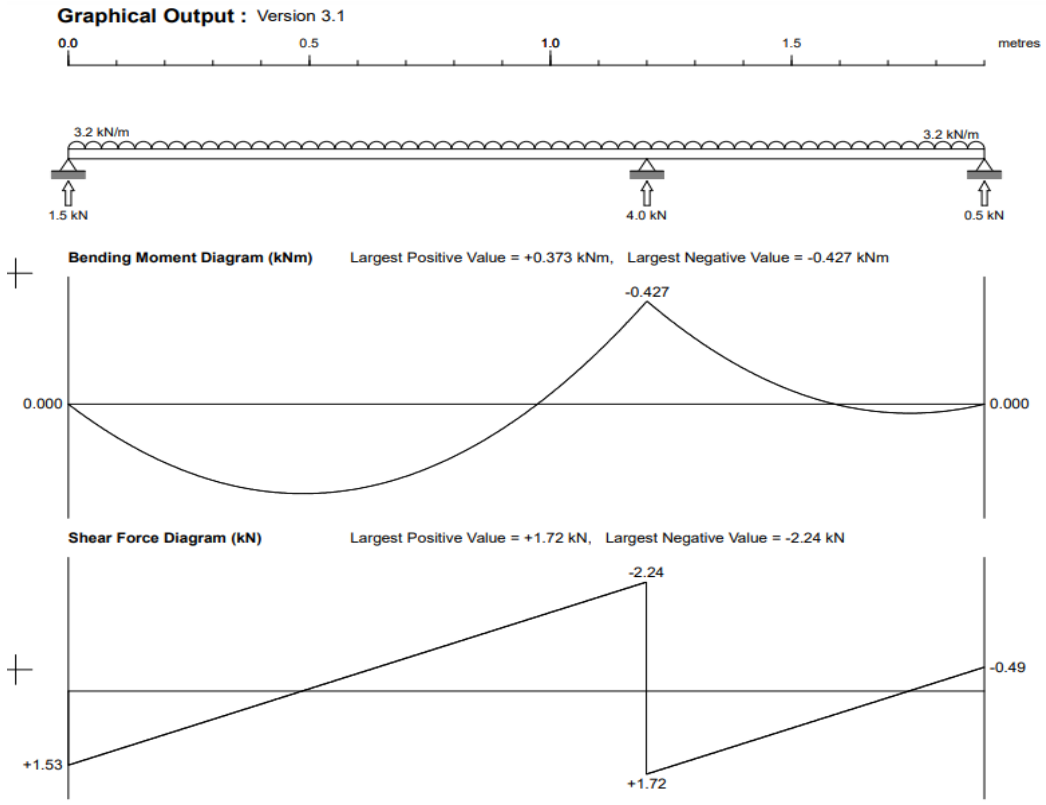
4.1 Boards

Scaffold Board Span		=	0.9	m	
Width		=	0.225	m	
Imposed load		=	3	kN/m²	
	UDL	=	0.675	kN/m	
Weight of boarding		=	0.5	kN/m²	
	UDL	=	0.1125	kN/m	
Total UDL		=	0.79	kN/m	
Concentrated load		=	1.5	kN	
Mo due to UDL		=	0.7875*0.9*0.9/8		
		=	**0.080**	**kNm**	
Mo due to Concentrated load		=	(1.5*0.9/4)+(0.1125*0.9*0.9/8)		
		=	**0.349**	**kNm**	
RM of scaffold board		=	0.475	kNm	TG20:21

0.475	≥	0.349	OK

4.2 Transoms

Transom Span		=	1.9	m
Centres		=	0.9	m
Imposed load		=	3	kN/m²
	UDL	=	2.7	kN/m
Weight of boarding		=	0.50	kN/m²
	UDL	=	0.45	kN/m
Total UDL		=	3.15	kN/m

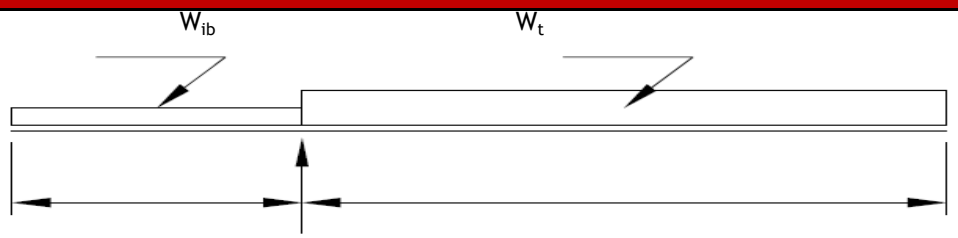


Max Mo	=	**0.43**	**kNm**	
RM of scaffold tube	=	1.12	kNm	TG20:21

1.12	≥	0.43	OK

4.3 Ledgers (With Inside Board)

Max Ledger Span (L)	=	1.8	m
Max Transom Span (L_t)	=	1.20	m
Max Transom Centres (L_t)	=	0.90	m
No. of Transoms per Ledger Span	=	1	No.
Effective Platform Inside Width (L_{ib})	=	0.70	m



0.7 m **R** 1.20 m

Reaction R at inside ledger:

R	=	4.00	kN			
Load from spur	=	0.5 / Cos (20)				
	=	0.47	kN			
Total Load	=	4.5	kN			
Bending moment of the ledger	=	1.61	kN.m	As continues		
BM Capacity in Type 4 Steel Tube	=	1.12	kNm	(As New Tube)	[2no]	(TG20:21)

2.24	≥	1.61	kNm	OK

4.4 Connection

Ledger connection to standard is govenered by the slip capacity of the couplers used.

Load on Connection	=	4.47	kN	
Capacity of Coupler	=	9.1	kN	(Class B)

9.1	≥	4.47	kN	OK

5.0 Leg Load

Scaffold Components	
Tube(kg/m)=	4.37
Fittings(kg/fitt)=	1.50
Boards(kg/m^2)=	25.00
Scaffold Information per Lift	
Main Boards (no)=	5.00
Inside Boards (no)=	3.00
Width of scaffold (m) =	1.125
Inside width (m) =	0.675
Bay Length (m)=	2.00
Lift Height (m)=	2.000

Effective Lift Height (m)=	2.478			
Actual No of Lifts (no)=	9.00			
Boarded Lifts (no)=	10.00			
Working Lifts (no)=	2.00			
	1st	2nd	3rd	4th
Imposed Load on Main Run (kN/m^2)=	3.00	1.5		
Imposed Load on Inside Run (kN/m^2)=	3.00	0.75		
Inside Hand Rails (no)=	2.00			
Inside Toe board(no)=	1.00			
Outside Hand Rails (no)=	2.00			
Section Bracing (no)=	1.00			
Inner Sway Bracing (no)=	0.00			
Outer Sway Bracing (no)=	1.00			
Additional Inner Leg Load (kN)=	0.00			
Additional Outer Leg Load (kN)=	0.00			

	Main Frame			
	Tub.Fit.	Boards	Imposed	Total
Total Inner Leg Load (kN)=	5.92	7.17	10.13	23.22
Total Outer Leg Load (kN)=	6.12	3.86	5.06	15.05

6.0 Leg Load

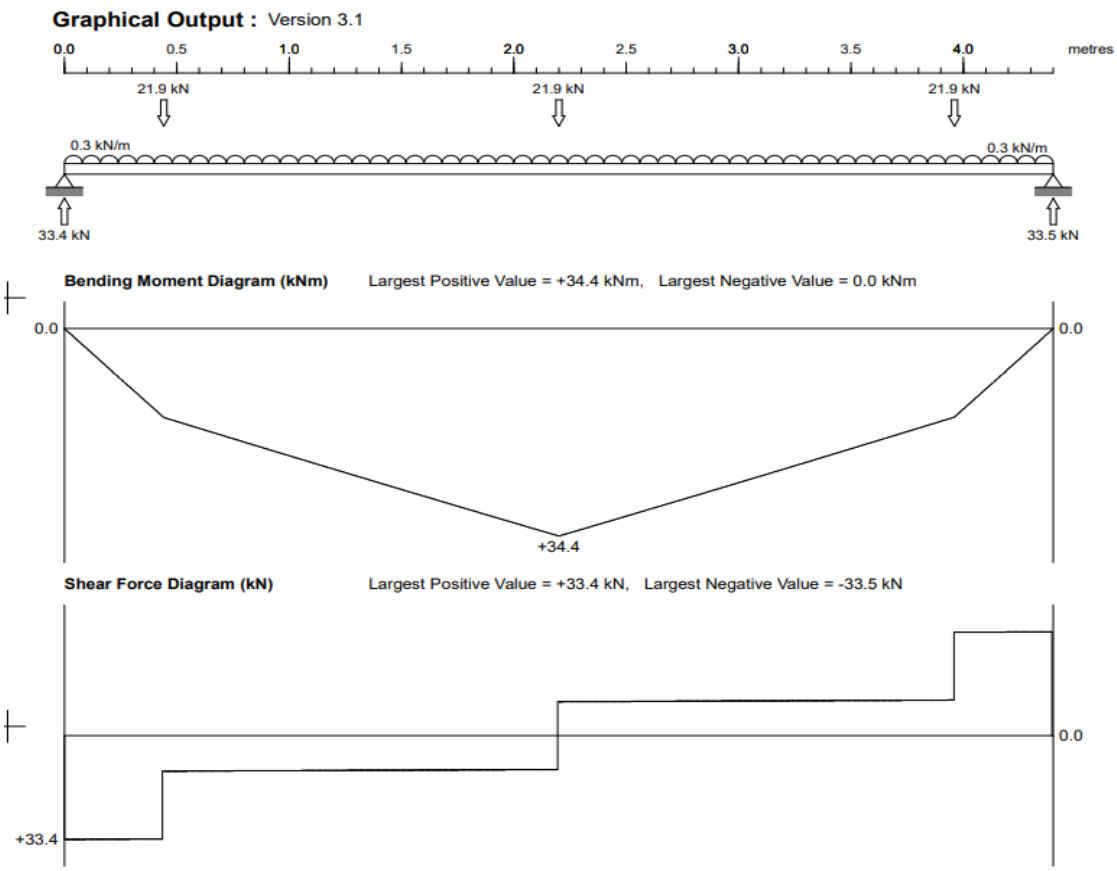
Scaffold Components				
Tube(kg/m)=	4.37			
Fittings(kg/fitt)=	1.50			
Boards(kg/m^2)=	25.00			
Scaffold Information per Lift				
Main Boards (no)=	5.00			
Inside Boards (no)=	3.00			
Width of scaffold (m) =	1.125			
Inside width (m) =	0.675			
Bay Length (m)=	2.00			
Lift Height (m)=	2.000			
Effective Lift Height (m)=	2.478			
Actual No of Lifts (no)=	8.00			
Boarded Lifts (no)=	9.00			
Working Lifts (no)=	2.00			
	1st	2nd	3rd	4th
Imposed Load on Main Run (kN/m^2)=	3.00	1.5		
Imposed Load on Inside Run (kN/m^2)=	3.00	0.75		
Inside Hand Rails (no)=	2.00			
Inside Toe board(no)=	1.00			
Outside Hand Rails (no)=	2.00			
Section Bracing (no)=	1.00			
Inner Sway Bracing (no)=	0.00			
Outer Sway Bracing (no)=	1.00			
Additional Inner Leg Load (kN)=	0.00			
Additional Outer Leg Load (kN)=	0.00			

	Main Frame			
	Tub.Fit.	Boards	Imposed	Total
Total Inner Leg Load (kN)=	5.28	6.46	10.13	21.86
Total Outer Leg Load (kN)=	5.46	3.48	5.06	14.00

7.0 Beam Check: 750 Apollo X-Beam

Inside Beam

Effective Beam Length	=	6.00	m	
Beam Span	=	5.00	m	
Beam Centres	=	1.20	m	c/c
Self Weight of Beam	=	0.07	kN/m	(Excluding Bracing/Ties)
Additonal Load from Lacing + Bracing	=	0.20	kN/m	(Including Fittings)
Total Beam UDL	=	0.27	kN/m	



Max Moment	=	34.4	kNm
Max Shear	=	33.4	kN

750 Apollo X-Beam		Restraints @ 1.0m Centres			Triple Beam
Moment Capacity	37.00	kNm	>	25.50	OK
Shear Capacity	35.00	kN	>	24.80	OK

7.1 Supporting Reactions

Reaction into Support	=	33.40	kN		

Standard to Beam connection is limited to slip capacity of the coupler used.

Capacity of Coupler	=	9.1	kN	(Class B)	(4No.)

36.4	≥	33.40	kN	OK

7.2 Leg Load

Self-weight of Leg	=	0.50	kN		
Reaction into Support	=	33.40	kN		
Total Axial Load	=	33.90	kN		
Effective length of Scaffold tube	=	2500	mm		
Axial Load Capacity	=	20.53	kN	(2No.)	(TG20:21)
41.06	≥	33.90	kN	OK	

8.0 Loading Gantry

8.1 Scaffold Boards

Scaffold Board Span	=	0.3	m	
Width	=	0.225	m	
Imposed load	=	10	kN/m^2	
UDL	=	2.25	kN/m	
Weight of boarding	=	0.5	kN/m^2	
UDL	=	0.1125	kN/m	
Total UDL	=	2.36	kN/m	
Concentrated load	=	1.5	kN	
Mo due to UDL	=	2.3625*0.3*0.3/8		
	=	**0.027**	**kNm**	
Mo due to Concentrated load	=	(1.5*0.3/4)+(0.1125*0.3*0.3/8)		
	=	**0.114**	**kNm**	
RM of scaffold board	=	0.475	kNm	TG20:21
0.475	≥	0.114		OK

8.2 Transoms

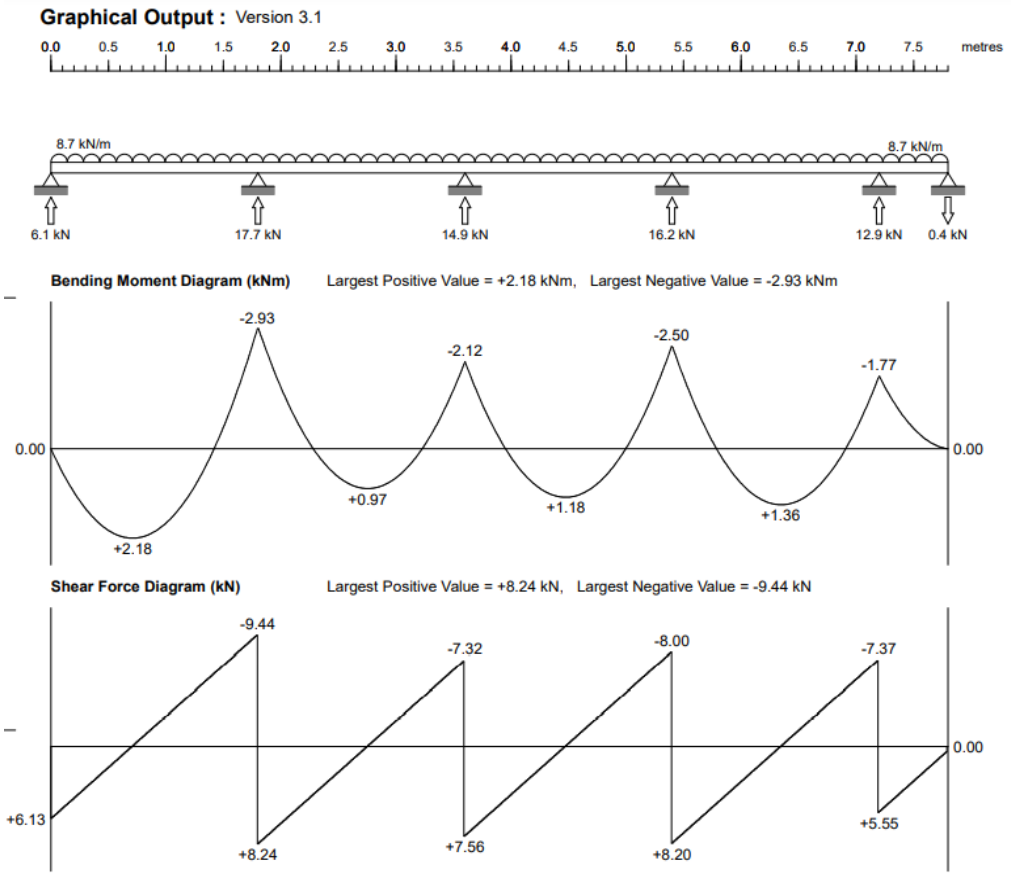
Transom Span	=	1.6	m	
Centres	=	0.3	m	
Imposed load	=	10	kN/m^2	
UDL	=	3	kN/m	
Weight of boarding	=	0.5	kN/m^2	

UDL	=	0.15	kN/m	
Total UDL	=	3.15	kN/m	
Concentrated load	=	1.5	kN	
Mo due to UDL	=	3.15*1.6*1.6/8		
	=	**1.01**	**kNm**	
Mo due to Concentrated load	=	(1.5*1.6/4)+(0.15*1.6*1.6/8)		
	=	**0.65**	**kNm**	
RM of scaffold tube	=	1.12	kNm	TG20:21

1.12	≥	1.01	OK

8.3 **Beam Analysis**

Span Max.	=	1.6	m
L	=	7.8	m
Imposed load	=	10	kN/m^2
Weight of boarding	=	0.5	kN/m^2
Total	=	10.5	kN/m^2
UDL	=	(10.5*1.6/2)	
	=	8.4	kN/m
Beam self weight	=	0.25	kN/m
Total UDL	=	8.65	kN/m



Max Moment	=	2.9	kNm
Max Shear	=	9.4	kN

Ladder Beams	*Restraints @ 1.2m Centres*	
Moment Capacity	12.5kNm	OK
Shear Capacity	12.5kN	OK

Connection check:

Max reaction from beam	=	17.70	kN		
Standard to Beam connection is limited to slip capacity of the coupler used.					
Capacity of Coupler	=	9.1	kN	(Class B) (4no.)	TG20:21

36.40 kN	>	17.70 kN	OK

8.4 Leg Load

Self-weight of Leg	=	15.10	kN
Reaction into Support	=	17.70	kN
Total Axial Load	=	32.80	kN

Effective length of Scaffold tube	=	2500	mm		
Axial Load Capacity	=	20.53	kN	(2No.)	(TG20:21)
41.06	≥	32.80	kN	OK	

9.0 Roof Access

9.1 Lifting beam

Lifting load	=	2.00	kN
Self-weight of beam	=	0.10	kN/m
Beam Span	=	3.00	m
Max Moment	=	1.61	kNm
Max Shear	=	1.15	kN

Ladder Beams	*Restraints @ 1.2m Centres*	
Moment Capacity	12.5kNm	OK
Shear Capacity	12.5kN	OK

9.2 Lifting beam tube support

Reaction from beam	=	1.15	kN		
Tube Span	=	1.80	m		
Max Moment	=	0.52	kNm		
BM Capacity in Type 4 Steel Tube	=	1.12	kNm	(As New Tube)	(TG20:21)
1.12	≥	0.52	kNm	OK	

9.3 Leg Load

LEG LOAD

Scaffold Components					
Tube(kg/m)=	4.37				
Fittings(kg/fitt)=	1.50				
Boards(kg/m²)=	25.00				
Scaffold Information per Lift					
Main Boards (no)=	5.00				
Inside Boards (no)=	3.00				
Width of scaffold (m) =	1.2				
Inside width (m) =	0.75				
Bay Length (m)=	1.80				
Lift Height (m)=	2.000				
Effective Lift Height (m)=	-				
Actual No of Lifts (no)=	2.00				
Boarded Lifts (no)=	1.00				
Working Lifts (no)=	1.00				
	1st	2nd	3rd	4th	5th
Imposed Load on Main Run (kN/m²)=	3.00				
Imposed Load on Inside Run (kN/m²)=	0.75				
Inside Hand Rails (no)=	2.00				
Inside Toe board(no)=	1.00				
Outside Hand Rails (no)=	0.00				
Section Bracing (no)=	1.00				
Inner Sway Bracing (no)=	0.00				
Outer Sway Bracing (no)=	1.00				
Additional Inner Leg Load (kN)=	0.00				
Additional Outer Leg Load (kN)=	0.00				

	Main Frame				End Frame
	Tub.Fit.	Boards	Imposed	Total	Total
Total Inner Leg Load (kN)=	1.36	0.65	3.95	5.95	3.43
Total Outer Leg Load (kN)=	0.98	0.35	3.04	4.37	2.57

Max Leg load	=	5.95	kN
Reaction from support tube	=	0.58	kN
Total load	=	**6.53**	**kN**

10.0 Stability

Scaffold to be tied to the existing structure.

Dynamic pressure from wind	=	Metspec design suit used	*BSEN1991-1-4*
Location	=	Fraser House, Manchester	
Grid reference	=	SJ842980	
Probability Factor	=	0.83	
Peak Velocity Pressure	=	0.442 kN/m²	*Appendix A*

Cpe (-Ve) parallel	=	1.2	[Average]	
Cpe (+Ve) windward	=	0.8		
Cpe (-Ve) leeward	=	0.5		
CpNet	=	1.3		
Scaffold solidity	=	100%	[Sheeted]	
Design Wind Pressure	=	0.57		
Coverage area	=	2.00	m X	5.00 m
	=	10.00	m^2	
Tensile Load per tie	=	5.75	kN	
Capacity of Coupler	=	9.1	kN	(Class B) (2No.)

18.2	≥	5.75	kN	OK

10.1 Ties

Type of Anchor: **HILTI HUS3-H/HF SCREW ANCHOR 10mm NCC**

Base Material	=	Brick		
Minimum Embedment	=	85.00	mm	
Tensile Load	=	5.75	kN	
Tensile Capacity of Anchor	=	13.20	kN	(1No.)

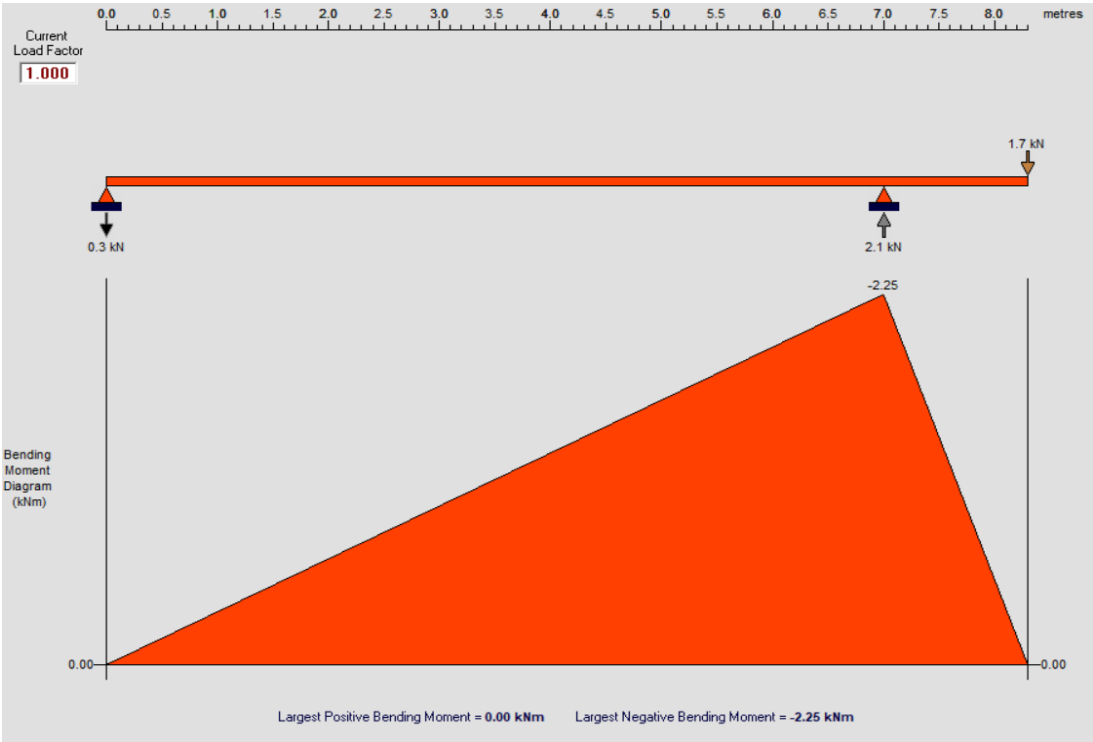
13.20	≥	5.75	kN	OK

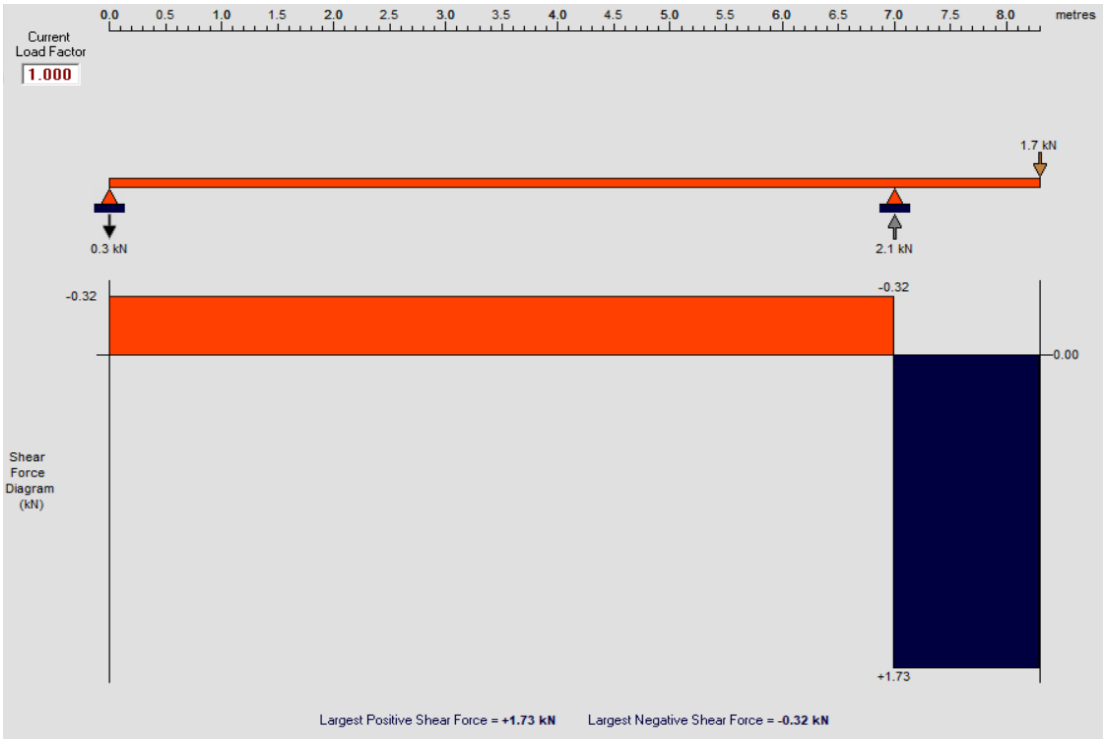
Pull Out Test (F.O.S 1.25)

Pull Out Test	=	7.18	kN

11.0 Beam Check **30-06-2022 Wrapping platform around chimney**

Area of loading	=	1.44	m^2
UDL	=	1.2	kN/m^2
Load on the beam	=	1.73	kN





Layher 450 Aluminium Beams	*Restraints @ 1.0m Centres*	
Moment Capacity	13.94kNm	OK
Shear Capacity	12.32kN	OK

11.0 Frame section F-F

Load on the beam	=	1.00	kN	
Area of loading	=	1.01	m^2	
UDL	=	1.2	kN/m^2	
Point Load from boarded platform	=	1.21	kN	
Total Point Load	=	2.21	kN	
OTM				
Point Load	=	2.21	kN	
Leaver arm of the load	=	1.00	m	
OTM with 1.5 F.O.S	=	3.32	kNm	
Leaver arm of tie	=	1.00	m	
Load on tie	=	3.32	m	
Spur check				
Load applied	=	2.21	kN	
Load on spur	=	2.70		
Capacity of Coupler	=	9.1	kN	(Class B)

9.1	≥	2.70	kN	OK

11 Structure Summary

Scaffold should be erected in accordance with TG20:21 and SG4:15.

Care must be taken to install correct number of uprights at indicated positions.

Care must be taken to install ties at indicated positions using load bearing couplers at all times.

Plan bracing to be installed as indicated on the drawing

All beams are installed with lacing & bracing

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

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

All tailback uprights to be spliced with 2 load bearing couplers.

Max lifting load on ladder beams over chimney not to exceed 200kg.

Max load on cantilever wrapped around chimney not to exceed 0.75kN/m2.

Refer to design drawing 9989-1G & 3 for details.

END OF CALCULATIONS

Appendix A: Wind Assessment

Wind Assessment to BS EN 1991-1- 4

Data Entry:-

SiteAltitude	50.000 m	ReferenceHeight(Z)			SizeEffectDimension(b+h)		
$V_{b,map}$	21.500 m/s	Roof	16.500	m	Roof	0.000	m
SeasonaFactor(C,season)	1.000	SideWalls	16.500	m	SideWalls	0.000	m
ProbabilityFactor(C,prob)	0.830	Gables	16.500	m	Gables	0.000	m
SiteID	*SJ842980*						

Dynamic Pressure Results

WindDirection(deg)		0	30	60	90	120	150	180	210	240	270	300	330
DirectionFactorC,dir		0.78	0.73	0.73	0.74	0.73	0.80	0.85	0.93	1.00	0.99	0.91	0.82
OrographyFactorCo		1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Effective Height (h-hdis)m	Roof	13.300	13.300	13.300	13.300	13.300	13.300	13.300	13.300	13.300	13.300	13.300	13.300
	Sides	13.300	13.300	13.300	13.300	13.300	13.300	13.300	13.300	13.300	13.300	13.300	13.300
	Gable	13.300	13.300	13.300	13.300	13.300	13.300	13.300	13.300	13.300	13.300	13.300	13.300
Altitude FactorC,alt	Roof	1.045	1.045	1.045	1.045	1.045	1.045	1.045	1.045	1.045	1.045	1.045	1.045
	Sides	1.045	1.045	1.045	1.045	1.045	1.045	1.045	1.045	1.045	1.045	1.045	1.045
	Gable	1.045	1.045	1.045	1.045	1.045	1.045	1.045	1.045	1.045	1.045	1.045	1.045
Roughness FactorCr	Roof	0.810	0.805	0.804	0.807	0.800	0.800	0.799	0.800	0.809	0.816	0.817	0.807
	Sides	0.810	0.805	0.804	0.807	0.800	0.800	0.799	0.800	0.809	0.816	0.817	0.807
	Gable	0.810	0.805	0.804	0.807	0.800	0.800	0.799	0.800	0.809	0.816	0.817	0.807
Exposure FactorCe	Roof	2.037	2.011	2.005	2.022	1.983	1.983	1.976	1.983	2.033	2.074	2.078	2.022
	Sides	2.037	2.011	2.005	2.022	1.983	1.983	1.976	1.983	2.033	2.074	2.078	2.022
	Gable	2.037	2.011	2.005	2.022	1.983	1.983	1.976	1.983	2.033	2.074	2.078	2.022
Vb,0(m/s)	Roof	22.473	22.473	22.473	22.473	22.473	22.473	22.473	22.473	22.473	22.473	22.473	22.473
	Sides	22.473	22.473	22.473	22.473	22.473	22.473	22.473	22.473	22.473	22.473	22.473	22.473
	Gable	22.473	22.473	22.473	22.473	22.473	22.473	22.473	22.473	22.473	22.473	22.473	22.473
Vb(m/s)	Roof	14.549	13.616	13.616	13.803	13.616	14.922	15.854	17.347	18.652	18.466	16.974	15.295
	Sides	14.549	13.616	13.616	13.803	13.616	14.922	15.854	17.347	18.652	18.466	16.974	15.295
	Gable	14.549	13.616	13.616	13.803	13.616	14.922	15.854	17.347	18.652	18.466	16.974	15.295
Vm(m/s)	Roof	11.782	10.964	10.949	11.139	10.900	11.945	12.674	13.886	15.089	15.068	13.860	12.346
	Sides	11.782	10.964	10.949	11.139	10.900	11.945	12.674	13.886	15.089	15.068	13.860	12.346
	Gable	11.782	10.964	10.949	11.139	10.900	11.945	12.674	13.886	15.089	15.068	13.860	12.346
Turbulence Intensityiv	Roof	0.260	0.260	0.260	0.260	0.260	0.260	0.260	0.260	0.260	0.260	0.260	0.260
	Sides	0.260	0.260	0.260	0.260	0.260	0.260	0.260	0.260	0.260	0.260	0.260	0.260
	Gable	0.260	0.260	0.260	0.260	0.260	0.260	0.260	0.260	0.260	0.260	0.260	0.260
PeakVelocity Pressureqp (kN/m²)	Roof	0.269	0.233	0.232	0.241	0.230	0.277	0.312	0.374	0.442	0.440	0.373	0.296
	Sides	0.269	0.233	0.232	0.241	0.230	0.277	0.312	0.374	0.442	0.440	0.373	0.296
	Gable	0.269	0.233	0.232	0.241	0.230	0.277	0.312	0.374	0.442	0.440	0.373	0.296
SizeEffect FactorCs	Roof	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	Sides	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	Gable	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000