

Revision A: Supporting Calculations



BDS | SCAFFOLD
DESIGN
SPECIALISTS

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Date: 13/10/2023		
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Date: 13/10/2023	Project: Ryland Building, Manchester	Drawing Ref: BDS - 10515 - 01 to 02
Checked By: Mike Brown	Drawing Title: Loading Platform & Access Ramp	Revision: A 13/10/2023
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Components & Material Properties

Items listed below are for information purposes only, & are not necessarily used in this design.

All tubes used in this design are based on type 4, unless otherwise stated.

All couplers used in this design are based on class "B", unless otherwise stated.

NASC TG20:21 - Page 119 - Table 5.9**Steel Tube (Type 4)**

Area	=	5.57cm ²
Wall Thickness	=	4mm
Self Weight	=	4.37kg/m (0.043kN/m)
Diameter	=	48.3mm
Radius of Gyration	=	1.57cm
Plastic Modulus	=	7.87cm ³
Design Strength	=	235N/mm ²
Modulus of Elasticity	=	210000N/mm ²
Moment of Inertia	=	13.8cm ⁴
Moment Capacity	=	1.12kNm
Shear Capacity	=	29.1kN

NASC TG20:21 - Page 121 - Table 5.10

<u>Effective Length (L_E)</u>	<u>Slenderness ratio - λ</u>	<u>Safe axial load -P_c</u>
1.0m	63.50	58.60kN
1.1m	70.00	55.25kN
1.2m	76.50	51.90kN
1.3m	82.70	48.60kN
1.4m	88.90	45.30kN
1.5m	95.30	42.25kN
1.6m	101.70	39.20kN
1.7m	108.05	36.45kN
1.8m	114.40	33.70kN
1.9m	120.75	31.40kN
2.0m	127.10	29.10kN
2.1m	133.45	27.20kN
2.2m	139.80	25.30kN
2.3m	146.15	23.65kN
2.4m	152.50	22.00kN
2.5m	158.85	20.65kN
2.6m	165.20	19.30kN
2.7m	171.55	18.20kN
2.8m	177.90	17.10kN
2.9m	184.25	16.15kN
3.0m	190.60	15.20kN
3.1m	196.95	14.40kN
3.2m	203.30	13.60kN
3.3m	209.65	12.90kN
3.4m	216.00	12.20kN

<u>Effective Length (L_E)</u>	<u>Slenderness ratio - λ</u>	<u>Safe axial load - P_c</u>
3.5m	222.35	11.60kN
3.6m	228.70	11.00kN
3.7m	235.05	10.50kN
3.8m	241.40	10.00kN
3.9m	247.75	9.55kN
4.0m	254.10	9.10kN

NASC TG20:21 - Page 129 - Table 5.14

Effective lengths, L_E of standards in ledger braced tied independent scaffolds with 2m lifts with effective façade bracing

Vertical intervals betv Bay lengths

lines of ties	1.2m	1.5m	1.8m	2.0m	2.1m	2.4m	2.7m
2m with 2m 1st lift	2.5	2.5	2.5	2.5	2.55	2.75	2.9
2m with 2.7m 1st lift	2.7	2.7	2.7	2.7	2.7	2.9	3
4m	3.2	3.2	3.2	3.2	3.2	3.2	3.2
6m	4	4	4	4	4	4	4

NASC TG20:21 - Page 166 - Table C1

Aluminium Tube

Area	=	6.15cm ²
Wall Thickness	=	4.47mm
Self Weight	=	1.65kg/m
Diameter	=	48.3mm
Radius of Gyration	=	1.56cm
Plastic Modulus	=	8.61cm ³
Design Strength	=	255N/mm ²
Modulus of Elasticity	=	70000N/mm ²
Moment of Inertia	=	14.9cm ⁴
Moment Capacity	=	1.33kNm

NASC TG20:21 - Page 167 - Table C.2

<u>Effective Length (L_E)</u>	<u>Slenderness ratio - λ</u>	<u>Safe axial load - P_c</u>
1.0m	64.2	48.90kN
1.2m	77	36.60kN
1.4m	89.9	27.90kN
1.6m	102.7	21.80kN
1.8m	115.5	17.50kN
2.0m	128.4	14.40kN
2.2m	141.2	12.00kN
2.4m	154	10.10kN
2.6m	166.9	8.70kN
2.8m	179.7	7.50kN

NASC TG20:21 - Page 135 - Table 5.15**Couplers**

Right Angle Coupler (Double) Class "A"	SWL =	6.10kN	Slip
Right Angle Coupler (Double) Class "B"	SWL =	9.10kN	Slip
Band & plate (Double) coupler	SWL =	6.10kN	Slip
Right Angle Coupler (Double) Self Weight	SW =	1.25kg	
Swivel Coupler Class "A"	SWL =	6.10kN	Slip
Swivel Coupler Class "B"	SWL =	9.10kN	Slip
Swivel Coupler Self Weight	SW =	1.33kg	
Sleeve Coupler Class "A"	SWL =	3.60kN	Tension
Adjustable Screw Jack (200mm extension)	SWL =	35.00kN	Compression
Girder Coupler (must be used in pairs)	SWL =	10.00kN	"X" Axis
	SWL =	30.00kN	"Y" Axis
	SWL =	12.50kN	"Z" Axis
Girder Coupler Self Weight (each)	SW =	1.50kg	

Timber Scaffold Boards

Self Weight	=	25kg/m ²
Width	=	225mm
Thickness	=	38mm
Section Modulus	=	47.5cm ³
Moment Capacity	=	0.48kNm

300mm Ladder Beams* (Steel) Laced at 1m c/c

Self Weight	=	0.30kN	(laced & braced)
Moment Capacity	=	10.40kNm	
Shear Capacity	=	18.00kN	

*For further information refer to manufacturer

RMD Superslim Soldiers

Moment Capacity	=	38.0kNm
Shear Capacity	=	75.0kN

*For further information refer to manufacturer

450mm Apollo Beams* (Aluminium) Laced at 1m c/c

Self Weight	=	0.14kN	(laced & braced)
Moment Capacity	=	15.70kNm	
Shear Capacity	=	13.90kN	

*For further information refer to manufacturer

750mm Apollo Beams* (Aluminium) Laced at 1m c/c

Self Weight	=	0.28kN	(laced & braced)
Moment Capacity	=	42.90kNm	
Shear Capacity	=	45.50kN	

*For further information refer to manufacturer

1300mm Apollo Beams* (Aluminium) Laced at 1m c/c

Self Weight	=	Varies TBC	(laced & braced)
Moment Capacity	=	98.52kNm	
Shear Capacity	=	44.25kN	

*For further information refer to manufacturer

1500mm Apollo Beams* (Aluminium) Laced at 1m c/c

Self Weight	=	Varies TBC (laced & braced)
Moment Capacity	=	255.00kNm
Shear Capacity	=	60.00kN

*For further information refer to manufacturer

1300mm Asterix Beams* (Aluminium)

Self Weight	=	Varies TBC (laced & braced)
Moment Capacity	=	102.20kNm Laced at 1m c/c
Moment Capacity	=	77.70kNm Laced at 1.5m c/c
Shear Capacity	=	42.10kN (Top & Bottom chords connected)
Shear Capacity	=	32.60kN (Bottom chord connected)

*For further information refer to manufacturer

450mm Layher Beams* (Aluminium) Laced at 1m c/c

Self Weight	=	0.14kN (laced & braced)
Moment Capacity	=	13.94kNm
Shear Capacity	=	12.32kN

*For further information refer to manufacturer

450mm Layher Beams* (Aluminium) Laced at 1.5m c/c

Self Weight	=	0.14kN (laced & braced)
Moment Capacity	=	8.06kNm
Shear Capacity	=	12.32kN

*For further information refer to manufacturer

450mm Layher Beams* (Aluminium) Laced at 2m c/c

Self Weight	=	0.14kN (laced & braced)
Moment Capacity	=	5.14kNm
Shear Capacity	=	12.32kN

*For further information refer to manufacturer

780mm Dessa Beams* (Aluminium) Laced at 1m c/c. (6no. bolts 3 each side of spigot)

Self Weight	=	0.28kN (laced & braced)
Moment Capacity	=	38.84kNm
Shear Capacity	=	23.71kN

*For further information refer to manufacturer

Relevant Design Standards/guidance (only a selection of the below standards are applicable for this design)

BS EN 39	:2001	Specification for steel scaffold tube.
BS EN 74-1	:2005	Couplers, spigot pins & baseplates for use in falsework & scaffolds.
BS EN 12811-1	:2003	Temporary works equipment: Scaffolds - Performance requirements & general design.☐
BS EN 12812-1	:2008	Falsework: Performance requirements & general design.
BS EN 1139-1-2	:1990	Metal scaffolding - part 1: Tubes - Specification for aluminium tube.
BS EN 1139-2-2	:2009	Metal scaffolding - part 2: Couplers - Specification for aluminium couplers.
BS EN 1991-1-1	:2002	Eurocode 1: Actions on structures - Densities, self-weight & imposed loads.
BS EN 1991-1-3	:2003	Eurocode 1: Actions on structures - Snow loads.
BS EN 1991-1-4	:2005	Eurocode 1: Actions on structures - Wind loads.
BS EN 1991-2	:2003	Eurocode 1: Actions on structures - Part2: Traffic load and bridges
BS EN 13374	:2013	Temporary edge protection systems - Product specification, test methods.
BS 5975	:2019	Code of practise for temporary work procedures & the p design of false work.
BS 2482	:2009	Specification for timber scaffold boards.
TG3:19		Erection, use & dismantling of temporary rubbish chutes on scaffold.
TG4:19		Anchorage systems.
TG9:18		Guide to the design & construction of temporary roofs & buildings.
TG12:17		Tying down of scaffold boards.
TG13:16		Non-standard boarded platforms.
TG16:21		Anchoring to the ground.
TG20:21		Technical guidance on the use of BS EN 12811-1.
SG4:15		Preventing falls in scaffolding.
SG5:18		Overhead power sources.
SG25:20		Access & egress from scaffolds.
SG27:09		Temporary edge protection on open steelwork.
SG28:17		Safe system of work for scaffolding associated with timber frame building construction.
SG29:17		Internal edge protection on scaffold platforms.
SG32:17		Provision of extended & telescopic transoms & board brackets.
SG34:17		Guidance on protection of the public

Job Description: Loading Platform & Access Ramp

Safe Working Loads: Loading Platform with 1no. Lift at: 10 kN/m²
 Ramp with 1no. Lift at: 10 kN/m²
 Access Scaffold with 1no. Lift at: 2 kN/m²

Item: Access Scaffold

Max Bay Length: 2.05m
 Max Bay Width: 1.20m (5 bds)
 Max Transom Centres: 1.10m
 Max Standard Load: Refer to DWG's

Item: Ramp & Loading Platform

Max Bay Length: 1.00m
 Max Bay Width: 1.20m (5 bds)
 Max Transom Centres: 0.50m
 Max Standard Load: Refer to DWG's

Item: Birdcage

Max Bay Length: N/A
 Max Bay Width: N/A
 Max Transom Centres: N/A
 Max Standard Load: N/A

Item: Buttress

Max Bay Length: N/A
 Max Bay Width: N/A
 Max Transom Centres: N/A
 Max Standard Load: N/A

Item: Ties (Tension)

Max Tie Load: N/A
 Preliminary Test: N/A
 Proof Test: N/A

Item: Ties (Shear)

Max Tie Load: N/A
 Preliminary Test: N/A
 Proof Test: N/A

Additional Comments (if required)

- Preliminary & proof tests not required.
- Level working platforms to be erected +/-50mm from window sill to suit external scaffold lift height configuration.
- Scaffold founded internally & subject to limited wind loading & tied to external access scaffold at various loactions. Scaffold height to base ratio <3:1 therefore no further calculations required & scaffold deemed Stable.

Item: Access Scaffold Y

Bay Lengths (m)	Bay Widths (m)	Transom C/C (m)	No. Inside Boards	SWL (kN/m ²)
2.05	1.2	1.1	0	2

Dynamic Load Applied (25%)	Board Dead Load (kN/m ²)
N/A	0.35

Consider Scaffold Boards Spanning

Dead Load	Centres	Width	Load	Results
Boards	1.1 m	0.225 m	0.35 kN/m ²	(kN) = 0.087
Imposed Loads	1.1 m	0.225 m	2 kN/m ²	(kN) = 0.495
Bending Moment	0.087	+	0.495 X 1.1 / 8	(kNm) = 0.080
Allowable Bending Moment For Scaffold Boards = 0.48kNm				(kNm) > 0.080
PASSES				

Transoms With No Inside Boards

Consider The Transoms Spanning

Dead Load	Centres	Span	Load	Results
Boards	1.1 m	1.2 m	0.35 kN/m ²	(kN) = 0.462
Tube	1.2 m	X	0.043 kN/m	(kN) = 0.052
Total	0.462 kN	+	0.052 kN	(kN) = 0.514
Imposed Load	1.1 m	1.2 m	2 kN/m ²	(kN) = 2.640
Non-cantilevered Transom BM as TG20:21 - section 5.11.1.1 - $M = 0.125 \times W \times L$ (kNm)				
Bending Moment	0.125	3.15 kN	1.2 m	(kNm) = 0.473
Allowable Bending Moment For Scaffold Tube = 1.12kNm				(kNm) > 0.473
PASSES				

Transoms With Inside Boards

Consider The Transoms Spanning

Dead Load	Centres	Span	Load	Results
Boards	1.1 m	0 m	0.35 kN/m ²	(kN) = 0.000
Tube	0 m	X	0.043 kN/m	(kN) = 0.000
Total	0.000 kN	+	0.000 kN	(kN) = 0.000
Imposed Load	1.1 m	0 m	0.75 kN/m ²	(kN) = 0.000
Cantilevered Transom BM as TG20:21 - section 5.11.1.2 - $M_c = 0.5 \times W_c \times L_c$ (kNm)				
Bending Moment	0.5	0.00 kN	0 m	(kNm) = 0.000
Allowable Bending Moment For Scaffold Tube = 1.12kNm				(kNm) > 0.000
PASSES				

Continuous Transoms e.g. Birdcage**Consider The Transoms Spanning**

Dead Load	Centres	Span	Load	Results	
Boards	1.1 m	1.2 m	0.35 kN/m ²	(kN) =	0.462
Tube	1.2 m	X	0.043 kN/m	(kN) =	0.052
Total	0.462 kN	+	0.052 kN	(kN) =	0.514
Imposed Load	1.1 m	1.2 m	2 kN/m ²	(kN) =	2.640
Continuous Transom BM as TG20:21 - section 5.11.1.3 - $M = 0.086 \times W \times L$ (kNm)					
Bending Moment	0.086	3.15 kN	1.2 m	(kNm) =	0.325
Allowable Bending Moment For Scaffold Tube = 1.12kNm				(kNm) >	0.325

PASSES**Simply Supported Ledger****Consider The Ledger Spanning**

Transom Point Load		2.05 m			
		3.15 kN			
Simply supported ledger as TG20:21 - section 5.12.1.1 - $M = 0.25 \times P \times L$ (kNm)					
Bending Moment	0.25	3.15 kN	2.05 m	(kNm) =	1.616
Allowable Bending Moment For Scaffold Tube = 1.12kNm				(kNm) >	1.616

FAILS**Refer To Comments Below****Continuous Ledger****Consider The Ledger Spanning**

Transom Point Load		2.05 m			
		3.15 kN			
Continuously supported ledger as TG20:21 - section 5.12.1.2 - $M = 0.167 \times P \times L$ (kNm)					
Bending Moment	0.167	3.15 kN	2.05 m	(kNm) =	1.080
Allowable Bending Moment For Scaffold Tube = 1.12kNm				(kNm) >	1.080

PASSES**Part Continuous Ledger (end bay)****Consider The Ledger Spanning**

Transom Point Load		2.05 m			
		3.15 kN			
Part continuous supported ledger as TG20:21 - section 5.12.1.2 - $M = 0.172 \times P \times L$ (kNm)					
Bending Moment	0.172	3.15 kN	2.05 m	(kNm) =	1.112
Allowable Bending Moment For Scaffold Tube = 1.12kNm				(kNm) >	1.112

PASSES

Additional Platform Check Comments (if required)

Simply supported ledgers not applicable within this item.

Item: Ramp & Loading Platform Y

Bay Lengths (m)	Bay Widths (m)	Transom C/C (m)	No. Inside Boards	SWL (kN/m ²)
1	1.2	0.5	0	10

Dynamic Load Applied (25%) Board Dead Load (kN/m²)

N/A

0.35

Consider Scaffold Boards Spanning

Dead Load	Centres	Width	Load	Results
Boards	0.5 m	0.225 m	0.35 kN/m ²	(kN) = 0.039
Imposed Loads	0.5 m	0.225 m	10 kN/m ²	(kN) = 1.125
Bending Moment	0.039	+ 1.125	X 0.5 /8	(kNm) = 0.073
Allowable Bending Moment For Scaffold Boards = 0.48kNm				(kNm) > 0.073

PASSES

Transoms With No Inside Boards

Consider The Transoms Spanning

Dead Load	Centres	Span	Load	Results
Boards	0.5 m	1.2 m	0.35 kN/m ²	(kN) = 0.210
Tube	1.2 m	X	0.043 kN/m	(kN) = 0.052
Total	0.210 kN	+	0.052 kN	(kN) = 0.262
Imposed Load	0.5 m	1.2 m	10 kN/m ²	(kN) = 6.000
Non-cantilevered Transom BM as TG20:21 - section 5.11.1.1 - $M = 0.125 \times W \times L$ (kNm)				
Bending Moment	0.125	6.26 kN	1.2 m	(kNm) = 0.939

Allowable Bending Moment For Scaffold Tube = **1.12kNm** (kNm) > **0.939**

PASSES

Transoms With Inside Boards

Consider The Transoms Spanning

Dead Load	Centres	Span	Load	Results
Boards	0.5 m	0 m	0.35 kN/m ²	(kN) = 0.000
Tube	0 m	X	0.043 kN/m	(kN) = 0.000
Total	0.000 kN	+	0.000 kN	(kN) = 0.000
Imposed Load	0.5 m	0 m	0.75 kN/m ²	(kN) = 0.000
Cantilevered Transom BM as TG20:21 - section 5.11.1.2 - $M_c = 0.5 \times W_c \times L_c$ (kNm)				
Bending Moment	0.5	0.00 kN	0 m	(kNm) = 0.000

Allowable Bending Moment For Scaffold Tube = **1.12kNm** (kNm) > **0.000**

PASSES

Continuous Transoms e.g. Birdcage**Consider The Transoms Spanning**

Dead Load	Centres	Span	Load	Results	
Boards	0.5 m	1.2 m	0.35 kN/m ²	(kN) =	0.210
Tube	1.2 m	X	0.043 kN/m	(kN) =	0.052
Total	0.210 kN	+	0.052 kN	(kN) =	0.262
Imposed Load	0.5 m	1.2 m	10 kN/m ²	(kN) =	6.000
Continuous Transom BM as TG20:21 - section 5.11.1.3 - $M = 0.086 \times W \times L$ (kNm)					
Bending Moment	0.086	6.26 kN	1.2 m	(kNm) =	0.646
		Allowable Bending Moment For Scaffold Tube = 1.12kNm		(kNm) >	0.646

PASSES**Simply Supported Ledger****Consider The Ledger Spanning**

Transom Point Load		1 m			
		6.26 kN			
Simply supported ledger as TG20:21 - section 5.12.1.1 - $M = 0.25 \times P \times L$ (kNm)					
Bending Moment	0.25	6.26 kN	1 m	(kNm) =	1.565
		Allowable Bending Moment For Scaffold Tube = 1.12kNm		(kNm) >	1.565

FAILS**Refer To Comments Below****Continuous Ledger****Consider The Ledger Spanning**

Transom Point Load		1 m			
		6.26 kN			
Continuously supported ledger as TG20:21 - section 5.12.1.2 - $M = 0.167 \times P \times L$ (kNm)					
Bending Moment	0.167	6.26 kN	1 m	(kNm) =	1.046
		Allowable Bending Moment For Scaffold Tube = 1.12kNm		(kNm) >	1.046

PASSES**Part Continuous Ledger (end bay)****Consider The Ledger Spanning**

Transom Point Load		1 m			
		6.26 kN			
Part continuous supported ledger as TG20:21 - section 5.12.1.2 - $M = 0.172 \times P \times L$ (kNm)					
Bending Moment	0.172	6.26 kN	1 m	(kNm) =	1.077
		Allowable Bending Moment For Scaffold Tube = 1.12kNm		(kNm) >	1.077

PASSES

Additional Platform Check Comments (if required)

Simply supported ledgers not applicable within this item.

Consider Load Per Node Capacities

Item: **Access Scaffold**

Bay Widths (m)	Bay Length (m)	SWL (kN/m ²)	Bds Dead Load (kN/m ²)	Tube Dead Load (kN)
1.2	2.05	2	0.35	0.45

No. Inside Boards	SWL (kN/m ²) inside bds
0	0.75

Coupler Type Used - Class A:		6.1kN	No. of Primary Connections:	1
Coupler Type Used - Class B:	Y	9.1kN	No. of Supplementary Connections:	0
			Strength of Connection:	9.10kN

Loads in accordance with TG20:21, 5.9.2

Inside Node

Bay Width	*	Bay Length	*	(SWL	+	BDS _{sw})	+	Tsw	Result
0.60m	*	2.05m	*	2	+	0.35	+	0.45kN	3.34kN
0.00m	*	2.05m	*	0.75	+	0.35			0.00kN
								=	3.34kN
					3.34kN	<	9.10kN	Therefore	PASSES

Outside Node

Bay width	*	Bay Length	*	(SWL	+	BDS _{sw})	+	Tsw	Result
0.60m	*	2.05m	*	2	+	0.35	+	0.45kN	3.34kN
					3.34kN	<	9.10kN	Therefore	PASSES

Item: Ramp & Loading Platform

Bay Widths (m)	Bay Length (m)	SWL (kN/m ²)	Bds Dead Load (kN/m ²)	Tube Dead Load (kN)
1.2	1	10	0.35	0.9

No. Inside Boards	SWL (kN/m ²) inside bds
0	0

Coupler Type Used - Class A:		6.1kN	No. of Primary Connections:	1
Coupler Type Used - Class B:	Y	9.1kN	No. of Supplementary Connections:	1
			Strength of Connection:	15.20kN

Loads in accordance with TG20:21, 5.9.2

Perimeter Node

Bay Width	*	Bay Length	*	(SWL	+	BDS _{sw})	+	T _{sw}	Result
0.60m	*	1.00m	*	10	+	0.35	+	0.45kN	6.66kN
					6.66kN	<	15.20kN	Therefore	PASSES

Centre Node

Bay width	*	Bay Length	*	(SWL	+	BDS _{sw})	+	T _{sw}	Result
1.20m	*	1.00m	*	10	+	0.35	+	0.90kN	13.32kN
					13.32kN	<	15.20kN	Therefore	PASSES

OUTSIDE STANDARD

Allowance For Double Width: N/A

Tube DL (kN/m)	0.043	Boards DL (kN/m ²) (kN/m)	0.35 0.056	Fittings (kN)	0.018	Length (m)	Width (m)	Quantity	Length (or) Area
Bay Size						2.05m	1.20m		
Standards (lift height)								1	1.10m
Ledgers								1	2.05m
Beam							kN/m	0	2.05m
Transom								3	0.60m
Guardrails								2	2.05m
Boarded (Main Platform)								1	1.23
Boarded (Inside Boards)								0	0.00
Toe Boards								1	2.05m
Ledger Bracing								0	2.05m
Façade Bracing								1	2.48m
Plan Bracing								0	2.53m
Fittings								8	N/A
Live Loads Applied				Total Number of Lifts:				2	
				Number of Boarded Lifts:				1	
(SWL) 100%		2.00kN /m ²		Total Dead Load Per Lift:					0.75kN
(SWL) 50%		1.00kN /m ²		Total Dead Load					1.94kN
(SWL) Inside bds		0.75kN /m ²							
Maximum No. Lifts at 100%		1		Total Live Load:					2.46kN
Maximum No. Lifts at 50%		0							
No. Lifts with inside bds loaded		1		Total Load Combined:					4.40kN
No. Support Stds/Puncheons		1							
Axial Load	Effective Length (Le)	Safe Axial Load (Pc)	Slenderness Ratio (λ)	Slenderness Max (λ)	Result				
4.40kN	1.5 m	42.25kN	95.3	271	PASSES				

Ground Bearing Pressure (GBP)

		Sole Pad Arrangements		
		Pad Width (m)	Pad Length (m)	Pad Area (sqm)
Typical Arrangement		0.225	0.450	0.10125
Increased Arrangement		0.450	0.450	0.2025
Tredda Plate		0.210	0.210	0.0441
Other	Y	0.150	0.150	0.0225
Imposed Load:	4.40 kN			
GBP:	195.52 kN/m ²			

Additional Comments If Required

CENTRE STANDARD

Allowance For Double Width: YES

Tube DL (kN/m)	0.043	Boards DL (kN/m ²) (kN/m)	0.35 0.056	Fittings (kN)	0.018	Length (m)	Width (m)	Quantity	Length (or) Area
Bay Size						2.05m	1.20m		
Standards (lift height)								1	0.75m
Ledgers								1	2.05m
Beam							kN/m	0	2.05m
Transom								3	1.20m
Guardrails								0	2.05m
Boarded (Main Platform)								1	2.46
Boarded (Inside Boards)								0	0.00
Toe Boards								0	2.05m
Ledger Bracing								1	1.88m
Façade Bracing								1	2.30m
Plan Bracing								0	2.53m
Fittings								6	N/A
Live Loads Applied				Total Number of Lifts:				2	
				Number of Boarded Lifts:				1	
(SWL) 100%		2.00kN /m ²		Total Dead Load Per Lift:					0.56kN
(SWL) 50%		1.00kN /m ²		Total Dead Load					1.99kN
(SWL) Inside bds		0.75kN /m ²							
Maximum No. Lifts at 100%		1		Total Live Load:					4.92kN
Maximum No. Lifts at 50%		0							
No. Lifts with inside bds loaded		1		Total Load Combined:					6.91kN
No. Support Stds/Puncheons		1							
Axial Load	6.91kN	Effective Length (Le)	1.5 m	Safe Axial Load (Pc)	42.25kN	Slenderness Ratio (λ)	95.3	Slenderness Max (λ)	271
									PASSES

Ground Bearing Pressure (GBP)

			Sole Pad Arrangements		
			Pad Width (m)	Pad Length (m)	Pad Area (sqm)
Typical Arrangement			0.225	0.450	0.10125
Increased Arrangement			0.450	0.450	0.2025
Tredda Plate			0.210	0.210	0.0441
Other	Y		0.150	0.150	0.0225
Imposed Load:	6.91	kN			
GBP:	306.95	kN/m ²			

Additional Comments If Required

INSIDE STANDARD

Allowance For Double Width: N/A

Tube DL (kN/m)	0.043	Boards DL (kN/m ²) (kN/m)	0.35 0.056	Fittings (kN)	0.018	Length (m)	Width (m)	Quantity	Length (or) Area
Bay Size						2.05m	1.20m		
Standards (lift height)								1	1.10m
Ledgers								1	2.05m
Beam							kN/m	0	2.05m
Transom								4	0.60m
Guardrails								2	2.05m
Boarded (Main Platform)								1	1.23
Boarded (Inside Boards)								0	0.00
Toe Boards								1	2.05m
Ledger Bracing								1	2.05m
Façade Bracing								1	2.48m
Plan Bracing								0	2.53m
Fittings								10	N/A
Live Loads Applied				Total Number of Lifts:				2	
				Number of Boarded Lifts:				1	
(SWL) 100%		2.00kN /m ²		Total Dead Load Per Lift:					0.90kN
(SWL) 50%		1.00kN /m ²		Total Dead Load					2.24kN
(SWL) Inside bds		0.75kN /m ²							
Maximum No. Lifts at 100%		1		Total Live Load:					2.46kN
Maximum No. Lifts at 50%		0							
No. Lifts with inside bds loaded		1		Total Load Combined:					4.70kN

Consider Imposed Load From Access Bay

Bay Width (m)	*	Bay Length (m)	*	(	SWL (kN/m ²)	+	Bds DL (kN/m ²)	)	+	Tube Dead Load(kN)	
0.6	*	1	*	(	2	+	0.35	)	+	0.45	
										=	1.86kN
Load	*	No. Lifts	=	Result							
1.86kN	*	1	=	1.86kN							
Load	+	Load	=	Result							
4.70kN	+	1.86kN	=	6.56kN							

No. Support Stds/Puncheons 1

Axial Load	Effective Length (Le)	Safe Axial Load (Pc)	Slenderness Ratio (λ)	Slenderness Max (λ)	Result
6.56kN	1.5	0.150	0.150	0.0225	FAILS

Ground Bearing Pressure (GBP)

				Sole Pad Arrangements		
				Pad Width (m)	Pad Length (m)	Pad Area (sqm)
Typical Arrangement				0.225	0.450	0.10125
Increased Arrangement				0.450	0.450	0.2025
Tredda Plate				0.210	0.210	0.0441
Other	Y			0.150	0.150	0.0225

Imposed Load: 6.56 kN
GBP: 291.52 kN/m²

OUTSIDE STANDARD

Allowance For Double Width: **N/A**

Tube DL (kN/m)	0.043	Boards DL (kN/m ²) (kN/m)	0.35 0.056	Fittings (kN)	0.018	Length (m)	Width (m)	Quantity	Length (or) Area
Bay Size						1.00m	1.20m		
Standards (lift height)								1	1.10m
Ledgers								1	1.00m
Beam							kN/m	0	1.00m
Transom								3	0.60m
Guardrails								2	1.00m
Boarded (Main Platform)								1	0.60
Boarded (Inside Boards)								0	0.00
Toe Boards								1	1.00m
Ledger Bracing								0	2.05m
Façade Bracing								1	1.95m
Plan Bracing								0	2.00m
Fittings								8	N/A
Live Loads Applied				Total Number of Lifts:				2	
				Number of Boarded Lifts:				1	
(SWL) 100%		10.00kN /m ²		Total Dead Load Per Lift:					0.54kN
(SWL) 50%		5.00kN /m ²		Total Dead Load					1.29kN
(SWL) Inside bds		0.75kN /m ²							
Maximum No. Lifts at 100%		1		Total Live Load:					6.00kN
Maximum No. Lifts at 50%		0							
No. Lifts with inside bds loaded		1		Total Load Combined:					7.29kN
No. Support Stds/Puncheons		1							
Axial Load	Effective Length (Le)	Safe Axial Load (Pc)	Slenderness Ratio (λ)	Slenderness Max (λ)	Result				
7.29kN	1.5 m	42.25kN	95.3	271	PASSES				

Ground Bearing Pressure (GBP)

		Sole Pad Arrangements		
		Pad Width (m)	Pad Length (m)	Pad Area (sqm)
Typical Arrangement		0.225	0.450	0.10125
Increased Arrangement		0.450	0.450	0.2025
Tredda Plate		0.210	0.210	0.0441
Other	Y	0.150	0.150	0.0225
Imposed Load:	7.29 kN			
GBP:	323.78 kN/m ²			

Additional Comments If Required

CENTRE STANDARD

Allowance For Double Width: YES

Tube DL (kN/m)	0.043	Boards DL (kN/m ²) (kN/m)	0.35 0.056	Fittings (kN)	0.018	Length (m)	Width (m)	Quantity	Length (or) Area
Bay Size						1.00m	1.20m		
Standards (lift height)								1	0.75m
Ledgers								1	1.00m
Beam							kN/m	0	1.00m
Transom								3	1.20m
Guardrails								0	1.00m
Boarded (Main Platform)								1	1.20
Boarded (Inside Boards)								0	0.00
Toe Boards								0	1.00m
Ledger Bracing								1	1.88m
Façade Bracing								1	1.78m
Plan Bracing								0	2.00m
Fittings								6	N/A
Live Loads Applied				Total Number of Lifts:				2	
				Number of Boarded Lifts:				1	
(SWL) 100%		10.00kN /m ²		Total Dead Load Per Lift:					0.50kN
(SWL) 50%		5.00kN /m ²		Total Dead Load					1.41kN
(SWL) Inside bds		0.75kN /m ²							
Maximum No. Lifts at 100%		1		Total Live Load:					12.00kN
Maximum No. Lifts at 50%		0							
No. Lifts with inside bds loaded		1		Total Load Combined:					13.41kN
No. Support Stds/Puncheons		1							
Axial Load	13.41kN	Effective Length (Le)	1.5 m	Safe Axial Load (Pc)	42.25kN	Slenderness Ratio (λ)	95.3	Slenderness Max (λ)	271
									PASSES

Ground Bearing Pressure (GBP)

Sole Pad Arrangements

	Pad Width (m)	Pad Length (m)	Pad Area (sqm)
Typical Arrangement	0.225	0.450	0.10125
Increased Arrangement	0.450	0.450	0.2025
Tredda Plate	0.210	0.210	0.0441
Other	Y 0.150	0.150	0.0225

Imposed Load: 13.41 kN
GBP: 596.00 kN/m²

Additional Comments If Required

INSIDE STANDARD

Allowance For Double Width: N/A

Tube DL (kN/m)	0.043	Boards DL (kN/m ²) (kN/m)	0.35 0.056	Fittings (kN)	0.018	Length (m)	Width (m)	Quantity	Length (or) Area
Bay Size						1.00m	1.20m		
Standards (lift height)								1	1.10m
Ledgers								1	1.00m
Beam							kN/m	0	1.00m
Transom								4	0.60m
Guardrails								2	1.00m
Boarded (Main Platform)								1	0.60
Boarded (Inside Boards)								0	0.00
Toe Boards								1	1.00m
Ledger Bracing								1	2.05m
Façade Bracing								1	1.95m
Plan Bracing								0	2.00m
Fittings								10	N/A
Live Loads Applied				Total Number of Lifts:				2	
				Number of Boarded Lifts:				1	
(SWL) 100%		10.00kN /m ²		Total Dead Load Per Lift:					0.69kN
(SWL) 50%		5.00kN /m ²		Total Dead Load					1.59kN
(SWL) Inside bds		0.75kN /m ²							
Maximum No. Lifts at 100%		1		Total Live Load:					6.00kN
Maximum No. Lifts at 50%		0							
No. Lifts with inside bds loaded		1		Total Load Combined:					7.59kN

Consider Imposed Load From Access Bay

Bay Width (m)	*	Bay Length (m)	*	(	SWL (kN/m ²)	+	Bds DL (kN/m ²)	)	+	Tube Dead Load(kN)	
0.6	*	0.5	*	(	10	+	0.35	)	+	0.45	
										=	3.56kN
Load	*	No. Lifts	=	Result							
3.56kN	*	1	=	3.56kN							
Load	+	Load	=	Result							
7.59kN	+	3.56kN	=	11.14kN							

No. Support Stds/Puncheons 1

Axial Load	Effective Length (Le)	Safe Axial Load (Pc)	Slenderness Ratio (λ)	Slenderness Max (λ)	Result
11.14kN	1.5 m	42.25kN	95.3	271	PASSES

Ground Bearing Pressure (GBP)

				Sole Pad Arrangements		
				Pad Width (m)	Pad Length (m)	Pad Area (sqm)
Typical Arrangement				0.225	0.450	0.10125
Increased Arrangement				0.450	0.450	0.2025
Tredda Plate				0.210	0.210	0.0441
Other	Y			0.150	0.150	0.0225

Imposed Load: 11.14 kN
GBP: 495.11 kN/m²

Project:	Ryland Building, Manchester
Drawing Number:	BDS - 10515 - 01 to 02
Item:	Loading Platform & Access Ramp
Revision (if applicable):	A 13/10/2023
Category of Check (1, 2, or 3):	2

Description of Temporary Works:

Loading Platform & Access Ramp

I certify for and on behalf of BDS Ltd, that in my opinion, the erection proposals and proposed temporary works details, specified in the schedule attached hereto relating to the construction of the above contract, are satisfactory for the proper discharge of responsibilities for the safe temporary works design elements of the works, and for their safe execution and removal (if applicable) in accordance with the drawings and specification, and without detriment to the related permanent Works.

Schedule of Drawings and Other Documents:

10515 - 01	Plan A-A	Elevation B-B	
10515 - 02	Section C-C	Section D-D	Section E-E

Supporting Calculations: Page 1 to 18
 Check Certificate: Page 19 of Calculations Document

Drawn By: Joe Rigby
 Company: Buckley Design Solutions

Signature: 

Drawing Status:
CONSTRUCTION

Calculations By: Jonny Hollingworth
 Company: Buckley Design Solutions

Signature: 

Checked By: Mike Brown
 Company: Buckley Design Solutions

Signature: 

Date:
 13/10/2023