Scaffolding... What? When? How & Why?





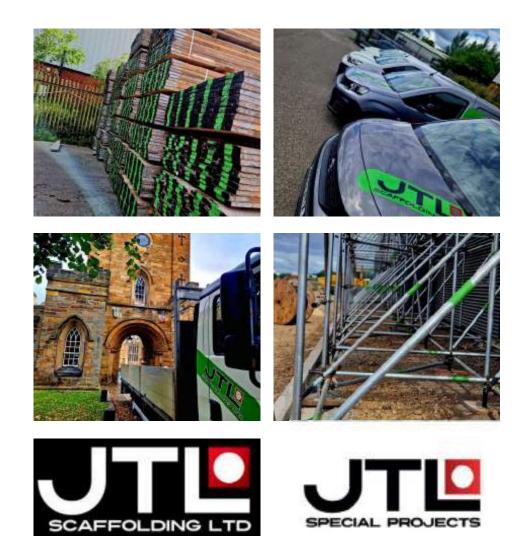


Introduction...

Matthew Johnson Beng (hons) GMICE

Temporary Works for 14 Years Industrial, Contract & Consultancy

https://www.linkedin.com/in/ma tthew-johnson-ab614361/



Who are JTL?

JTL Scaffolding Ltd

Nest Road, Gateshead, NE10 OES 0191 469 4964

JTL Special Projects Ltd

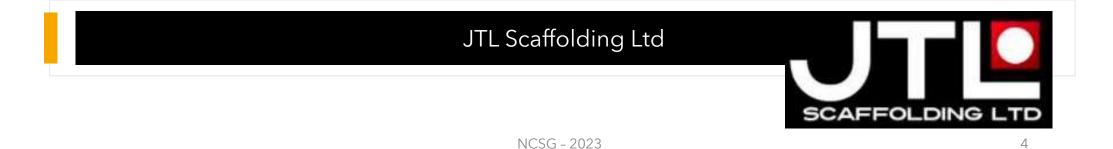
Port of Dundee, DD1 3NA

01382 456067

Info@JTL-Group.co.uk



What is Scaffolding...



What is Scaffold?

Definition of 'scaffold'

scaffold

Collins COBUILD

Word Frequency

(skæfould 🃢 🕕)

Word forms: plural scaffolds 40

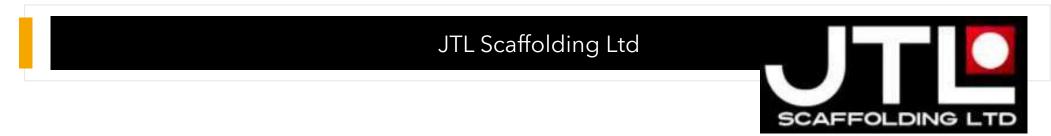
1. COUNTABLE NOUN

A scaffold was a raised platform on which criminals were hanged or had their heads cut off.

Moore ascended the scaffold and addressed the executioner.

2. COUNTABLE NOUN

A scaffold is a temporary raised platform on which workers stand to paint, repair, or build high parts of a building.

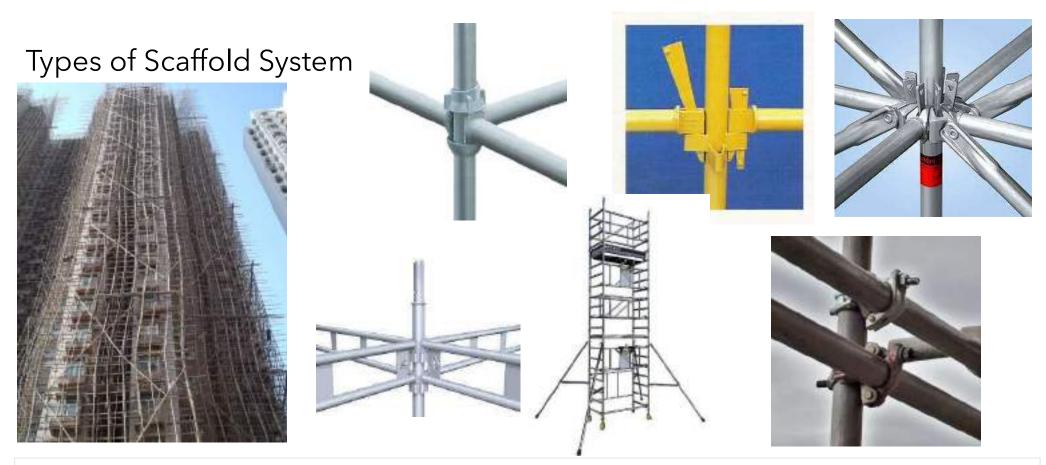


Regulations / Guidance

Working at Height Regulations 2005 BSEN 12811 Part 1 - Tubular Scaffolding BSEN 12812 - System Scaffolding BS5975 - Temporary Works BS 1139 or BS EN 39 - Steel Tube EN 74 - Fittings BS2482 - Scaffold Boards BSEN 13501 - Fire Retardants for board BSEN 13374 - Edge Protection BSEN 795 - Anchor Devices Building Regs M & BSEN 12811 - Stairs and Ramps Eurocode 1 - Wind, Snow & Actions

NASC – Safety Guidance (SG) NASC - Technical Guidance (TG)

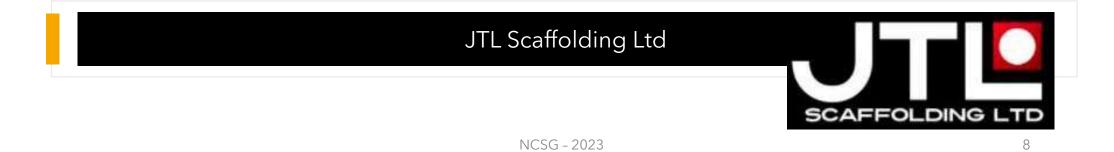




JTL Scaffolding Ltd



How do We Use It?



Types of Scaffold - Application

Access Scaffold - Independent, Tower, Hanger, Birdcage, Staircases

Storage - Loading Bay, Truss Racks, Lintel Racks, Pipe Racks, Loading Gantries

Protection - Temporary Roofs, Hoarding, Crash Decks, Pavement Gantries, Fans

Support - Shoring for Concrete, Propping, Needling, Flying Shores, Façade Retention

Advertising - Sign Boards, Information Boards, Digital Advertising

Lifting - Lifting Gantries, Turfer Support

Event - Staging, Seating, Pedestrian Access, Ramps



Types of Scaffold - Cantilevered Hanger









Types of Scaffold - Cantilevered Hanger



JTL Scaffolding Ltd



Types of Scaffold - T&F Stairs





JTL Scaffolding Ltd



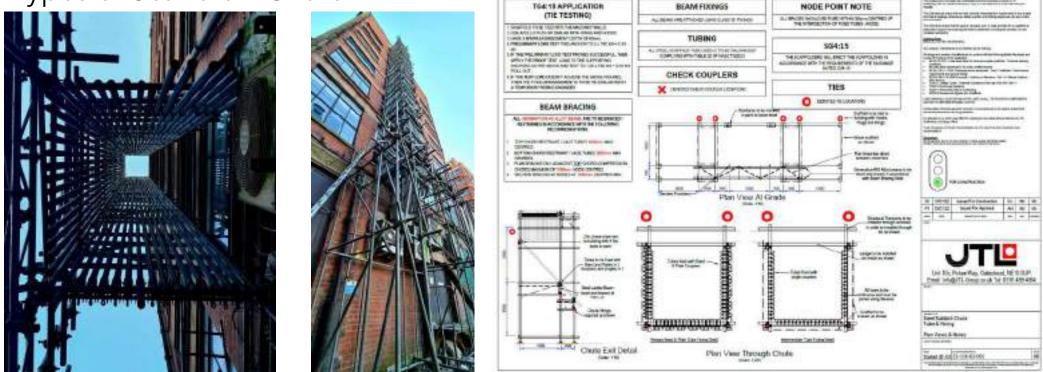




JTL Scaffolding Ltd



Types of Scaffold - Chute

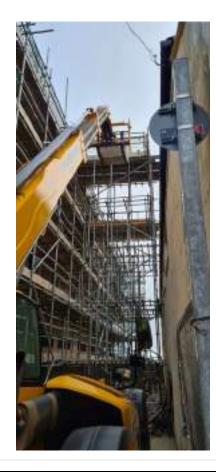


JTL Scaffolding Ltd



Types of Scaffold - Loading







JTL Scaffolding Ltd



Types of Scaffold - Demolition







JTL Scaffolding Ltd



Types of Scaffold - Spurred Access





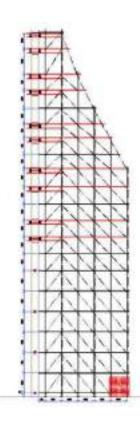
Types of Scaffold - Façade Retention



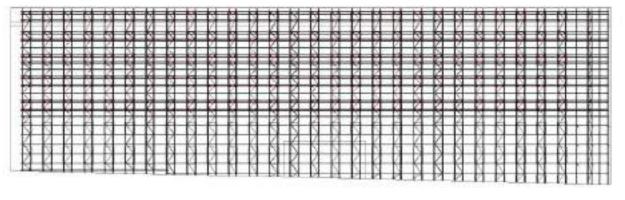


JTL Scaffolding Ltd





Types of Scaffold - Market Street, Pilgrim Quarter





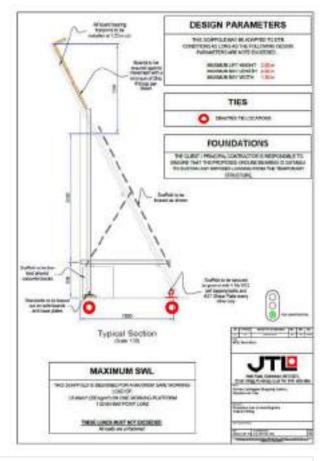
JTL Scaffolding Ltd



Types of Scaffold - Protection Fan







JTL Scaffolding Ltd



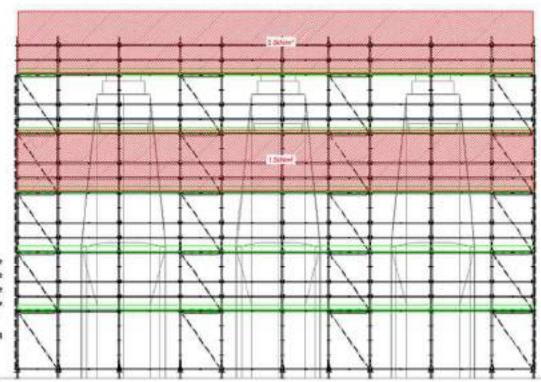
Scaffold Loadings

These loading requirements are stated on the TG20 compliance sheets for clarity.

Load class	Platform loading
1	One platform at 0.75 kN/m² and one 50%-loaded platform at 0.375 kN/m².
2	One platform at 1.5 kW/m² and one 50%-loaded platform at 0.75 kW/m².
2	One platform at 2.0 kW/m ² and one 50 %-loaded platform at 1.0 kW/m ² .
4	One platform at 3.0 kN/m ² and one 50 %-loaded platform at 1.5 kN/m ² .

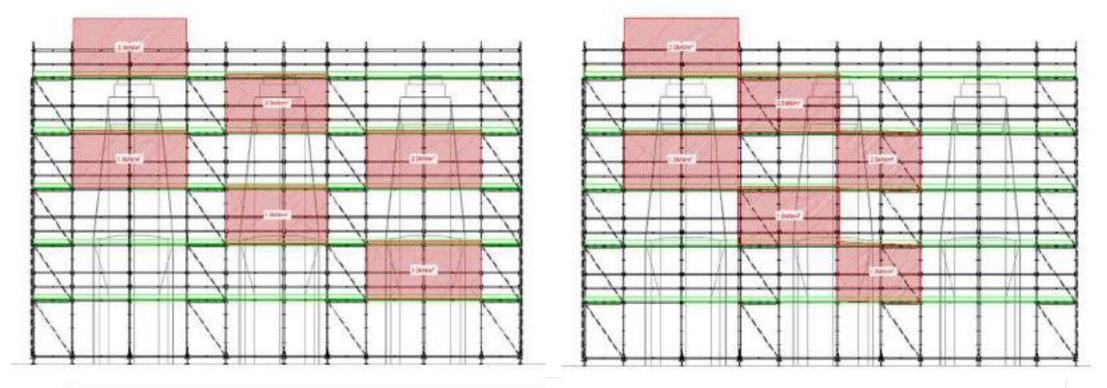
Table 5.1 platform loading by load class.

MAXIMUM SWL	Loadings	
THIS SCAFFOLD IS DESIGNED FOR A MAXIMUM SAFE WORKING LOAD OF: 2.0 kN/m² (200 kg/m²) ON ONE WORKING PLATFORM 1.0 kN/m² (100 kg/m²) ON A SECOND WORKING PLATFORM 0.75 kN/m² (75 kg/m²) ON INSIDE BOARDS	Working Load: Additional Load: Inside Board: Hop Up Bracket:	1 Lift(s) at 2.00 kN/m² 1 Lift(s) at 1.00 kN/m² 2 Lift(s) at 0.75 kN/m² NALift(s) at NAkN/m²
THESE LOADS MUST NOT EXCEEDED All loads are unfactored	Maximum Calcula	ted Leg Load is as shown





Scaffold Loading

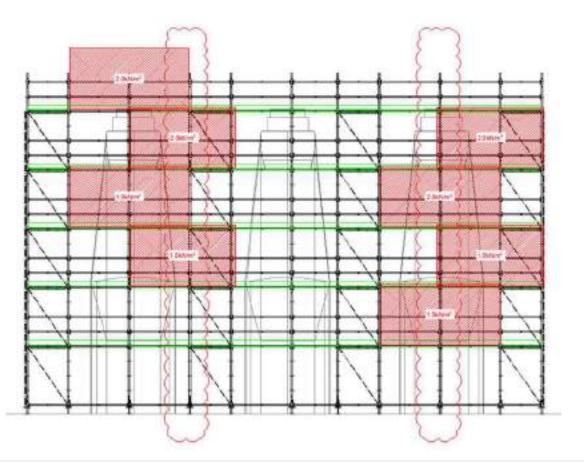






Scaffold Loading

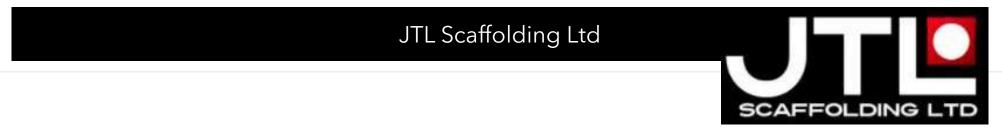
Overload the standard in accordance with the design but not necessarily the component itself





JTL Scaffolding Ltd

Engineering/Scaffold Design



Scaffold Loading

Limit State Design (LSD) - Eurocode

- Used by some Scaffold Design but not as common
- Mainly used for Steel Design
- Design a Steel based on a Load required & FOS

Permissible Stress Design

• Pre determined Component Load

Tulle numerial	Outor manager	Avertikel Dickette	100	Solitan ana	Second something of area	Ratios of gynation	Platfo artfilm modules	Characteristic yield chron	Salv solving maneral	Bate-writing official
	11111	10445	April 1	4,3091	1000	1.000	1001	5,79,091	Materia	15.851
Trops 4 their hole to 05 kH 24 (2011 or \$0 1129-011789) (ad here)	413	417	:411	342.	11.8	8.87	1.82	100	1.12	- 291
Pyper in close frame for each first and the state of the second states of the second states of the second	415	-10	40	416	12.68	1.86	14	200	2.81	334
Trans & these Subsciences (11.000-1000) (soc.com)	80	-40	1973	432	01	(9.8E)	1.00	(H)	100	1.000
Type 4 the Table to 2011 THE THE Law (, with 10% continues with works).	418	16	1497	416	12.84	1.84	100	110	9.PY	- 211
ek in sizen positischer vergenzeiten ist in der hier sitere Gener	993	14	220	+53	11.0	9.001	1.52	100	1.40	101
ALL & ELEVEN personnel sheet take grain 1251 to 92 DE 16216 or 82 10218 totel, with UK-converse advanced	477	10	394	439	15.5	1.00	1.02	- 291	139	812

Alle 5.8 Properties of these sections for conditions seminary loant in such deing charters.

Ratic section	Orientation	Dection tree	Section metaller	Strength class	Working land these tagonally (MI)	Welking load methand capacity (blime
2014 TRE HAS ALL PLATE LINES	Luctu:		\$4.19	234	44	145
The + J TP was andres (memory on peeps (respond	SHENK	112.5	1018	101	19.0	10.1
	une	312.9	1018	104	102	3.29
	- OHR	712.0	1822	-010	(16))	1,008
	10.000	mza	1007.0	124	3.7	112
221 + 71 NM ENDE	Little	967	2163	CH4	12	1.201
	Gene	167	284	104	1.0	-1,698
	to eig	MET	852.8	-2746	85	1.454
	01.423p	167	102.8	0,0	H	A 888
20E + 100 www.thriber	SHOW.	- 2011	1271	C18	10.0	1.009
	Later	38	3013	104	10	185



Scaffold Loading

Prective Length Ly (mm)	Silonderness ratio A	State axiat load P, (NN)
80	42	70.9
0	25.4	
80	38.1	543
// 08	90.8	50.3
000	41.5	542
100	76.3	42.4
400	11.9	427
900	101.7	37.8
100	5144	32.8
200	122.1	282
200	135.8	24.8
400	152.5	211
900	1652	18.9
900	172.9	16.8
000	190.5	14.9
100	033	184
400	216.0	12.0

Appendix D - Safe axial loads of steel scaffold tubes manufactured in accordance with BS1139-1:1982

Table D.1 Sale and loads for permissible stress design of steel unaffold takes manufactured in accordance with 05 1135-1-1902



JTL Scaffolding Ltd

26

Temporary Works Design - What is Required - WAH Regs 2005

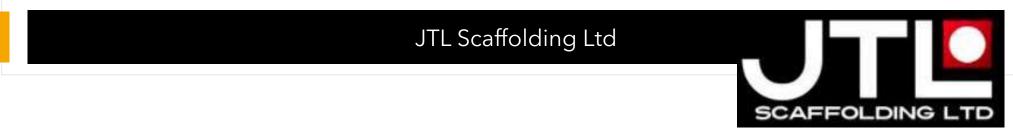
SCHEDULE 3 REQUIREMENTS FOR WORKING PLATFORMS

PART 2 ADDITIONAL REQUIREMENTS FOR SCAFFOLDING

Additional requirements for scaffolding

- 7. Strength and stability calculations for scaffolding shall be carried out unless-
 - (a) a note of the calculations, covering the structural arrangements contemplated, is available; or
 - (b) it is assembled in conformity with a generally recognised standard configuration.

8. Depending on the complexity of the scaffolding selected, an assembly, use and dismantling plan shall be drawn up by a competent person. This may be in the form of a standard plan, supplemented by items relating to specific details of the scaffolding in question.



Design Brief BS 5975

13.2

13.2.1

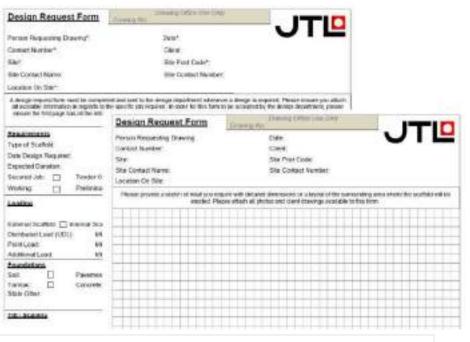
Design brief

- Contact details
- Requirements
- Intended Uses
- Program
- Phasing
- Duration
- Hazards
- Environmental issues
- Foundations

MGL GROU			TW DESIGN BRIE Contr
Contract Name:	Pigrim	Quarter	Contract Number: 50024
Temporary Works In	formation	N.	
TW Register Referen	ICH .	25	TW tem Description And Location
TW Design Category	ŝ.	3	Scallold protection to the rear of Cartiol House to
TW Implementation	lisk	High	include helo stavcase

towards the preparation of the brief.





JTL Scaffolding Ltd

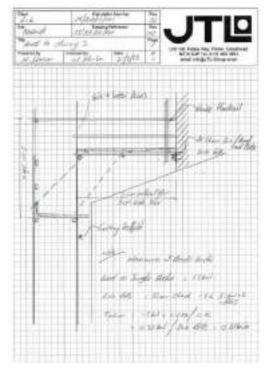
A design brief should be prepared to serve as the basis for subsequent decisions, design work,

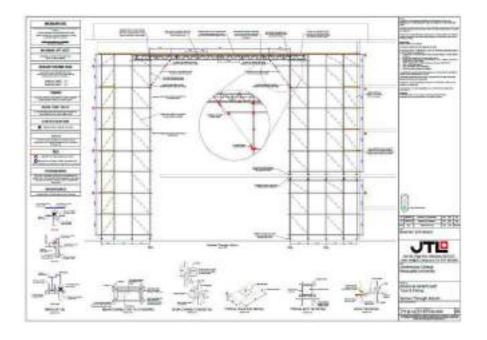
calculations, drawings and design checks. All concerned with the construction should contribute



Temporary Works Design - What is it?







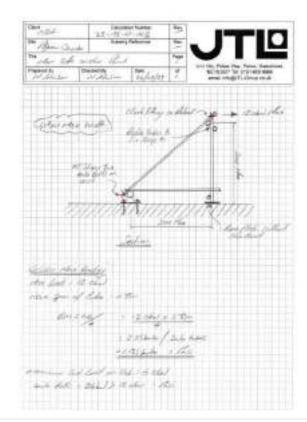
JTL Scaffolding Ltd



Temporary Works Design - What is it?

344 ASL	11-10-11-08-	3	I THE I PA
* Agai Canto		100	JTP
the the had been	to family for to and shy		ou too, Hoan Way Pales Sellipticat
H Jan St	Craded No Com S Harder Criden fast	10	HE STORF THE OLD LARS AREA amount integrate characteristic
The Physics		1111	11111111111111
the fals			
Attainer	and Sectored 1	und the	Mat
They Lost	contrat of and	Sector	1 1900 + 28- AR
			1 -2 3 Day / Allen
dent,"	a designed	Sand	Cardinal to Card
(manual)	2 and		
1 200	Sugar de la constantint		
200			
13			
Section And	in some standing t dit	and day	del in the
spran 6	- and a strain		Jansa
Contractor of the	= 1.8 M		OC 141 CITE OF COLUMN TO A COLUMN
	= degen		
			This love + Sab + 216 his
Stream of	<u>len:</u> = 17.144/2.8		- 8.44-1
	- http:/	0	1 2 1 2 1 1 2 1 1 2 1 1 1 1 1 1 1 1 1 1
Colorer Ma	a later when the	no de	- level - 2201
	250 / 2.200 = \$ 4	the /2 a	i his
	13.20	10.00	
Abritian a	Routh Barline in	gente av	2 - 100 Aut - 17 Blacks
			as isen ha

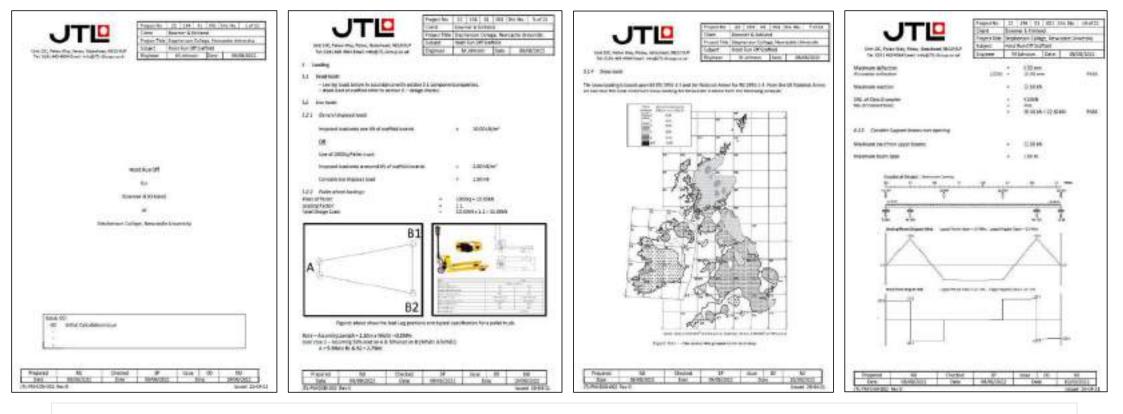
Dece .	15×171×17+182	3	10000
Mar Our		10	JTĽ
	in that & secret	rap.	List 100 Parks Ville Parks (Section)
President	There in 1 1/2/22	1	MENDOP Tel 3131 alto 484
11124	solution and the later	TTT I	
- 16 M	mar medi		
Adventure	and destroyed - 18 44	414	decidents will 200
		111	
AM 54- A-			
4	2.1		
	and Suran will		10.00
	1		Common est
dente or	et ess detage		- e
Alternere.	Anton Appl - 24	61 m m	stafe de de de
in della	216 P stokt mit	100	edo schite 40
and the second	and a second second	Call I	and a new M
		1	
Ter in		112	
SEP to		1.22 m	1 + Boliev Let v 1840 Let
3.4. (1. 12)	app a district of the	1445	1. 1995 (AV)



JTL Scaffolding Ltd

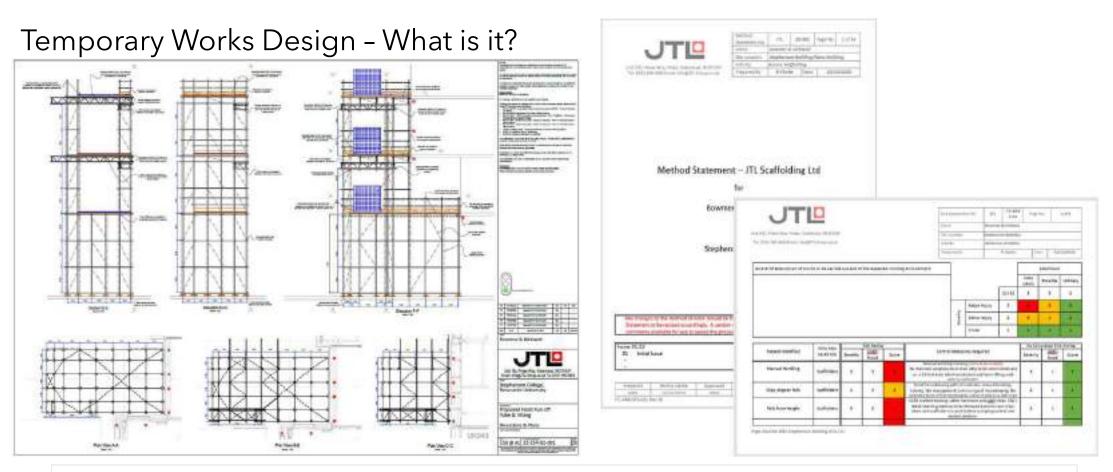


Temporary Works Design - What is it?









JTL Scaffolding Ltd



Inspections





JTL Scaffolding Ltd







JTL Scaffolding Ltd







JTL Scaffolding Ltd

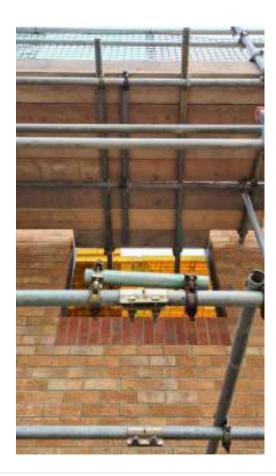


Joints in ledgers and guard rails

Joints in ledgers at the same lift and in adjacent lifts should not normally occur in the same bay. However, the absence of a joint in the guard rail in any bay may be accepted as giving sufficient continuity to the scaffold to permit joints in the ledgers above and below it in the same bay.

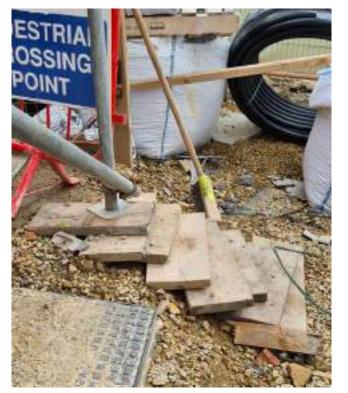
Joints in the ledgers of TG20 compliant scaffolding may be made anywhere within a bay if sleeve couplers or tubelock couplers are used. However, where an inner cantilevered platform is provided as described in section 6.19, any joints at the lift incorporating the cantilevered platform should be within 300 mm of a standard unless they are spliced.

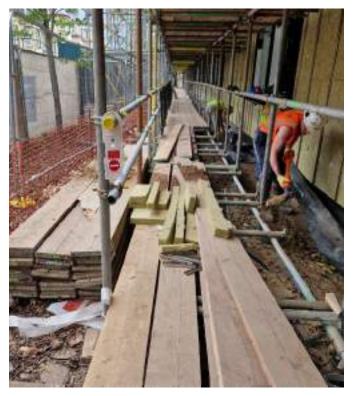
Joints in guard rails are normally permitted in any bay and may be placed anywhere within the bay.



JTL Scaffolding Ltd









JTL Scaffolding Ltd

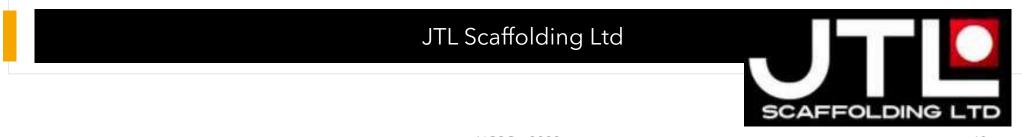


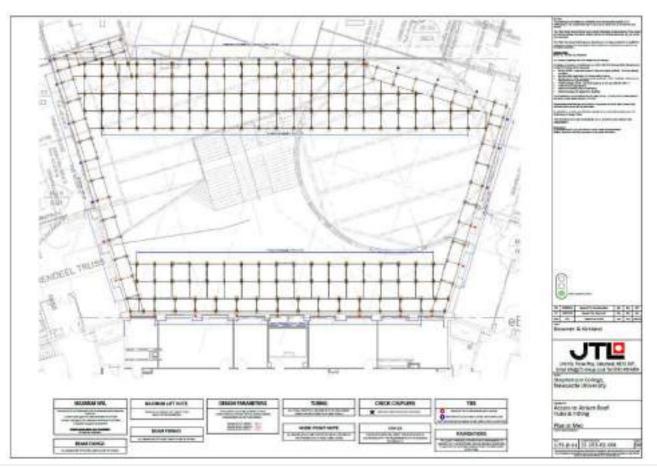
- Dimension Considered Maximums Depends on the Scaffold/Design
- Sleeves are permitted in the same bay on ledgers
- Sleeves in Standards MUST be Spliced if in same frame
- Cracks in Boards are permitted but within the limitations
- Engineers are not always right
- Scaffolders are not always wrong
- Scaffolding is a key part of a Projects, So why is it always the first to be cut down?
- It is the clients responsibility to ensure ground conditions are acceptable
- Gaps in platforms are allowed, gaps smaller than a single board (225mm) can be covered with Ply
- Lapped boards are permitted (not limited to corners)





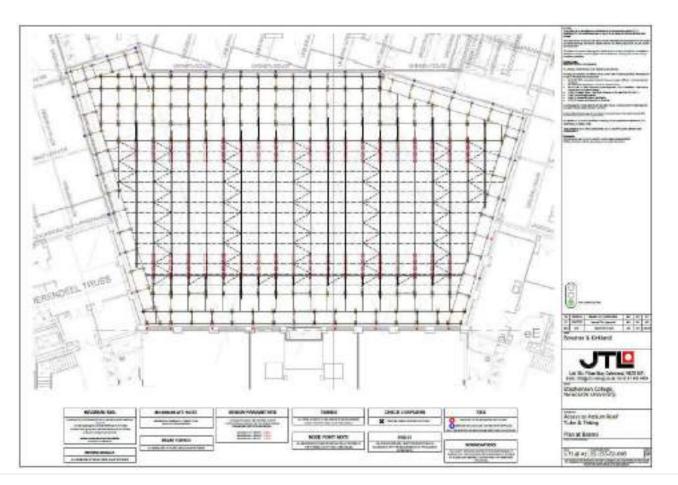
Atrium Access Stephenson College Bowmer & Kirkland





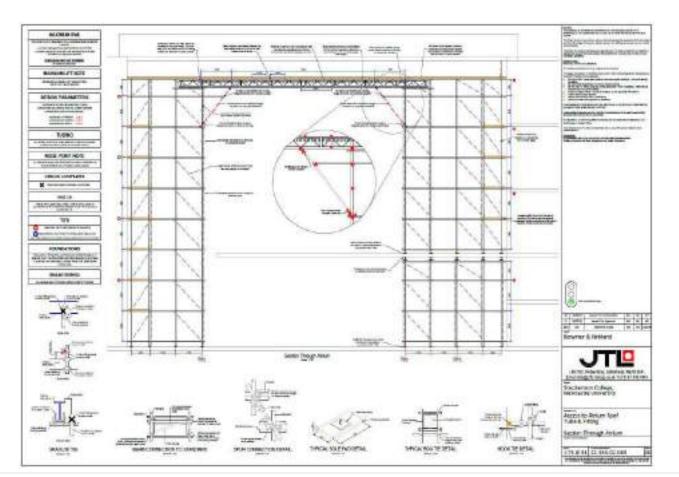


NCSG - 2023

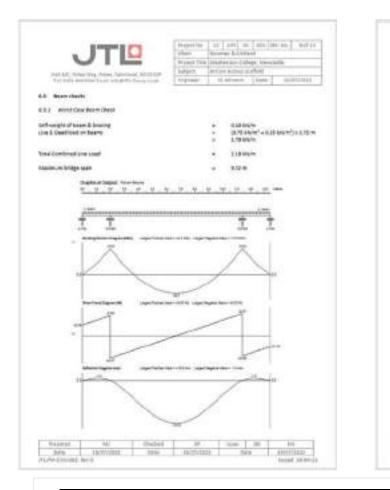


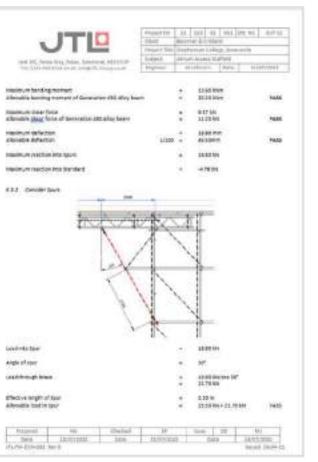


NCSG - 2023









Burden B La	Charles I and		199 22	[== 1] ==	24	3104.31
		Interior & United Interior College, New Johns Jackse words confided				
	Addent.					
[164] M.C. Nation Wey, Prime, Solutional, MITTURE Solution, and Advances and Article Solution.	- Proprietant		-	[inset]	-	
	-				_	
Coperation of Stationgy (Securit Inter-Specific Station of Station & Station of #178		3	(250 + 10	A TT /TO MA	et)	122
DOUBLE SPIRE RESIDENCE IN DRIVER TO SAVE DRIVE	TI IN ATTRACT			citizen a		168
call vito and Soar when doubled		1.1	21,7844	10		
and the man state of the state and		-	20.45 10			
				and the second		
capacity of feelings (owe know bow). 240 w. states to share w. 90%				120 (M)+ 120 M 10 /		
				+ 10.8h km		1455
consider has been stand here been			decapi-s	11.7016		
		÷.		1.1.1.1		
Charactly of Trillings		۰.	839104	10.05.06		144
UPPLARETWIT NTTHE REQUIRE ON STRUCTURE	MORANT .					
Capacity of littings with Supplementary roughly				1004054		
ano y soch a she y ech				130411-024		
		*	111800	1-22.0110	t	TAR
Vertical load thom connection				-10.00.00	£1	
THE OTHER REPORTS AND ADDRESS OF			246.04	10.0034		PARS
iffective couplingft			100 8			
Set al ana		*	203844	+ 7 98 KN		PASS
dist is within and speciality			418.84			
NOTE AND ADDRESS BETWEEN BELING DATA OF THE	195 Novel 84 17	LICER				
UNUM ORTH CHRISTLARY OLD BY (1997-DA), LOAD MOR	0.040.0	+		2,06.00		
with the local of frame-off in lacked			345.66	artial ber	गविभ	
Present IV. Darlard				w.	- 14	_



JTL Scaffolding Ltd

Challenges

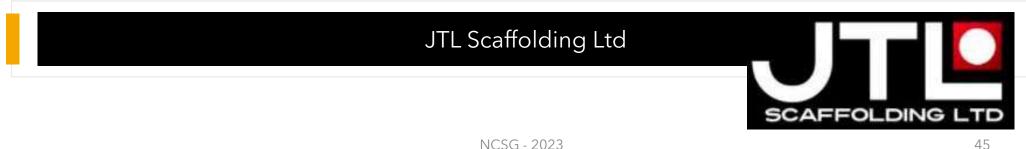
Pre Start Details/Information - Expectations

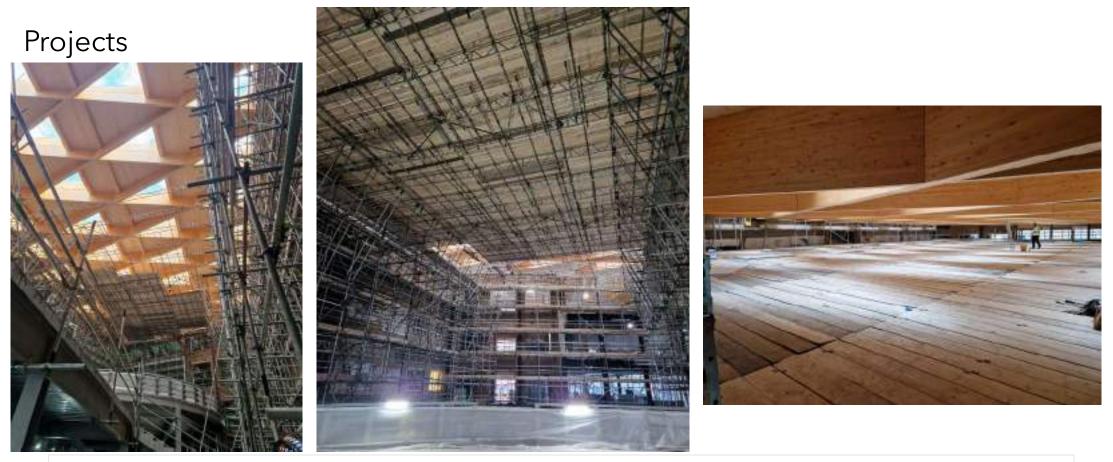
- Schedule at Tender "Atrium Birdcage" ٠
- Early in Program No issues with Materials
- No requirement for lower access
- No access/egress issues
- No Logistic Issues
- Simple Design, Big Scaffold, Easy to Erect, Standard Labour
- No ties required •

Reality

- Atrium Beam Section... Massive Beam Section
- Late in Program Walls... Everywhere
- Floor works and Partition Works
- Walls... Millions of Walls... Everywhere.. Oh and Glass... Big expensive panels of Glass
- Logistic Issues Walls... Everywhere
- Detailed Design, Big Scaffold, Difficult to Erect, Advanced Structure, Offshore Labour
- Can't tie to nothing... Walls, Glass etc..

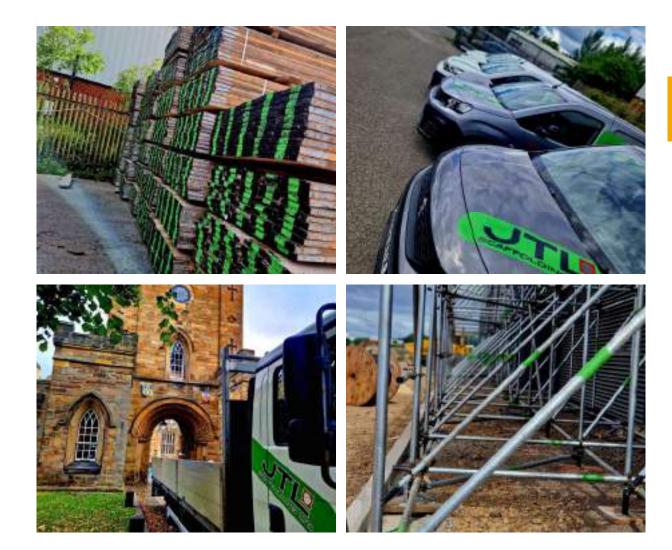
Variation... well, you can imagine





JTL Scaffolding Ltd





Questions...



Matthew Johnson - 07772718292

JTL Engineering Manager

Matthew.johnson@JTL-Scaffolding.co.uk

