Scaffolding...

What? When? How & Why?

JTL Scaffolding Limited




Introduction…

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Temporary Works for 14 Years

Industrial, Contract & Consultancy

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Who are JTL?

JTL Scaffolding Ltd

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What is Scaffolding...

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What is Scaffold?

Definition of 'scaffold'

scaffold

Collins COBUILD

(skæfould)

Word forms: plural **scaffolds**

Word Frequency

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.

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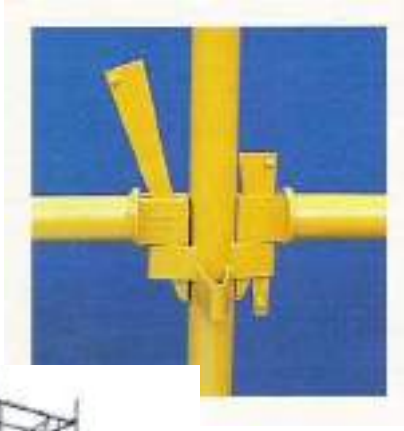
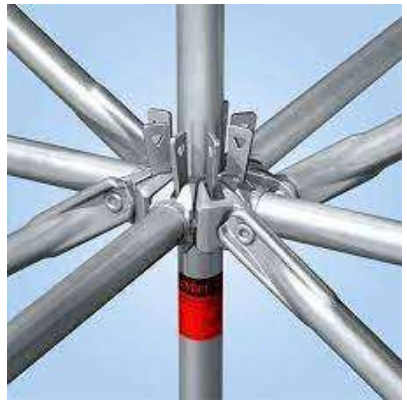
Regulations / Guidance

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)

Types of Scaffold System





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How do We Use It?

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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

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Types of Scaffold – Cantilevered Hanger

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Types of Scaffold – Cantilevered Hanger

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Types of Scaffold – T&F Stairs

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Types of Scaffold – System Stairs

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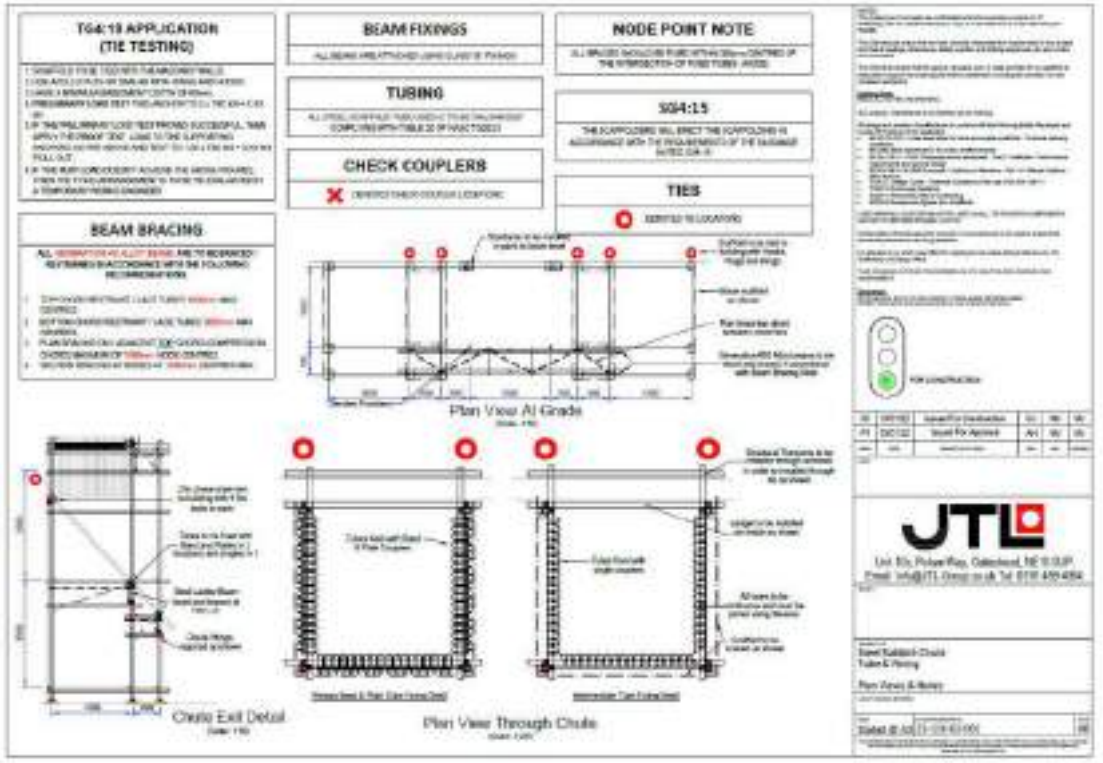
Types of Scaffold – Chute



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Types of Scaffold – Loading

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Types of Scaffold – Demolition

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Types of Scaffold – Spurred Access

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Types of Scaffold – Façade Retention

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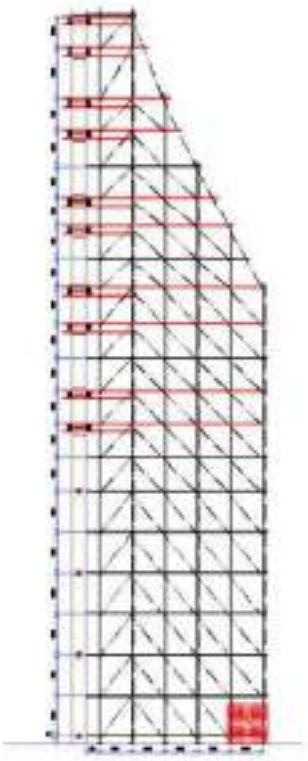
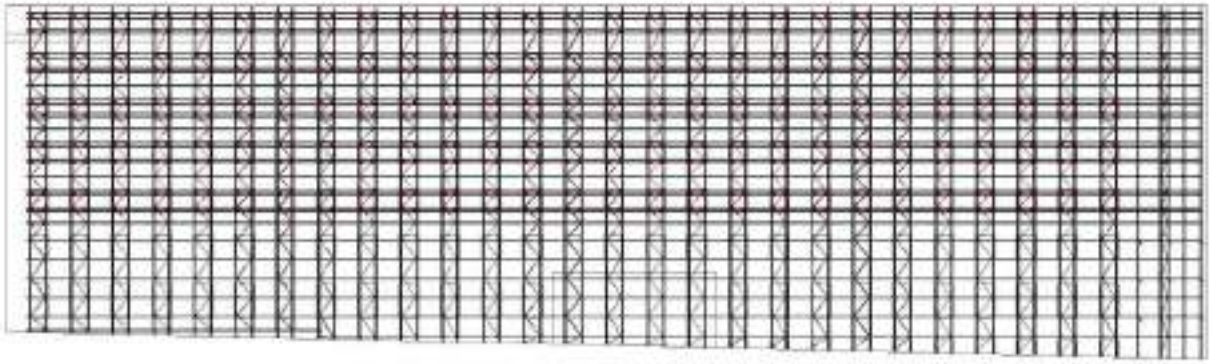
Types of Scaffold – Market Street, Pilgrim Quarter





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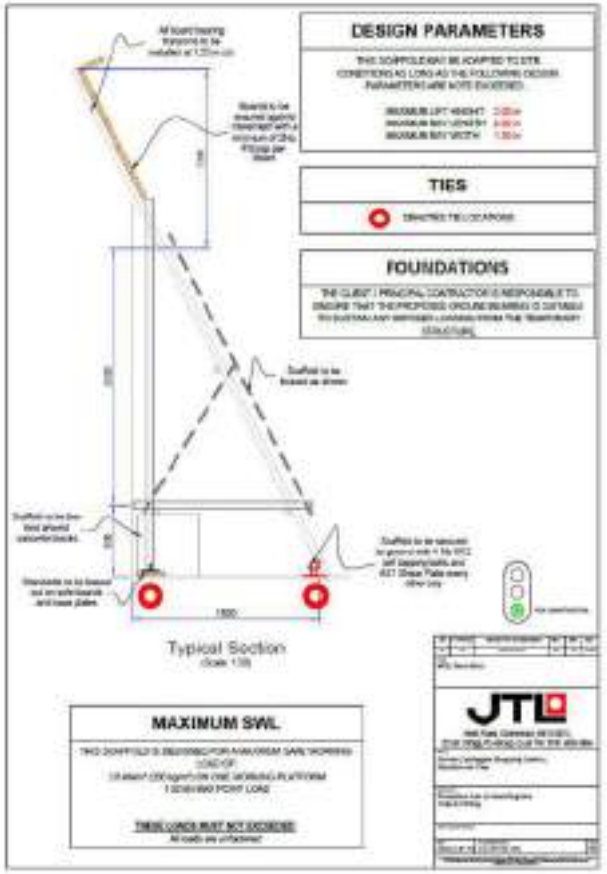
Types of Scaffold – Protection Fan



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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 kN/m² and one 50%-loaded platform at 0.75 kN/m².
3	One platform at 2.0 kN/m² and one 50 %-loaded platform at 1.0 kN/m².
4	One platform at 3.0 kN/m² and one 50 %-loaded platform at 1.5 kN/m².

Table 6.1: platform loading by load class.

MAXIMUM SWL

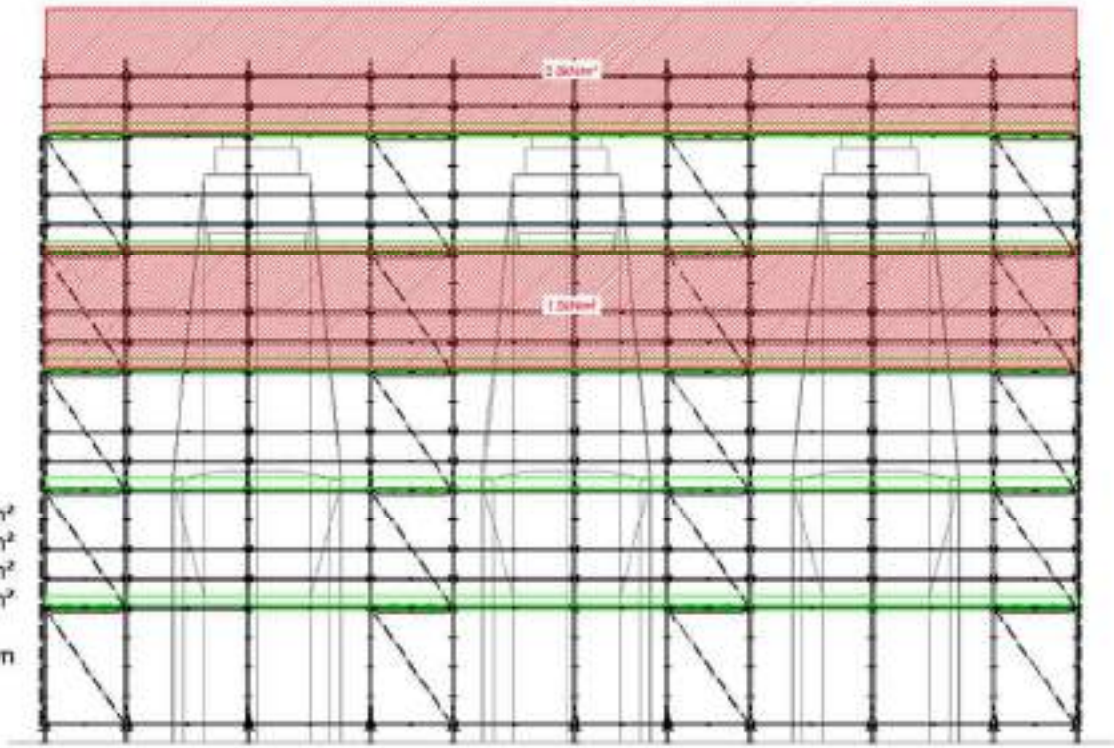
THIS SCAFFOLD IS DESIGNED FOR A MAXIMUM SAFE WORKING LOAD OF:
2.0 kN/m² (200 kg/m²) ON ONE WORKING PLATFORM
1.0 kN/m² (100 kg/m²) ON A SECOND WORKING PLATFORM
0.75 kN/m² (75 kg/m²) ON INSIDE BOARDS

THESE LOADS MUST NOT EXCEEDED
All loads are unfactored

Loadings

Working Load:	1	Lift(s) at	2.00 kN/m²
Additional Load:	1	Lift(s) at	1.00 kN/m²
Inside Board:	2	Lift(s) at	0.75 kN/m²
Hop Up Bracket:	NA	Lift(s) at	NA kN/m²

Maximum Calculated Leg Load is as shown



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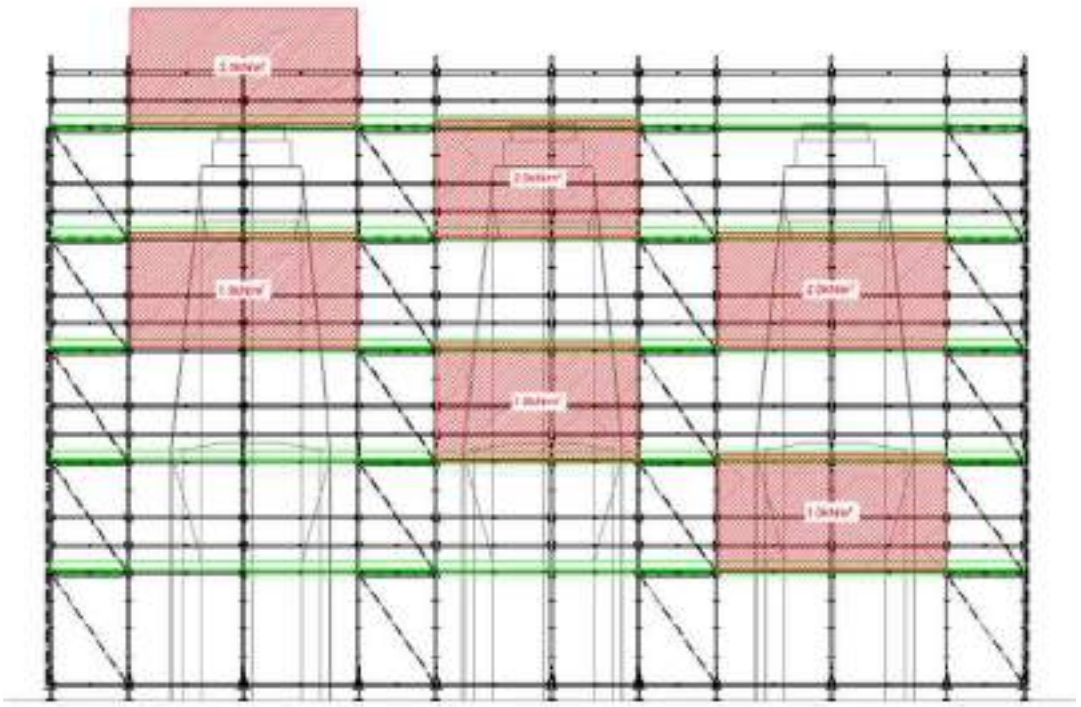
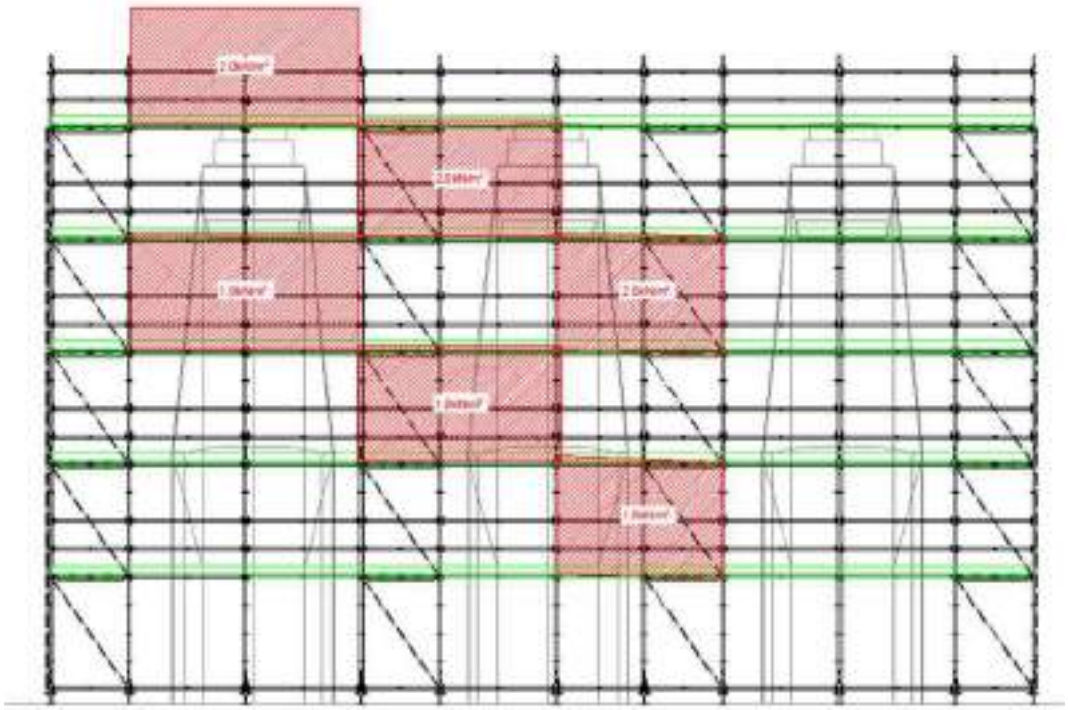
Scaffold Loading





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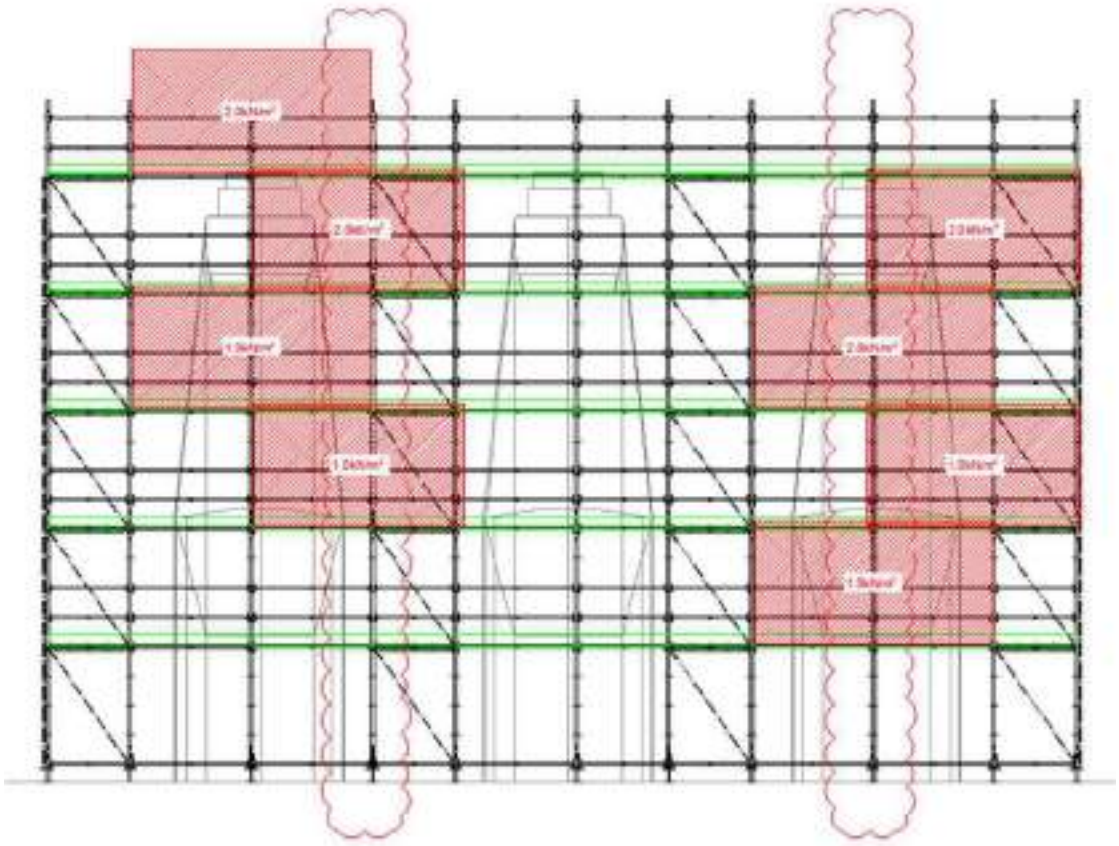
Scaffold Loading

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



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Engineering/Scaffold Design

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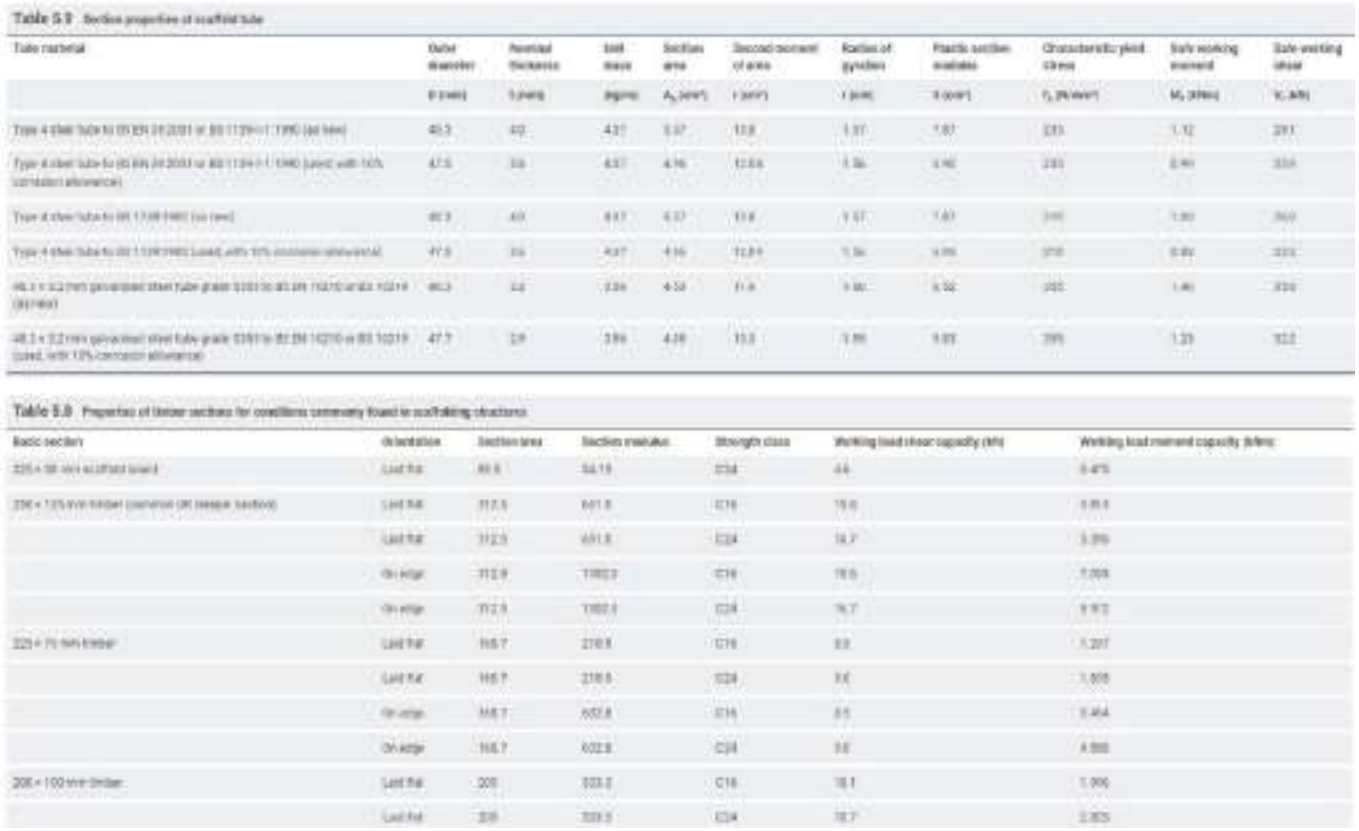
Scaffold Loading

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



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Scaffold Loading

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

Table D.1 Safe axial loads for permissible stress design of steel scaffold tubes manufactured in accordance with BS 1139-1:1982

ALL NEW TUBES

Effective Length L_E (mm)	Slenderness ratio λ	Safe axial load P_c (kN)
200	12.7	70.9
400	25.4	68.9
600	38.1	64.2
800	50.8	59.3
1000	63.5	54.0
1200	76.2	48.4
1400	88.9	42.7
1600	101.7	37.3
1800	114.4	32.9
2000	127.1	28.2
2200	139.8	24.6
2400	152.5	21.5
2600	165.2	18.9
2800	177.9	16.8
3000	190.6	14.9
3200	203.3	13.4
3400	216.0	12.0

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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.

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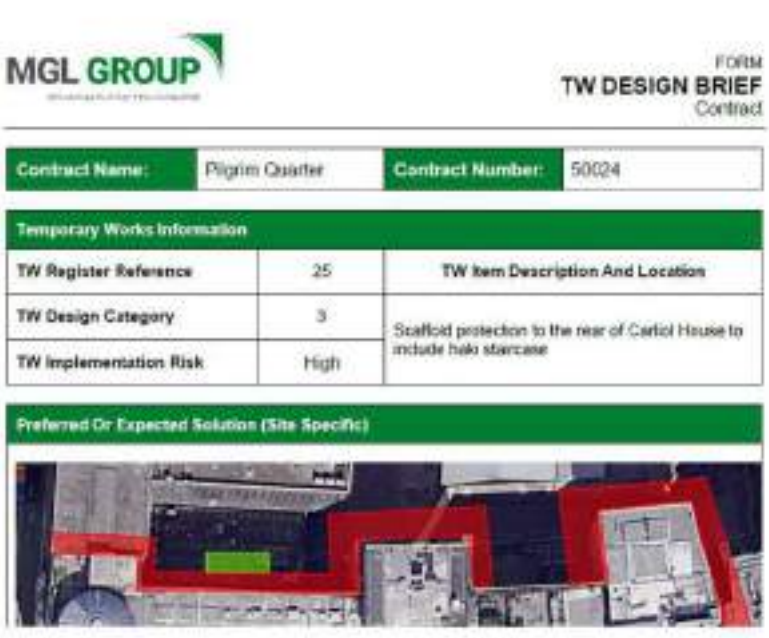
Design Brief BS 5975

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

13.2 Design brief

13.2.1 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 towards the preparation of the brief.



MGL GROUP

FORM
TW DESIGN BRIEF
Contract

Contract Name:	Pilgrim Quarter	Contract Number:	50024

Temporary Works Information		
TW Register Reference	25	TW Item Description And Location
TW Design Category	3	Scaffold protection to the rear of Carlol House to include hako staircase
TW Implementation Risk	High	

Preferred Or Expected Solution (Site Specific)

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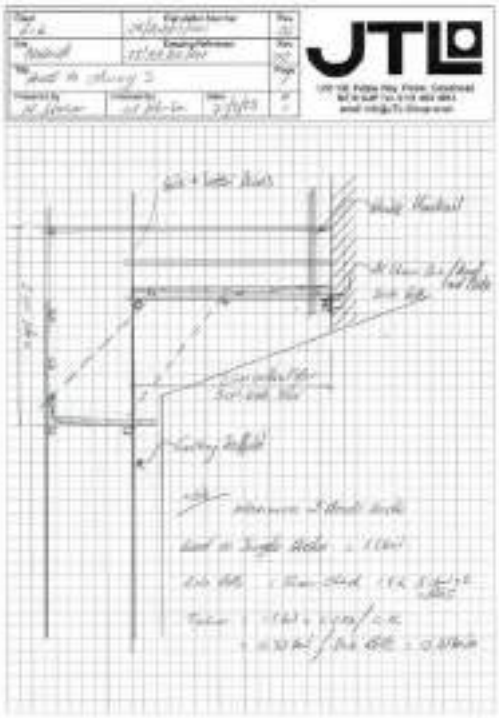
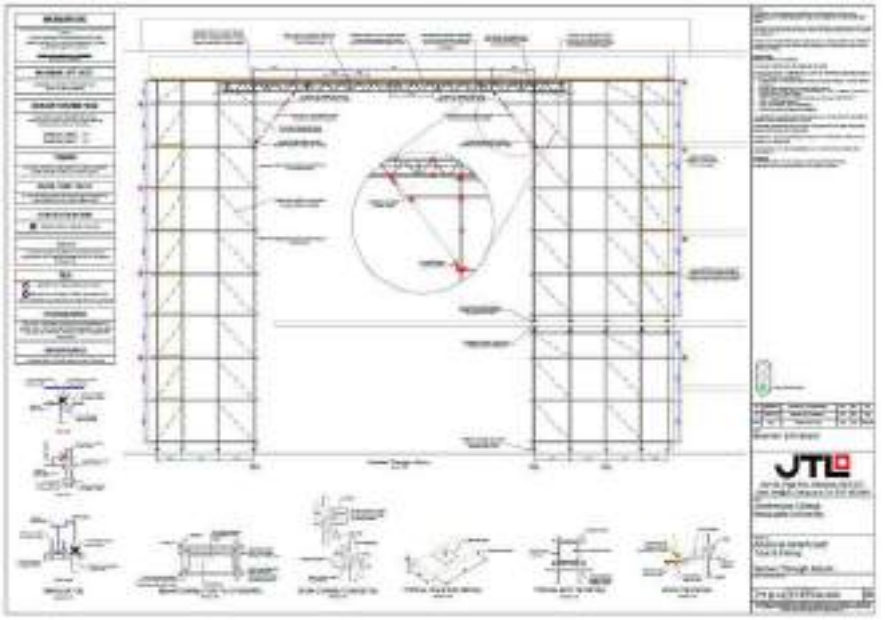
Temporary Works Design – What is it?





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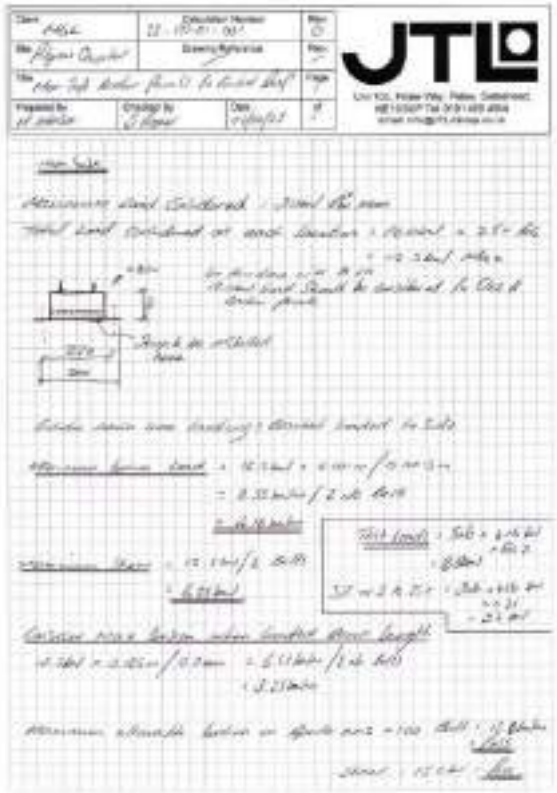
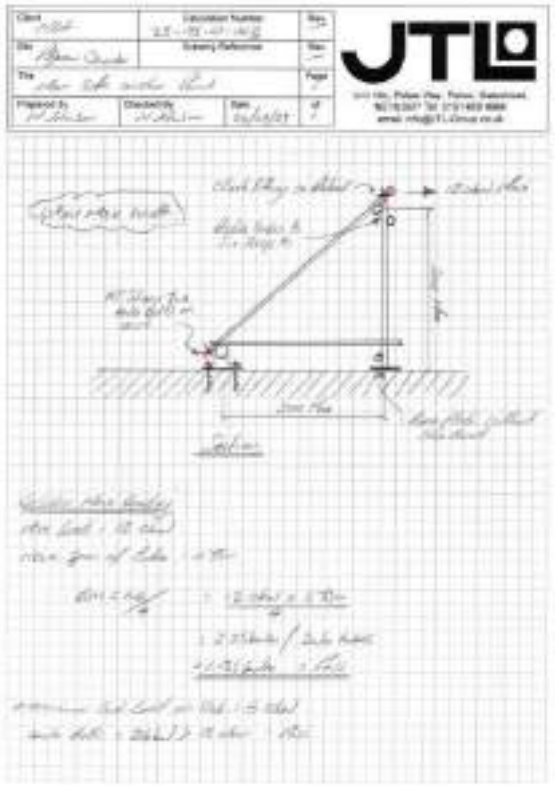
Temporary Works Design – What is it?





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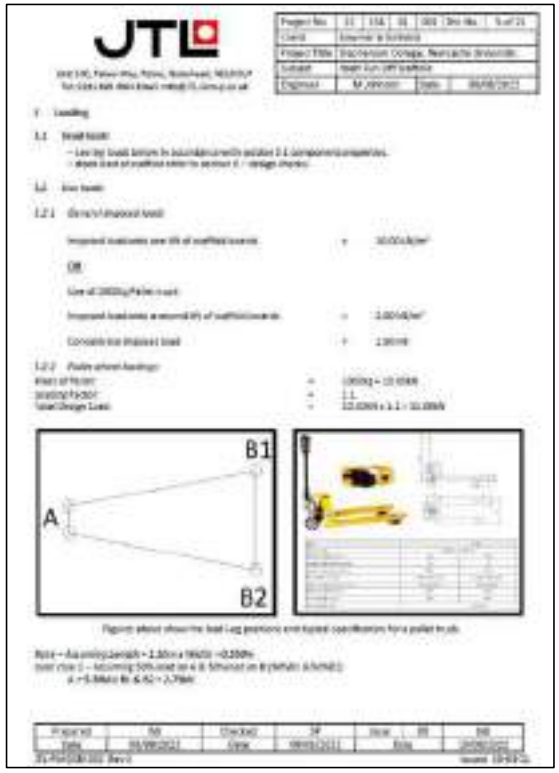

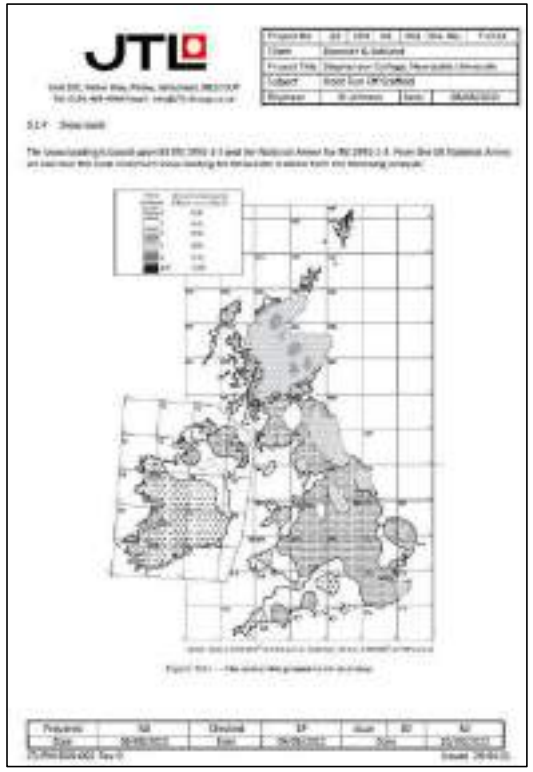

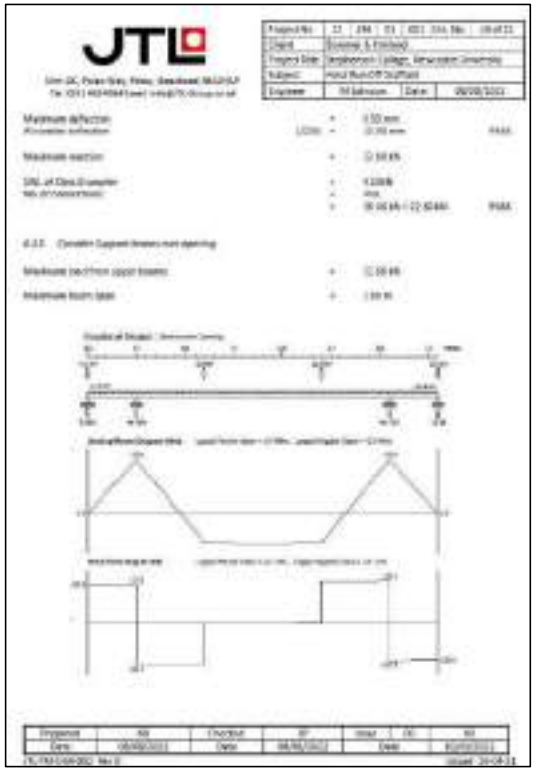

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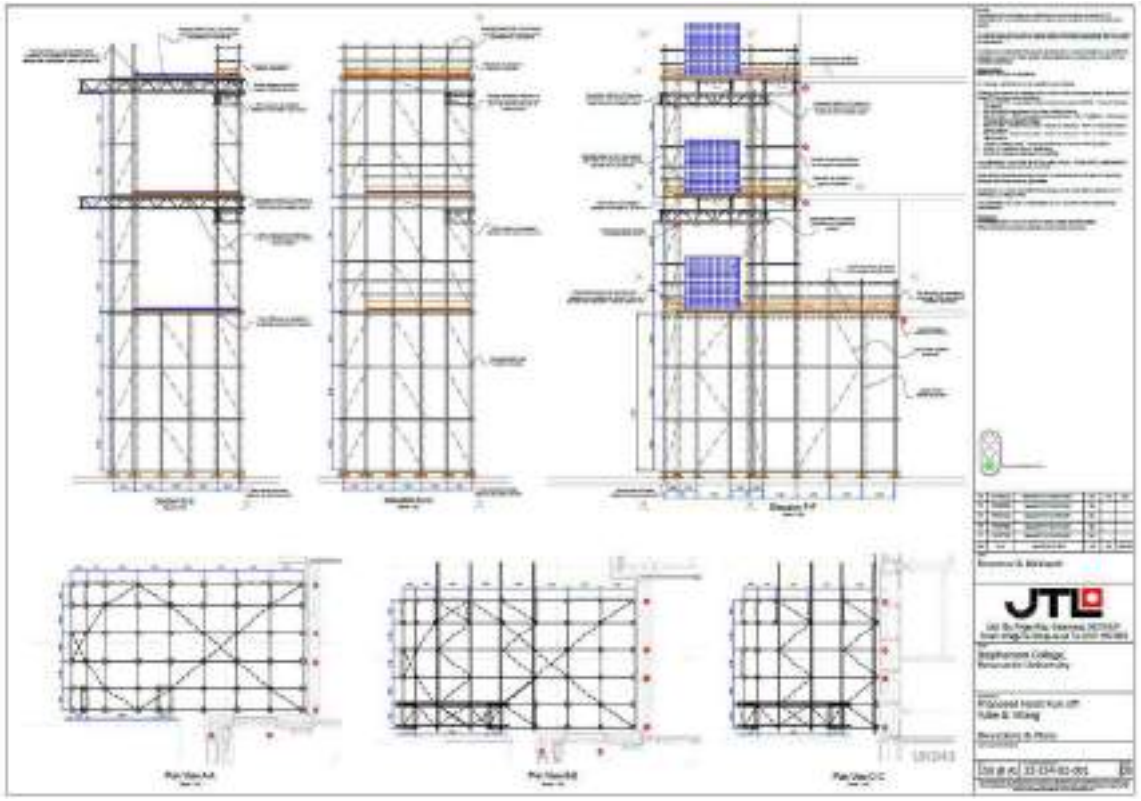
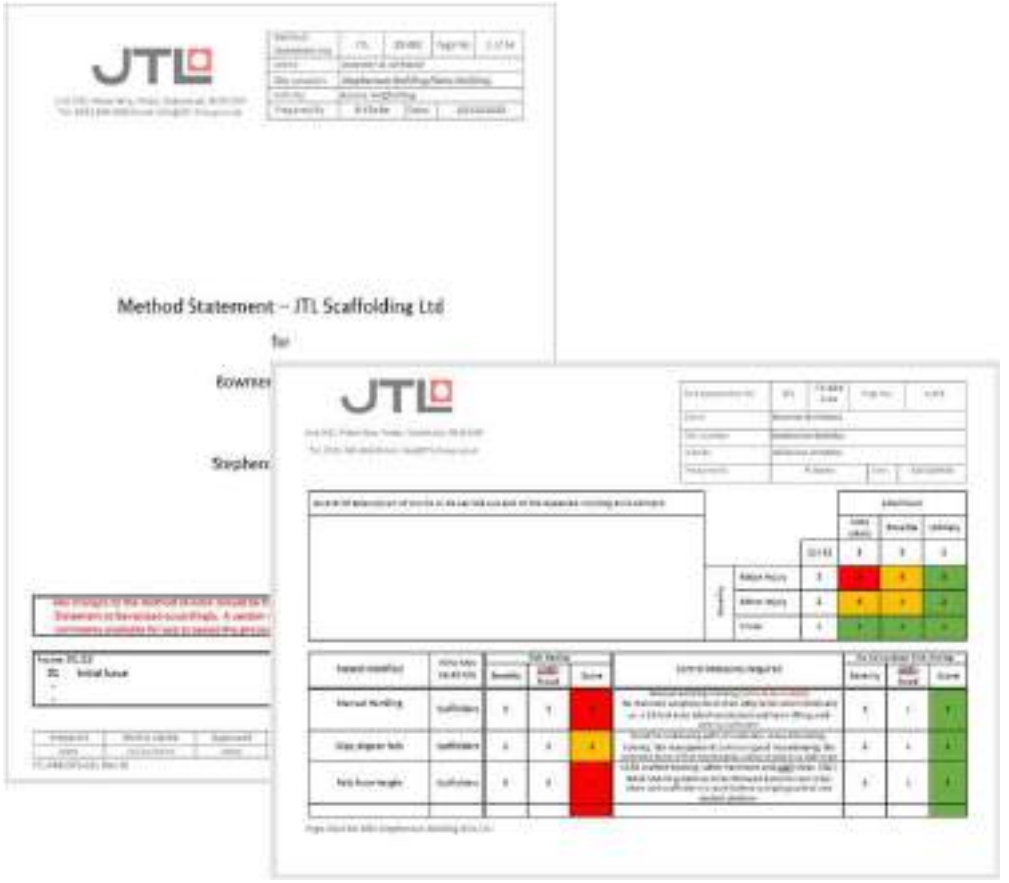
Temporary Works Design – What is it?





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Inspections

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Common Errors/Misconceptions

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Common Errors/Misconceptions

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Common Errors/Misconceptions

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Common Errors/Misconceptions

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 tube-lock 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.

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Common Errors/Misconceptions

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Common Errors/Misconceptions

- 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)

Projects

Atrium Access
Stephenson College
Bowmer & Kirkland

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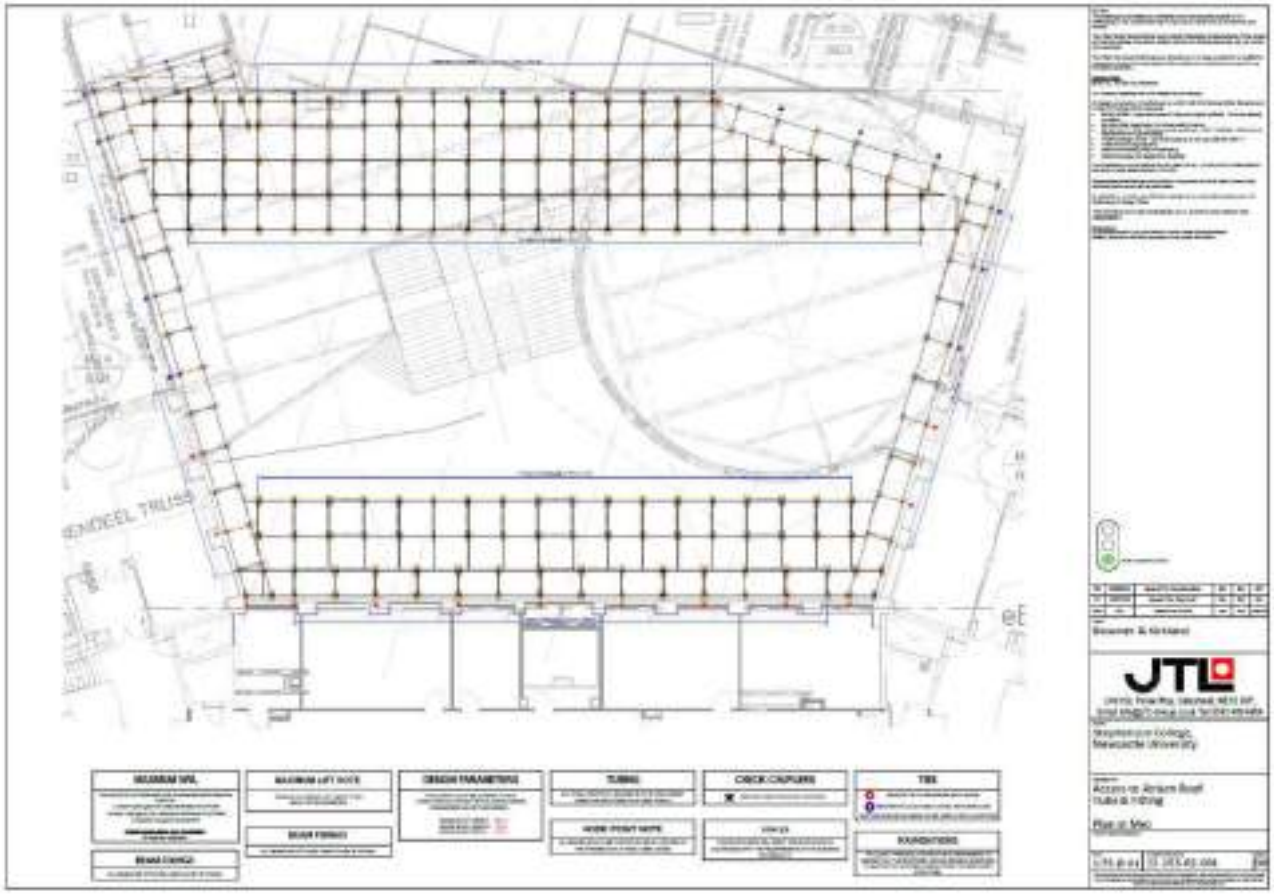

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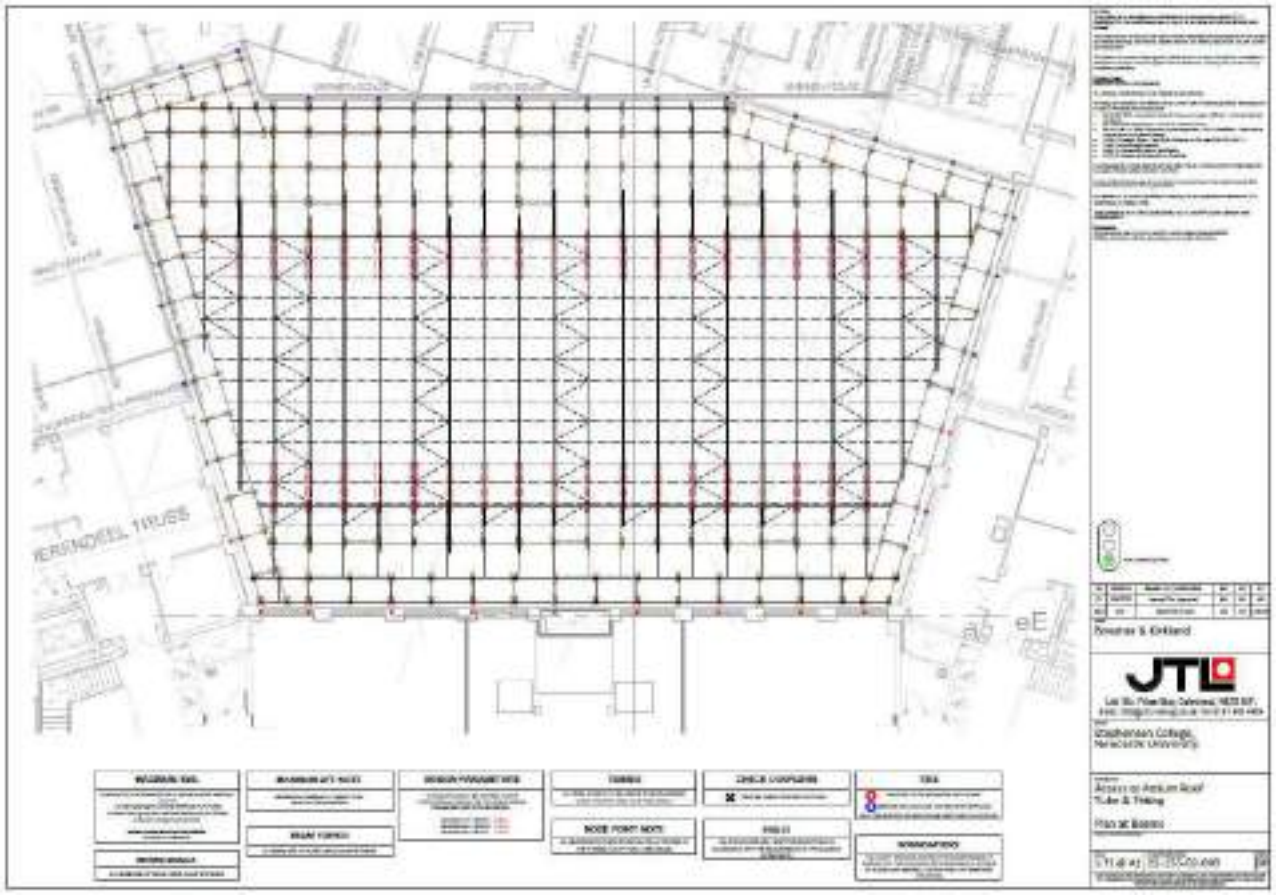

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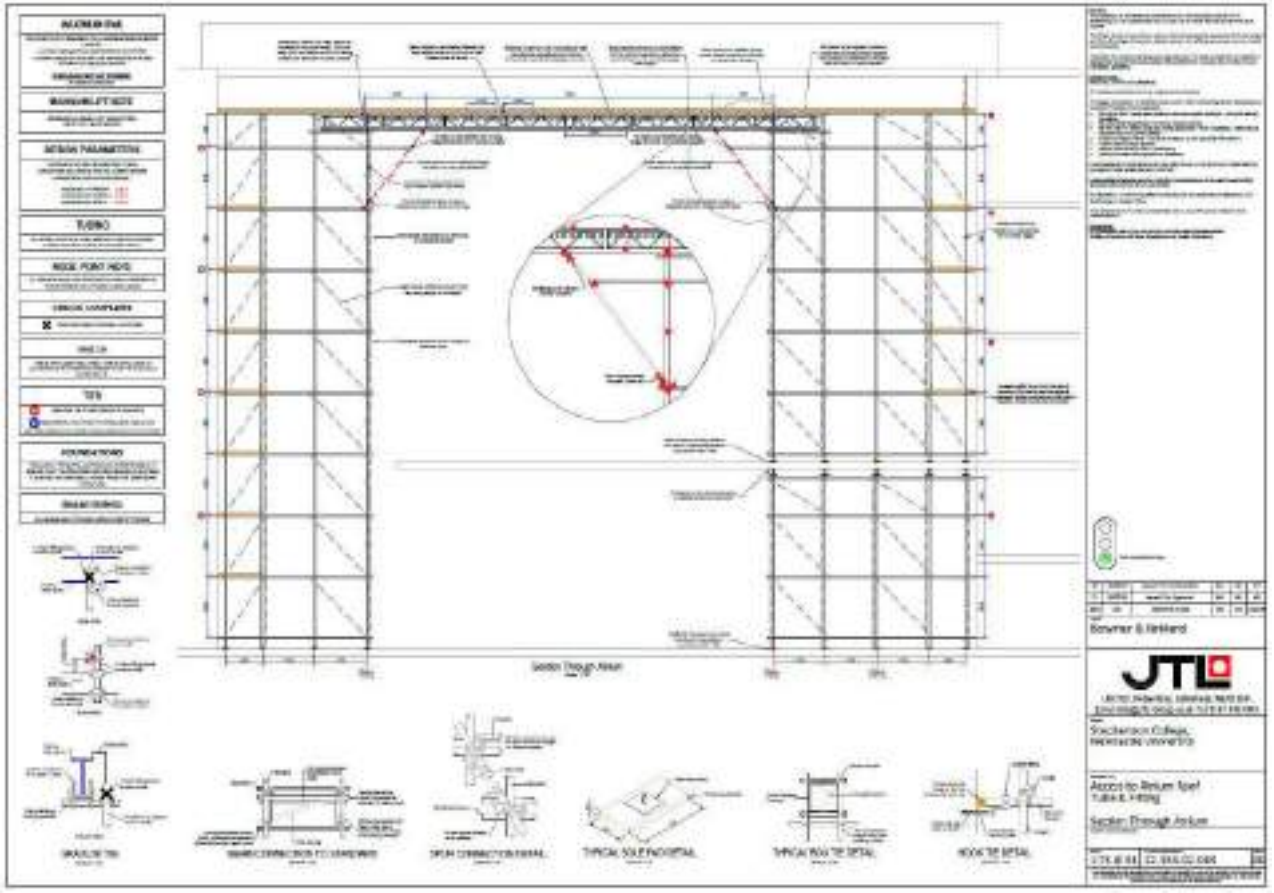

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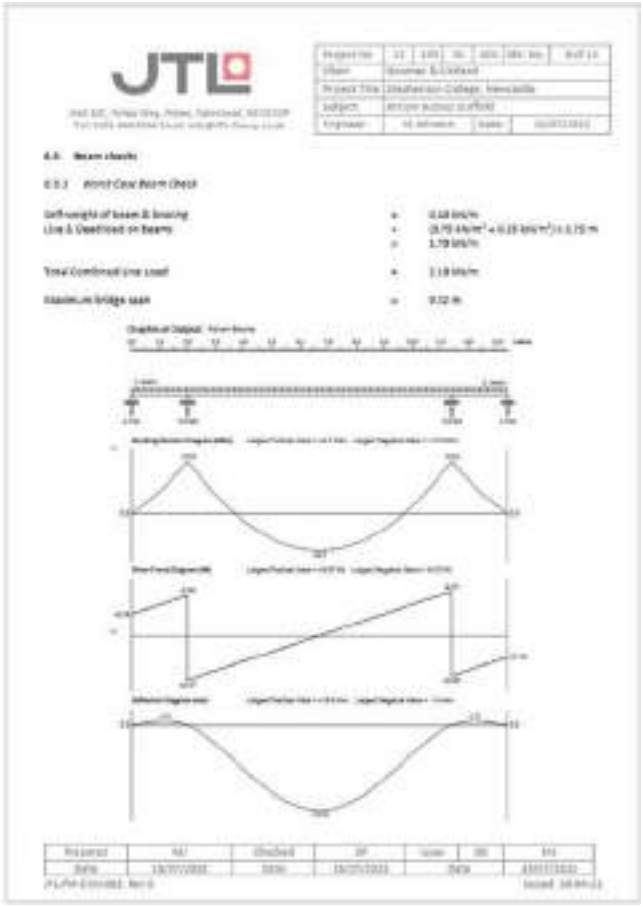

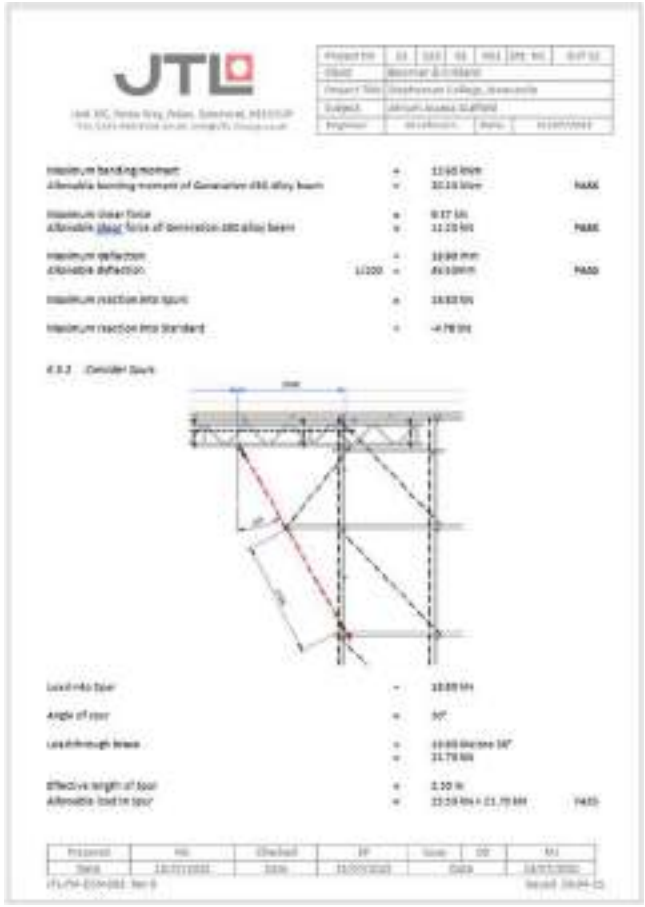

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Challenges

Pre Start Details/Information – Expectations

- Schedule at Tender – "Atrium Birdcage"
- 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

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Projects

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Questions…

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