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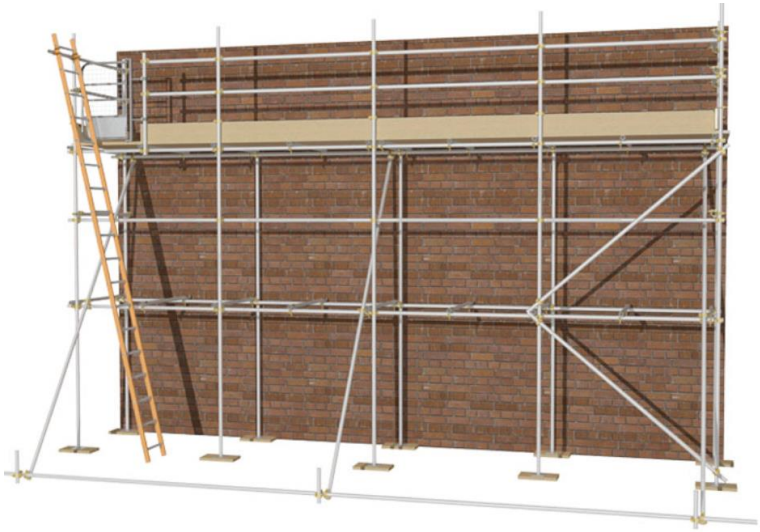
TG20 Operational Guide

What is TG20?

- TG20 is a guide to good practice for tube and fitting scaffolding.
- TG20 has become the ‘unofficial code of practice’ for tube and fitting scaffolding and provides comprehensive guidance for construction, use and maintenance.
- TG20 is used by constructors, inspectors, health and safety professionals and all who procure, supply or manage scaffolding.
- The TG20 suite of documents consists of:
    - Operational Guide
    - eGuide
    - Design Guide
    - User Guide (A6 Pocket-sized booklet)



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Why is TG20 needed?

The Work at Height Regulations 2005 state that:

“Strength and stability calculations for scaffolding shall be carried out unless [...] it is assembled in conformity with a generally recognised standard configuration.”

Essentially, this means that all scaffolding needs to be designed.

The TG20 eGuide provides innovative software which can be used to produce ‘compliance sheets’ for most commonly used scaffolds. These form ‘generally recognised standard configurations’ which are accepted by the HSE and have been designed to BS EN 12811.

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Features of TG20:21:

- All guidance documents have been reviewed and significantly revised.
- TG20 is available online in the NASC ePortal.
- Can be accessed via a web browser on most devices
- The TG20 Operational Guide and TG20 Design Guide are available in both physical and digital copies.

What is a compliance sheet?

A ‘TG20 compliance sheet’, contains all information necessary to construct the specified scaffold.

Please note that either an applicable TG20 compliance sheet or a bespoke design drawing should be available for every scaffold.

Typical compliance sheet (front)

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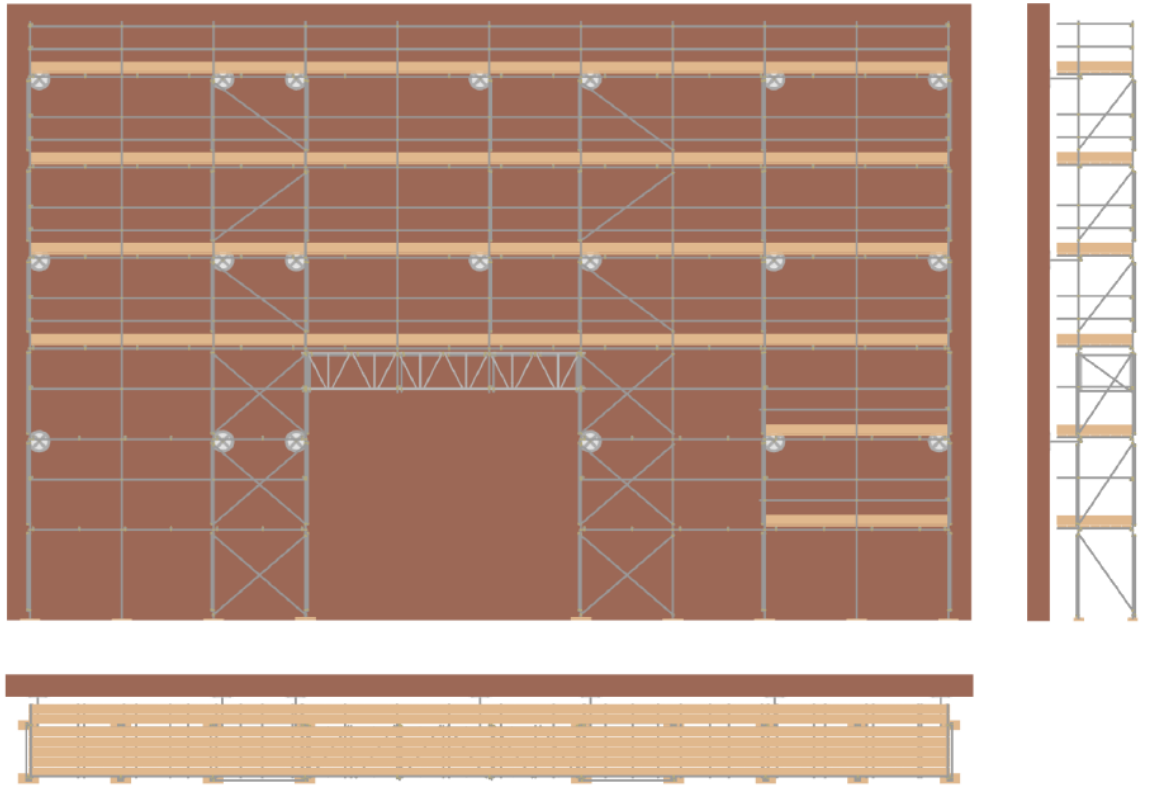
TG20:21 compliance sheet

A tied independent tube and fitting scaffold in accordance with TG20:21 chapters 06 and 07.



Sign-off

Contract no:
ABC-1234
Client:
ABC Construction Ltd.
Site reference:
NASC, 12 Bridewell Place, London, EC4V 6AP
Scaffold reference:
0001
Company:
Scaffolding Services Ltd.
NASC membership no:
Not an NASC member
Prepared by:
Fred Jones
Position:
Site Manager
Signature:
Date:
01/01/2021
Checked by:
John Smith
Position:
Contracts Manager
Signature:
John Smith
Date:
01/01/2021
Notes:
Some notes may be provided here.

Wind factor 20	Maximum height	Maximum boarded lifts	Maximum lift height	Maximum bay length	Maximum boards wide	Maximum loading	Tie load Very light duty	Maximum leg load
Low	12 metres	4	2 metres	2 metres	5 + 2	2.0 kN/m²	1.6 kN	11.4 kN

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Please see the important accompanying notes on the reverse. Use of this NASC document does not infer NASC membership, which can be confirmed at www.nasc.org.uk.

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Typical compliance sheet (back)

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TG20:21 compliance sheet

A tied independent tube and fitting scaffold in accordance with TG20:21 chapters 06 and 07.

Construction

- ✓ Constructed from type 4 galvanised steel tubes.
- ✓ Maximum 2 boarded lifts and 6 unboarded lifts permitted with ladder landings.
- ✓ Maximum transom spacing: 1.2 metres.
- ✓ Facade braced every 6 bays per elevation.
- ✓ Ledger braced at alternate standards and end frames.
- ✓ Double guard rails and toe boards at boarded lifts.
- ✓ Single guard rails at unboarded lifts.
- ✓ Internal edge protection may be provided where required.
- ✓ Fully or partially clad with high-permeability debris netting.

DESIGNED BY CALCULATION TG20 COMPLIANT TO BS EN 12811-1

Loading

- ✓ One lift loaded to 2.0 kN/m² (load class 3, general purpose) plus one lift 50% loaded per facade.
- ✓ Maximum inside board loading 0.75 kN/m² at the working lift.
- ✓ Maximum leg load 13.3 kN, to be supplied to the client for foundation design.

Ties

- ✓ Tied at alternate lifts to TG20 tie pattern A and at the top lift at ledger braced standards with 2.3 kN (very light duty) ties.
- ✓ Tie tubes may be connected to the inner face of the scaffold. Additional sway resistance should be provided (TG20 section 7.9).
- ✗ The facade must not have significant openings.

Add-on features

- ✓ A gin wheel may be used to a maximum of 50 kg.
- ✗ No other add-on features are permitted without a TG20 compliance sheet or design advice.

Wind factor 20	Maximum height	Maximum boarded lifts	Maximum lift height	Maximum bay length	Maximum boards wide	Maximum loading	Tie load Very light duty	Maximum leg load
Low	16 metres	2	2 metres	2 metres	5 + 2	2.0 kN/m²	2.3 kN	13.3 kN

Sign-off

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Compliance sheet designs

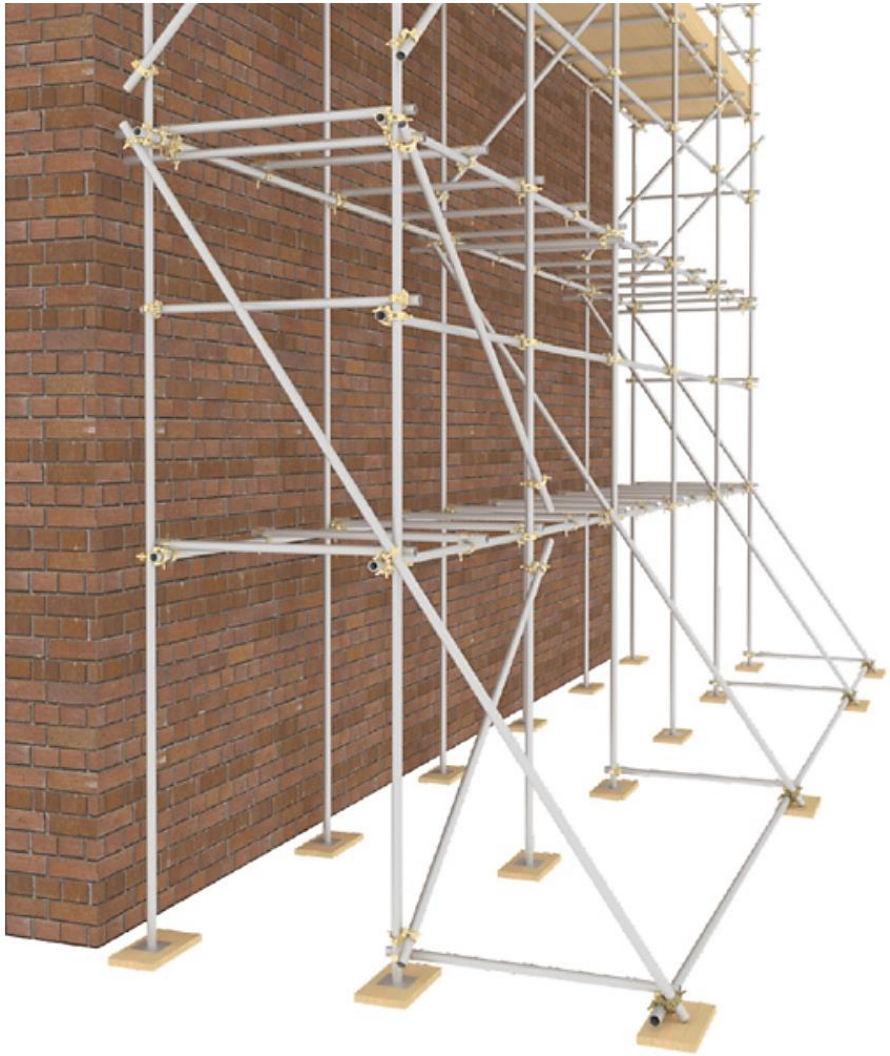
The range of commonly used scaffolds for which compliance sheets can be produced includes:

- Independent tied scaffolds with up to 3 inside boards
- Part boarded Independents
- Bridging in independents
- Putlog scaffolds
- Internal and external birdcages
- Loading bays (with and without prefabricated beams) 8 or 10 boards wide
- Static and mobile towers
- Tied towers
- Lift shaft towers
- Chimney stack scaffolds

Key features: Three inside boards

- Compliance sheets may include independent scaffolds with 3 inside boards.
- Although the board bearing transoms are not overloaded, a certain amount of deflection of the working platform may be experienced.
- If the deflection is considered to be excessive, it may be counteracted by providing the board-bearing transoms in adjacent pairs.
- Alternatively, this may also be achieved by using proprietary transom units or by fitting an assembly of rakers to support the free ends of the transoms.

Key features: Rakers



Rakers may be used in the following circumstances:

- In place of ties for unclad independents up to 6.0m high, provided that transoms are also butted to existing façade.
- Rakers may be used in place of ties at the first or second lift if the tie duty doesn’t exceed 2.7kN (see compliance sheet). The remaining lifts must be tied as usual.
- To stabilise single lift scaffolds.

Rakers and butting structural transoms are required at alternate standards connected with right angle couplers.

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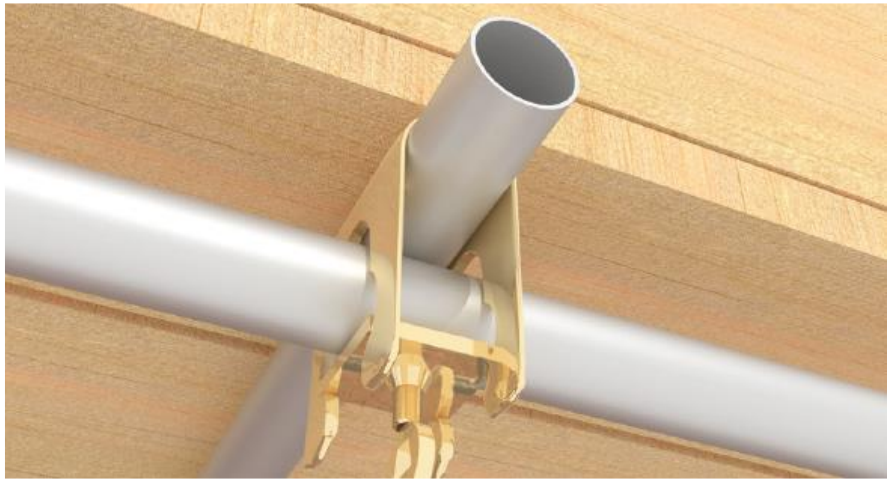
Key features: Structural transoms

Structural transoms should be fitted with right angle couplers or bands and plates, within 300mm of a node point whenever specified on the compliance sheet. Examples include:

- All sheeted scaffolds.
- Some debris netted scaffolds (dependent on height and wind exposure).
- To stabilise untied single lift scaffolds (must be connected to standards below ledger with right angle couplers).
- Principal transoms on all birdcages and freestanding / mobile towers.



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Key features: Prefabricated transom units

TG20 compliant independents may be constructed with prefabricated transom units.

Ledger bracing must always be fitted to all TG20 compliant sheeted scaffolds, even if transom units are used.

Ledger bracing may be omitted only when specified on the TG20 compliance sheet. (Ledger bracing may still be required on certain scaffolds, dependent on height and wind exposure.)

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Key features: Bridging

At least one bay of scaffolding should be provided at each side of the of the opening and between openings to accommodate the bracing.

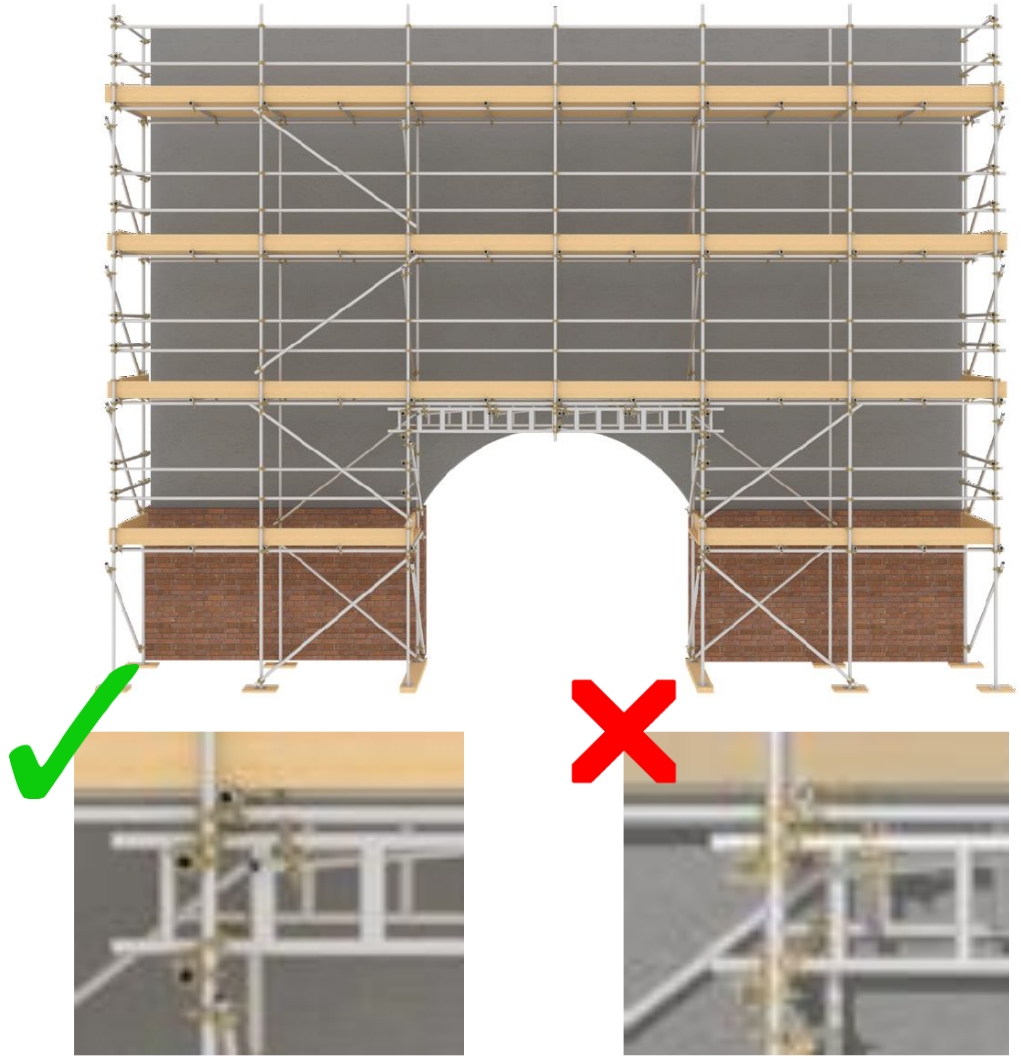
Façade bracing must be fitted to both inside and outside faces at each side of the opening.

Supporting standards must be ledger braced.

Bracing must be fitted from foundation to beam level.

Supporting standards should be doubled where specified by the compliance sheet.

Ladder beams must never be supported on their ‘horn ends’.



Key features: Loading Bays

Façade and ledger bracing must be fixed at every frame to full height.

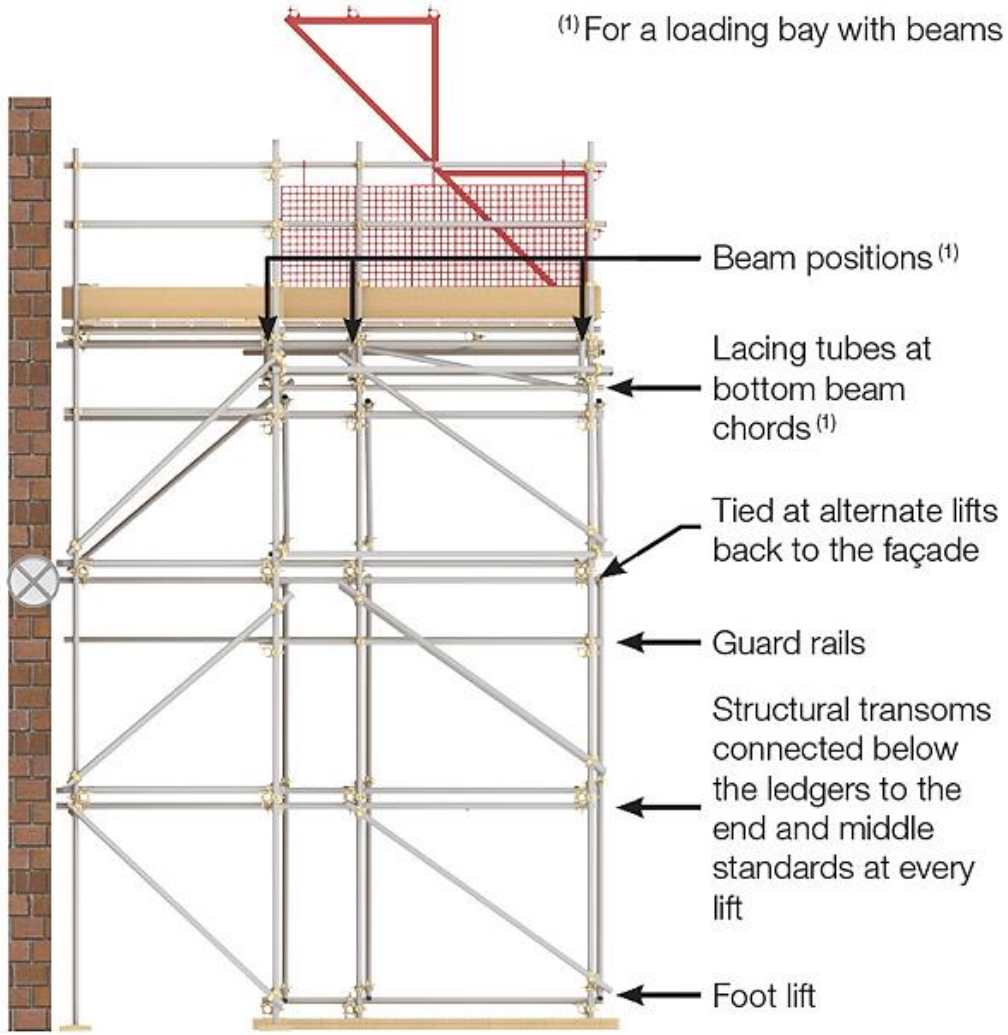
Tower must be tied to façade via main scaffold at end standards at alternate lifts.

Structural transoms must be fitted at every intersection. Loading bay tower must not be clad.

Double sole boards or sleepers should be fitted beneath tower baseplates.

Plan bracing is required directly below the loading platform.

Board bearing transoms are required at a maximum spacing of 300mm.



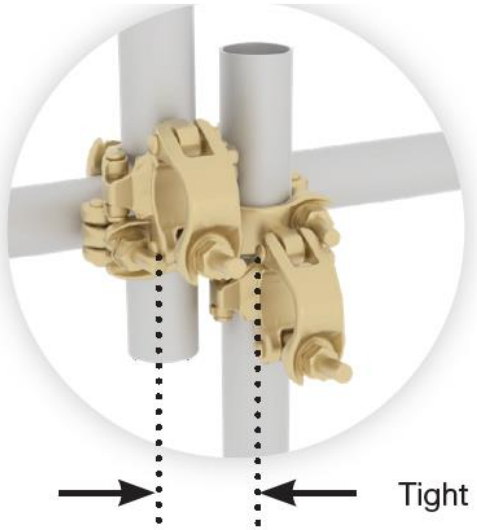
Key features: Loading Bays

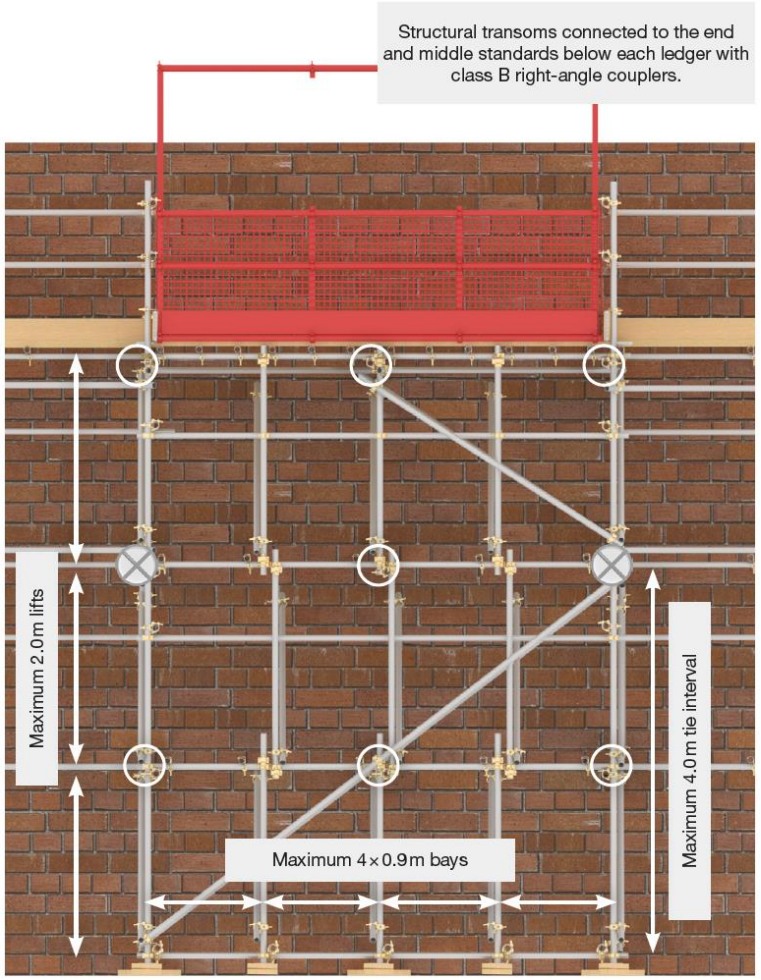
A loading bay without beams may be erected progressively with staggered standards (as shown).

Standards must be connected to ledgers with class B couplers tight against each other.

Supplementary couplers should be fitted directly above the puncheon and below the standard at each connection (as shown below).

Maximum load signs should be clearly displayed.





Key features: Towers

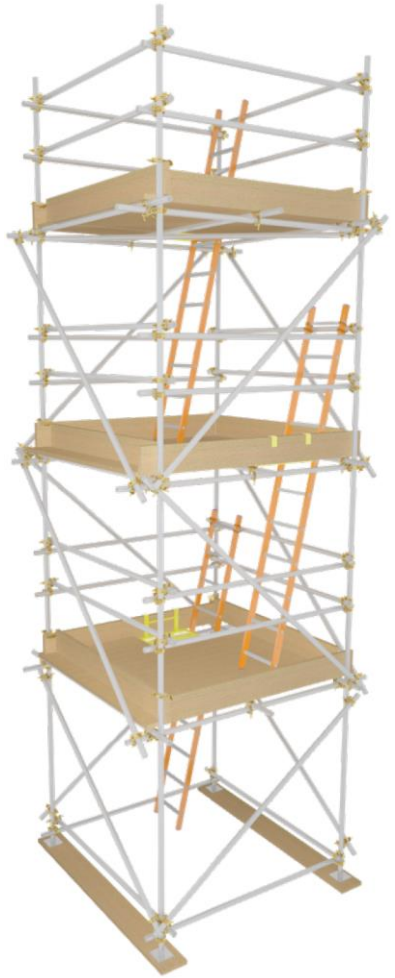
Castors should be fitted with brakes and applied during use.

A foot lift is required.

Bracing on all 4 sides to full height, connected to extended transoms and ledgers with right angled couplers.

Plan bracing at alternate lifts, including the foot lift and the top lift.

Ladders should be inclined at 75° (4 vertical to 1 horizontal).



Maximum loading	Maximum Base Dimensions	Maximum height	
		Interior tower	Exterior tower
0.75kN/m2	2.7m x 2.7m	9.5m	8.0m
1.5kN/m2	2.1m x 2.1m	7.4m	6.3m
2.0kN/m2	1.8m x 1.8m	6.3m	5.4m

Maximum height to base ratio	
Interior	3.5 to 1
Exterior	3.0 to 1

Key features: Birdcages

TG20:21 covers both internal (no wind) and external birdcage scaffolds.

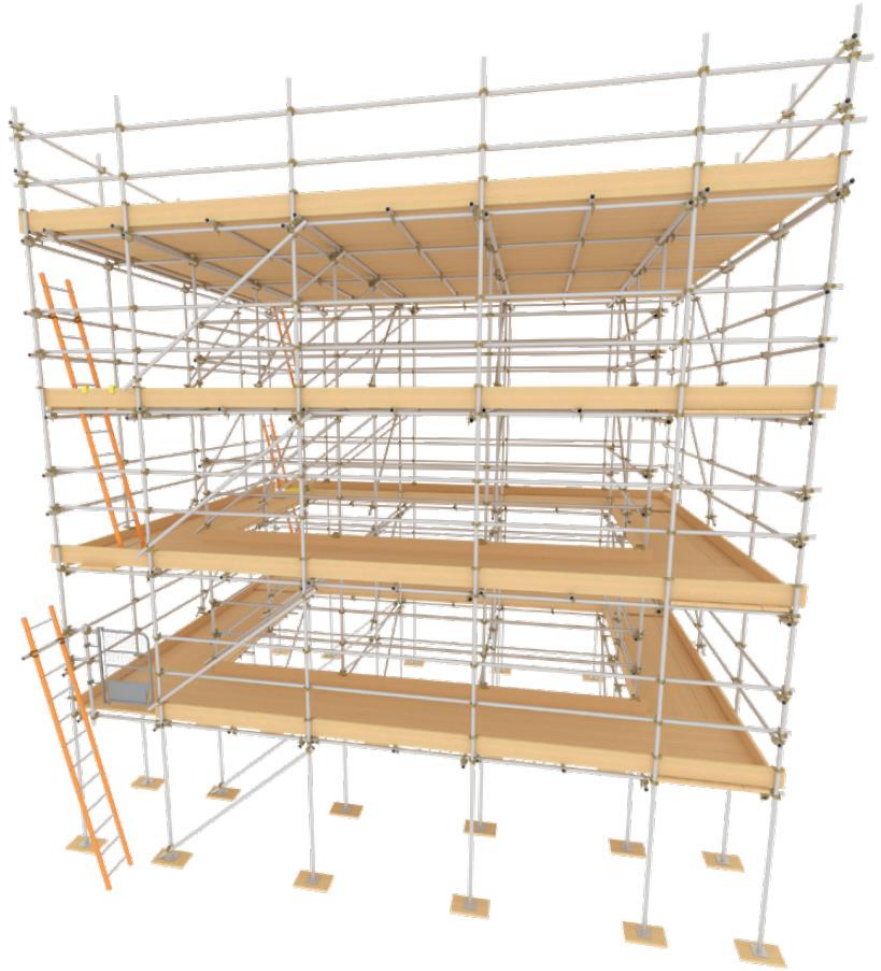
Birdcages may have top lift boarded, top and perimeter lifts boarded or be fully boarded.

One lift and one perimeter lift may be fully loaded or a second full lift may be 50% loaded.

Birdcages may be tied, butted or freestanding.

Maximum lift height is 2.0m with up to 2.5m permitted at the first lift.

A foot lift is required for all single lift birdcages.



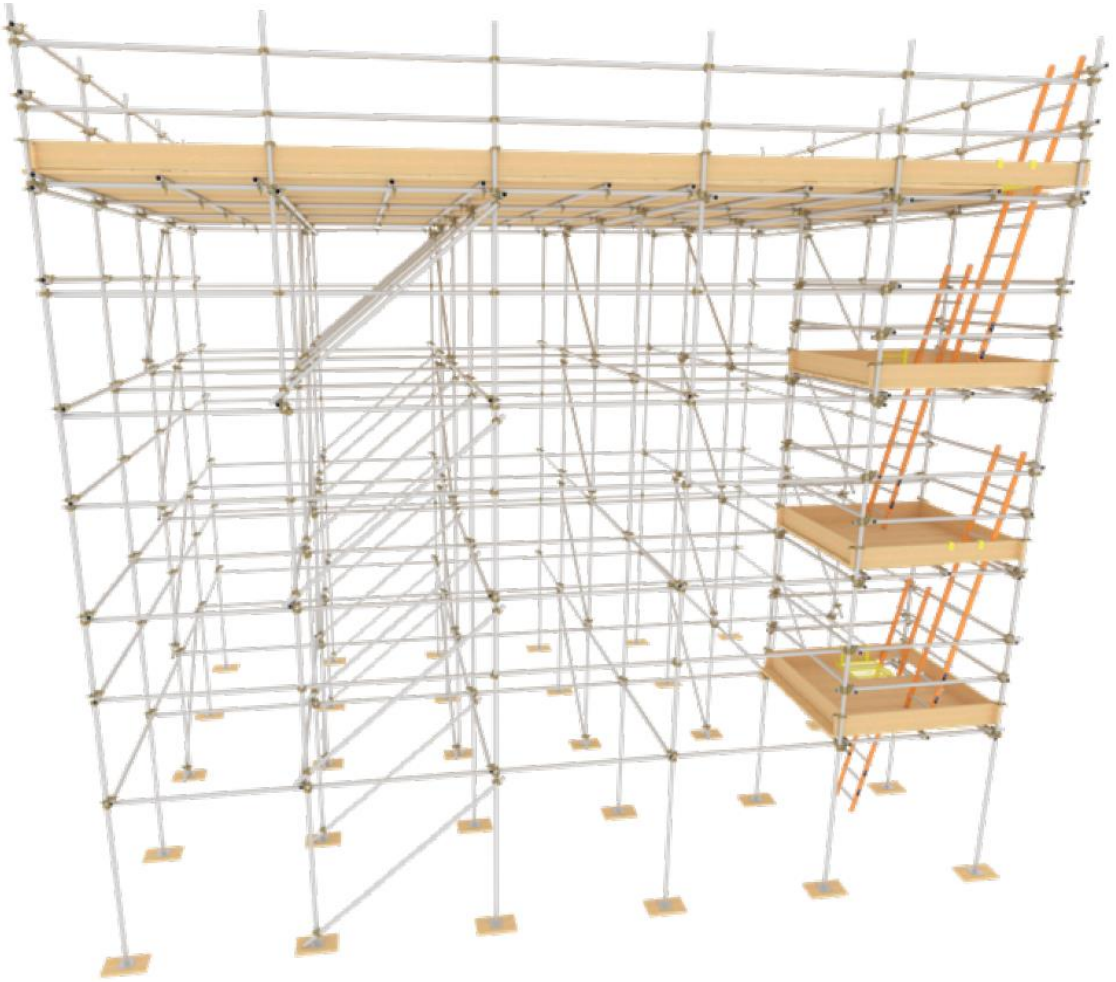
Key features: Birdcages

Ledgers must be fixed to the standards with right angled couplers at each lift.

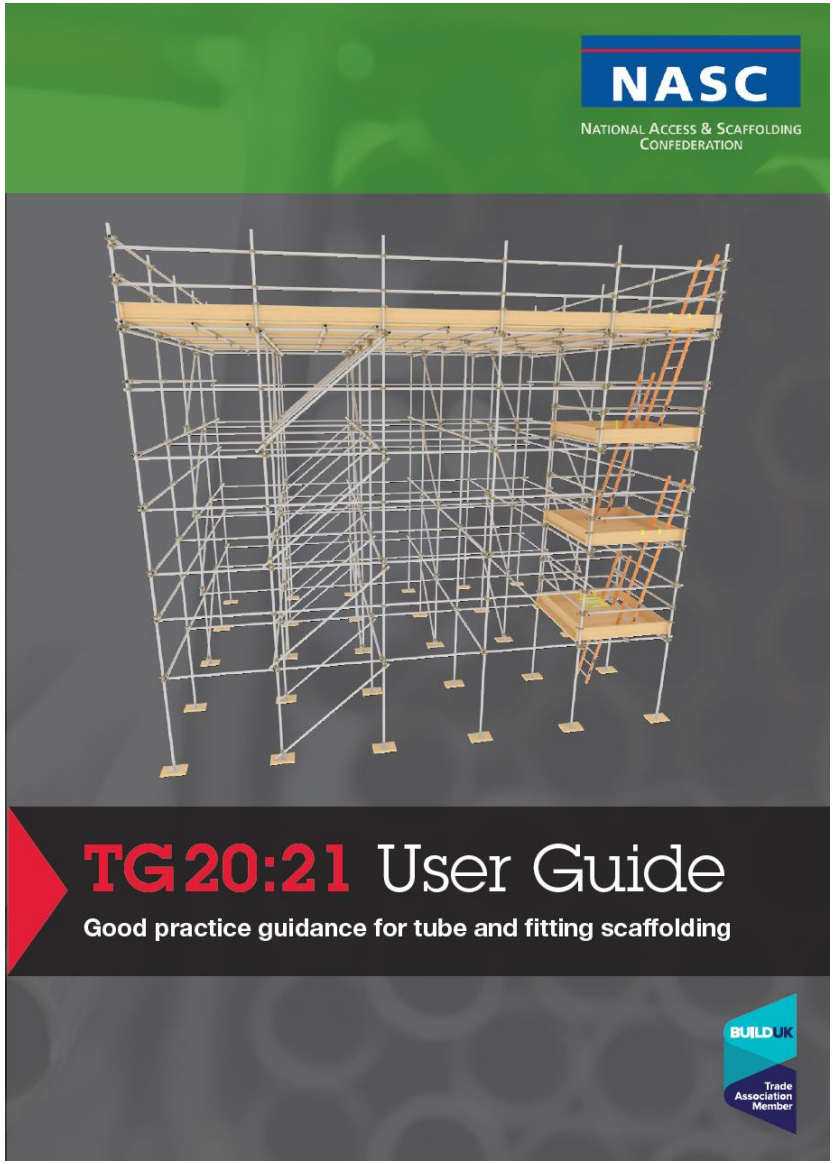
Principal transoms must be fixed to the standards, below the ledgers, with right angle couplers. Board bearing transoms may then be fixed with putlog couplers where required.

Maximum heights, tie positions and bracing patterns are all specified on the TG20 Compliance sheet.

Maximum Loading	Maximum bay size
0.75kN/m2	2.1m x 2.1m (9 boards)
1.5kN/m2	1.9m x 1.9m (8 boards)
2.0kN/m2	1.7m x 1.7m (7 boards)



Further details for the construction of these and other types of scaffold are included in the TG20:21 User Guide.

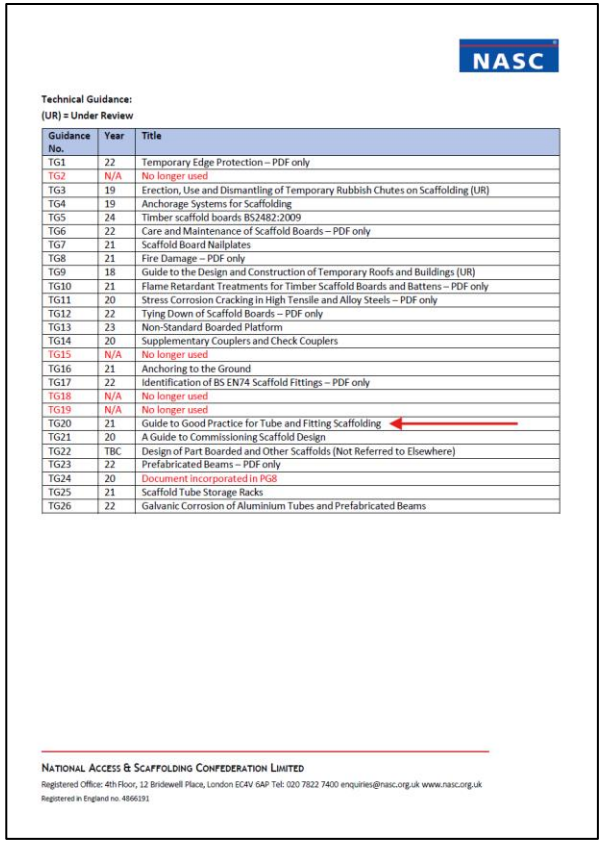


Note: TG20 is part of a raft of NASC Guidance notes

- TG20:21 is one of over 100+ guidance notes available – click on the link for index: https://nasc.org.uk/blog/article/nasc-publishes-guidance-index/

- Click on link for the NASC shop: https://nasc.org.uk/shop/

- TG20:21 can be broken down as follows:
  - TG = Technical guidance
  - 20 = is the 20th safety guidance note produced
  - 21 = is the year of issue.



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Technical Guidance:
(UR) = Under Review

Guidance No.	Year	Title
TG1	22	Temporary Edge Protection – PDF only
TG2	N/A	No longer used
TG3	19	Erection, Use and Dismantling of Temporary Rubbish Chutes on Scaffolding (UR)
TG4	19	Anchorage Systems for Scaffolding
TG5	24	Timber scaffold boards BS2482:2009
TG6	22	Care and Maintenance of Scaffold Boards – PDF only
TG7	21	Scaffold Board Nailplates
TG8	21	Fire Damage – PDF only
TG9	18	Guide to the Design and Construction of Temporary Roofs and Buildings (UR)
TG10	21	Flame Retardant Treatments for Timber Scaffold Boards and Battens – PDF only
TG11	20	Stress Corrosion Cracking in High Tensile and Alloy Steels – PDF only
TG12	22	Tying Down of Scaffold Boards – PDF only
TG13	23	Non-Standard Boarded Platform
TG14	20	Supplementary Couplers and Check Couplers
TG15	N/A	No longer used
TG16	21	Anchoring to the Ground
TG17	22	Identification of BS EN74 Scaffold Fittings – PDF only
TG18	N/A	No longer used
TG19	N/A	No longer used
TG20	21	Guide to Good Practice for Tube and Fitting Scaffolding
TG21	20	A Guide to Commissioning Scaffold Design
TG22	TBC	Design of Part Boarded and Other Scaffolds (Not Referred to Elsewhere)
TG23	22	Prefabricated Beams – PDF only
TG24	20	Document incorporated in PG8
TG25	21	Scaffold Tube Storage Racks
TG26	22	Galvanic Corrosion of Aluminium Tubes and Prefabricated Beams

National Access & Scaffolding Confederation Limited
Registered Office: 4th Floor, 12 Bridewell Place, London EC4V 6AP Tel: 020 7822 7400 enquiries@nasc.org.uk www.nasc.org.uk
Registered in England no. 4866191

Questions?

- For queries:
  - read each TG20 section in context.
  - talk to your contracts supervisor, manager, or H&S advisor.
  - TG20 includes useful references.

- For further queries, contact the NASC:
  - enquiries@nasc.org.uk
  - healthandsafety@nasc.org.uk
  - technical@nasc.org.uk

National Access and Scaffolding Confederation (NASC)
4th Floor, 12 Bridewell Place, London EC4V 6AP
enquiries@nasc.org.uk www.nasc.org.uk
Tel: 020 7822 7400

- SG4:You User guide to SG4 Preventing falls in scaffolding.
- SG7 Risk assessments and method statements.
- SG16 Management of fall protection equipment.
- SG19 A guide to formulating a rescue plan.
- SG25 Access and egress from scaffolds.
- SG27 Guidance on temporary edge protection on open steelwork, roofs and slab edges etc.
- SG29 Internal edge protection on scaffold platforms.
- TG1 Temporary edge protection.
- TG9 Guide to the design and construction of temporary roofs and buildings.
- TG20 Operational guide – A comprehensive guide to good practice for tube and fittings scaffolding.

HSE Books
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- HSG150 Health and safety in construction (currently under review – see HSE website).
- HSG33 Health and safety in roof work.
- L153 Managing health and safety in construction.
- INDG 367 Inspecting fall arrest equipment made from webbing or rope.
- GEIS6 The selection, management and use of mobile elevating work platforms.
- Research Report 116 Falls from height – Prevention and risk control effectiveness.
- Research Report 708 Evidence-based review of the current guidance on first aid measure for suspension trauma.

Prefabricated Access Suppliers and Manufacturers Association (PASMA)
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- Operators' Code of Practice.

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- Code of Practice.

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