Appendix I

Index of changes

The following changes have been made to the TG20:21 Design Guide in comparison with the edition published in 2013. Note that minor editorial changes and updated references have been omitted for clarity.

Section	Title	Changes in TG20:21
-	Foreword	The foreword has been updated for TG20:21.
1.4	Structural materials and components	TG20 compliant high-tensile steel tubes may now be supplied in accordance with BS EN 10210-1 or BS EN 10219-1.
2.1.1	Description of tied independent scaffolds	The text has been updated to permit up to three inside boards in accordance with the TG20:21 compliant definitions for independent scaffolding.
		Figure 2.1 has been updated to show single-bay façade bracing and SG4 compliant single guard rails.
2.1.2	Duty of tied independent scaffolds	Table 2.1 has been updated to include three inside boards.
2.1.5.2	Joints	The guidance for the position of sleeve couplers has been removed.
2.1.6.1	Length of transoms	The text has been updated for up to three inside boards.
2.1.7.3	Façade bracing	Figure 2.2 has been clarified with consistent bay lengths and a note has been added that SG4 compliant single guard rails have been omitted.
2.1.7.4	Plan bracing	Figure 2.3 has been clarified to show the positions of adjacent tie tubes or structural transoms.
2.1.8.10	Internal cantilever platforms	The text has been updated for up to three inside boards.
2.1.9.15	Equivalent tying value of rakers	The notes for figure 2.13 have been updated to reference alternative configurations of rakers illustrated in the TG20:21 Operational Guide.
2.1.10.1	Landings	The maximum 9.0 m vertical distance between landings has been reduced to 6.0 m in line with TG20:21 Operational Guide section 8.4.
2.1.10.2	Ladder towers and bays	Figure 2.14 has been modified to correct the positions of the guard rails and to show ladders spanning single lifts.
2.1.11	Pavement lifts	Figure 2.15 has been updated to show SG4 compliant single guard rails. The notes for the figure have been updated as arrangements (b) and (c) are not applicable where ties are required at every lift.
2.1.12.1	Bridge members	The requirements for section bracing have been clarified.
2.1.13.1	Gin wheels	The description of the gin wheel configuration for putlog scaffolding has been modified in line with section 11.1 of the TG20:21 Operational Guide.
		The text referencing hook type gin wheels has been removed, as has figure 2.16(b).
2.2	Loading bays founded on the ground	The text in this section has been modified to reflect the modifications made to TG20 compliant loading bays in TG20:21.
		Figure 2.17 has been replaced with a representative illustration of a TG20:21 compliant loading bay.
2.3.1	Access birdcages – Description	The text has been extended to provide additional examples of typical usage.
2.3.2	Loading	Some of the commentary has been removed.
2.3.3	Dimensions	An alternative method of achieving wider spacings of standards has been provided.
2.3.7.2	Bracing	Figure 2.18 has been updated to match the bracing patterns from figures 13.8 – 13.12 of the TG20:21 Operational Guide.
2.3.7.5	Overturning	The maximum height-to-base ratio for free-standing internal birdcages has been conservatively reduced from 4:1, as it was in TG20:13, to 3:1 in TG20:21.
2.3.7.6	Single lift birdcages	Figure 2.19 has been revised to include an indication of the edge protection at the top lift.

Section	Title	Changes in TG20:21
2.4	Putlog scaffolds	Figure 2.20 has been revised to show single bay façade bracing and SG4 compliant single guard rails.
2.5.5	Mobile towers	The requirements for TG20:21 compliant mobile towers have been provided.
		Figure 2.21 has been revised to show a sloping ladder, in preference to a vertical ladder.
3.1.1	Special scaffolds – General	A summary has been provided of the required design loading and checks.
3.2	Protection fans and nets	Figures 3.1 (a) – (c) have been revised to show tubes as alternatives to wires, where appropriate, and SG4 compliant single guard rails.
3.3	Pavement frames or gantries	Additional guidance has been provided for required clearances, illumination, buried services and required licences.
3.4.2	Stair towers – Loading	Additional guidance has been provided including a summary of the loading requirements from BS EN 12811-1 and the requirement for the fatigue testing of welded aluminium stair tread assemblies from BS EN 12810-2 Annex C.
3.4.3	Stairway dimensions	The minimum clear width defined in BS EN 12811-1 has been stated.
3.4.4	Decking	A note has been added about access openings.
3.5	Cantilever scaffolds	Figure 3.2 has been replaced with a more typical example of current practice.
3.5.3	Fixing the beams to the structure	Minor amendments have been made to the text and a note added about timber packing.
3.5.4	Supported scaffolding	The text has been revised with the requirement for section bracing.
3.5.5	Safety during erection and dismantling	A note has been added that the use of a MEWP or other suitable access from below should be considered to reduce the risks of working at height.
3.6	Truss-out scaffolds	Figure 3.3 has been replaced with a more typical example of current practice. Notes have been added to figures 3.4 and 3.5 to state that boards and guard rails have been omitted for clarity and supplementary couplers may be required.
3.6.6	Safety during erection and dismantling	A note has been added that the use of a MEWP or other suitable access from below should be considered.
3.7	Power line crossings and other protection scaffolds	Additional references have been added to external publications.
3.8.5	Masts, lighting towers and transmission towers – Standards	Guidance has been added for the splicing of joints.
3.8.7	Bracing	Guidance has been included for plan bracing.
3.8.10	Access and inspection	The guidance for inspections has been edited.
3.9.2	Kentledge, guys and struts for free standing scaffolding – Kentledge	Clarifications have been made to the text.
3.9.3	Anchors	Minor clarifications have been made to the text in this section.
3.9.5	Scaffold tube stabilisers	This section has been renamed and clarifications made to the text.
3.10	Slung scaffolds	This section has been renamed and largely rewritten to reflect current practice, including the replacement of figures 3.9 (a), (b) and (c) with figures 3.9, 3.10 and 3.11, which show more pertinent construction details.
3.11	Pedestrian bridges and walkways	A note has been added about proprietary bridging systems.
3.13	Mechanical hoists	A note has been added about the presence of wind loading.
3.14	Lifting gantries	This section has been largely rewritten to reflect current practice, including the replacement of figure 3.10 with figure 3.12.
3.16	Spectator terraces and seating stands (grandstands)	This section has been renamed and largely rewritten to reflect current practice.
3.17.1	Temporary storage on site – General	A reference has been added to NASC TG25.

Section	Title	Changes in TG20:21
3.17.7	Plan bracing	A note has been added that plan bracing can be used to eliminate or reduce section bracing where clear access is required.
3.18.3	Hoardings and fences – Design issues	Guidance has been provided for resistance to sliding. The reference to TG15 has been removed as it is currently withdrawn.
3.19	Free standing scaffolds for house building	A reference has been added to section 6.23 of the Operational Guide for free-standing single-lift scaffolds.
3.20	Scaffolds for domestic chimneys	Minor clarifications and edits have been made to this section.
4.2.2.1	Vertical imposed loads applied to working areas and access routes	The text in this section has been edited and clarified.
4.2.2.1.2	Working areas	The 'partial area load' column and related note have been removed from table 4.1 as this loading is more suited for modular platform design than for scaffold design. The text of note 1 has been clarified.
4.2.3.2.2.1	Simple procedure to calculate maximum velocity pressure	The reference to the simplified wind procedure in the TG20 Operational Guide has been removed as this procedure is not included in TG20:21.
4.2.3.5	Site or location coefficient c_S	The note about the c_S factor for wider façades in the previous guidance was inconclusive and has been removed.
4.3.1.1	Permissible stress or working load format	The conclusion of the comparison between approaches has been clarified.
4.4.2	Scaffolds with prefabricated transom units	The naming of 'system transom units' has been changed to 'prefabricated structural transom units' for consistency with the remainder of the guide.
4.5.2	Birdcages	This section has been updated as TG20:21 compliant definitions are available for external birdcage scaffolds. The birdcage bracing rules reproduced from the Operational Guide have been removed as they are already defined in section 2.3.7.2.
5.1	Scaffolding self-weights and dead loads	Tables 5.1 and 5.2 have been updated to remove the references to Type 3 steel tubes, as their use is not recommended, and instead provide values for TG20 compliant high-tensile steel tubes.
5.4.1	Scaffold boards	The text and moment resistance values have been updated to reflect the values that can be calculated from the subsequent tables in this section.
5.4.3	Section capacities for common timber sections	The use of the shear strength enhancement from clause 16.4.2.8 of BS 5975:2019 has been clarified.
		Table 5.7.2 now includes a value of K_3 for a loading duration of 6 months.
		Table 5.8 has been updated to replace non-standard timber sizes with preferred sizes from BS 5975: 225 × 100 mm has been replaced with 150 × 50 mm and 200 × 75 mm has been replaced with 200 × 100 mm.
5.5	Section properties of scaffold tubes	A note has been added that the approach taken in providing an allowance for corrosion is conservative.
5.9	Structural properties and design criteria for couplers	The properties for TG20 compliant structural transom unit couplers have been revised to match those in the NASC publication: *Structural requirements and test procedures for TG20 compliant prefabricated structural transom units* and note 9 has been updated. These revisions were made to permit a greater number of prefabricated transom units to be TG20 compliant while not affecting the maximum safe heights of TG20 compliant scaffolding calculated with these properties.
		The safe slip force values have been removed for band and plate couplers and note 10 has been modified to provide explanation.
		Safe slip force values have been included for supplementary couplers, with note 13 added as explanation. These values are based on the text of section 5.9.2, which is unchanged.
5.11.3	Butting transoms	The guidance for the service gap has been removed and replaced with a note about using end caps to protect the façade.

Section	Title	Changes in TG20:21
5.13	Function and load capacity of tie tubes and additional sway restraint	Clarifications have been made to the text describing the calculation procedure.
5.15.1	Tie / anchor forces normal to the façade	A note has been added that the maximum tie duty may need to be calculated for the temporary condition when the top line of ties has not yet been installed.
5.15.1.3	Scaffolds clad with sheeting (or low permeability netting of unknown permeability)	Clarifications have been made to the text describing the calculation procedure.
A.2	Wind exposure assessment used in the TG20 eGuide	This section has been significantly revised to clarify the wind factor calculation procedure used by the TG20:21 eGuide, including the equation used to calculate the wind factor and the equation used to relate the wind factor to the equivalent peak velocity pressure. This wind factor has been termed $S_{wind,eGuide}$ to differentiate it from the S_{wind} factor calculated by manual procedure in section 4.2.3.
		Section A.2.2 has been removed, as it described the manual wind factor procedure from the TG20:13 eGuide, which is not available in TG20:21. The section heading for A.2.1 has also been removed.
		All references to the TG20:13 eGuide wind factor $(S_{TG20:13})$ in the appendices have been replaced with S_{wind} where it is not necessary to differentiate between the calculation methods.
E.1	Foundation design	A reference has been added to Temporary Works Forum publication TWf 2020:01, which supersedes TW16.041.
F.2.4	Prefabricated structural transom unit coupler	Table F.1 and the subsequent calculations have been updated with the TG20 compliant transom unit coupler structural properties from table 5.15.
G.1	TG20 Research results – General	A note has been added to state that the research relates to TG20:13 except where noted.
G.2	Verification of effective lengths given in TG20:08	A concluding statement has been added.
G.28	Birdcage scaffold bracing systems	The load combinations listed here have been extended to include those for external birdcages, which were included in the TG20:21 compliant scaffold definitions. Reference has been made to section 2.3.7.2 for the resulting bracing patterns.
G.30.2	Free standing access scaffolds 2 m high	A summary has been added of the calculation work undertaken to determine the stability of a single-lift untied scaffold in TG20:21.
H.1	British Standards	The references have been updated here and throughout the TG20:21 Design Guide.
H.2	NASC Safety and Technical Guidance	The list of NASC publication has been updated.
H.5	Acknowledgements	The acknowledgements have been updated for TG20:21.