



Temporary Works Design Risk Classification Matrix

Risk Class Category	Risk Class 0 Basic construction methods	Risk Class 1 Routine construction methods	Risk Class 2 Specialist construction methods	Risk Class 3 Bespoke construction methods
BS 5975 Scope	Restricted to standard solutions only, to ensure the site conditions do not conflict with the scope or limitations of the chosen standard solution.	For simple designs. These may include: formwork; falsework (where top restraint is not assumed); needling and propping to brickwork openings in single storey construction.	On more complex or involved designs. Designs for excavations, for foundations, for structural steelwork connections, for reinforced concrete.	For complex or innovative designs, which result in complex sequences of moving and/ or construction of either the temporary works or permanent works.
Independence of Design Checker	Because this is a site issue, the check may be carried out by another member of the site or design team, i.e. TWC.	The check may be carried out by another member of the design team.	The check should be carried out by an individual not involved in the design and not consulted by the original designer. The check must be performed from design drawings, calculations to be redone by the Checker.	The check should be carried out by another organisation, independent of the original design company. The check must be performed from design drawings, calculations to be redone by the Checker.
Explanation of design checking requirements	Risk Class 0 temporary works do not require an additional design where standard/ proprietary designs and details are used, as long as the installation of the works is strictly in accordance with the manufacturer's guidance. A check should be made that the standard/ proprietary solution is supported by design drawings and calculations, and a TWDC should still be issued (can be by a TWC). All RAMS documents must be prepared and reviewed as per normal best practice.	Risk Class 1 temporary works designs also include any Class 0 methods used in an unusual (non-standard) or higher risk situation, for example; any interface with members of the public or other 3rd party users. Class 1 can be design checked by another member of the same design team that was involved in the original design.	Risk Class 2 temporary works designs also include any Class 1 method used in an unusual or high risk situation. Class 2 must be design checked by someone independent of the original design team (i.e. not involved in or consulted by the original design team). Note: Class 2 and 3 design checks should be performed from design drawings and the documents provided in the original TWDB. The Design Checker must reproduce calculations independently as part of the check.	Risk Class 3 temporary works also include any Class 2 method used in an unusual or high risk situation. Class 3 must be design checked by a completely separate design agency, independent of the design agency that produced the original TWD, and that was not consulted during the design process. Note: Class 2 and 3 design checks should be performed from design drawings and the documents provided in the original TWDB. The Design Checker must reproduce calculations independently as part of the check.



Temporary Works Design Risk Classification Matrix

Item	Description	Risk Class 0 Basic construction methods	Risk Class 1 Routine construction methods	Risk Class 2 Specialist construction methods	Risk Class 3 Bespoke construction methods
1.0 Site establishment					
1.1	Site mesh fencing	Not on a public interface and less than 2m high. See note 1.	On a public interface or exceeding 2m high.	Mesh with banners, signs, netting etc. fixed to the panels.	
1.2	Site hoarding Including; surface kentledge & water ballast systems, conventional hole and post solutions	Not on a public interface and less than 2m high including solutions generated using CES automatic computer programme. See note 1	On a public interface or exceeding 2m high including solutions generated using CES automatic computer programme.	When required by third party organisations such as Highways England, Network Rail, EA etc.	When required by third party organisations such as Highways England, Network Rail, EA etc.
1.3	Site gates	System designs up to 2 m high built in accordance with the manufacturer's user manual.	Solid gates with an area below 42m ² or a weight less than 400 kg.	Solid gates with an area above 42m ² or a weight above 400 kg.	
2.0 Scaffolds and access					
2.1	Tube and fitting scaffolds - tied	Unsheeted TG20:13 compliant scaffolds. Not exceeding 6m high or 12m long. Face tied to structure as TG20:13. See note 1.	Sheeted TG20:13 compliant scaffolds. Not exceeding 6m high or 12m long. Face tied to structure as TG20:13.	Scaffolds not conforming to a TG20:13 compliance sheet. Not exceeding 12m in height or 25m in length. Additional details that are not covered by TG20:13 compliance sheets (separate designs, drawings/ sketches will be required).	All others.
2.2	Tube and fitting scaffolds - freestanding	Hop ups and stairs not exceeding 1.25 m high and braced on all sides.	Unsheeted. Not exceeding 6m high or 12m long.	Sheeted. Not exceeding 6m high or 12m long.	All others.
2.3	System scaffolds, tied or freestanding	Not exceeding 3m high in accordance with the product user manual. See note 1.	Unsheeted less than 6m high or 12 m long in accordance with a user manual.	Sheeted. Not exceeding 6m high or 12m long in accordance with a user manual.	All others.
3.0 Excavations					
3.1	Excavations with trench/ manhole boxes	Single stacked boxes with battered end slopes and minimal ground water. Installed in accordance with product user manual.	With extension boxes or retained soil at ends and minimal ground water. Installed in accordance with product user manual.	Used near existing structures (where the structure must be protected) and minimal ground water. Installed in accordance with product user manual.	



Temporary Works Design Risk Classification Matrix

3.2	Excavations with trench sheets	Less than 1.2m deep with no significant groundwater.	Less than 3.6m deep with no adjacent structures and minimal ground water.	Greater than 3.6m deep but less than 6m deep with minimal ground water. Close to adjacent structures that must be protected.	Greater than 6m deep or where the formation is below the water table in water bearing strata, tidal conditions exist in the local water course and sloping ground.
3.3	Sheet piled cofferdams and pits together with supporting frames		Less than 3.6m deep with no adjacent structures and minimal ground water.	Greater than 3.6m deep but less than 10m deep with minimal ground water. Close to adjacent structures that must be protected.	Greater than 10m deep or where the formation is below the water table in water bearing strata, tidal conditions exist in the local water course and sloping ground.
3.4	Basement construction			Single storey basements where exclusion zone can be imposed with no structures/ loads bearing on retained earth within 45 degree line drawn from excavation formation. Minimal ground water present bleeding from the battered face above a toe drain at the formation level.	Large basements including propping and dewatering schemes.
3.5	Piling gate design		Up to 8m long gates.	Longer than 8m or unusual design. When used in river, coastal or marine environments.	
3.6	Dewatering systems	Sump pumping or small well pointing schemes.	Schemes requiring long term drawdown greater than 2m deep.	Deep well systems.	Dewatering systems where breakdowns could affect the stability of an excavation.
4.0	Plant mobility				
4.1	Working platforms for tracked plant		Plant less than 50t on flat ground.	Plant exceeding 50t or near slopes. Reinforced platforms.	Platforms on poor ground such as peats and very soft clays. Cement bound platforms.
4.2	Crane outrigger foundations		50t max crane capacity in good ground. (35t max outrigger load).	Poor ground conditions or crane between 50t and 300t capacity (200t max outrigger load).	Cranes 300t capacity or above or using superlift type attachments. Significant concern over ground conditions.



Temporary Works Design Risk Classification Matrix

4.3	HIAB, MEWP and concrete pump outrigger foundations		Good ground conditions and outrigger loads less than 100 kN/m ² .	Poor ground conditions or outrigger loads exceeding 100 kN/m ² .	Where standard solutions or bespoke arrangements impose loads larger than the in-service loading on unfinished or completed permanent works that are used for support and/or stability.
4.4	Tower crane foundations			Routine tower crane bases.	Complex or unusual bases.
4.5	Barge mounted equipment			All barge mounted equipment except for those listed as Class 3.	All barge mounted cranes and lifting equipment.
4.6	Lifting schemes and lifting equipment	Conventional lifting with single crane and standard lifting equipment used in accordance with manufacturer's guidance.	Where lifting eyes are fixed to load and lifted by single crane (except when supplied by manufacturer for specialist equipment). The lifting of reinforcement cages.	All lifting equipment using a single crane except as noted in Class 3. Loads to be rotated in elevation during lift.	Complex lifts such as large bridge beams and those using multiple cranes. Lifting equipment on floating craft or items subject to 1000 repetitive lift cycles.
5.0	Concrete work				
5.1	Double sided formwork	Walls up to 2.4m high.	Formwork founded at ground level. Walls not exceeding 6m high.	Formwork not founded at ground level. Walls higher than 6m. See note 2.	When required by third party organisations such as Highways England, Network Rail, EA etc.
5.2	Single sided formwork	Walls up to 0.9m high.	Walls up to 2.4m high.	Walls higher than 2.4m. See note 2.	When required by third party organisations such as Highways England, Network Rail, EA etc.
5.3	Falsework (supporting soffit formwork)		Less than 6m high. Slabs less than 0.5m thick. Beams not exceeding 1m deep.	Greater than 6m high. Beams exceeding 1m thick or heavy suspended items or falsework required for bridging beams.	Falsework subject to lateral loads or inclined soffits. Falsework for post tensioned structures.
5.4	Back propping (typically but not only found in multi story flat slab construction)		Single level back propping where early concrete strength is known and supporting floor structural performance is known and does not exceed a 70% / 30% split of the loading between upper and lower supporting floors.	Two levels of back propping solutions where early concrete strength is known and supporting floors structural performance is known and does not exceed a 65%/23%/12% split of the loading between upper, middle and lower supporting floors.	Two levels or more of back propping. Back propping solutions that relies on the preloading of props to redistribute loads to the supporting floors or where the supporting floor is prestressed and/ or the concrete has not achieved full design strength.



Temporary Works Design Risk Classification Matrix

5.5	Permanent metal deck formwork (Construction phase where concrete is a dead load and has no structural strength)		Spans within the manufacturer's published maximum 'unpropped' length and slab thickness data in the construction phase where the fresh concrete is a dead load and non structural.	Spans exceeding the manufacturer's published maximum 'unpropped' length and slab thickness data in the construction phase where the concrete is a dead load and non structural or where additional back propping is shown to be needed.	When required by third party organisations such as Highways England, Network Rail, EA etc.
5.6	Reinforcement cage stability	Walls less than 3m high and assembled in accordance with a standard solution data sheet. Concrete pressure evaluation to CIRIA 108 or similar. See note 1.	Walls in excess of 3m high but less than 6m high. Lifting points and bracing for lifting in cages.	In excess of 6m high requiring bracing/ propping. Lifting points and bracing for lifting in cages.	Walls in excess of 6m high freestanding where internal bracing or external propping is or is not shown. Any reinforcement where fixers are required to work below the top mat/ within the cage.
6.0	Structural stability				
6.1	Freestanding masonry walls (part-built)	The maximum daily lift height above a tied location that the bedding mortar allows and as defined in the contract specification/ permanent design/ or industry good practice guides.	Masonry panels up to 3m high where penetrations exist, lintels are missing, top/ side restraints or returns are missing or not yet installed and the mortar has not achieved the stated design strength. Walls subjected to temporary wind loading due to the structure having incomplete cladding or envelope.	Where masonry panels are near completed size and higher than 3m but detailed top/ side restraints or returns are missing or not yet installed and the mortar has not achieved the stated design strength. Walls subjected to temporary wind loading due to the structure having incomplete cladding or envelope.	
6.2	Effects of vibration and settlement				Assessment of potential damage to adjacent existing structures and to the structure undergoing modification.
6.3	Demolition methods		Simple demolition of single storey buildings.	General case for demolition.	Bridges and complex structures. Post tensioned structures. Use of partially demolished structures. On or near a public interface.
6.4	Temporary stability of precast elements during erection		At ground level.	Multi-storey construction. Bridge beams or elements on permanent supports.	Adjacent to infrastructure (road, rail, services etc.). Bridge beams or elements on temporary props or suspension rods/ wires/ cables.



Temporary Works Design Risk Classification Matrix

6.5	Modification of existing structures		Modification of conventional building structures where primary load bearing or lateral bracing elements are not affected. Simple needling or propping complying industry best practice to enable modification of load bearing elements.	Schemes requiring removal of cladding which may contribute to the integrity of the structure. Complex needling, propping, underpinning to allow modification of load bearing and lateral stability elements.	Modification to any structure which remains in use or not subject to exclusion zones.
6.6	Temporary stability during steel erection Including; composite structures, framed buildings and bridges		Normal building frames.	Frames requiring temporary restraints (e.g. portal frames).	Bridges and complex structures.
6.7	Façade retention				All schemes.
6.8	Temporary stability of tension structures Including; cable suspension bridges, catenary and cable stay bridges, sports arenas, architectural roofs and large industrial buildings		Spans less than 30m.	Spans less than 30m alongside rail infrastructure.	Spans in excess of 30m alongside railway.
7.0	Affects on permanent work				
7.1	Permanent works in a temporary condition			General case - The permanent works designer should also be consulted.	Complex or high risk situations with whole or part completed structures including but not restricted to composite structures, bridge beams, bridge parapet formwork, permanent falsework and the like.
7.2	Temporary loads on permanent works		Imposed loads from construction plant or outrigger loads on ground floor slab on grade.	General case - The permanent works designer should also be consulted.	Complex or high risk situations with whole or part completed structures including but not restricted to composite structures, bridge beams, bridge parapet formwork, permanent falsework and the like.



Temporary Works Design Risk Classification Matrix

8.0 Pressurised systems					
8.1	<p>Pressure jetting</p> <p>Including; pressure washing, drain and sewer cleaning, surface preparation, tube, pipe & bundle cleaning, concrete breaking, hydro demolition</p>	<p>Used in accordance with manufacture's guidance. Operative to be assessed as competent and trained in the use and operation. As a general rule if the equipment is an "off the shelf kit" being used in a manufacture's standard configuration it will be Risk Class 0.</p>			<p>System that include a bespoke element or non-standard configuration.</p> <p>If the operation is hydrostatic equal to or above 20bar or pneumatic equal to or above 0.5bar or 250 bar/ litres (bl). Any temporary works required to support the pressurised system. Mechanical Appointed Person shall be advised of intended works.</p>
8.2	<p>Pressurised temporary systems.</p> <p>Including; compressed air, concrete pumping, shotcrete, hydro demolition, highways drainage, expandable pipe stopper systems, air systems to assist in plant/ machine movement</p>	<p>As a general rule if the system is an "off the shelf kit" being used in a manufactures standard configuration it will be Risk Class 0.</p>			<p>System that include a bespoke element or non-standard configuration.</p> <p>If the operation is hydrostatic equal to or above 20bar or pneumatic equal to or above 0.5bar or 250 bar/ litres (bl). Any temporary works required to support the pressurised system. Mechanical Appointed Person shall be advised of intended works.</p>
8.3	<p>Pressurised permanent systems</p> <p>Pipework, vessels and other process plant pressure testing of systems that will eventually form part of the permanent works</p>	<p>Up to a maximum pressure of .02 bar pneumatic (200mm head of water) or 1 bar Hydraulic (10m head of water).</p>	<p>If the test is hydrostatic below 20bar or pneumatic below 0.5bar or 250 bar/ litres (bl). Any temporary works required to support the pressurised system. Mechanical Appointed Person shall be advised of intended works.</p>		<p>If the test is hydrostatic equal to or above 20bar or pneumatic equal to or above 0.5bar or 250 bar/ litres (bl). Any temporary works required to support the pressurised system. Mechanical Appointed Person shall be advised of intended works.</p>
Notes					
Note 1 - Where reinforcement cage stability, scaffolds, fencing/ hoardings and pressure testing are deemed Class 0 they should still be entered onto the TW register.					
Note 2 - Where local conditions are likely to increase risk (proximity of the public, traffic or services for instance) the class should be raised as appropriate.					
Note 3 – Volume1 Series 500 specification for Highways (Drainage and Service Ducts) refers to testing of pipelines and ducts to 100mm (.01bar) head of water for air tests and 1.2m (.117bar) head of water for water tests.					