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| Scope |
| The requirements of this procedure apply to all the Company employees, the supply chain and all other parties involved in the design, construction, maintenance and removal of Temporary Works.  This procedure must be used for all Balfour Beatty projects, the minimum standards outlined in this procedure must be adopted on all JV projects. |

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| Purpose |
| The purpose of the procedure is to ensure that Temporary Works required for all the Company projects are designed, constructed, loaded, unloaded, and dismantled safely. This procedure is based on Section 2 of BS5975, which describes the procedural control of Temporary Works.  This document provides further additional background information on the controls to be adopted for the management, design, construction, maintenance and removal of Temporary Works. It is intended to be followed in conjunction with the Management of Temporary Works Process Map ([ENG-PM-0101a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12516)).  Specific Strategic Business Unit (SBU) procedures are highlighted below within each main heading.  The format of this document lists all necessary procedural information in normal text. *All information or guidance is shown in italics*. |

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| Abbreviations / Definitions | |
| **DI** | Designated Individual: Responsible for establishing and implementing a set of procedures for the control of temporary works for that Business Unit and for ensuring that any sub-contractors have adequate temporary works procedures if they are carrying out and managing temporary works. |
| **TWC** | Temporary Works Coordinator: Individual responsible for the safe control and coordination of temporary works design and construction on site. |
| **ATWC** | Alternate Temporary Works Coordinator: Assumes the role of the TWC, as directed by the TWC, when the TWC is not available. |
| **TWS** | Temporary Works Supervisor: Individual responsible for assisting the TWC with their inspection and administration duties. |
| **PL** | Project Lead: Person on site responsible for the overall safe construction of the works. |
| **PWD** | Permanent Works Designer: The organisation responsible for delivering the permanent works design. |
| **TW** | Temporary Works: Parts of the works that allow or enable the construction/demolition of, protect, support or provide access to, the permanent works and which might or might not remain in place at the completion of the works. |
| **TWD** | Temporary Works Designer: Individual or organisation responsible for the design of a temporary works scheme. |
| **TWDC** | Temporary Works Design Checker: Individual or organisation responsible for carrying out a design check on a temporary works scheme. |
| **BL** | Bid Lead: Individual responsible for the preparation and submission of a bid. |
| **E&DL** | Engineering & Design Lead: as identified in the Group Minimum Engineering Expectations (GMEE). |
| ***Red Italics*** | *Document not yet available in UK BMS. Use legacy document in the interim.* |

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| INPUTS | | |
| **Reference** | **Type** | **Title** |
| [Link](https://home360.balfourbeatty.com/kc/EngTech/TempWorks/Pages/Default.aspx) | 360 Site | Temporary Works Community of Practice 360 Site |
| [ENG-PM-0101a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12516) | Process Map | Temporary Works Process |
| [ENG-RM-0101a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12497) | Reference Material | Temporary Works Management Classes with Examples |
| [ENG-RM-0101b](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-8002) | Reference Material | Temporary Works Inspection Checklists |
| [HSF-PR-0022](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-1113) | Procedure | Demolition |
| [HSF-PR-0016](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-8608) | Procedure | Excavations |
| [HSF-PR-0039](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-8085) | Procedure | Lifting Operations |
| [HSF-PR-0063](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-8232) | Procedure | Work at Height |
| [HSES-PR-0011](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-8591) | Procedure | Setting People to Work Safely |
| [ENG-MA-0100](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-7822) | Reference Material | GMEE |
| [PAS 8811](https://www.twforum.org.uk/news/pas-8811/) | On-line Document | PAS 8811 Code of practice for temporary works - client |

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| OuTPUTS | | | |
| **Reference No.** | **Document Title** | **Responsibility** | **Retention Period** |
| [ENG-SF-0101a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12506) | Appointment of Designated Individual | SBU Director | 12 years |
| [ENG-SF-0101b](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12500) | Appointment of TWC/ATWC/TWS | PL | 6 years |
| [ENG-TF-0101a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13986) | Temporary Works Register | TWC | 6 years |
| [ENG-SF-0101c](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13985) | Temporary Works Check Certificate | TWD / TWDC | 6 or 12 years \* |
| [ENG-TF-0101g](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12502) | Temporary Works Permit to Proceed | TWC | 6 or 12 years \* |
| [ENG-TF-0101f](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-4783) | Temporary Works Inspection Checklists | TWC | 6 or 12 years |
| [DES-TF-0016b](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-5539) | Designers Assessment Questionnaire | TWC | 6 or 12 years \* |
| [DES-TF-0017e](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12509) | First Schedule - Fire Engineer Services |  |  |
| [HSF-SF-0018a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-6882) | Subcontractors Demonstration of Competence | TWC | 6 or 12 years \* |
| [HSF-SF-0022b](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-1124) | Demolition Works Pre-Start Planning Checklist | TWC | 6 years |
| [HSES-TF-0011d](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-7852) | Work Package Plan | TWC | 6 or 12 years \* |
| [ENG-TF-0101b](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13987) | Bid Stage Temporary Works Register | E&DL | 6 years |
| [ENG-TF-0101e](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12499) | Temporary Works Design Brief | TWC | 6 or 12 years \* |
| [ENG-TF-0101c](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13984) | Temporary Works Design Change Form | TWC | 6 or 12 years \* |
| [ENG-RA-0101a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12503) | Temporary Works Design Risk Assessment | TWD / TWDC | 6 or 12 years \* |
|  | *Plant Bearing Pressures for Un-Bound Platforms* |  |  |
|  | *Plant Bearing Pressures for Bound Platforms* |  |  |
| \* Refer to ‘Section 9 – Archiving’ for more information on retention periods. | | | |

**PROCEDURAL REQUIREMENTS**

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|  | **BID STAGE** |
|  | During the bid stage (Gated Lifecycle Stages 1-3) all items of temporary works required must be identified, priced, programmed and included in the tender. This is the responsibility of the Engineering and Design Lead (E&DL), who should seek expert advice wherever possible. The Bid Stage Temporary Works Register ([ENG-TF-0101b](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13987)) will list out all the temporary works. Allowances for the design and checking fees for these works are to be included. Known risks associated with identified temporary works must be assessed and residual risks which have financial, health & safety and/or programme implications must be included in the Risk Register. |
|  | **APPOINTMENTS, ROLES & RESPONSIBILITIES** |
|  | **SBU Director** |
|  | The SBU Managing Director, or other suitable Board Director, must appoint a competent Designated Individual (DI) for their Business Unit.  The DI is appointed by the SBU Director, using form Appointment of Designated Individual ([ENG-SF-0101a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12506))  *An up to date list of the DIs is kept within the* [*360 Temporary Works Community pages*](https://home360.balfourbeatty.com/kc/EngTech/TempWorks/Pages/Default.aspx)*.* |
|  | **Designated Individual (DI)** |
|  | Responsible for establishing and implementing a set of procedures for the control of temporary works for that Business Unit and for ensuring that any sub-contractors have adequate temporary works procedures if they are carrying out and managing temporary works. The DI must approve all Temporary Works Coordinator (TWC) and Alternate Temporary Works Coordinator (ATWC) appointments within their SBU, after suitable competency checks are completed. The DI must also undertake similar competency checks for Temporary Works Supervisor (TWS) appointments where they are inspecting and signing off Temporary Works Permits. The DI must approve all internal Temporary Works Designers and Checkers (TWD & TWDC), and they may be referred to by the TWC for approvals of external TWD & TWDCs where necessary. |
|  | **Temporary Works Coordinator (TWC)** |
|  | Individual responsible for the safe control and coordination of temporary works design and construction on site. They have the authority to stop the works if they believe there is a safety, program, or reputational risk of proceeding with inappropriate temporary works. Every project must have a TWC appointed.  The TWC is appointed by the Project Lead (PL) and approved by the DI, using form Appointment of TWC/ATWC/TWS ([ENG-SF-0101b](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12500))  *The TWC will normally be based on site, but if deemed a small site, then directly responsible from a remote location.*  The main duties and responsibilities of the TWC are:   * Ensure they have records of their TWC appointment and approvals from their DI. * Coordinate with all parties involved in the design and construction of temporary works. * Undertake regular interdisciplinary meetings to update the Temporary Works Register ([ENG-TF-0101a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13986)) and continually review risk. * Liaise with clients to determine if schemes may affect the public and to ascertain approval process and certification required. * Compile and periodically update the Temporary Works Register with all relevant information and to periodically review the Register ([ENG-TF-0101a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13986)) with the TWD and PL to suit the project timeframe. * Prepare/review Design Briefs for adequacy/completeness prior to issue to the TWD. * As part of the requirements of Construction (Design and Management) Regulations (CDM), ensure all TWDs and their organisations, working for their project, are competent to undertake the design work. * For all sole design services arrangements, the PL and TWC are to ensure that all external designers have completed the Designer Assessment Questionnaire ([DES-TF-0016b](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-5539)). However, for all designs procured through either, supply of equipment, or as part of a construction subcontract arrangement, the PL and TWC are to ensure that all external designers have completed the Subcontractors Demonstration of Competence ([HSF-SF-0018a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-6882)) and to ensure that all previous prequalification exercises are registered on the Balfour Beatty supplier database. * To understand the Project Fire Strategy, and to review temporary works risks for relevant fire safety design issues, in particular: design, location, protection of escape routes, identification and specification of all fire safety systems that are required, surface spread of flame requirements for surface materials, structural fire resistance requirements, fire compartmentation requirements including fire-stopping and cavity barriers, external fire spread, access and facilities for fire services (Refer to [DES-TF-0017e](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12509)). * The TWC is to liaise with the DI to advise on TWD competency as necessary. * Ensure that an adequate temporary works design is carried out. * When selecting a Standard Solution, those responsible will ensure that they understand and take account of the limitations of these designs so that they are only used in appropriate circumstances. The TWC is to ensure this process is followed, and that the Standard Solution is clearly illustrated in sketches, risk assessments if necessary, and described in the Method Statement. * Supervise and assess the competency of the TWS with the PL, and to gain approval from the DI where the TWS is responsible for signing off Permits to Proceed ([ENG-TF-0101g](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12502)). * Ensure the TWS appointments have clearly defined limits of responsibility. * Brief all TWSs on their duties and scope of responsibility. * Ensure that the duration for temporary works designs, checking and construction are realistically timed in the construction programme. * Ensure that the completed designs are obtained from the TWD within the required deadline. Ensure that the designer complies with the design brief and adequately describes the residual risks. * Ensure that the TWD has assessed design risks specific to that design, and has demonstrated a reduction of risk to an acceptable level through design mitigations. All residual risks are to be clearly shown on drawings. *It is essential for the TWC to understand the designers risk assessment process to allow them to incorporate additional measures into specific RAMS.* * Discuss any changes to the design with the TWD and manage the design change process using the Design Change Form ([ENG-TF-0101c](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13984).). * Ensure that a temporary works design is checked by a TWDC with the correct level of independence. * Ensure that a Temporary Works Design & Check Certificate is issued ([ENG-SF-0101c](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13985)). * Ensure that designs are issued to the construction team and other interested parties, e.g. client. * Ensure that construction is only carried out from drawings issued ‘for construction’. * Ensure that the construction method statement incorporates the requirements of both the permanent and temporary works designs, e.g. loads on foundations/permanent works, structural integrity, stability, specific sequence and hold points, etc. * Check that materials and equipment are adequate, especially when they have been used before. * Check preparations for temporary work structures (e.g. foundations) and allow erection to proceed through issuing of permits to proceed ([ENG-TF-0101g](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12502)). * Draw up and agree with the site team a list of hold points for certain operations for which inspection is required prior to work progressing further. This forms the basis of the Inspection and Test Plan. * Carry out inspections of temporary works and permanent works at temporary stages, prior to loading and unloading, and ensure the competence of any persons where delegated to carry out on-site inspections. Records of inspections can be made on the Temporary Works Inspection Sheets ([ENG-TF-0101f](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-4783)) *Inspections should align with company defect free delivery plans and recorded in inspection and test plans.* * Ensure that all Basic Scaffolds (as defined by NASC document TG20:13) are inspected by a person who has passed a CISRS Basic Scaffold Inspection course. All other designed, or bespoke, scaffolds must be inspected by either:- a competent CISRS Advanced Scaffolder, who was not involved with the erection of the structure, or a person who has passed the CISRS Advanced Scaffold Inspection course. * Ensure coordination of permanent and temporary works is achieved. * Ensure that erected temporary works are maintained and inspected at a defined frequency. * Maintain adequate site records of all temporary works documentation:   + TWC, ATWC, TWS appointments ([ENG-SF-0101b](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12500))   + Designer Assessment Questionnaires ([DES-TF-0016b](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-5539))   + Subcontractors Demonstration of Competence, with design ([HSF-SF-0018a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-6882))   + Temporary Works Register ([ENG-TF-0101a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13986))   + TW Design Briefs and any subsequent changes to the brief ([ENG-TF-0101e](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12499)).   + TW drawings, risk assessments, & schedules.   + Design and Check Certificates ([ENG-SF-0101c](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13985))   + Written authorisation for changes to design TW’s from TWD using the Design Change Form ([ENG-TF-0101c](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13984)).   + Inspection and test records ([ENG-TF-0101f](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-4783))   + Signed off permits to proceed/load/unload ([ENG-TF-0101g](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12502)).   + Site TW meeting minutes. * *The procedure only requires Classes 1 to 3 to maintain the above documents. However, it is recommended to adopt similar records for Class 0 where possible, and also where the client may require documentation for all Management Classes of Temporary Works. Records of decisions of Class 0 Temporary Works being selected are useful for Method Statements, commercial decisions and for investigating incidents.* |

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|  | **Specific Sites where BB is not Principal Contractor** |
|  | *The TWC on BBGE projects and some BB Rail projects will normally be a TWC employed by the non-BB Principal Contractor (PC).*  These projects will have a TWS who is responsible for liaising with the PC’s TWC on all TW matters, such as piling platform designs & inspections and excavations. The TWS is to report all concerns with the project’s TWC to their DI for clarification. |
|  | On Balfour Beatty Ground Engineering sites the main item of temporary works is the piling platform. The documents below will be used to manage the piling platform on site where Balfour Beatty or others are the Principal Contractor and have TWC responsibilities:   * Working Platform - Design and Operation ([ENG-PR-1520-GE](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-8170)) * Piling Platform Inspection Sheet ([OPS-SF-1850a-GE](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-11445)) * Working Platform Certificate ([ENG-SF-1520a-GE](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-8259)) * Working Platform Inspection ([ENG-SF-1520b-GE](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-8260)) * Plant Bearing Pressures for Un-Bound Platforms * Plant Bearing Pressures for Bound Platforms |
|  | **Alternate Temporary Works Coordinator (ATWC)** |
|  | Responsible person who assumes the role of the TWC, as directed by the TWC, when the TWC is not available, e*.g. when the TWC is off site due to leave, sickness etc.*  The ATWC is appointed by the PL and approved by the DI, using form Appointment of TWC/ATWC/TWS ([ENG-SF-0101b](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12500)). Every project must have an ATWC appointed.  The main duties and responsibilities of the ATWC are the same as the TWC. The ATWC must ensure they maintain an understanding of the project temporary works to allow them to take on the TWC role as required. |
|  | **Temporary Works Supervisor (TWS)**  Individual responsible for assisting the TWC with their inspection and administration duties.  TWS’s are appointed by the TWC and PL, and approved by the DI using form Appointment of TWC/ATWC/TWS ([ENG-SF-0101b](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12500))  When the TWS’s inspections are counter signed by the TWC (and therefore accountability is taken by the TWC), then the approval of the DI is not required.  When the TWS is employed by a sub-contractor they are to be appointed and approved by their own company’s DI, and reviewed and approved by the Balfour Beatty DI.  A TWS will be appointed for a specific item(s) of work on site (i.e. excavations, formwork, falsework) to suit their experience and expertise. The TWS will be able to carry out inspections and issue permits on the behalf of the TWC within the skill area they have been approved for. Records of inspections can be made on the Temporary Works Inspection Sheets  ([ENG-TF-0101f](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-4783)).  In particular the TWS shall:-   * Ensure they receive a briefing from the TWC on their duties and scope of responsibility. * Check that materials and equipment are adequate, especially when they have been used before. * Check preparations for temporary works structures (e.g. foundations) and allow erection to proceed. * Carry out inspections of temporary works, and permanent works at temporary stages, prior to loading and unloading. * Ensure that erected temporary works, and permanent works at temporary stages, are maintained and inspected regularly. * Refer back to the TWC to clarify all uncertainties before signing off any permits. |
|  | **Temporary Works Designer (TWD)** |
|  | Individual or organisation responsible for the design of a temporary works scheme.  They will prepare competent designs in accordance with the Design Brief issued by the TWC. The TWD will be responsible for resourcing all designers necessary to meet the deliverables of the site brief. Design risks are to be assessed by the TWD and designed out or minimised where possible. All residual risks that cannot be minimised to acceptable levels must be communicated on all documentation, including drawings, so that design risks can be managed by others. The TWD must understand their duties under the Construction (Design & Management) Regulations.  If TW designs are procured outside of BB then these external designs must be checked or reviewed by a suitable internal BB TWDC, unless the TWC is confident that both external design and check will not subject the company to technical and safety risks.  Designers will consider, amongst other items: the Design Brief; construction sequence; erection and construction tolerances; testing; loadings; design life; design codes and standards; statutory requirements; ground conditions; health and safety; environmental effects.  Designers will prepare suitable calculations based upon British Standards, industry guidance, and recognised engineering principles. Sufficient drawings, sketches, design statements and outline method statements will be produced to enable the Temporary Works to be constructed, inspected, used, maintained and dismantled in a safe manner.  Where appropriate, the designer will identify inspection and test requirements, including hold points. The TWC must ensure that these requirements are incorporated into the Inspection and Test Plan.  The designer will sign a design certificate, which will ordinarily be Form ([ENG-SF-0101c](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13985))  *Internal TWDs are to be utilised where possible.* *The TW design will only be as good as the Design Brief that is prepared, and internal TWD’s will provide additional levels of interrogation in the design and check phases, and normally better understand the wider aspects of business risks.* |
|  | **Temporary Works Design Checker (TWDC)** |
|  | Individual or organisation responsible for carrying out a design check of a temporary works scheme.  The TWDC must view the Design Brief and ensure that the design complies with its requirements. The TWDC must complete the design check for structural adequacy and issue a Temporary Works Design & Check certificate when completed.( [ENG-SF-0101c](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13985))  *For Management Class 2, 3 & 4 the TWDC should prepare their own calculations without sight of the TWD calculations, unless the design is complex and disputes need to be resolved by comparing design assumptions, computer inputs and outputs. It is good practice for the TWDC to review the TWD’s Design Risk Assessment. Communication of design issues should be resolved with the TWC or the TWD.* |
|  | **COMPETENCE** |
|  | Competence is a complex mix of experience, knowledge, skills, training, attitudes, understanding of TW procedures and other attributes. To enable approvers to assess parts of competence, COMAEA should be used, where possible, to validate experience and skills gained. Approvers will also need to carry out further checks to demonstrate other areas of competence that COMAEA does not cover. |
|  | **Designated Individual (DI)** |
|  | Each SBU’s Managing Director will set a Policy to enable a highly experienced and competent engineer, to act as the DI within the Company to approve all TWD, TWC, ATWC and TWS appointments.  *The MD has discretion to decide if their SBU requires the DI to be a Chartered Engineer.* The *DI should preferably be a Chartered Engineer or hold equivalent demonstrable experience commensurate to the scale and complexity of the project and temporary works requirements.*  The DI is appointed by the MD, or suitable Board Director, using form Appointment of Designated Individual ([ENG-SF-0101a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12506)) |
|  | **Temporary Works Coordinator (TWC)** |
|  | The PL is responsible for assessing the competency of TWC candidates for their projects prior to the DI approving the nomination. Once the candidate has been approved by the DI then the appointment can be made by the PL.  The TWC is an accountable role in the implementation of temporary works schemes and it is more important to be a good communicator and conscientiously carry out their duties than to be capable of designing temporary works. Competence checks should confirm their main attributes including:-   * Engineering knowledge and understanding – ability to apply technical and practical skills (read, understand and implement the requirements of drawings and specifications). * Management and leadership – ability to plan and manage temporary works design and checks, particularly people and resources. * Independent judgement – ability to identify limits of personal and team’s knowledge and skills. * Health, safety and welfare – a sound knowledge of legislation, hazards and safe systems of work, ability to manage health, safety and welfare within own area of responsibility. * Interpersonal skills and communication – ability to communicate well with others at all levels, ability to discuss ideas and plans competently and with confidence.   TWCs must have a competent balance of experience, knowledge, training, qualifications and understanding of the TW Procedures. In order of priority:   * Experience relevant to the type and complexity of the temporary works on the project that they will be involved. * Attended an approved CITB TWC training course. * Ensure that if they are required to inspect a basic scaffold they have passed a CISRS Basic Scaffold Inspection course. If they are inspecting all scaffolds they must ensure they are independent of the erection process and have passed the CISRS Advanced Scaffold Inspection course. * Received a briefing from the DI (or a competent and experienced individual such as the TWD) on the role and delegated responsibilities, including an update on the Management of Temporary Works Procedures at periods not exceeding 2 years. *This should include guidance on subject matter briefings, such as Power T&D specific courses.* * If being nominated for first appointment, must have attended an approved CITB TWC training course within the last 2 years, or be able to demonstrate recent relevant training, knowledge and experience for this role with another organisation. * If being nominated for re-appointment, must have undertaken the role of TWC within the last 2 years. If this requirement is not satisfied, the nominated person must attend the next available approved CITB TWC training course and receive an update on the Management of Temporary Works Procedures. They must also have attended an update/refresher training within a period not exceeding 5 years after completing the TWC course, and at periods not exceeding 5 years thereafter. * *It is desirable, although not essential, to have formal qualifications e.g. HNC, Degree.*   *There are no mandatory qualifications to be a TWC, although the DI must appoint someone who is suitably competent and experienced for the project which they will be undertaking. Whilst it might be desirable to use Chartered Engineer TWCs for projects with highly complex, high value and high risk temporary works this is certainly not the case for projects that are relatively simple, low risk temporary works where a suitably experienced manager would be most suitable. The experience and competence of the TWC should be commensurate with the scale and complexity of the temporary works which they are appointed to manage.* |
|  | **Project Specific Requirements** |
|  | For National Grid projects the TWC must have completed a Basic Electrical Safety Competence training course, before appointment as a TWC. |
|  | **Alternate Temporary Works Coordinator (ATWC)** |
|  | The competency requirements for an ATWC are the same as for a TWC. Please refer to TWC competence section. |
|  | **Temporary Works Supervisor (TWS)** |
|  | The PL and TWC are responsible for assessing the competency of TWS candidates for their projects. For the TWS to be permitted to sign off permits they must also be approved by the DI.  TWS’s must have, as a minimum:   * Relevant knowledge, experience and up to date training for the nature and complexity of the work they are being appointed to supervise (i.e. excavations). * Have received a briefing from the TWC on the role and delegated responsibilities including an update on the BMS Temporary Works procedures. * If inspecting Basic Scaffolds (as defined by NASC document TG20:13) by themselves, have attended a CISRS Basic Scaffold Inspection training course.   *There is also a CITB TW Supervisor training course and a CITB TW General Awareness course which may be relevant for those who are not expecting to be appointed as a TWC.* |
|  | **Temporary Works Designer (TWD)** |
|  | The TWC is responsible for allocating temporary works design to the most suitable, appropriate and competent TWD. Assessment of the competency of internal BB TWD’s is to be undertaken by their SBU DI.  External TWD competence is to be undertaken by the TWC, with assistance from the DI and the BB TWD where necessary.  All TWD’s must be reviewed for their appropriate skills, knowledge and experience, to perform structural calculations, analysis and organise the delivery of working drawings. All TWD’s must have engineering knowledge and understanding, and the ability to identify design risks, and minimise these through competent, practical, buildable and safe temporary works designs.  *There are no mandatory qualifications to be a TWD, although the DI and/or the TWC must appoint someone who is suitably competent and experienced for the project which they will be undertaking. Whilst it might be desirable to use Chartered Engineer TWD's for projects with highly complex, high value and high risk temporary works this is certainly not the case for projects that are relatively simple, low risk temporary works where a suitably experienced TWD would be most suitable. The experience and competence of the TWD should be commensurate with the scale and complexity of the temporary works which they are assigned to design.* |
|  | **External TW Design** |
|  | External temporary works designs may originate from either a consultant, proprietary supplier, or subcontractors designer.  The DI or their nominated person, normally the TWC, is responsible for ensuring that all subcontractors that have an involvement in temporary works, have used competent designers and will review the competence questionnaires.  Subcontractors must demonstrate that their designers are competent by using the standard form Subcontractors Demonstration of Competence ([HSF-SF-0018a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-6882))  All subcontract designs must be reviewed by the TWC with input from the Balfour Beatty TWD for Classes 1-4. Where designers are engaged directly by the project team, they must demonstrate their competence by completion of template form Designers Assessment Questionnaire ([DES-TF-0016b](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-5539)). |
|  | **Temporary Works Design Checker (TWDC)** |
|  | The competency requirements for a TWDC are similar, or greater than those for the TWD, depending on the level of Management Class allocated to the specific design. Please refer to TWD competence section. |
|  | temporary works register |
|  | *The temporary works register is a template form and can be enhanced for project specific requirements.(* [ENG-TF-0101a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13986))  There are specific additional SBU requirements within the template form within the right hand side columns that must be included when used by that SBU. Please see template form Temporary Works Register ([ENG-TF-0101a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13986))  The Temporary Works Register should be treated as a ‘live’ document and must be reviewed and updated on a regular basis in accordance with the project requirements. It is the responsibility of the TWC, with the assistance of the TWD if required, to update it.  The following items (4.1 to 4.7) must be considered and listed within the Temporary Works Register ([ENG-TF-0101a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13986)) :-  Further guidance on temporary works solutions can be found on the [temporary works community of practice 360 page](https://home360.balfourbeatty.com/kc/EngTech/TempWorks/Pages/Default.aspx). |
|  | **Description of Temporary Works** |
|  | Describe the item of temporary works, e.g. formworks to west abutment wing wall, external brickwork scaffold to Sports Hall, ground support to MH 123. Each item of temporary works to be designed must have it’s own unique reference number. |
|  | **Management Class** |
|  | Temporary works will be classified according to the design complexity, execution risk, and consequences of failure in line with BS5975. The below classification may dictate the arrangements for design, design checking, inspection and release of hold points. The temporary works Management Class may be dictated by the highest contributing risk as identified in the table below (refer to [PAS 8811](https://www.twforum.org.uk/news/pas-8811/)).   |  |  |  |  | | --- | --- | --- | --- | | **Design Complexity Risk** | **Execution Risk** | **Consequence of Failure Risk** | **Management Class** | | DC0:  Standard Solutions. | E0:  No identified practical mode of failure. | CF0:  Benign, no impact. | **MC0:**  Designer: Site  Check: TWC | | DC1:  Simple designs. | E1:  Minor structures with high level of robustness and redundancy. | CF1:  Low impact, entirely within site, inconvenient but personal injury unlikely. | **MC1:**  Designer: TWD  Check: TWDC (Cat 1) | | DC2:  More complex or involved designs, or where there is an interaction between separately managed schemes. | E2:  Conventional structures. | CF2:  Potentially major effect, but would not initiate any secondary events, chain reactions or major incidents. | **MC2:**  Designer: TWD  Check: TWDC (Cat 2) | | DC3:  Complex or innovative design, or which results in complex sequences or moving and/or constructing either the temporary works or permanent works. | E3:  Schemes with dependency on critical structural details, significant tensile details, little or no redundancy, or inherent instability. | CF3:  Catastrophic failure, or minor failure leading to secondary events, chain reactions or major incidents. | **MC3:**  Designer: TWD  Check: TWDC (Cat 3) | | DC4:  Abnormal and highly innovative designs beyond the scope of normal design codes and practice |  | CF4:  Major catastrophic failure, leading to major financial or reputational damage to the overall business | **MC4:**  Designer: TWD  Check: TWDC (Cat 3)  Independent Peer Review |   *i.e. If your risks are; DC1, E1, CF2, you would use the highest associated Management Class of MC2 for the temporary works item.*  *The increase in Management Class indicates an increased risk with the temporary works item. This increases the independency of the design and check, and the scrutiny placed on the implementation of the temporary works scheme on site.*  *Examples of temporary works items within each Management Class can be found within* Temporary Works Management Classes with Examples ([ENG-RM-0101a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12497))  The project controls for managing the temporary works are identified in the following table:- |
|  | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **Management Class** | **Identify the Temporary Works** | **Temporary Works Classification**  **(see Note 1)** | **Options and Concept Review** | **Prepare Design Brief** | **Design and Design Risk Assessment** | **Design Check and Certification**  **(see Note 2)** | **Site Inspection**  **& Permit Sign Off** | | Class 0 | Project Team | TWC | Project Team | (see Note 1) | Project Team/TWC | TWC/TWD  (see Note 3) | TWC, ATWC, or TWS | | Class 1 | Project Team | TWC agreed by TWD | Project Team | Project Team and approved by TWC | TWD | Collaborative check by another Engineer within the organisation | | Class 2 | Project Team | TWC agreed by TWD | Project Team with assistance from TW dept if requested | Project Team and approved by TWC | TWD | Independent check by another Engineer within the organisation | | Class 3 | Project Team | TWC agreed by TWD | Project Team with assistance from TW dept if requested | Project Team and approved by TWC | TWD | Independent check by a Designer from a different organisation | TWC, ATWC | | Class 4 | Project Team | TWC agreed by TWD and DI | Project Team with assistance from TW dept and DI | Project Team and approved by TWC | TWD | Independent check by a Designer from a different organisation. Also Peer Review  (see Note 4) | TWC, ATWC |   **Notes**  1. Design Brief not required for Class 0 however the scheme details must be recorded by a competent person and approved by the TWC. *Also, it is recommended to prepare a record for Class 0 solutions where possible, and also where the client may require documentation for all Management Classes of Temporary Works. These records are useful for Method Statements, commercial decisions and for investigating incidents.*  2. It is recommended that design check certifications are carried out in house. For all external designs, a design check/review must be undertaken by a suitable TWD outside that organisation. All designs must be reviewed by Balfour Beatty to ensure that the company business management system (BMS) is complied with.  3. A Temporary Works Design Check Confirmation/Approval form is required for Class 0 temporary works, unless it can be demonstrated clearly, that two competent persons have separately designed (originator) and checked (TWC, TWS) the scheme, and there are sufficient records demonstrating this e.g. referenced, signed and dated sketches.  4. The DI may appoint a representative or specify an independent review team. |
|  | **Location** |
|  | Location of the temporary works item to be included in relation to existing assets, i.e. grid reference & level. |
|  | **Programme** |
|  | A record must be made of construction start date; submission date of the Design Brief to the TWD; considering time for client approvals, and any need for a design statement. |
|  | **Temporary Works Designer & Checker** |
|  | The TWD and the TWDC must be identified in line with the independency required as indicated from the Management Class table above.  Temporary Works in Management Class 0 do not require design calculations. However, sketches will be prepared to show the arrangement of the Temporary Works and identify the equipment chosen.  Designers are reminded to comply with requirements of the Construction (Design and Management) Regulations. The designer will provide information to the Principal Designer, via the TWC, as may reasonably be requested by the Principal Designer.  Where a complex temporary works scheme involves design contributions from more than one designer, one of the designers will undertake the role of lead designer. The lead designer for a temporary works scheme may not necessarily be the Principal Designer.  The lead designer will ensure that:   * There is an appropriate distribution of design tasks amongst the designers, especially where the design of temporary works is an integral part of the permanent works methodology. * The communication of design data between organisations is controlled * Design contributions from all designers are compatible with each other, and any necessary iterations are completed. * The lead designer has a holistic understanding of the whole design. * The design output is complete and clearly communicated. * The Principal Designer is informed of significant risks that cannot be eliminated.   The same approach will be taken where the check of a complex temporary works scheme involves contributions from more than one checker.  Design will be carried out in accordance with sub-section 9 of BS 5975. |
|  | **Inspections and Permits** |
|  | Inspection & Hold Points  Initial construction hold points must be indicated here, along with the requirement for ongoing checks throughout the use of the temporary works scheme.  Client Specific Design Statements and Checking Requirements  Additional documents and sign off required by specific clients.  Clients such as Network Rail, Crossrail, London Underground, Highways England, HS2 etc will have minimum technical approval systems to follow. |
|  | **Standard Solutions** |
|  | BS 5975 permits the use of Standard Solutions. Section 9.4.1 of BS 5975 states:-  *“A “standard solution” comprises a suitable arrangement for which the basic design work has already been carried out and presented in a tabular or other easily assimilated form, and for which no further structural calculations are necessary.”*  For example, a Standard Solution may be the use of a trench box for excavation support, used in accordance with the supplier’s recommendations.  Where suppliers produce Standard Solutions to suit their products, these should be in accordance with the recommendations of BS 5975 and should be accompanied by information covering layout, loading, limitations and tolerances, together with information for safe installation and removal.  When selecting a Standard Solution, those responsible will ensure that they understand and take account of the limitations of these designs so that they are only used in appropriate circumstances. No further design or design check is required, but the Standard Solution will be clearly illustrated in sketches and described in the Method Statement. The use of the Standard Solution will be recorded in the Temporary Works Register, and appropriate Permits used to release Hold Points. |
|  | **DESIGN BRIEFS** |
|  | It is the responsibility of the TWC to review and issue all Design Briefs to the TWD and TWDC using Temporary Works Design Brief Form ([ENG-TF-0101e](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12499)). The TWC may enlist assistance from the site team to prepare the Design Brief and gather all necessary information.  Enquiries relating to the Design Brief must always be directed through the TWC.  Each Design Brief will have a unique number referenced back to the TW Register.  *Information required for each Design Brief will differ depending on the nature of the temporary works scheme. In general, minimum information required includes:*   * *Specific unusual loading conditions - e.g. stockpiles /heavy plant hard standings next to cofferdams.* * *Specific ‘required by’ date allowing a realistic design period (agreed with TWD).* * *Relevant permanent works drawings (note that the designer may be able to obtain these directly e.g. from Business Collaborator or similar).* * *Buildability notes or sketches by site.* * *Preferred or available materials.* * *A plan showing site topography (services, levels, existing buildings, cabins, etc).* * *Appropriate site investigation with quantitative data e.g. borehole logs with soil descriptions; locations and ground levels; ground water regime; lab test results; interpretive report etc.* * *Supplier plant loading information with dimensions, weights and imposed loadings.*   ***Note*** *that an incomplete Design Brief may delay preparation of the scheme, and an inaccurate brief will normally result in an inappropriate design.*  *Particular attention should be given to Design Briefs issued to specialist proprietary equipment suppliers and scaffolding companies, as they only accept responsibility for the ability of their components to resist the applied loads. Usually, interface design elements such as foundations, effects on the permanent works, large timber form make ups, timber wedges and packs, providing stability of ‘top restrained’ falsework are not covered within their design, which normally results in other designers completing additional supporting design work.* |
|  | **DESIGN & RISK ASSESSMENTS** |
|  | **Design** |
|  | It is the responsibility of the TWD to provide a safe design in accordance with the supplied temporary works Design Brief and the CDM Regulations.  All temporary works designs must be issued to the TWC with:   * A design working drawing, to allow for construction of the scheme and checking thereafter. * A design certificate (this usually forms part of the design check certificate). See Temporary Works Design & Check Certificate ([ENG-SF-0101c](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12501)) * Evidence that a Design Risk Assessment (DRA) has been undertaken, in accordance with CDM 2015, highlighting the risk mitigation used throughout the design process and how residual risk items are communicated to the site team and other designers. *For all internal temporary works designs, the internal TWD would undertake a DRA in accordance with the process below, and issue the DRA to the TWC for their information. If the design is externally provided then the TWC is to review their external DRA method and recommend the use of the Balfour Beatty DRA method if missing or of sub-standard quality.* |
|  | **Design Risk Assessment** |
|  | *For internal BB designs, design risks arising from hazards associated with operations involving temporary works are considered and assessed during the development of the relevant Temporary Works designs using a ‘five-by-five’ matrix, in line with the Balfour Beatty Group policy for Risk Management.*  All external designers must demonstrate how they assess hazards for design risks during the design stage. If they are reluctant to demonstrate a system then the BB design risk assessment process is to be adopted by the designer.  *The BB design risk assessment process is as follows:*  *Hazards considered during the design process are termed ‘Design Criteria’. The resulting Risks are assessed, reflecting* ***their likelihood to occur and the severity of the consequence in the event that they do occur.***  ***Likelihood*** *of occurrence of the Hazard is assessed using the following guidelines:*   * ***5 Almost Certain*** *Greater than 90% chance of occurring* * ***4 Probable*** *Greater than even chance of occurring* * ***3 Possible*** *Greater than 10% chance of occurring* * ***2 Remote***  *Greater than 1% chance of occurring* * ***1 Improbable*** *So unlikely, it can be assumed not to occur*   ***Severity*** *of the consequence of the occurrence of the Hazard is assessed within the following categories:*   * ***Structural Integrity (of existing structures).*** *Where the Temporary Works supports, or is supported by, existing structures.* * ***Safety.*** *Where the Temporary Works could be involved with events causing injury to personnel and the public.* * ***Programme.*** *Where the Temporary Works could be involved with events leading to delay of the Permanent Works construction*   *Within each category, Severity is assessed in five levels, from 5 (most severe) to 1 (least severe).*  *Some Hazards may require assessment of severity in more than one of the categories, in which case each assessment will be considered independently.*  *Risks are graded using the ‘five-by-five’ matrix to derive Risk Index values and guidelines are given concerning the acceptability (or otherwise) of the level of risk. Values must be recorded using both numerical value and colour of the cell within the matrix.*  *If the risk level is unacceptable, measures must be taken to reduce it.*  *Each measure considered is identified and the modified Severity and Likelihood of the Hazard reviewed. This process is repeated until either the Risk Index value (after the mitigating measure has been incorporated) is acceptable, or the designer concludes that the Risk is best dealt with by others.*  *Where the Risk is not reduced to an acceptable level by the design process, details of the Risk together with suitable control measures will be passed on as ‘Residual Risks’.*  *For Risks assessed, after mitigation, to be Risk Index ‘orange’, contingency measures must be identified together with controls which would assist in determining when these measures are to be employed.*  *The process is recorded on a Temporary Works Design Risk Assessment form which is provided to the TWC together with the checked drawings giving full details of the Temporary Works design. See form* ([ENG-RA-0101a](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12503)). |

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|  | ***Temporary Works Risk ‘Five by Five’ Matrix***   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | ***Severity*** | ***S1*** | ***S2*** | ***S3*** | ***S4*** | ***S5*** | | ***Structural Integrity (st)*** | *No Loading* | *Acceptable Loading* | *Structural Distress* | *Structural Failure* | *Structural Collapse* | | ***Safety (s)*** | *No Injury* | *Minor Injury* | *Major Injury* | *Fatality or Multiple Injury* | *Multiple Fatality* | | ***Programme (p)*** | *No Delay* | *Hours Delay* | *Days Delay* | *Weeks Delay* | *Months Delay* | |  |  |  |  |  |  | | ***Likelihood*** | ***L1*** | ***L2*** | ***L3*** | ***L4*** | ***L5*** | |  | *Improbable* | *Remote* | *Possible* | *Probable* | *Almost Certain* | | *Probability of Occurrence* | *0 - 1%* | *1 – 10%* | *10- 50%* | *50 – 90%* | *90 – 100%* | |
|  | **Risk Assessment Matrix**   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  | ***L1*** | ***L2*** | ***L3*** | ***L4*** | ***L5*** | | ***S5*** | ***5*** | ***10*** | ***15*** | ***20*** | ***25*** | | ***S4*** | ***4*** | ***8*** | ***12*** | ***16*** | ***20*** | | ***S3*** | ***3*** | ***6*** | ***9*** | ***12*** | ***15*** | | ***S2*** | ***2*** | ***4*** | ***6*** | ***8*** | ***10*** | | ***S1*** | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | |
|  | **Risk Descriptions**   |  |  | | --- | --- | | ***Risk Index*** | ***Definition*** | | *(Red)* | *The risk is unacceptable. The level of risk must be reduced by alternative design.* | | *(Orange)* | *The risk is on the borderline of acceptability. Design alternatives to be assessed or risk passed-on with guidance on control/monitoring arrangements together with contingency measures.* | | *(Yellow)* | *The risk may be acceptable. Design alternatives need be assessed only if this can be done without detriment to other design aspects.* | | *(Green)* | *The risk is acceptable. Design alternatives need not be assessed.* | |
|  | **Notation for Further Action (if applicable)**   |  |  | | --- | --- | | ***Symbol*** | ***Description*** | | ***D*** | *Information to be included on drawing.* | | ***S*** | *Information to be included in specification.* | | ***H*** | *Information to be included in the Health and Safety Plan.* | | ***F*** | *Maintenance and Demolition information to be included in the Health and Safety File.* | | ***Des*** | *Action by another Designer.* | | ***C*** | *Action by the Client.* | |
|  | **Design Check** |
|  | It is the responsibility of the TWDC to carry out a review of the temporary works design scheme in accordance with the Management Class assigned.  In detail:   * **Management Class 0 -** This could be the TWC; if suitable design experience (competency to undertake design) can be demonstrated. * **Management Class 1 -** A member of the design team who has not been involved in preparation or in aiding the preparation of the design. * **Management Class 2** **-** An individual not involved in the design and not consulted by the designer. * **Management Class 3** **-** A member of a separate design organisation, which might be an external consultant, who can be regarded as fully independent of the original design group. * **Management Class 4 -** A member of a separate design organisation, which might be an external consultant, who can be regarded as fully independent of the original design group. This will be subject to an independent Peer Review.   *The design check ensures that the design is specific for its purpose, buildable, complete with specification, method and setting out data, conveys residual risk information, and also complies with the Design Brief.*  *The original designer’s calculations will not normally be referred to except to determine relevant assumptions or specific codes used or to resolve any disagreement on matters of loads/stresses etc.*  If the check is a completely independent check to Management Classes 3 & 4, the TWDC will communicate through the TWC, and not directly with the TWD, to close out any comments or amendments to the design.  On successful completion of the check, the TWDC will issue a design check certificate. See Temporary Works Design & Check Certificate ([ENG-SF-0101c](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13985)) |

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|  | **Power T&D Specific Items**  National grid projects must have the design verified by a qualified TP141 engineer. *This typically includes all Management Class 2 and above designs.*  Design verification and assurance, in accordance with National Grid’s UKBP/TP188, shall be applied to all Management Class 3 TW as well as sealing end protection scaffolds & temporary scaffold guards for power line crossings. *Additionally, Management Class 2 TW will be categorised as either high or low risk, in accordance with TP184, Cl 7.2.*  *All scaffolding must comply with the scaffolding specification* [*DES-RM-5965a-PTD*](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13461)*.*  *All Design must comply with ENATS 43-119.* |
|  | **Gas and Water Specific Items**  To further support the work carried out within the TW Procedure a G&W Temporary Works Guidance Document has been produced[ENG-RM-0101c-GW](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-9171). This Guidance document requires to be read on conjunction with TW procedure |
|  | **Balfour Beatty Rail**  Where Temporary Works are installed on Rail based projects the risk to the operational railway must be taken into account. The TWC will be required to liaise with the relevant railway authority and agree if approval for the works is required. The TWC will take into account the available access for inspection when specifying the Temporary Works via the Design Brief.  For temporary works on London Underground / TfL Infrastructure a Temporary Works Concept Design Statement must be prepared and accepted by the relevant head of profession or delegated authority.  Temporary Works on Network Rail will be reviewed by the TWC and Network Rail Designated Project Engineer (DPE) to determine if Network Rail approval is required.  Where Network Rail approval is required Network Rail forms F002 and F003 as per NR Business Process NR/L2/CIV/003 must be completed using the Temporary Works option and submitted to the Network Rail Designated Project Engineer for approval. The F003 form will act as the Design Check Certificate.  Temporary Works Designers and TWCs are to be appointed as Contractors Responsible Engineer (CRE) as per Network Rail standard NR/L2/INI/02009.  Typically the CEMs take on the role of DI as agreed with the ORR |
|  | **HIGH RISK ACTIVITIES** |
|  | **Demolition Work** |
|  | All demolition work shall follow the BB Demolition procedure ([HSF-PR-0022](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-1113)).  For high risk demolition the TWC is to ensure that both the HSEN, and Engineering (Temporary Works), TWD functions are to review the Risk Assessment and the Work Package Plan to identify key structural stage hold points and temporary structural support.  Demolition Works Pre-start Planning Checklist ([HSF-SF-0022b](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-1124)) and safe system of works checklist forms ([HSES-TF-0011d](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-7852)). to be followed and signed by the Engineering (Temporary Works) functions where necessary. |
|  | **Ground Support Methods** |
|  | * *“Dig and Push”*   *The ground support term which defines installation of ground sheeting systems progressively during excavation normally whilst installing propping support.*  *The method is normally selected where good ground conditions exist and where risk assessments dictate ground movements can be controlled appropriately.*   * *“Pre-driven”*   *The ground support term which defines pre-installation of ground sheeting systems before excavation commences.*  *The method is normally adopted where control of ground movement is important.*  *The pre-driven sheeting system has to be designed for both driving conditions and excavation stages.* |
|  | **Dewatering** |
|  | Appropriate dewatering methods must be engineered to allow for any excavations to be in the dry.  Dewatering systems must be designed so that there are no detrimental ground settlement effects on surrounding assets, structures and ground generally. *It is normal that complex dewatering systems are designed, supplied and installed by external companies.* |
|  | **OHL Work** |
|  | For all Fall Protection Scaffolding, the clearance between conductor and scaffold should be assessed on site, if the ‘cold’ sag of a conductor is approaching the ‘live zone’ or ‘vicinity zone’, some experience and guidance should be sought on this from a line designer. Power Line Fall Protection Scaffolds shall comply with the requirements of Energy Networks Association – ENA-S-43119 issue 2. |
|  | **Excavations** |
|  | *Excavations pose a high risk to projects.*  All excavations are temporary structures and therefore need designing, checking and construction using this temporary works process.  *There are statutory requirements under the Health and Safety at Work Act for regular monitoring and inspection of excavations, which is also managed through the HSF process. Further guidance is available within document (*[HSF-PR-0016](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-8608))*.* |
|  | **Rebar Stability** |
|  | All reinforcement structures should be treated as Temporary Works.  Reinforcement cages for walls, columns, slabs and other slender elements are engineered temporary structures, where safe stability is ensured through the Temporary Works process. Traditionally, safe stability has been ensured by reliance on experience, custom and practice using competent steel fixers and competent supervisory staff. However a number of recent industry reinforcement incidents has resulted in the requirement for more site guidance and the need for increased technical controls. In particular, lessons learnt from the AWPR project can be found in the Reinforcement Detailing and Installation – Good Practice Guide on the [360 Temporary Works Community of Practice Page](https://home360.balfourbeatty.com/kc/EngTech/TempWorks/Pages/Default.aspx).  If reinforcement cages are adequately restrained horizontally either by:- the formwork shutters, access scaffolds or, external props, then these cages do not require designing as free standing structures. However sufficient designs checks then will be needed to satisfy the structural capacity of those shutters, scaffolds and props.  If reinforcement cages are not restrained horizontally by external elements then the cage has to be designed to support itself and wind loads etc by internal stiffening, normally additional reinforcement to the permanent works reinforcement.  The TWC is responsible, with advice from the TWD and others, to list all rebar elements onto the Temporary Works Schedule and to decide on the Management Class. To aid this process the TWC should follow the flowchart shown in Guidance Note C0063-BBMP-00-XX-GN-W-008 “Stability of reinforcement cages”, to understand how custom and practice checks can raise or lower the management class recommended.  Note that additional design and checks will be needed for lifting of pre-assembled rebar cages (Class 2)  More guidance can be obtained from the Site Guidance Note and other documents listed in [360 Temporary Works Community of Practice page](https://home360.balfourbeatty.com/kc/EngTech/TempWorks/Pages/Default.aspx). |
|  | **DESIGN CHANGE** |
|  | The TWC must manage all design change. If design changes are required after the checked design has been issued, it must be identified and communicated to the TWD using the Design Change form ([ENG-SF-0101c](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13985)).or with a newly issued Design Brief Form.  The TWD must review and amend the design in accordance with the changes required. The revised design must be checked by the TWDC, and a new Temporary Works Design & Check Certificate ([ENG-SF-0101c](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-13985)) issued.  The amended design must be approved by the TWD and the TWDC.  The TWC must ensure that all variations to the original design have been incorporated and agreed by all parties, before release of any hold points.  The Design Change Forms should be used for Classes 1, 2, 3 and 4.  It is also recommended to be used for Class 0, where necessary to suit the project, at the discretion of the TWC. |
|  | **INSPECTION & PERMITS** |
|  | The TWC, with input from the TWD via the design details, may specify mandatory inspections at hold points throughout the construction of a temporary works scheme:  *Hold points should be seen as cut-off points to inspect the works, after which access to rectify work would be very difficult, such as; falsework foundations after grid erection, or varying levels of cofferdam support frames. Generally hold points take place:*   * *Prior to loading the works, e.g. placing concrete onto falsework.* * *Prior to a change in loadings, e.g. prior to pre-stressing operations or excavating below a level.* * *Prior to striking or removing the temporary works.* * *After any accidental damage occurs, which might cause instability.*   These inspections are recorded and signed by the person who carried out the inspection. In all cases any of the TWC, ATWC, or TWS will sign off the Permit to Proceed when the work is satisfactory, see Temporary Works Permit to Proceed ([ENG-TF-0101g](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-12502)).  The permits are issued with a ‘load by’ time and date, i.e. the works will require re-inspection if a delay occurs in loading, or unloading them.  Note that the TWC certifies that ‘The works are in accordance with the listed drawings /documents’. The TWC must use discretion and if in any doubt consult the TWD on items built but not in accordance with the design.  Signed off inspection forms are auditable records and must be kept securely on site.  *The TWC should monitor the ongoing works regularly, so that potential problems are foreseen at an early stage.*  *The following points should be noted when carrying out inspections:*   * *Inspections should be carried out in a systematic fashion.* * *Ensure safe access.* * *Ensure correct documentation, e.g. use latest drawings.* * *Ensure correct materials have been used and no damage or undue corrosion is apparent.* * *Confirm all members present with correct sizes and spacing.* * *Check connections between these members.* * *Check tolerances where specified.* * *Understand the principal load paths and check that these are continuous at each interface.* * *Check on the bracing provisions in all planes (vertical, lateral horizontal).*   *Inspection should be recorded using standard inspection checklists where possible or similar bespoke checklists developed and used. See form* [ENG-TF-0101f](https://home360.balfourbeatty.com/ghoreferencecentre/Group%20BMS/_layouts/DocIdRedir.aspx?ID=2KHUWT73P6SE-1572-4783)  *The TWC should, where appropriate, obtain specialist assistance in checking particular works e.g. complex scaffolding.* |
|  | **ARCHIVING** |
|  | This section expands on the retention periods in the Outputs section at the start of this document.   * All retention periods are to be measured from financial completion of a project, or from the termination of employment for appointment records. * Where items have the option of 6 or 12 years retention period the following must be applied:   + 6 years if: the temporary works item has been removed from the project as part of delivering the permanent works (i.e. scaffolding).   + 12 years if: the temporary works item has been left in place (i.e. sheet piles or tower crane bases). |