

Guidance Document

G1350

Guidance for the Provision of Civil Engineering Assurance

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MAYOR OF LONDON

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This document must not form part of Contractual terms and conditions between London Underground and Suppliers.

Neither London Underground nor Suppliers are bound to provide any of the items or services or follow any processes described in this document unless they are also required to provide them explicitly by other, contractually binding documents.

The information within this document must not be used by London Underground or Suppliers to raise or moderate expectations of delivery by Suppliers or London Underground over and above Contractual requirements.

1 Purpose

- 1.1 The purpose of this document is to provide guidance for the management and delivery of Assurance in relation to the Civil Engineering assets by the following:
- Description of key Assurance requirements and activities.
 - Explanation of why they are necessary.
 - Provision of practical advice to help deliver robust and meaningful assurance.
 - 'Signpost' the documents that are relevant and where they can be found.
 - Provides advice on the application of risk based assessment to appropriately allocate surveillance resources.

2 Scope

- 2.1 This Guidance applies to the Assurance of Civil Engineering Assets owned by London Underground (LU) i.e.
- Bridges and Structures (including Station structures),
 - Earth Structures,
 - Deep Tube Tunnels and Shafts
 - Pumps and Drainage
- 2.2 The references within this document to the LU process for the management and delivery of Assurance in relation to the Civil Engineering assets. It should be noted that other companies within TfL e.g. Tube Lines follow their own equivalent approved processes.

3 Guidance

3.1 Engineering Governance

- 3.1.1 LU has responsibility as the Safety Certificate holder under The Railways and Other Guided Transport Systems (Safety) Regulations (ROGS) in its role as Train Operator for passenger trains and as Infrastructure Manager (for the whole LU network including assets maintained and renewed by Tube Lines).
- 3.1.2 The Head of Engineering, Capital Programmes Directorate has been appointed as the LU Independent Competent Person (ICP) under ROGS and has a direct reporting line to the Director of Safety for this responsibility. This is discharged through the relevant Profession Heads of asset disciplines who are independent of delivery functions and who maintain sufficient levels of asset domain and systems engineering competence to allow LU to fulfil its statutory obligations for safety verification.
- 3.1.3 The Head of Engineering is supported by the following Profession Heads for the Civil Engineering discipline:
- Profession Head - Civil Engineering
 - Profession Head – Bridges and Structures
 - Profession Head – Deep Tube Tunnels and Shafts
 - Profession Head – Earth Structures
 - Profession Head – Pumps and Drainage
- 3.1.4 The Profession Head establishes standards in relation to their respective asset area and seeks Assurance that these assets are designed, constructed, installed and maintained in accordance with those standards. The Profession Head establishes verification and surveillance plans on a risk basis for their respective asset areas. The Profession Head provide Assurance to the Head of Engineering that these plans

have been completed and that any non-compliance or safety issues have been addressed or an appropriate action plan is in place to address the issue. Where necessary, the Head of Engineering escalates non-compliance or safety issues to the LU Director of Safety.

- 3.1.5 The LU Manager's Handbook H-018 Managing Engineering describes the requirements for sufficient independence in respect of Assurance and audit activities. Staff engaged in Assurance and audit processes should be sufficiently outside of the management chain responsible for an activity for objectivity to be achieved and demonstrated.
- 3.1.6 A matrix of Accredited Discipline Engineers including Civil Engineers is published on the LU Intranet ([Engineering Accreditation Matrix](#)) and owned by the relevant Profession Head as a formal record of delegated authority for Project Management Framework (PMF) Product approvals and also non-PMF deliverable approvals e.g., ACR certificates, standards, concessions. The need for accreditation only relates to final approval of the product, not the preparation and checking. The level of delegated accreditation authority given to an engineer is based on the individual's technical skills, domain knowledge and experience in the relevant field of application following a formal competency assessment by the relevant Profession Head. Formal accreditation procedures are in place, owned and managed by the relevant Profession Head. The Work Instruction W0165 Accreditation of Accountable Persons in Engineering can be accessed via the company management system library on the Intranet.
- 3.1.7 Where observation by the Profession Head or an Accredited Civil Engineer indicates based on the level and nature of risk that additional intervention or intrusion measures are required, one, or a combination of the following, is initiated depending on risk criticality:
- detailed documentation checks
 - physical asset checks
 - increased direct and indirect verification and focused monitoring/management of highly critical aspects
 - the issue of a "Please Assure me (PAM) letter"
 - the issue of an Engineering Regulatory Notice (ERN)
 - withdrawal of an asset from full service
 - non-release of works/assets for use.

3.2 Assurance

- 3.2.1 The purpose of Assurance is essentially to confirm that products/services/works meet requirements. Assurance is defined as the extent that defined requirements have been complied with and that controlled processes have been followed in achieving the deliverables. The level of Assurance required shall be commensurate with the level of risk and complexity in the delivery of the products/services. LU manages Assurance through the Cat 1 Standard S1538 Assurance. Handbook H-0018 Managing Engineering provides instructions and guidance for the delivery of engineering products and services including Assurance. .
- 3.2.2 Independent oversight of Asset Performance (APD) and Capital Programmes (CPD) Directorate project activities is undertaken by the Profession Heads through risk based surveillance. This surveillance is linked to the Civil Engineering Verification Activity Plan (VAP) which is updated by the Profession Head Civil Engineering on an annual basis- ref section 3.10

3.3 Civil Engineering Standards

- 3.3.1 At the end of the 1980's LU decided to document contemporary engineering knowledge, judgement, custom and good practice across all engineering functions in the form of engineering standards. The aim was to capture valuable information, to promote consistency and efficiency, and to facilitate work by external Suppliers. Issue of the civil engineering suite of standards commenced in 1992 and it has been subject to continuing strengthening and improvement.
- 3.3.2 Civil Engineering standards are mandatory documents which set out minimum requirements. There are three types of LU Standards
- **Category 1 Standards:** these apply to LU and all Suppliers including Tube Lines and PFI contracts.
 - **Category 2 Standards:** these were originally developed as part of the PPP contract and were owned by the Infracore (Tube Lines and Metronet). Almost all of the Cat 2 Civil Engineering standards have been removed following the assimilation of Metronet back into LU. However Tube Lines still have their own set of these standards.
 - **Category 5 Standards:** these apply only to LU and are mostly company safety, performance or business related Standards. There are no Civil Engineering specific Cat 5 standards
 - **Specifications:** these define products or services to be delivered for LU e.g. specify the workmanship and materials for civil and structural works in project or maintenance work contracts.
 - **Guidance Documents:** these provide guidance on the adoption of preferred good practices.
- 3.3.3 Standards are fundamental to the Safety Certification and Safety Authorisation for LU under ROGS. All works must be carried out in accordance with LU Standards or where it is required to deviate from standards for whatever reason a concession must be obtained (see section 3.4). When applied properly, the use of standards saves the time, and hence the costs, of specifiers and designers, delivers civil engineering assets giving consistent established proven performance, and facilitates cost effective technical solutions to engineering problems. It is emphasised that the Project Engineer/Discipline Engineer /Designer must ensure that any designs or works are in accordance with LU Standards. Any potential deviation from standard must be covered by a concession.
- 3.3.4 The Civil Engineering Profession Heads have a surveillance programme which includes checks on compliance with standards. Where surveillance identifies a deviation from standards not addressed by a concession, a Corrective Action Request (CAR) or a Please Assure me/ERN will be raised.
- 3.3.5 All standards, specifications and guidance documents are available through the LU Intranet Management System Library. Note that only the standards accessed via the Management System Library are "controlled". Standards on CD-ROM's more than four weeks old and all hard copy prints of standards are uncontrolled and should be regarded as potentially superseded.



3.3.6 The relevant Profession Head can provide advice on interpretation of a civil engineering standard. If a change in standard or the development of a new one is proposed this should be raised with the relevant Profession Head in the first instance. If the proposal is supported the Profession Head will refer the item to the Directors Risk and Assurance Change Control Team (DRACCT) as required under its published terms of reference which allows:

- Raising queries about interpretation of a standard
- Proposing an amendment to standard
- Drafting a new standard or redrafting an existing one.

3.4 Concessions

3.4.1 A concession is a formal method of approval, for proposed deviations from and variations to a standard. Concessions are necessary to:

- Prevent unsafe or otherwise unacceptable designs being adopted
- Allow standards to be challenged where circumstances justify it
- Document the deviations from standards
- Provide Assurance that standards are properly managed in accordance with LU Safety Certification under ROGS.

3.4.2 If a Project Engineer/Discipline Engineer /Designer or Asset Manager considers that a deviation from a Standard will benefit the business in terms of improved or cost effective construction or maintenance, the potential concession applicant must consider the following:

- A concession will not be granted unless it is supported by the relevant Civil Engineering Profession Head.
- For a concession to a design standard, it is essential to plan concession applications as part of the design process. The notice to make an application should be identified clearly in the associated works Conceptual Design Statement.
- Until a concession application is granted, the applicant should generally proceed with design, construction or maintenance on the assumption that the concession will be rejected. To do otherwise risks abortive work and unplanned consequences.

3.5 Engineering Regulatory Notices

3.5.1 Engineering standard 1-003 Engineering Regulatory Notices defines the requirements for the structure, format, content, issue, control and withdrawal of Engineering Regulatory Notices (ERNs) and the management arrangements for any other related local systems which may be required. An ERN provides a means of immediate intervention, which cannot be achieved by other management processes and procedures in order to deal with an unsafe, or potentially unsafe, condition.

3.5.2 An ERN is created in response to situations where immediate intervention is necessary. It would normally be considered to control significantly increased safety, operational or environmental risk for one or more of the following purposes:-

- Enforcing a requirement in an existing standard controlling safety;
- Enforcing a matter perceived to constitute an emerging safety issue;
- Dealing with a non-compliance with a requirement of an existing standard;

- Providing an interim control (which subsequently may be developed into a new standard or incorporated into an existing standard);
- Producing a desired outcome which has not emerged due to a failure of a management system, or other cause;
- Dealing with working practices, technical information or other matters involving a person or organisation (including consultants) employed by LU.

Each notice is issued under a formal document control system and is mandatory. The names of all those who need to receive the notice are identified and listed before the notice is signed. Nominated recipients are responsible for ensuring that the notices are also circulated to individuals reporting to them who need to be informed and similarly to relevant contractors and Suppliers serving their unit.

3.5.3 Notices are classified into one of three categories:

- **Prohibition Notice (PN)** - to stop the use of assets or working practices where there is a risk of serious personal injury, or significant safety risk;
- **Safety Instruction (SI)** - to require additional controls to be put in place in response to unsatisfactory asset performance, or condition or a working practice that would likely result in an unsafe situation which, if not addressed, would lead to a Prohibition Notice;
- **Safety Alert (SA)** - to advise on safety implications that may result in an unsafe situation.

3.6 Please Assure Me Memo (PAM)

3.6.1 Occasionally it is necessary for the Profession Head or an Accredited Civil Engineer to issue a formal memo requesting Assurance; this is in the form of a Please Assure Me memo (PAM). This instrument is designed to elicit action or information to resolve or clarify an outstanding issue or concern. A PAM standard pro-forma is available from the Civil Engineering Team Administrator.

Failure by the recipient of a PAM to respond satisfactorily or in a timely manner may result in the issue of an Engineering Regulatory Notice.

3.7 LU Products Register

3.7.1 LU maintains a Products Register ([LU Products Register](#)). Products on that register are deemed approved for use on the LU system. Should a Supplier or contractor wish to use a product not on the register then approval from the relevant LU Profession Head should be sought and granted before it is incorporated in the works. The product should then be submitted for formal approval and entry on to the Products Register as soon as practicable thereafter

3.7.2 The purpose of the Products Register is to:

- provide an accessible catalogue of products which are accepted as suitable for purpose for use on the LU network
- promote innovation and shared learning across LU and Suppliers
- reduce / eliminate duplication of Assurance approvals
- provide a consistent approvals workflow and records retention
- obtain consent to test / trial products
- support LU Standard 1-011 Registration of Products

3.7.3 The Products Register is applicable to:

- London Underground and its Suppliers

- Any asset group
- Any Product type, including:
- Items, parts/components
- Assemblies of parts
- Proprietary materials & products
- Custom made materials & products

3.7.4 The details and status of registered products do change over time. To view the current details or to print product registration certificates visit the online register at: www.lu-apr.co.uk. New users may also apply at this site to access the products register.

3.8 Programme or Project Execution Plans

- 3.8.1 The purpose of the Project Execution Plan (PEP) from the LU Project Management Framework (PMF) is to act as the central reference document for managing all aspects of the execution of the programme or project – including programme or project management; engineering management including Assurance ; construction management; health, safety and environmental management; procurement; maintenance readiness; operational readiness; stakeholders etc. ([Programme or Project Execution Plan PMF Product Description](#))
- 3.8.2 The size, scale, and complexity of the Programme or Project Execution Plan (PEP) should reflect the size, scale, complexity and risk of the programme or project. For smaller or less complex projects it may be entirely appropriate for the execution of the project to be largely or entirely described in the PEP and without producing many other separate documents. This is unlikely to be suitable for larger or more complex projects where including all plans in the PEP will result in a document that is unwieldy and difficult to review.
- 3.8.3 The arrangements for how the project will comply with its duty holder responsibilities under CDM Regulations should be described in the PEP, including the appointment of the Designer duty holder.
- 3.8.4 The Profession Head or an Accredited Civil Engineer is responsible for endorsing the PEP as the designated technical authority for the relevant engineering discipline. The Project/Programme Manager is responsible for approving the PEP to confirm that this deliverable meets the requirements of the relevant [PMF Product Description](#) and that all consultation comments have been addressed to the satisfaction of consultees

3.9 Design Management Plans

- 3.9.1 For more complex programmes or projects involving multiple assets or disciplines, a Design Management Plan (DMP) may be required. For simpler projects this may be covered in the Project Execution Plan (PEP). The DMP describes how the programme or project manages and controls the design process to ensure the development and production of compliant, cost-effective, co-ordinated and approved designs. The DMP also specifies the processes through which risks will be identified, assessed and managed ([Design Management Plan PMF Product Description](#))
- 3.9.2 The Profession Head or an Accredited Civil Engineer is responsible for approving the DMP the designated technical authority and confirming that approval from the other affected discipline technical authorities has been completed where relevant. The Project/Programme Manager is responsible for accepting the DMP as the person accountable for its delivery.