

S1023 A5

Infrastructure protection

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1 Purpose

The purpose of this standard is to define how LU deal with Outside Parties to avoid disruption to LU operations or damage to LU assets when undertaking or proposing to undertake works on, over, under or adjacent to LU assets. Outside Parties are individuals, developers, contractors, etc. who are not procured by LU or their suppliers. The Standard also covers the requirement for LU to consider external risks.

2 Scope

2.1 This standard applies to the following activities undertaken by LU in connection with Outside Parties:

2.1.1 Dealing with the movement of Abnormal Loads notified under the Road Vehicles (Authorisation of Special Types) (General) Order 2003 Regulations and Special Order Vehicles in accordance with Section 44 of the Road Traffic Act 1988.

The effect of the movement of vehicles complying with the Road Vehicles (Construction and Use) Regulations 1986 does not fall within the scope of this standard.

This standard also covers Outside Parties applying static Abnormal Loads to LU structures (either directly or indirectly), such as crane outrigger loads. The standard does not apply to the approval of static Abnormal Loads on LU structures resulting from a LU project. In this case, the project has to satisfy themselves through the assurance process and other LU Standards that there will be no adverse impact from these loads.

2.1.2 Dealing with notices under the New Roads and Street Works Act 1991, the Traffic Management Act 2004 and other streetworks enquiries.

Due to the location of LU's railways under streets and footpaths together with the use made by Statutory Undertakers of bridges spanning the railway to carry their services there is a constant threat of damage occurring to the railway or its infrastructure when Statutory Undertakers or Local Authorities and occasionally other organisations undertake works within the streets and footpaths. This standard covers the management and monitoring of these works, particularly where there are shallow structures or other issues that would make the site a Street of Engineering Difficulty under the terms of the 1991 Act.

This standard does not absolve the LU Power team of their obligations under the New Roads and Street Works Act. LU will not process notices that may impact on Power assets, although any such notices received will be passed on the LU Power team.

This standard does not cover streetworks in connection with LU projects. The LU project team shall ensure that street works are undertaken in a manner that does not adversely impact on LU structures and will attend any meeting required by the Highway Authority.

Any structural works by a LU project to accommodate supplies or services shall be undertaken to the relevant LU Standards.

- 2.1.3 Dealing with enquiries regarding the location and nature of LU's assets from Outside Parties. These enquires are often the first recognition of a potential development or works and a record of the interest is useful in tracking progress of these Works;
- 2.1.4 Reviewing and responding to planning applications submitted to local authorities by Outside Parties for developments in the vicinity of the railway;
- 2.1.5 Patrolling the railway route to identify works that could affect LU assets and operations that have not otherwise previously been identified to LU;
- 2.1.6 Liaison with Outside Parties during the inception, design and delivery of projects to facilitate works around the railway, agree designs, methods of construction and monitoring of site activities that could affect LU assets and operations. This activity is known as dealing with Outside Parties Works.

LU has no specific powers to require Outside Parties wishing to undertake work on their own land to do so in any specified manner, unless that land has a restrictive covenant in favour of LU. LU does, however, have a clear interest in seeking to influence such works to be done in a way that takes account of all possible interfaces with the railway.

- 2.1.7 Granting Licences to Outside Parties and providing advice to other LU departments such as Legal and Property in the preparation of Development Agreements, Vesting documents, Leases and similar legal agreements.
- 2.2 This Standard also applies to the identification of LU assets vulnerable to unintentional (accidental) actions of a third party, the effects of climate change to LU assets and the control of any resulting External Risks. These activities may include mapping, risk appraisal, monitoring of assets, consultation with and provision of information to relevant LU departments and other interested parties (for example, Local Authorities, the Office of Rail Regulation and the Bridge Strike Prevention Group).
- 2.3 LU standards and assurance processes do not apply to Outside Parties working on land that is not owned by LU, unless they have contracted to do so through a Development Agreement, Lease or similar agreement. The LU Infrastructure Protection (IP) Engineer must however apply the principle of engineering standards as appropriate to protect LU assets and operations. The LU IP Engineer must act reasonably in applying standards, recognising that the Outside Party is not bound to comply unless there is a statutory requirement.
- 2.4 Where an Outside Party wishes to undertake work on LU land then LU has powers to require the works to be undertaken in a specified manner. Under these circumstances the LU IP Engineer will advise the Outside Party of the relevant LU standards appropriate to the nature and scope of the works and will require the Outside Party to comply with them.

3 Requirements

3.1 Movement of abnormal highway loads

- 3.1.1 The IP Engineer shall keep a record of all height and width restrictions and load capacities of structures over or carrying public highways. They shall regularly liaise with TfL structural assessment engineers to ensure this record is kept up to date following any assessment or re-assessment.
- 3.1.2 Assessment engineers shall provide the IP Engineer with the results of any assessment or re-assessment, including the capacity of the structure to carry Abnormal Loads if included in the scope of the assessment. If no assessment of Abnormal Load has been undertaken then the structure shall be considered as having no Abnormal Load capacity.
- 3.1.3 LU shall receive process and respond to notices under the following legislation:
- a) The Road Vehicles (Authorisation of Special Types) (General) Order 2003
 - b) Section 44 of the Road Traffic Act 1988
- 3.1.4 LU shall examine each notification to see if the Haulier's intended route passes over or under an LU structure and whether it is to pass without restriction, requires special conditions to be imposed or must be routed away from the structure.

Note: Special measures may include:

- a) temporary or permanent strengthening required to sustain the loading (which will require technical approval and certification in accordance with LU standards);
- b) alternative proposals to reduce the proposed loads in certain locations;
- c) restrictions with respect to off-loading and manoeuvring;
- d) restrictions in positioning of vehicle;
- e) supervision of passing by LU.

- 3.1.5 The IP Engineer shall also review details and respond to Outside Parties seeking approval from LU where their activities impose static Abnormal Loads (such as those imposed from operating cranes and in particular from outriggers or mobile cranes) on LU structures.
- 3.1.6 If the static Abnormal Load cannot be sustained and the Outside Party still requires the operation or activity to take place then the Outside Party will need to agree with LU the implementation of special measures.
- 3.1.7 If the Outside Party is proposing to pass an Abnormal Load over any structure or wishes to place a static Abnormal Load on a structure that does not have a suitable assessment (and there is no alternative route / location) then a special assessment will need to be undertaken. This will normally be done by the LU Assessment Team (subject to their workload) and the LU IP Engineer must liaise with them to ascertain if they can undertake this assessment.

Any inspection and assessment undertaken by an Outside Party shall be to the relevant LU Standards and be treated as Outside Party Works. The results of this Outside Party assessment shall be issued to the LU Assessment Engineer.

- 3.1.8 The IP Engineer shall maintain a register of indemnities for Hauliers and shall invite the Hauliers to renew these indemnities annually.

3.2 Street works

- 3.2.1 The LU IP Engineer shall keep an updated list of locations where there are shallow structures (i.e. Streets of Engineering Difficulty or Special Interest as defined in the New Roads and Street Works Act 1991).
- 3.2.2 LU project managers, maintenance engineers or others responsible for repairing or renewing structures shall advise the IP Engineer of any changes to structures that may revise the depth of the structure below street level. Similarly, the IP Engineer shall be advised of any new structures constructed under a street. The IP Engineer shall use this information to keep updated the list referred to in paragraph 3.2.1.
- 3.2.3 The LU Power team shall ensure that the LU IP Engineer is made aware promptly of any new or diverted cable routes that are not on LU property. This is required to ensure that the LU Power team receives any notices that could affect their assets and for LU to include these cable routes in the register of Streets of Engineering Difficulty and Streets of Interest.
- 3.2.4 The LU IP Engineer shall provide mapping to Local Authorities in order to register Streets of Engineering Difficulty or Special Interest and shall notify the Local Authority of any changes in the designation of streets.
- 3.2.5 LU shall liaise regularly with other relevant groups in their capacity as Bridge Authority and Street Manager. LU IP Engineer will attend London Joint Utilities Group, Highway Authorities, Utilities Committee and Local Authority co-ordination meetings as LU representative for impacts on LU assets.
- 3.2.6 LU shall receive, process and respond to street works notices both in their capacity as the Bridge Authority and as the Street Manager for certain roads in its possession.
- 3.2.7 Any notification received under the street works legislation by another person within LU shall be passed to the LU IP Engineer for action. Notices received by the LU Power team will be processed by them with regards to their cable assets but shall be passed to the LU IP Engineer to deal with structural interfaces.
- 3.2.8 The LU IP Engineer shall investigate whether or not the Works proposed under the Notice are adjacent to or over an LU structure or will affect an LU power cable or duct.
- 3.2.9 In cases where the Works are judged to affect LU power cables or ducts, the LU IP Engineer shall advise the LU Power team who shall then liaise directly with the Outside Party to ensure the cables or ducts are suitably protected.

- 3.2.10 If the Works are judged to affect LU interests (other than power cables or ducts) then LU IP Engineer shall notify the Outside Party. This notification may include a plan identifying the location of the LU interests. The IP Engineer shall remind the Outside Party of their legal obligations to provide information and request details of the proposed works; the site specific method of working; means of mitigating any risk of damage to LU assets; equipment to be used and intended programme of works. The IP Engineer shall endeavour to agree a safe method of working and programme with the Outside Party. If appropriate, the IP Engineer shall request trial holes to confirm depth of cover to LU structures and/or to establish vibration and noise levels caused by the works. Where there is a risk of potential damage to LU infrastructure, the IP Engineer shall visit the works to monitor progress and compliance with the agreed method of working.
- 3.2.11 Where damage is caused to LU infrastructure during street works, then upon advice or discovery of this damage, the LU IP Engineer will request that the Outside Party halt these Works pending an urgent site meeting. In the case where the damage extends through, or into, the structure then the LU IP Engineer shall take appropriate action to protect the safety of the railway and refer the matter immediately to the relevant maintenance team within LU.
- 3.2.12 The LU IP Engineer will advise the Outside Party that they are being held fully responsible for the damage. LU will instruct the nature and extent of the repairs required together with the method required for carrying them out, confirming this to the licensee in writing. LU may elect to undertake these repairs, particularly if access to the operational railway is required. In this case, the LU IP Engineer will advise the Outside Party and ensure there is a mechanism in place for recovering LU costs.
- 3.2.13 Where any repair is being undertaken by the Outside Party, the LU IP Engineer will monitor the progress of these repairs and reinstatement to ensure they have been completed to the agreed specification and to a satisfactory standard of workmanship.
- 3.2.14 Where street works activities identify new information about LU assets and their location, the LU IP Engineer shall update the records referred to in paragraph 3.2.1.

3.3 Infrastructure location enquiries

- 3.3.1 The LU IP Engineer shall keep suitable records about the location of assets that LU is responsible for.
- 3.3.2 LU project managers or others responsible for creating new assets shall advise the IP Engineer of the creation of any new structural asset or the removal of a redundant asset so that the records noted in paragraph 3.3.1 can be kept up to date. This applies to structures outside LU's demise, including Power assets.
- 3.3.3 Any location enquiry from an Outside Party received by another person within LU shall be passed to the LU IP Engineer for action. Enquiries received by the LU Power team will be processed by them with regards to cable assets but

shall be passed to the LU IP Engineer to deal with regards to LU operational interfaces.

- 3.3.4 The LU IP Engineer shall operate a system to record, manage and administer enquiries requesting information on the location of LU infrastructure. The LU IP Engineer shall, as far as reasonably practicable, ensure the Outside Party is made aware of the location of LU assets so that these assets are properly considered by the Outside Party in their design and implementation of any planned Works.
- 3.3.5 Where the location of the site falls within a zone of interest to LU, the LU IP Engineer shall notify the Outside Party in writing of this fact and supply a plan normally to a scale of 1:1250 showing the LU assets (annotated where possible to give the approximate level to ordnance datum of the top of the feature). The response to the Outside Party shall also include contact details of the relevant IP Engineer responsible for dealing with any further correspondence on the planned works and issue a copy of LU Guidance Document G0023 "Infrastructure Protection - Special Conditions for Outside Parties Working on or Near the Railway" if appropriate.
- 3.3.6 Asset information shall only be released in relation to a specific enquiry that includes the location of the site in question. The IP Engineer shall consider the security implications of issuing information to any Outside Party. Information must be issued in paper or pdf format. CAD or GIS files must not be issued when dealing with a location enquiry.
- 3.3.7 Where the proposed site is judged not to be a concern to LU then LU IP Engineer shall inform the Outside Party accordingly.
- 3.3.8 If a location enquiry is received that falls within the safeguarded area of a potential TfL project then the IP Engineer shall pass the enquiry on to the relevant safeguarding manager.
- 3.3.9 If a location enquiry is received that relates to other rail operator's assets (such as Network Rail or the Post Office Railway) then the IP Engineer shall advise the Outside Party of this interface and provide relevant contact details, if known.
- 3.3.10 If a location enquiry is received from a conveyancing solicitor, seeking more extensive information on matters of ownership or rights, then the enquiry will be forwarded to TfL Property.

3.4 Planning applications by outside parties

- 3.4.1 Any party receiving a planning application for works on or to property owned or leased by LU shall refer the planning application to TfL Property. LU only has a limited time to respond to notices so referral must be without delay.
- 3.4.2 The LU IP Engineer shall issue borough maps to all Planning Authorities where LU has a property or operational interest. This mapping will show the zone of LU interest in order that the Planning Authority can check if LU might have an interest and send to LU relevant planning applications submitted to them under the relevant planning legislation.

- 3.4.3 Regular liaison with Planning Authority officers shall be undertaken by the LU IP Engineer to ensure they have suitable processes in place for issuing planning applications to LU.
- 3.4.4 The LU IP Engineer shall operate a system to record, manage and administer the response to any planning application. Upon receipt of a planning application, the LU IP Engineer shall review the application to identify issues that could affect LU interests.
- 3.4.5 If the LU IP Engineer considers that any planning application could have such a serious effect on LU interests, or that an objection should be made to the application for other reasons, they shall ensure that a formal objection is lodged with the Planning Authority. This must be done in writing and include reasons for the objection, a plan showing LU assets and any other relevant information. The IP Engineer shall also notify the Outside Party of this objection and invite them to meet to try and resolve LU issues before the planning application is determined.
- 3.4.6 In reviewing a planning application, the LU IP Engineer will consider the following issues and how they might affect the railway or how the railway might affect the proposed works described in the planning application:
- a) noise and vibration impact on or from the railway
 - b) emissions from tunnel and ventilation shafts or emissions from the proposed development
 - c) electro-magnetic radiation impact on LU systems or the potential interference on the Outside Party systems from the railway
 - d) access for maintenance to the railway or to the development
 - e) no support to be taken from LU land or structure
 - f) light and air from LU land
 - g) whether there are any applicable special conditions
 - h) boreholes and piling work over or immediately adjacent to tunnels
 - i) changes of loading on or from LU structures
 - j) security and any required revisions to fencing
 - k) the impact on the railway from any change of use of land
 - l) obstruction of signals
 - m) landscaping and planting works
 - n) water run-off from the development
 - o) environmental pollution from construction or occupation of the development
 - p) road/rail interface risks
 - q) restrictions on vehicular access such as height or weight restrictions
 - r) other appropriate issues.

3.4.7 If there are particular issues that LU require addressing, the LU IP Engineer shall write to the planning authority requesting that they include relevant conditions in the granting of the planning application. This response shall include reasons for requesting these planning conditions and a plan showing the interface with LU. If the LU IP Engineer considers that there are no issues with the planning application then they shall notify the planning authority accordingly.

3.5 Railway route patrolling

3.5.1 The LU IP Engineer shall programme and manage regular inspections of all locations on the route of the railway to ensure that no building, civil engineering or other work is being (or is likely to be) carried out, which could adversely affect LU operations, infrastructure or other assets.

3.5.2 For tunnel sections, inspections shall be carried out at street / surface level and shall be undertaken at the following intervals:

- a) for subsurface (cut and cover) tunnels, at intervals of not more than five weeks, with an average interval of four weeks
- b) for Deep Tube Tunnels, at intervals of not more than ten weeks with an average interval of eight weeks.

3.5.3 For open sections of the railway, inspections will be carried out from a train at intervals of not more than five weeks with an average interval of four weeks.

3.5.4 Depots shall be inspected at intervals of not more than five weeks with an average interval of four weeks.

3.5.5 If during route patrolling the LU IP Inspector identifies any new work (i.e. not already being dealt with by LU as Outside Party Works) that could affect LU interests, but where there is no immediate danger to the railway, the inspector shall prepare a written report regarding the work. This report will include location details, known contact information and recommended actions. The report shall be submitted to the LU IP Engineer within five days of the works being identified.

3.5.6 Where the LU IP Inspector identifies an immediate danger to LU assets (whether or not the works are already being dealt with by LU as Outside Party Works), they shall:

- a) advise those responsible for the works to cease and make safe the works or work element that is endangering LU interests (such advice shall initially be given verbally and followed up in writing as soon as possible)
- b) if there is a danger to the operation of the railway immediately contact the Line Controller and in any case advise the LU IP Engineer as soon as possible
- c) submit an incident report or provide adequate information for the LU IP Engineer to submit an incident report under the current LU incident reporting procedures
- d) prepare and submit a report as set out in paragraph 3.5.5 above.

- 3.5.7 The LU IP Engineer shall keep records of these inspections and follow-up actions undertaken. If the inspector has identified a danger to health and safety, the LU IP Engineer shall inform the Health and Safety Executive (HSE) accordingly as soon as is practicable.

3.6 Outside Party Works

- 3.6.1 The LU IP Engineer shall consult with the Outside Party to identify risks that the activities of the Outside Party may impose on the safe operation of the railway and the integrity of LU assets. The LU IP Engineer shall liaise with the Outside Party to provide advice in how risks of their works on the railway, or risks the railway may cause to their works, might be mitigated and help deliver these works in a safe manner.
- 3.6.2 The LU IP Engineer shall check for any covenants or restrictions on the site or existing contractual obligations between the parties and advise the Outside Party accordingly. They shall ensure such restrictions are respected by the Outside Party.
- 3.6.3 If the Outside Party is proposing to construct permanent works on LU land and there is no existing Lease, Development Agreement or other contractual arrangement (or they need to vary an existing covenant or other agreement), then the LU IP Engineer shall refer the matter to TfL Property.
- 3.6.4 The Outside Party shall be issued a copy of LU Guidance Document G0023 “Infrastructure Protection - Special Conditions for Outside Parties Working on or Near the Railway” by the LU IP Engineer, who will request that the Outside Party provide relevant information as described in G0023.

3.6.5 Temporary access to and use of LU land

- 3.6.5.1 Access to LU land for the purposes of visual survey and inspection shall be at LU’s discretion. In this event the Outside Party will be required to complete an indemnity in the form given in LU Guidance Document G0024 “Infrastructure Protection - Form of Indemnity to Access LU Land” and have undertake appropriate LU training.
- 3.6.5.2** Outside Parties requiring temporary access to LU land to undertake their works (including any occupation by temporary works, crane oversail, topographical surveys or tunnel movement monitoring) shall be required to enter into a form of Licence (see LU Guidance Document G0025 “Infrastructure Protection - Licence to Carry Out Works on LU Land”) and have undertaken appropriate LU training.
- 3.6.5.3** All works on LU land and any agreed modifications to LU assets shall comply with LU standards. In the event of conflict between other LU standards and this Infrastructure Protection standard, the LU Principal Infrastructure Protection Engineer shall be responsible for resolving the conflict. He shall also be responsible for determining which elements of LU Standard S1552 “Contract QUENSH Conditions” or LU Guidance Document G0023 “Infrastructure Protection - Special Conditions for Outside Parties Working on or Near the Railway” shall apply.

3.6.5.4 The LU IP Engineer shall refer requests for permanent access over, easements under or other permanent use of LU Land to TfL Property and TfL Legal.

3.6.6 Works over, under and adjacent to operational areas

3.6.6.1 The LU IP Engineer shall, as far as is reasonably practicable, ensure that all works carried out by Outside Parties over, under or adjacent to LU land shall be undertaken so as to minimise the potential adverse effect on LU's railway services and assets.

3.6.6.2 The Outside Party and LU IP Engineer shall work together to agree the measures necessary to predict or establish the effects the works of the Outside Party have on LU assets. This may be done by survey, inspection, calculations, monitoring, track / clearance gauging or other suitable measures relevant to the particular works and level of risk to LU.

3.6.6.3 Where there is more than one concurrent Outside Party project within a single zone of influence of LU assets the LU IP Engineer shall take into account the possible cumulative effects from these projects. The LU IP Engineer shall endeavour to get all parties to work together to agree co-ordinated predictions of the combined impact on LU and install a single monitoring system. It may be appropriate to suggest that all Outside Parties appoint an independent co-ordinating engineer to address the cumulative impacts of all projects on LU. The LU IP Engineer shall also ensure any action plan adequately addresses combined impact scenarios.

3.6.6.4 Lighting on work sites adjacent to the railway shall be positioned and/or screened in order not to obstruct or distract train drivers' vision and shall not be in any way similar to any railway or road traffic signals such that drivers could be confused.

3.6.7 Plant on LU land or outside party's land (particularly cranes, other lifting appliances, and tall plant)

3.6.7.1 The LU IP Engineer must ensure that any Outside Party's Plant used or stored on LU Land has the appropriate plant approval in accordance with standard S1171 "All Plant – Acceptance, Use and Maintenance", unless it is separated from the track by an effective physical barrier (as defined in standard S1171) and this Plant within the physical barrier is not able to oversail LU Land outside the barrier.

3.6.7.2 Plant not situated on LUL Land will not require plant approval under standard S1171. However, the LU IP Engineer must satisfy themselves that the risks to the railway from the use, abuse or storage of any Outside Party Plant (whether or not covered by standard S1171) are mitigated to as low as reasonably practicable.

3.6.7.3 The planning and operation of cranes and tall plant shall be completed as prescribed in The Lifting Operations and Lifting Equipment Regulation (LOLER).

3.6.7.4 The LU IP Engineer must ensure that risks to the railway from tall plant or lifting operations adjacent to the railway boundary are mitigated to as low as reasonably practicable. Lifting operations on or over LU land must be undertaken in accordance with the relevant LU Standards with any submissions required by these standards issued to the LU IP Engineer for acceptance.

3.6.7.5 During traffic hours, cranes or other tall plant shall not be set up or permitted to lift or carry loads in such a way that any part of the plant, equipment or loads carried could enter over the LU Critical Boundary (examples of Critical Boundaries are shown in Figure 1). This applies to plant in normal operation and in any potential abnormal state, which may include mechanical failure, collapse, toppling or failure of supporting ground. It shall be acceptable for the LU IP Engineer to agree suitable mitigation measures (such as de-rating the crane capacity, slew limiters or other controls) with the Outside Party in order to satisfactorily address potential abnormal states.

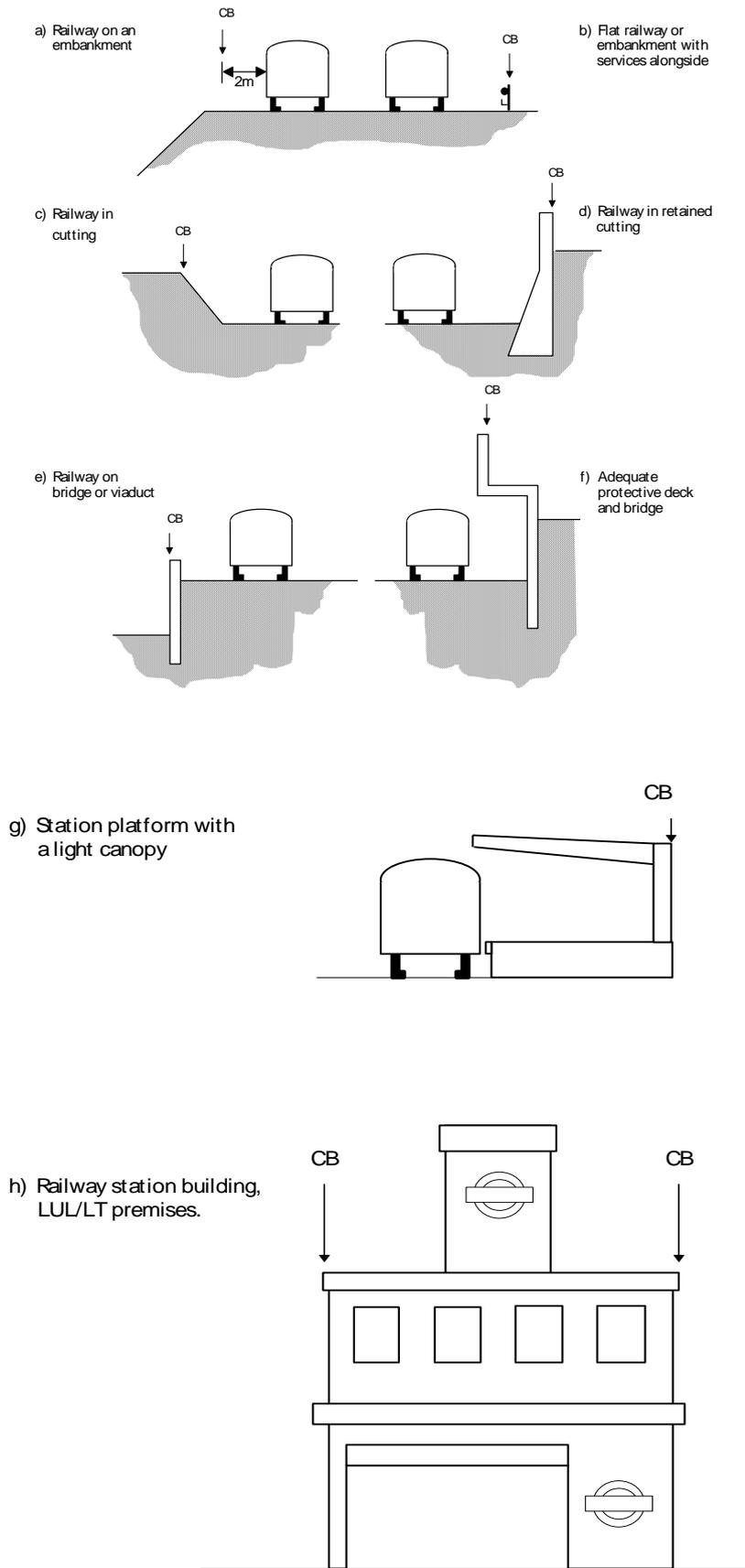


Figure 1 – Examples of the Critical Boundary (CB) (not to scale)

- 3.6.7.6 During traffic hours, plant shall be positioned such that it does not obscure any railway signals or operational signs, prevent access to any railway equipment or distract train drivers.
- 3.6.7.5 In all cases where a physical structure on the Critical Boundary is assumed to act as a restraint to mitigate a potential abnormal operation (such as a swinging load), the LU IP Engineer shall satisfy themselves that this structure can restrain the predicted load and that it is adequately protected from damage.
- 3.6.8 Scaffolding, Falsework or Other Temporary Works
- 3.6.8.1 Where a scaffold or falsework is erected by an Outside Party in a location such that in normal operation the scaffold could enter over the LU Critical Boundary (examples of which are shown in Figure 1), it shall comply with the requirements of the LU Standard S1062 “Temporary Works”. Where scaffold or other temporary works are near to LU assets but not on LU land, the LU IP Engineer shall satisfy themselves that the temporary works design and construction methodology does not pose an unacceptable risk to the railway.
- 3.6.8.2 If temporary works adjacent to the railway are to be erected or struck in more than one shift, details of safe hold points at which to stop the temporary works shall be agreed between the LU IP Engineer and Outside Party.
- 3.6.8.3 Where scaffold is adjacent to the railway, the design shall ensure that unauthorised access to or from the railway via the scaffold is prevented. Similarly, any scaffolding that may provide an unofficial exit from a station shall be secured in such a way so as to prevent passengers having the opportunity to evade payment of fares.
- 3.6.9 Permanent works by the outside party**
- 3.6.9.1 Structures (including foundations) of outside party buildings and railway buildings shall be kept independent of each other whenever practical, taking due consideration of historical structural and legal arrangements. This requirement shall also apply to non-structural Party Walls as defined in the Party Wall etc. Act 1996, where shared single skin walls shall be avoided wherever possible.
- 3.6.9.2 If a new LU structure (i.e. a structure that is to be owned and maintained by LU) is being designed by an Outside Party to support an Outside Party development then the provisions of LU Standard S1050 “Civil Engineering – Common Requirements” shall be complied with.
- 3.6.9.3 It is accepted that there may be occasions where existing Outside Party structures take support from LU infrastructure or that there are existing LU structures that were originally designed to support a commercial development. Due to site constraints, legal obligations or commercial opportunities there may be no option but for the Outside Party to share structural elements, foundations or generally take support from existing LU infrastructure. If this is the case, the Outside Party shall be required to prepare a justification report for approval as required in LU Standard S1050 “Civil Engineering – Common Requirements” It is also essential that the Outside Party demonstrates to LU in this justification report that the LU structure is capable of supporting the proposed Outside Party

structure. Once this report is approved, the LU IP Engineer must ensure that shared structures and/or rights of support are covered in adequate legal documentation. The LU IP Engineer shall liaise with TfL Property and TfL Legal and shall provide suitable advice in the preparation of this legal documentation.

- 3.6.9.4 Where an Outside Party is constructing infrastructure that will be occupied by LU (but not owned and maintained by LU) then the LU IP Engineer must ensure that the relevant LU spatial design standards are being complied with by the Outside Party, that the LU Strategy team agree any operational layout and that suitable engineering maintenance provisions and controls are in any airspace lease between LU and the Outside Party.
- 3.6.9.5 Where LU is undertaking design and construction on behalf of an Outside Party of infrastructure that will eventually be owned and maintained by the Outside Party (e.g. a station box that is part of a wider commercial development) then the provisions of Standard S1050 shall be complied with.
- 3.6.9.6 Railway structures and new Outside Party developments shall have independent drainage systems to the point where they enter the public sewer system. Similarly, electric, water, telecommunications, gas and other services shall also be independently provided to the Outside Party development. No Outside Party services shall be situated within the LU operational demise.
- 3.6.9.7 The design of Outside Party developments over and adjacent to LU land shall include all practical means to avoid locating lifts over railway operational areas. Further guidance is given in G0023 “Infrastructure Protection - Special Conditions for Outside Parties Working on or Near the Railway”.

3.6.10 Fuel storage near the railway

3.6.10.1 *The LU IP Engineer shall take advice from the LU Fire Engineering Team if an Outside Party proposes to construct new fuel storage and/or dispensing facilities within 30m of LU operational property. This shall apply to petrol, diesel, fuel oil and liquid petroleum (or other gas) installations.*

3.6.10.2 Requirements for new or replacement underground storage tanks shall be agreed by the LU Fire Engineering Team by the LU IP Engineer and communicated to the Outside Party.

3.6.10.3 Removal of redundant tanks shall not be undertake until the Outside Party has demonstrated to the LU IP Engineer that they have written authority to do so, that the tanks and associated pipework have been properly purged and that there is no risk of contaminants entering LU land. The LU IP Engineer shall satisfy themselves that the risk of damage to adjacent LU structures is suitably mitigated before agreeing to the removal of redundant tanks and equipment.

3.6.11 Service crossings

3.6.11.1 Where a service authority or other Outside Party seeks to lay pipes, cables or other services within LU land, the requirements stated in LU Guidance G0023 “Infrastructure Protection - Special Conditions for Outside Parties Working on or Near the Railway” shall be complied with.

- 3.6.11.2 If the crossing is not covered by an existing easement or other similar agreement, the LU IP Engineer shall ensure that the Outside Party enters into an easement (or similar) with LU before works commence. This easement is to be prepared by TfL Legal with TfL Property input as required and must cover requirements and restrictions on installation and long term maintenance, including any special access arrangements and/or temporary occupation of LU land.
- 3.6.11.3 Public sewers and water supply mains crossing LU land shall be adequately hydraulically and structurally designed by the Outside Party. This design shall be submitted for approval by the LU IP Engineer. The LU IP Engineer shall ensure the Outside Party reviews and addresses the risk to LU assets as a result of sewer or water supply main structural failure or system hydraulic overload. The Outside Party shall be required to demonstrate this risk is as low as reasonably practicable.
- 3.6.11.4 The LU IP Engineer shall ensure the Outside Party tests any new or altered Service Crossing (including sewers and water mains). These tests shall ensure the crossing is fit for purpose, the risks to the railway from the crossing have been minimised and where relevant, the crossing meets the agreed hydraulic design criteria. The tests will be in accordance with the Outside Party's own standards and industry best practice.

3.6.12 Alterations to LU assets

- 3.6.12.1 Unless covered by a Development Agreement or similar, alterations to LU assets shall not generally be permitted. However, if the Outside Party can demonstrate to the satisfaction of the LU IP Engineer that minor alterations are unavoidable, then alterations to LU assets may be considered. If it is deemed that a minor alteration is permissible, the Outside Party must enter into a bespoke licence for these works. The LU IP Engineer must liaise with TfL Legal to ensure this licence is agreed before works commence. Consideration must also be given as to whether there is a commercial gain to LU in permitting these alterations and the LU IP Engineer should seek advice from TfL Property accordingly.
- 3.6.12.2 All work to LU assets shall be conducted in accordance with the relevant LU Engineering Standards and assurance process. The LU IP Engineer shall be responsible for ensuring the assurance process is being adequately carried out.

3.6.13 Environmental risks

- 3.6.13.1 The LU IP Engineer shall consider whether the proposed Outside Party development has the risk of increasing the environmental impact on LU, for example increased surface water run-off from the development; changes in ground water levels, stability of earth structures or reduced tunnel ventilation.
- 3.6.13.2 Where there is a possible increased flood risk, the LU IP Engineer shall ensure that the Outside Party adequately addresses the requirements in LU Standard S1052 "Civil Engineering – Gravity Drainage Systems" regarding flood risk to the railway.

- 3.6.13.3 If the Outside party project is large enough to require an environmental impact assessment as part of the planning process, the LU IP Engineer shall review a copy of this document. They shall, as far as is reasonably practicable, ensure that where environmental risks to the railway are identified, the Outside Party takes suitable steps to mitigate these risks.
- 3.6.13.4 The LU IP Engineer shall consider whether effects of new (or removed) vegetation, noise, dust, smoke, vibration or other environmental matters arising from the Outside Parties proposals will impact on LU operations and/or infrastructure and will request mitigation measures be incorporated by the Outside Party accordingly.
- 3.6.13.5 When on site, the LU IP Inspector (or LU IP Engineer) will report any observed pollution incidents impacting on the railway (such as illegal discharges, burning waste, pollutants carried by rain water run-off) to the LU IP Engineer who will liaise with the LU HSQE team to agree any remedial measures. The LU IP Engineer will advise the Outside Party as soon as possible of the required remediation and ensure this is adequately undertaken.
- 3.6.14 Construction work in river beds adjacent to LU assets
- 3.6.14.1 Work which involves penetration of the river bed can lead to direct damage to LU tunnels by plant during its operation, dropped plant or equipment or detonation of (wartime) unexploded ordnance.
- 3.6.14.2 Examples of activities considered to carry a risk of river bed penetration are excavation, dredging, piling, boring, probing; anchors, spudding; accident; dropped piles; dropped equipment and/or materials; cranes/plant falling off barges; ship impact and vessels sinking.
- 3.6.14.3 Due to the nature of this risk there are specific procedures that are mandatory for working in a riverbed or on river walls within 50m of LU tunnels.
- 3.6.14.4 The LU IP Engineer must ensure that the following mitigation processes are applied by the Outside Party:
- a) the Outside Party must demonstrate to the satisfaction of the LU IP Engineer that that the relevant waterway authority (Port of London Authority, British Waterways or Environment Agency) has agreed a proper management regime for river operations;
 - b) a topographical survey to LU Standard 1-026 "Topographical Surveys and Mapping" is carried out to confirm the location of LU assets with respect to the proposed works;
 - c) risk assessments and method statements must include a consideration of the flooding risk to the LUL system and mitigations to ensure that this remains ALARP throughout the works. All stages of the works must be covered, including borehole investigations etc;
 - d) the risk assessments must include consideration of the consequences of accidental events from the works and the possible existence and detonation of unexploded ordnance. As a general guide it is assumed

that a device of up to 250kg could exist and could be detonated by riverbed penetration;

- e) method statements will include an investigation incorporating desk study, remote scan and physical examination of the riverbed for possible explosive devices. The work shall be carried out by ordnance detonation and clearance specialists and incorporate the acknowledged latest technology. The specialist will sign off the proposed construction area as not containing anomalies that could be unexploded devices, within the capabilities of the technology used;
- f) the design and construction method shall adequately demonstrate to the satisfaction of the LU IP Engineer that the risk of flooding to the LUL system has been minimised;
- g) appropriate supervision and controls are in place to the satisfaction of the LU IP Engineer.

3.6.14.5 Measures shall be taken to mitigate the risk and ensure that this remains ALARP. These could include full closure of the appropriate section of line(s); weekend closures; suitable monitoring and emergency plans; provision of new temporary or permanent floodgates or closure of refurbished existing gates.

3.6.14.6 Where works are to be carried out, the following shall be incorporated in the contractor's method statement, with the controls set out in Table 1.

	Location	Control
1.	All cases up to 50m from tunnel	Review flooding risk details of current situation. Carry out hydrographic surveys at appropriate intervals. Checking of all contractors setting out and operational controls by LU.
2.	0 to 3 m radially from the tunnel exterior	No riverbed penetration or risk of penetration to be allowed.
3.	3 to 15m radially from the tunnel exterior	Works with Riverbed penetration or risk of penetration to be carried out in non-traffic hours with floodgates closed Emergency preparedness plan and supervision required. Vibration monitoring in tunnels to ensure percussive accelerations do not exceed acceptable limits and therefore increasing the risk of damage to the tunnel.
4.	15 to 30m radially from the tunnel	Works with Riverbed penetration or risk of penetration to be carried out in non-traffic hours. Emergency preparedness plan and supervision required.

	Location	Control
5.	30 to 50m radially from the tunnel	Agreed modifications to emergency response plans. Monitoring of Riverbed levels, tunnel dimensions and contractors methods.
6.	Works not involving river bed penetration	Agreed modifications to emergency response plans Monitoring of contractors methods.

Table 1 – Controls to be in Place During Riverbed Works

3.6.15 Condition surveys of LU assets

3.6.15.1 Notwithstanding the requirements of the Party Wall Act, the LU IP Engineer shall suggest to the Outside Party that a condition survey of the likely affected LU assets is carried out before works commence, with a second condition survey being carried out on completion of the works. The close-out condition survey shall be undertaken within 6 months of the completion of the Outside Parties works. Consideration should also be given to undertaking condition surveys at key intermediate project milestones (such as completion of bulk excavation).

3.6.15.2 A typical report and suggested list of defects to be recorded in a condition survey is given in LU Guidance G050 “Civil Engineering – Common Requirements”.

3.6.15.3 Condition surveys shall be undertaken by the Outside Party and witnessed by a LU IP Engineer, Inspector or Party Wall Surveyor appointed by TfL Property. The schedule of condition shall contain details of all defects visible on the date of the inspection. The description of each defect and its location shall be sufficient to allow subsequent surveyors to identify any changes in the condition of the asset.

3.6.15.4 Where it is believed by either the Outside Party or LU IP Engineer that an existing defect may worsen during the course of the works, consideration shall be given to regular monitoring of the defect.

3.6.15.5 Any damage to, movement of, or deterioration in the condition of the LU asset, whether or not directly attributable to the works, shall be reported to the relevant LU department responsible for maintenance of the asset. The LU IP Engineer shall also advise TfL Risk Management. Any structural defects which pose a threat to the safety of the railway shall be immediately reported in accordance with the appropriate LU Standards.

3.6.15.6 If a defect is identified that is clearly attributable to the Outside Party then the LU IP Engineer shall advise the Outside Party and ask them to notify their insurers. The Outside Party and LU IP Engineer shall agree the scope of making good defects and who will undertake this work.

3.7 Licences and other Legal Input

- 3.7.1 If an Outside Party needs to access LU property to undertake a visual inspection, condition survey or other site visit, they are required to provide LU with a Form of Indemnity. A template Form of Indemnity is given in LU Guidance G0024.
- 3.7.2 Where an Outside Party proposes to undertake works on LU land of a temporary nature, such as tunnel monitoring, crane oversail, erecting scaffold or topographical surveys, they are required to enter into a Licence. Template Licences and associated information are covered in LU Guidance G0025.
- 3.7.3 The LU IP Engineer shall be consulted and provide relevant engineering guidance to TfL Legal and TfL Property for land disposal, new leases, easements or other property matters relating to Outside Parties. Where new legal agreements are being prepared, the LU IP Engineer shall provide engineering input and shall support TfL Legal and/or TfL Property in the negotiation of engineering matters with the Outside Party.

3.8 External risks

3.8.1 Vehicle incursion

- 3.8.1.1 The LU IP Engineer will review the railway interfaces with neighbouring areas and assess the risk of a vehicle incursion onto track. The LU IP Engineer shall advise the relevant LU departments of the assessed risk for them to instigate mitigation measures as appropriate. The LU IP Engineer will keep a record of the remaining risks to these areas after mitigation measures have been put in place.

3.8.2 Bridge strike management

- 3.8.2.1 The LU IP Engineer shall record all incidents of bridge strikes by road vehicles and their impact on LU assets and/or operations. The LU IP Engineer will liaise with Local Authorities in order to advise them of any substandard signage or to propose the instigation of possible preventative measures.

3.8.3 Neighbouring Asset Ownership and Condition

- 3.8.3.1 LU IP will maintain a register of structural assets on, over or under LU property, which are allocated LU structure numbers, but are not maintained by LU. This register shall include ownership details (where known) and shall refer to any lease or other property documentation that may regulate the owner's obligation to maintain.
- 3.8.3.2 The LU IP engineer shall keep this register regularly updated and shall ensure that (when advised by other parts of TfL) new land or property agreements made by TfL, which impose an obligation to maintain an asset referred to in 3.8.3.1, are included in the register as soon as practicable after they are entered into.
- 3.8.3.3 Where property or other legal agreements exist for assets noted in the register, the LU IP Engineer will monitor and take steps to check compliance with these

documented obligations (for example ensuring structural inspections are undertaken). If these obligations are not being met by the asset owner, the LU IP Engineer shall escalate to TfL Legal in order to take advice on what recourse may be available to LU and will arrange for other LU teams to step in if appropriate.

- 3.8.3.4 Regardless of any obligation on any other party, LU will conduct General Inspections of all assets listed in the register in accordance with S1060 and issue the ensuing report to the LU IP Engineer who will notify the responsible party of any issues or concerns identified in the report. In the event of any such asset being an immediate danger to the railway, LU Guidance G1001 “Incident Management Arrangements – Civils Assets” shall be followed.
- 3.8.3.5 The LU IP Engineer will identify areas where damage to an LU asset has become apparent due to the degradation of a neighbouring non LU asset. The LU IP Engineer will assess the risk to these LU assets and advise the relevant LU departments for them to instigate mitigation measures as appropriate. The LU IP Engineer will keep a record in the register of any remediation measures requested and/or implemented.
- 3.8.4 Climate Change Impact
 - 3.8.4.1 The LU IP Engineer shall keep abreast of current climate change legislation and codes of practice and shall provide engineering expertise and advice to LU departments regarding climate change adaptation and mitigation.

4 Responsibilities

- 4.1. Where it is noted in this standard that LU has a responsibility to provide information to the Infrastructure Protection Engineer, this responsibility extends to any supplier working for LU or Transport for London as appropriate.

5 Supporting Information

5.1 Safety Considerations

- 5.1.1 Outside Party activities covered by this standard generate risks to LU assets and services. The proximity of the railway also creates risks for the Outside Parties. This standard has been developed from experience of working with Outside Parties and should be followed to mitigate these risks.

5.2 Environmental Considerations

- 5.2.1 This standard includes requirements for considering environmental impacts of proposed and actual works by Outside Parties.

5.3 Customer Considerations

- 5.3.1 For this standard, Outside Parties are customers and the controls in this standard are there to ensure consistent approach and appropriate levels of intervention by LU. This standard of approach and intervention will also mitigate delays and disruption to customers travelling on the LU system.

6 References

6.1 References

References in the text are made to latest editions unless specific editions are cited.

Note: References in this standard to particular EC Directives and Regulations, Acts of Parliament, Statutory Instruments or Common Law are made only if the subject demands them. Users of engineering standards are bound by all the relevant requirements of the law, regardless of whether or not there is any reference to them in the standard. The lists below are provided to assist users of this standard and are not necessarily specifically referred to in the standard.

6.1.1 Statutory documents

Document no.	Title or URL
	Access to Neighbouring Land Act 1992
	The Construction (Health, Safety & Welfare) Regulations 1966
	Road Vehicles (Construction and Use) Regulations 1986
	The Road Vehicles (Construction and Use) (Amendment) Regulations 1995
	Road Vehicles (Authorisation of Special Types) (General) Order 2003
	Road Traffic Act 1988
	New Roads and Street Works Act 1991
	Health and Safety at Work etc. Act 1974
	Management of Health and Safety at Work Regulations 1992
	Party Wall etc. Act 1996
	The Building Regulations 1991
	The Construction (Design and Management) Regulations 2015
	The Electromagnetic Compatibility Regulations 1992
	The Fire Precautions (Sub-surface Railway Stations) (England) Regulations 2009
	The Lifting Operations and Lifting Equipment Regulations 1998
	The Petroleum (Regulation) Acts 1928 and 1936 (Repeals and Modifications) Regulations 1974
	The Railway (Safety Case) Regulations 2000
	The Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS) (as amended) 2011
	The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995
	Town and Country Planning (General Permitted Development) Order 1995
	The Town and Country Planning (Environmental Impact Assessment) Regulations 2011
	Town and Country Planning Act 2009

	Transport and Works Act 1992
	Environmental Protection Act 1990
	Climate Change Act 2008

6.1.2 Industry codes of practice

Document no.	Title or URL
	Building Surveys and Inspections of Commercial and Industrial Property, Royal Institute of Chartered Surveyors
PM 42	Excavators used as cranes
GS 39	Training of crane drivers and slingers
HS(R) 23	Guide to The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
	Jacking Concrete Pipes, Concrete Pipe Association and Pipe Jacking Association joint publication
BD37/88	Loads for highway bridges, Department of Transport
CIRIA Special Publication 131	Crane Stability on Site
GS15	General Access Scaffolds
GS31	Safe Use of Ladders, Step Ladders and Trestles
GS42	Tower Scaffolds
HS(G)41	Petrol Filling Stations: Construction and Operation
CIRIA C650	Environmental Good Practice on Site
PPG6	Pollution Prevention Guidelines. Environment Agency

6.1.3 LU company documents

Document no.	Title or URL
1-026	Topographical Surveys and Mapping
S1050	Civil Engineering – Common Requirements
S1052	Civil Engineering – Gravity Drainage Systems
S1062	Temporary Works
S1171	All Plant – Acceptance Use and Maintenance
S1552	Contract QUENSH Conditions
S1622	Glossary of Terms and Abbreviations
G0023	Infrastructure Protection - Special Conditions for Outside Parties Working on or Near the Railway
G0024	Infrastructure Protection - Form of Indemnity to Access LU Land
G0025	Infrastructure Protection - Licence to Carry Out Works on LU Land
G050	Civil Engineering – Common Requirements
G1001	Incident Management Arrangements – Civils Assets

6.2 Abbreviations

The following abbreviations are created

- a) within London Underground’s Glossary of Terms (S1622)
- b) from published sources that are clearly identified.

Abbreviation	Definition	Source
ALARP	As Low As Reasonably Practicable	a
CAD	Computer Aided Design	a
CB	Critical boundary	a
CDM	Construction (Design and Management) Regulations	a
GIS	Geographical Information System	a
HSE	Health and Safety Executive	a
HSQE	Health, Safety, Quality & Environmental	
LOLER	The Lifting Operations and Lifting Equipment Regulations 1998	a
LU	London Underground	a
QUENSH	Contract QUENSH Conditions	a
TfL	Transport for London	a

6.3 Definitions

The following topic specific definitions are created:

- a) within London Underground's Glossary of Terms (S1622);
- b) from published sources that are clearly identified.

Term	Definition	Source
Abnormal Load	A vehicle or its load being moved by road where its length, height, width or weight are greater than those of a 'Construction and Use' vehicle as defined by current legislation.	a
Bridge Authority	The authority in which a bridge is vested.	a
Contractor	A company, firm, person, supplier, consultant, sub contractor, agent or stockist, providing goods, materials or services. Contractors may be company employees.	a
Critical Boundary	The edge of the zone or area of land in respect of which LU has concern regarding the operation of tall Plant and equipment, including cranes. Each case is to be considered on its merits to determine the appropriate Critical Boundary for the site in relation to the nature of the LU asset to be protected and the type of equipment and operations planned.	a
Haulier	The person or organisation that owns, or is responsible for, the proposed vehicular Abnormal Load.	a
Hazard	Any source of potential damage, harm or adverse effects on something or someone under certain conditions.	a
Incident	An undesired event that results in, or under slightly different circumstances could have resulted in, harm to people, damage to property, damage to the environment, or loss of process.	a
Licensee	The person or party in whose favour a licence is issued as required by this procedure.	a
Local Authority	The statutory body that has political and administrative powers to control a particular city or region.	a
LU land	Any land, including airspace, subsoil, property, building or structure in the freehold or leasehold ownership or in the occupation of LU excluding land owned by LU or TfL leased to an Outside Party.	a

LU IP Engineer	Generic term for an Infrastructure Protection Engineer (employed by LU or commissioned by LU and acknowledged as competent to perform the role by the Professional Head of Infrastructure Protection) being responsible for undertaking the relevant requirements of this standard. This includes, but is not limited to, Abnormal Loads Engineer, Streetworks Engineer, Vesting Engineer, Outside Parties Engineer, Planning Engineer and External Risks Engineer.	a
Outside Party	An individual, organisation or company whose assets or business could be affected by LU works or who is proposing works on his own land (including land leased from LU) or as part of his business which may have an affect on LU assets or services. This includes other railway operators such as Network Rail as well as other TfL modes including Dockland Light Railway or Surface Transport. The definition does not include those working as suppliers (or within the supply chain of a supplier) to London Underground.	a
Planning Authority	A statutory body responsible for managing and granting planning consent, normally but not always the Local Authority.	
Plant	Equipment or machinery used for construction or maintenance purposes or for transportation of materials.	a
Property	Buildings, including both operational and disused stations (including platforms, station tunnels, pedestrian tunnels, disused tunnels, shafts for lifts and escalators, stairs, steps and ramps, all within the curtilage), depots, workshops and offices (including non-operational offices), the fittings and equipment, and associated drainage, landscaping, gardens, grounds, enclosures and fences.	a
Railway	The premises and land in use for railway and associated purposes, including station approach roads and forecourts, where these are owned or occupied by London Transport or its subsidiaries.	A
Railway buildings	A building occupied or utilised by LU for purposes directly connected with the operation of the railway.	a
Risk	A measure of the combination (usually the product) of the probability or frequency of occurrence of a defined Hazard and the magnitude of the consequences of the occurrence.	a

Schedule of Condition	An agreed record of the condition of, and visible defects in, the relevant parts of an asset or assets owned by the affected party.	a
Service Authority	Any party external to LU, providing public or private gas, water, communications, power or other services. This shall include bodies more generally known as statutory undertakers.	a
Service crossing	A sewer, water or gas pipe or power, electrical or communication cable or any other similar conduit or service which is the property or responsibility of others and which crosses under the railway and includes any extensions thereof under LU land.	a
Statutory Undertakers	Companies that provide services such as gas, water, electricity, telephones, sewerage.	a
Street Authority	The highway authority in respect of streets maintainable at public expense (normally a Local Authority).	a
Street Manager	As the Street Authority in respect of streets not maintainable at public expense (may still be a Local Authority).	a
Works	The execution, demolition and permanent works to be constructed, installed, completed, inspected, maintained and monitored in accordance with the approved design, including all temporary, associated, ancillary and incidental works which are in the vicinity of or, in the opinion of the LU Engineer, could affect the safety of the railway.	a

7 Person accountable for this document

Name	Job title
Malcolm Payne	Principal Infrastructure Protection Engineer

8 Document history

Issue no	Date	Changes	Author
A1	October 2007	Authorised for use. Previous authorisation is valid	
A2	July 2008	Minor amendments to clause 3.6.10	
A3	May 2012	Re-structuring of standard, update to current working practices and references, addition of External Risks and expansion of Service Crossing section as per DRACCT No. 799	Richard Davies
A4	November 2015	As per DRACCT 04105; shared structures provisions clarified and requirements relating to plant approval added (see also DRACCT 02865).	Richard Davies
A5	January 2017	As per DRACCT 05010; requirements to create and maintain a register of third party assets added to Section 3.8; reference to Power PFI amended.	Richard Davies