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Integrated Management System

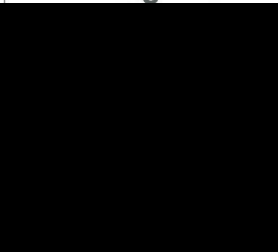
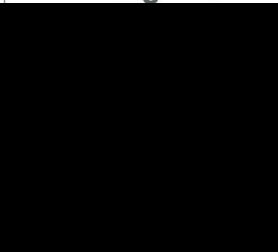
Infrastructure Protection Regime - Guidance for Third Parties

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Issue	Date	Comments
7	07/08/2015	Major revision after comprehensive review.

	Name	Signature	Date
Custodian	Infrastructure Engineering Manager		17 / 08 / 15
Approver	Head of Engineering		1 / 9 / 2015



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Definitions and Acronyms

“ALARP”	means As Low As Reasonably Practicable
“Asset Protection Agreement (APA)”	means Asset Protection Agreement
“BCP”	means Business Critical Process
“CDM”	means the <i>Construction (Design and Management) Regulations 2015</i> .
“Conceptual Design Statement”	means a document that signifies that a professionally competent person or body, employed by the Third Party, is satisfied that the scheme chosen to bring about the change to the infrastructure will meet the requirements of the remit. It also confirms that appropriate standards and / or design criteria are proposed for the detailed design / checking process.
“Concessionaire (CGLR)”	means City Greenwich Lewisham Rail Link Plc.
“Condition Survey Report”	means a detailed report prepared by a suitably qualified professional, following a survey, containing photographs and text descriptions to record the condition of the assets.
“Crane Management Plan”	means a lifting management plan, including risk assessments and method statements, for siting, erection, jacking up and dismantling and removal of cranes. It will also detail the manner in which the crane(s) will be operated and will include but not be limited to the crane lifting arrangements, operational procedures (including any radio communications), details of loads to be lifted, radius, slew restrictions and collapse radius.
“CRT”	means Control Room Technician
“Development Questionnaire”	means the questionnaire provided to Third Parties upon notification, requiring the Third Party to complete as much detail as possible regarding the nature of the development and its likely effects on the Railway.
“DLR”	means the Docklands Light Railway.



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“DLRL”	means Docklands Light Railway Limited and generally includes reference to its Stakeholders.
“DLRL Land”	means any land, including subsoil, property, building, structure (or the airspace above these) in the freehold, leasehold or occupation of DLRL for the purposes of the railway undertaking.
“DLRL Stakeholders”	means DLRL and, where appropriate, the Franchisee and Concessionaire.
“DLRL Tunnel Protection Zone”	means the land and subsurface space taken up by the tunnel and the surrounding land and / or subsoil within 3 metres of the face of the tunnel (Refer to Appendix A for further information).
“Electromagnetic Compatibility”	means the ability of apparatus to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbance to other apparatus in that environment.
“Engineering Hours”	means the period at night and after cessation of normal rail operations when the electrical current to the conductor rail may be turned off to enable the safe conduct of planned or emergency engineering maintenance activities. (Refer to Appendix B for further information)
“Engineering Review Panel (ERP)”	means the Engineering Review Panel which comprises DLRL, Franchisee, Concessionaire, designer, affected stakeholder and Third Party representatives for the purpose of reviewing monitoring trigger breaches during the carrying out of Third Party Activity. The ERP is to assess methodology, causes of movement, remedial actions, trend analysis, forecasts and implications.
“Franchisee”	Keolis Amey Docklands Ltd.

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“Infrastructure Manager”	means under ROGS, the person or organisation who in relation to infrastructure other than a station, is responsible for developing and maintaining that infrastructure or, in relation to a station, the person who is responsible for managing and operating that station, except that it shall not include any person solely on the basis that they carry out the construction of that infrastructure or station or its maintenance, repair or alteration; and manages and uses that infrastructure or station, or permits it to be used, for the operation of a vehicle.
“Letter of Responsibility”	means the formal letter issued by DLRL for proposals perceived to be very low risk to the Railway.
“Letter of No Objection”	means a letter from DLRL indicating that it does not object to the Third Party Activity proposed; such a letter does not in any way absolve the Third Party of its responsibilities under legislation to ensure risks are maintained to ALARP.
“Lewisham Extension”	means the infrastructure assets of the Lewisham Extension, from Mudchute to Lewisham, which are owned and maintained under a concession agreement between DLRL and CGLR .
“Operational Partners”	means the Franchisee operating trains on behalf of DLRL and in relation to any land south of DLR Crossharbour Station also means CGLR (and its successors in title or assigns).
“Possession”	means a period of time when and a defined area on the Railway where the electrical current to the conductor rail is turned off (causing a cessation of normal rail operations) to enable the safe conduct of planned engineering or maintenance activities that would not be possible or practicable to conduct within engineering hours.
“PICOW”	means Person In Charge Of Works.



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<p>“Protection Zone (or Zone of Influence)”</p>	<p>means land and air space within a distance of usually and no less than 5 metres from the outer face of all DLRL permanent structures and fence lines (and where on viaduct the land and air space beneath) on or in which works or associated maintenance activities could affect the safe, efficient and economic operation of the DLR.</p> <p>The extent of the zone and consequent mitigation measures and requirements are dependent upon the Third Party Activities concerned (Refer to Appendix A for further information).</p>
<p>“Railway”</p>	<p>means the Docklands Light Railway (including all extensions and all retail units and other retained estates let or to be let by DLRL) and any other extension, enhancement or modification on the date of its completion.</p>
<p>“Railway Operations Corridor”</p>	<p>means the space within which the DLR operates and includes land, subsurface ground, airspace, structures, maintenance space, stations, depots, track work and equipment and is generally DLRL Land that is located within the first adequate fence or structure barring access to the running tracks.</p>
<p>“ROGS”</p>	<p>means the <i>Railways and Other Guided Transport Systems (Safety) Regulations 2006</i>.</p>
<p>“ROGS Duty Holders”</p>	<p>refers to Docklands Light Railway Limited as the Infrastructure Manager (excluding stations) and the Franchisee as Transport Undertaking and Infrastructure Manager (Stations).</p>
<p>“Technical Submission”</p>	<p>As defined in section 3.1.</p>
<p>“TfL”</p>	<p>means Transport for London.</p>
<p>“Third Party” or “Third Parties”</p>	<p>means any Third Party Principal, or their agents and contractors, concerned with any prospective Third Party Activity.</p>
<p>“Third Party Activity”</p>	<p>means any Third Party planning application, construction activity or operation on the DLRL Estate and / or land adjoining the Railway that in DLRL’s assessment constitutes a potential risk to the safe, efficient, economic and reliable operation of the Railway.</p>



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“Third Party Interface Manager (TPIM)”	means the appointment made by DLRL to manage Third Party submissions. For Third Party Activities potentially impacting the Lewisham Extension, the Third Party Interface Manager will normally be CGLR.
“Working on the Railway Manual (WoRM)”	means the document of that name with standard number SOP PC 1.01 which may be updated from time to time.

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1. INTRODUCTION

1.1. Application

- 1.1.1. The requirements and information contained within this document are applicable to Third Parties, including interest holders, contractors and developers proposing to conduct works that have the potential to impact the integrity of Docklands Light Railway (DLR) infrastructure or have a negative effect on the railway operations or which introduce risk or impose costs on the DLR.
- 1.1.2. This document is predominantly aimed at those who intend as owner, developer or contractor to undertake works in close proximity to the Railway. It should be noted that an additional set of railway standards, including the WoRM, applies to those undertaking works on the Railway.
- 1.1.3. Whilst this document is written with consideration of developers and contractors where temporary or permanent works are to be carried out which require planning consents, it recognises that works may not need planning permission (for example permitted development) or comprise maintenance and renewal, or even require an alternative consent for example transport movements such as abnormal loads. This document aims to provide a degree of guidance for all.

1.2. Purpose

- 1.2.1. The purpose of this document is to establish an infrastructure protection regime which:-
 - Is consistent with contemporary good practice within the rail and construction industries;
 - If complied with, seeks to ensure the safe, efficient and economic operation of the Railway and the safety of the travelling public, the general public and all those working on, or near the Railway to a level of risk that is As Low As Reasonably Practicable (ALARP);
 - Assists Third Parties to identify the risks and costs associated with working on or near the railway, to identify ways of mitigating those risks and avoid disruption to the operation of the Railway;
 - Ensures Third Parties are adequately insured;
 - Communicates the legitimate requirements of DLRL as Infrastructure Manager, owner and / or lessor of the Railway, and those of DLRL's Operational Partners to Third Parties;

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- Encourages adequate consultation at an early stage and for Third Parties to make adequate provision in their programmes for engagement.

*Note: These requirements are established through 'shall' statements such as "the Third Party **shall**" and compliance with the provisions of such statements are considered to be mandatory by DLRL.*

- Communicates guidance to Third Parties which is consistent with contemporary good practice and is relevant to safety and activities having the potential to impact the Railway.

Note: The more significant examples of which are identifiable by a statement commencing with the phrase "the Third Party is advised".

- 1.2.2. Compliance with these requirements and the information contained within this document will help satisfy the obligations of the Duty Holders under ROGS.

1.3. Background

- 1.3.1. DLRL is the Infrastructure Manager of the DLR under the *Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS)* and is responsible for appointing the contractors who operate and maintain DLR. It is the responsibility of ROGS Duty Holders and DLRL's Operational Partners to carry out their duties under ROGS and manage the operation and maintenance contracts to ensure the safe operation of the railway, the safety of the travelling public, the general public and all those working on the railway to a risk level that is ALARP. The infrastructure protection measures provided within this document have been established against that fundamental background and it is the reasonable expectation of DLRL that the Third Party proposing to undertake works having the potential to affect the safe, efficient and economic operation of the Railway, the safety of the travelling public, the general public and all those working or residing on or near the railway will fully comply with the provisions of this document.
- 1.3.2. Infrastructure protection measures deemed appropriate by DLRL will be subject to compliance inspections and monitoring to ensure that all works on or adjacent to the railway are done in a manner agreed with the TPIM and that associated risks are managed or mitigated to a level that is ALARP.
- 1.3.3. The Third Party also has responsibilities under the *Health and Safety at Work Act 1974* with which it will need to comply.

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- 1.3.4. The ROGS Duty Holders and Operational Partners have both the ability and intent to take any necessary enforcement action to protect the following:-
- The integrity of DLR infrastructure;
 - The safe, efficient and economic operation of the Railway;
 - The safety of the travelling public;
 - The safety of all those working on the Railway.
- 1.3.5. The Third Party should note that action will be taken to ensure compliance with DLRL Duty Holders' obligations under ROGS.
- 1.3.6. Where proposed works are either on DLRL Land or within the Protection Zone or close to tunnels and / or where the proposed works present significant risk to either DLRL Land, DLRL Tunnel Protection Zone or the Protection Zone the Third Party shall indemnify DLRL in relation to the conduct of such work and where specified within this document, will be required to enter into an Asset Protection Agreement (APA) with DLRL to undertake the work. It is often appropriate to agree matters in relation to collateral warranties, undertakings and insurances as part of the APA. Consistent with its responsibilities as Infrastructure Manager, DLRL require that the method of undertaking works is agreed in writing prior to works commencing, that the agreed method is strictly followed in practice and that works are carried out by suitably qualified and experienced staff and is applicable to the following:-
- Works within the Railway Operations Corridor;
 - Works on DLRL Land or within or adjacent to the Protection Zone;
 - Works which have the potential to impact the integrity of DLR infrastructure;
 - Works which may have a negative effect on the safe, efficient or economic operation of the Railway; the safety of the travelling public, the general public and / or all those working on or near the Railway.
- 1.3.7. If the Third Party is unsure whether works may have a negative effect on DLR infrastructure, the Third Party is advised to seek advice from the TPIM well in advance of the works.

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2. INTERFACE MANAGEMENT AND APPROVALS

The Third Party is advised that the term “as advised in writing” includes the use of e-mail or letter.

2.1. Pre-Planning Approval Stage

- 2.1.1. Third Parties often contact DLRL in advance as part of an initial enquiry for a works proposal close to the Railway (irrespective of planning requirements). Early dialogue is encouraged for all enquiries and we encourage all Third Parties to give visibility of the programmed works for their proposals and any subsequent variations thereof.
- 2.1.2. When seeking to conduct works in close proximity to the Railway the Third Party shall contact DLRL at developmentconsultations@dlr.tfl.gov.uk or 020 7363 9600 to initiate the process for consideration of the works prior to making the Planning Application.
- 2.1.3. The local planning authority may also consult with DLRL at a pre-planning stage and / or on submission of the application depending upon the nature of the proposal. This consultation is direct with DLRL or via TfL Borough Planning.
- 2.1.4. Where planning consents are also sought formal notice on DLRL may need to be served by the applicant where DLRL has a property interest.
- 2.1.5. On receipt of any relevant Planning Applications the TPIM will:-
 - Forward these to DLR stakeholders for review, collate any comments and provide a consolidated response to the local council or TfL as applicable.
 - Be the single point of contact with the Third Party on behalf of the DLR.
 - Seek to ensure that compliance with this *Infrastructure Protection Regime - Guidance for Third Parties* document and any relevant DLRL processes are made conditions of the Planning Approval.
- 2.1.6. Following DLRL being informed that planning permission has been granted, DLRL will advise the Third Party of any further actions required to protect the Railway.
- 2.1.7. DLRL will issue a Development Questionnaire after initial contact or when DLRL identifies or is notified of Third Party Activity in the proximity of the Railway that has the potential to impose a risk to the railway.

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- 2.1.8. Where any meetings are arranged with DLRL, the Third Party shall take all reasonable measures to send representatives to meetings with a level of authority, seniority and knowledge of the proposed works such that appropriate and achievable agreements can be made and decisions taken. Upon return of the completed Development Questionnaire, an initial review and assessment of risk is undertaken and the TPIM will provide a response to Third Party. It may be necessary to meet with the Third Party to explore the proposals. The response will indicate further action required by the Third Party and will depend on the scale or risks of the development but could include any or all of the following:-
- **Technical Submission** (see Section 3.1)
 - **Letter of Responsibility** – Where risk is perceived to be very low risk, DLRL may issue a Letter of Responsibility. This sets out DLRL's view of the information supplied by the Third Party and any required actions.
 - **Infrastructure Protection Regime - Guidance for Third Parties** – This document gives detailed information on the actions needed to be taken by the Third Party to protect the Railway, DLR passengers and DLR staff.
 - **Asset Protection Agreement** – Sets out the conditions on which DLRL agrees to work with the Third Party on the project including details of charges which are available upon request.
 - In cases which import a greater degree of risk or complication an *Infrastructure Protection Agreement* is normally required. DLR may also agree conditions in formal correspondence.
- 2.1.9. For the avoidance of doubt these steps do not replace legislative requirements such as the *Party Wall etc. Act 1996*



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3. DESIGN CONSIDERATIONS

3.1. Technical Submission

3.1.1. Prior approval of a technical submission will be required before carrying out the following works on or over DLRL Land or within or adjacent to the DLRL Protection Zone:-

- Works on any part of a site which is over or adjacent to a DLR structure.
- Demolition of existing structures or the construction of new structures within DLR airspace;
- Any works which could change the loading on DLR structures.

If deemed acceptable, a Letter of no Objection will be issued.

3.1.2. Depending on the nature of the proposed works the Technical Submission, as a minimum, is to include some or all of the following documentation:-

- A Conceptual Design Statement in a format to be advised by the TPIM;
- A topographical survey of the site which shows the relationship of the DLR infrastructure or tunnel to the ground surface features and the proposed works;
- The results of ground investigation and soil tests;
- Details of any temporary or permanent changes in loading which may affect the infrastructure or tunnel;
- A statement of the predicted effects of the works and in particular:
 - Changes in stresses
- Ground movements such as heave or settlement
- Distortion of the infrastructure or tunnel
- Proposals for the limitation of the effects identified above;
- An assessment of ground movements resulting from the proposed works signed by a suitably qualified and experienced engineer;
- Proposals for inspections and schedules of condition of DLR infrastructure or tunnels in accordance with Appendix L;
- Proposals for monitoring and reporting to the TPIM the effects of the works on DLR infrastructure and tunnels before, during and after construction in accordance with Appendix L;

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- A comprehensive risk assessment for each separate aspect of the works which could impact on DLR infrastructure, tunnels or railway operations and which has been identified and agreed following a DLRL review of the initial impact assessment.

3.1.3. The Third Party is advised to proactively consult with the TPIM when works of the type described above are planned, to ensure proper arrangements are in place to protect the Railway.

3.1.4. Prior to commencing any excavation or piling works over or adjacent to DLR infrastructure and tunnels the Third Party shall check with the TPIM and with all other appropriate authorities and obtain written confirmation of the depth and location of their infrastructure and tunnels.

3.1.5. The Third Party shall not commence such works until they have been advised in writing by a Letter of No Objection.

3.2. Comprehensive Risk Assessment

3.2.1. The Third Party shall ensure that the comprehensive risk assessment is specific to the proposed works and considers the following:-

- What could go wrong
- What can be done to minimise the likelihood of something going wrong
- What can be done to mitigate the impact of something going wrong
- How risks can be reduced to ALARP

3.2.2. The Third Party shall ensure they fully understand the impact of the proposed works upon railway operations. In this context the Third Party may seek advice from the TPIM.

3.3. Contaminated Land

3.3.1. The Third Party is advised that some parts of the DLR have been built on contaminated land and in some cases membranes or other remedial measures have been used.

3.3.2. The Third Party shall take into account the possibility of the impact of contaminated land on their works programme and take appropriate measures to ensure that the integrity of any existing remedial action remains uncompromised.

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3.4. Flooding and Other Environmental Considerations

- 3.4.1. Some sections of the DLR network are susceptible to the impact of flooding.
- 3.4.2. Where proposed activities could increase the likelihood of flooding on the network, DLRL will require the Third Party to ensure that flood risks are fully considered and where applicable are reduced to ALARP as follows:-
- Identify and review the following information:-
 - Existing flooding risk level
 - Existing flooding control measures
 - Water sources that could impact on the location
 - Characteristics of the location that control inward water flow
 - Potential changes to flow rates
 - Identify any proposed mitigations;
 - Identify any changes to the flooding risk profile of the DLR;
 - Confirm that the risk remains ALARP.
- 3.4.3. Where required by DLRL the Third Party shall prepare and submit for review and consideration by DLRL a *Flooding Risk Assessment*.
- 3.4.4. Where incorporating a sustainable design solution into their project, the Third Party shall demonstrate to DLRL that these measures will not adversely impact on DLRL's sustainable drainage or climate change obligations.
- 3.4.5. The Third Party shall consider any other environmental risks to the DLR arising from their proposed development (including those brought about by climate change) and design to minimise these risks.

3.5. Building over the Railway

- 3.5.1. Where the Third party proposes to build over the Railway, detailed consultation at an early stage is advised to establish the Third Party's property rights to do so.
- 3.5.2. Prior to considering an agreement to permit construction of any building over the Railway, DLRL will need to receive from the Third Party and give consideration to a detailed impact assessment, incorporating risk assessments, design

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proposals, construction method statement and details of future maintenance arrangements for the Railway.

- 3.5.3. Appropriate details would need to be incorporated into any easements, leases and licences.

3.6. Lift Shafts over DLR Operational Areas

- 3.6.1. The Third party shall wherever possible avoid locating lifts directly over or immediately adjacent to railway tracks, platforms, stations and other public or staff areas.

- 3.6.2. Where this is not possible, the Third Party will be required to demonstrate to the satisfaction of DLRL that there is no viable alternative to situating lifts directly above operational areas.

- 3.6.3. Where DLRL accepts the principle of a lift shaft over operational areas, the TPIM will require additional safeguards in the design and construction of the lift, as detailed in Appendix H.

3.7. Tree Removal, Surgery and Planting

- 3.7.1. Refer to Appendix I for requirements and advice in relation to tree removal, tree surgery and tree planting on or near DLRL land.

3.8. Piling

- 3.8.1. In order to discharge its responsibilities under ROGS it is necessary for DLRL to protect the ongoing integrity of its tunnels; particularly from the impact of piling operations.

- 3.8.2. Except as specified within this section, the Third Party is advised that DLRL:-
- Will not permit the conduct of any piling works that may intrude into its land ownership;
 - Will not permit the conduct of any piling works within the DLRL Tunnel Protection Zone;
 - Will not permit any under-ream bored piles such that under-reaming will encroach into the DLRL Tunnel Protection Zone;
 - Would strongly resist driven or percussive bored piling operations within an 'exclusion zone' of 15 metres from DLR infrastructure or tunnels unless a

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method is proposed which does not involve low frequency high amplitude vibrations and this is agreed in advance by DLRL in writing;

- Will encourage the Third Party to make every effort to design their works such that no piles need to be constructed within a zone created by a rectangle in a section formed by a 6.0m offset above the crown of the tunnel and 3.0m offset horizontally from its sides.

3.8.3. If piles are proposed to be constructed within the DLRL Tunnel Protection Zone, the Third Party will need to demonstrate to the satisfaction of DLRL the reasons why this is the case, the predicted impacts arising from such activity and the specific measures to be applied to protect the tunnel from direct or indirect damage.

3.8.4. Whenever any piling is proposed near to the railway and has the potential to impact DLR tunnels (or structures), whether or not it falls into the DLRL Tunnel Protection Zone, the Third Party is requested to prepare a Technical Submission for review and consideration by DLRL. Where such an activity is found to be acceptable this will be communicated in writing by the TPIM together with any mandatory conditions.

3.8.5. Whenever piling works are proposed in a river within 50m of any DLR tunnel; or for river walls, within 50m of any DLR tunnel, then the provisions of the preceding paragraph also apply; however DLRL will also specify mandatory procedures for tunnel closures and Engineering Hours working and these will be communicated in writing by the TPIM.

3.8.6. Notwithstanding the above, notices as required under the *Party Wall etc. Act* or other Statutory Instruments will still be required (where appropriate) and the relevant Acts will still apply.

3.9. Drainage Connections

3.9.1. All DLRL owned drainage systems have been provided for the use of the Railway and are not available to the Third Party.

3.9.2. The Third Party is advised to design new drainage systems to connect directly to the public sewerage system or other suitable outfall independently of DLRL owned systems.

3.10. Permanent Boundary Fences

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3.10.1. Fencing required to prevent access to the track is to be undertaken in accordance with the requirements specified within *DLR Engineering Standard ES-501 Civil, Structural, Architectural and Landscaping Works*.

3.11. Noise Considerations

3.11.1. DLRL has a *Noise and Vibration Policy* for properties adjacent to the Railway and the Third Party needs to ensure that nothing done affects compliance with that Policy and that they incorporate measures in their design to ensure their works comply with the *DLR Engineering Standard ES-101 Noise and Vibration Policy*.

3.12. Telecommunications

3.12.1. New developments can disrupt or weaken the DLR's protected network radio signals and station to train Wi-Fi used for the operation of the railway.

3.12.2. The Third Party shall undertake a radio frequency survey prior to, at agreed intervals and post works to establish that the radio signal strength and station / train Wi-Fi is unaffected by the development. Such surveys would be used to develop and agree interim and permanent solutions to mitigate the effect of Third Party Activities on radio signal where network operational radio signal and / or Wi-Fi is disrupted or weakened.

3.12.3. The Third Party shall ensure that any radio telecommunications used on site either during or after construction do not interfere with the DLR network radio signals.

4. CONSTRUCTION**4.1. Safety**

4.1.1. The potential risk of accident caused by work done in an unsafe manner is obvious. Small objects on or near the track can cause injury or delays whilst work within areas used by the travelling public can cause obstruction, frustrations or injury.

4.1.2. Against this background, the Third Party shall not undertake works on DLRL Land without the express written permission of the TPIM.

4.1.3. If such works are determined to be acceptable to DLRL or are deemed to be required by DLRL, the TPIM will include in the permission the following information:-

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- The times when the work can be undertaken;
- Details of any additional safety measures required.

4.1.4. The Third Party shall observe and mandate the use on site of all safety related requirements and equipment as specified by legislation and / or within this document and any additional measures which have been included in the permission.

4.1.5. These requirements do not relieve the Third Party from their responsibilities under statute, particularly the *Health & Safety at Work Etc Act 1974* and the *Construction (Design and Management) Regulations*.

4.1.6. Where the work proposed qualifies as construction work under The *Construction (Design and Management) Regulations*, the Third Party shall submit to the TPIM site specific CDM related information, including contact details of the key CDM duty holders in the timeframes specified within the APA.

4.2. Fire and Emergency Preparedness Plan

4.2.1. Where required, the Third Party shall prepare and submit for review and consideration by DLRL, a *Fire and Emergency Preparedness Plan* (including emergency contacts) giving an appropriate range of mitigations should the proposed works have an unplanned impact on DLR infrastructure or operations.

4.2.2. The Third Party shall ensure that adequate and robust fire and emergency procedures, complying with the requirements of the *Regulatory Reform Fire Safety Order*, are in place for activities on DLRL Land or within or adjacent to the Protection Zone and that all personnel on site know their duties and responsibilities under the plan.

4.2.3. Refer to Appendix D for further fire precaution guidelines.

4.3. Method Statements

4.3.1. The Third party shall submit to the TPIM a detailed method statement for each separate aspect of the works, linked to the associated comprehensive risk assessment required by Section 3 in a suitable timeframe before the work is due to commence.

4.3.2. The method statement is to be in the form of a clear written statement that includes the following general information:-

- The nature of the works, including details of all below ground works;

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- Identification of proposed work that could affect DLRL Land or DLR train operations;
- Identification how the proposed works are to be conducted including how the Railway, train operations and the proposed works are to be separated and protected;
- The materials and plant to be used in the proposed works;
- The proposed works programme;
- The names and contact phone numbers of all key personnel and a 24 hour emergency contact number;
- Details of an agreed monitoring regime.

4.3.3. It is acceptable on method statements to use generic terms such as 'using hand held power tools', 'using a wheeled excavator', 'using a 25 tonne crane with 25m operating radius' where the proposed work is to be done using general mechanical tools or machinery.

4.3.4. Where the proposed work involves an unusual degree of novelty, complexity or risk DLRL will require a more robust method statement to be prepared.

Where applicable, the TPIM will communicate such requirements in writing and these may include the following:-

- General arrangement drawings of the works;
- Calculations and other details. This may include soil analysis and movement predictions;
- Copies of lifting plans.

4.3.5. Where satisfied with the content of method statements and risk assessments the TPIM will advise acceptance in writing.

4.3.6. Acceptance of a method statement by DLRL does not in any way absolve the Third Party from responsibility for the safety of the proposed works; neither does such acceptance suggest that the Third Party has met its statutory requirements.

4.4. Accidents and Incidents

4.4.1. In all cases of an incident or a dangerous occurrence on DLRL Land, the Third Party shall comply with the requirements of *RIDDOR 2013* and provide copies of any notifications to the TPIM.

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4.4.2. The Third Party shall provide and maintain an Accident Book (Form BI 510 form or similar) at any work location where two or more people are employed at a work-site on DLRL Land.

4.4.3. The Third Party shall provide and maintain, for the use of all personnel, proper and sufficient First Aid facilities in accordance with *The Health and Safety (First Aid) Regulations 1981* and these facilities are to be readily available for use at all times.

4.5. Working on DLRL Land

4.5.1. The Third Party is advised that consistent with its responsibilities under the ROGS, DLRL will take such actions as are necessary to ensure the safe operation of the Railway, the safety of the travelling public, the general public and all those working on the Railway.

4.5.2. The primary means available to DLRL to discharge these responsibilities is by ensuring the complete separation of such activities from the Railway Operations Corridor by limiting the conduct of related work to Engineering Hours or dedicated Possessions.

4.5.3. Third Parties are advised not to assume that access to the Railway Operations Corridor will be granted and where it is it:-

- Can be expected to be extremely limited;
- Is likely to have associated costs;
- Will be conducted during Possessions or Engineering Hours;
- Will require compliance with DLRL's *Working on the Railway Manual* which the TPIM will make available.

4.5.4. DLRL will not generally authorise the following works to be undertaken outside of Engineering Hours or Possessions:-

- Works within 5m of the nearest rail and in certain circumstances a greater distance may be specified;
- Works where no physical barrier exists between the work and the nearest rail.

4.5.5. In those exceptional circumstances where DLRL permits works in the Railway Operations Corridor when trains are in operation the following criteria; as a minimum, will need to be met:-

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- The works are considered to be compatible with the safe operation of DLRL train services;
- An effective barrier has been erected which contains all plant and equipment, is of a height equivalent to the tallest item of plant and complies with the specification communicated in writing by the TPIM; and horizontal distances to the works are either:
 - At least 4.0 metres from the nearest rail; or
 - At stations, at least 2.0 metres from any platform edge and the work will not interfere with passengers or the safe operation of the station.

4.5.6. DLRL will only permit the use of a Possession to enable works on the following conditions (as a minimum):-

- Work is to be conducted in accordance with the relevant provisions of the *DLRL Working on the Railway Manual*;
- Subject to the relevant provisions of the charging regime having been met.

4.5.7. The Third Party is advised that a DLR representative(s) can be expected to be on site whenever work is permitted to be undertaken during Engineering Hours or a Possession and that this representative has the full authority of DLRL to give instructions as to when it is safe for the work to commence and when it must cease.

Note: A failure to observe such instructions that result in a delay to DLRL train services will result in a financial penalty being imposed by DLRL as stated in the APA.

4.5.8. In the event of work being prevented or delayed for any reason, the Third Party remains liable for the associated costs of the DLR representative(s) in attendance.

4.5.9. General requirements to be universally applied when working on DLRL Land are given in Appendix E.

4.6. Working Above the Railway

4.6.1. Working above the Railway will not be permitted except when unavoidable and then in Engineering Hours or Possessions and with suitable protection and safeguards.

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4.6.2. A detailed risk assessment, method statement and protection regime will need to be submitted and accepted in writing before any such works can proceed.

4.7. Condition Surveys

4.7.1. Before any works are undertaken by an external party on DLRL Land the Third Party may be required to carry out a survey of all parts of the Railway affected by the proposed works (including structures and land) in accordance with requirements established by DLRL. The survey is to record and where appropriate, photograph the condition of the assets and identify relevant statutory requirements applicable to the works (such as the *Party Wall etc. Act*).

4.7.2. The Third Party is advised that such a survey may also be required by DLRL before any works are undertaken by an external party within the DLRL Protection Zone and where applicable, such requirements will be conducted in accordance with the requirements established by DLRL and contained within the APA.

4.7.3. The Third Party shall engage the services of a suitably qualified surveyor who is acceptable to DLRL to conduct the survey; the surveyor will be accompanied by a DLR representative nominated by the TPIM whose role will be to confirm the findings and ensure safety during the inspection.

4.7.4. In order for DLRL to assess the qualifications and experience of the nominated Surveyor, the Third Party shall submit a copy of the nominee's curriculum vitae for consideration by the TPIM.

4.7.5. Where the surveyor is acceptable, the TPIM will advise the Third party of their acceptance and arrangements can be put in place to conduct the condition survey inspection.

4.7.6. The Third Party is to provide DLRL with a Condition Survey Report and this report will provide the reference source for any follow-up inspections to be conducted by DLRL staff upon completion of the works.

4.7.7. The Third Party shall be responsible for meeting the full costs incurred by DLRL arising from:-

- Supporting the initial survey;
- Conducting the follow-up survey;
- The work required to rectify any defects agreed to have been caused by the Third Party's works;

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- Where applicable, any additional surveys that may be required at key stages during the programme of works.

4.7.8. The Third Party are advised that notwithstanding the above, notices as required under the *Party Wall etc. Act* or other statutory instruments will still be required where appropriate.

4.8. Inspection of Works

4.8.1. The Third Party is advised that licence agreements made under these requirements give DLRL the right to conduct site visits as deemed appropriate as part of an overall compliance programme where works are being conducted on DLRL Land or within the Protection Zone; and such rights will be exercised.

4.8.2. Where applicable, the TPIM will advise the Third Party of relevant details associated with proposed inspections in a timely manner; and such communications will identify the DLR representative who will conduct the visit.

To the extent possible, the TPIM will negotiate and agree suitable arrangements with the Third Party.

4.8.3. The Third Party shall support the effective conduct of DLRL inspection activities; including the provision of free and open access at all times for this purpose.

4.8.4. During the conduct of a site inspection and where considered appropriate, a DLR representative may make observations and representations to the Third Party where the DLR representative identifies issues of concern or believes:-

- That the works represent a threat to the safety of the travelling public, the general public and all those working on the Railway (whether or not the works are being conducted in accordance with the agreed method statement);
- That the works represent a threat to the safe, efficient and economic operations of the Railway;
- That the behaviour and / or actions of any person undertaking the works is considered to be such (whether through ignorance, design or incapacity through drink, drugs, including medicines, or any other reason) as to put themselves, others, the Railway or its operation at risk;
- Has a fundamental concern that the works are not being conducted in compliance with the terms of agreements reached with DLRL or submissions accepted by DLRL or approvals granted by DLRL;

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- Considers there to be genuine risk to a DLRL asset or operation

4.8.5. Where such valid observations or representations are made, the Third Party shall initiate actions as needed to resolve the matter, even if these result in site work being stopped or the removal of identified personnel.

4.9. Hoardings and Temporary Fences

4.9.1. Hoardings are to be erected at all locations where works are to be conducted on DLRL Land; whether or not the proposed hoarding is to be erected on stations or trackside.

4.9.2. Hoarding requirements may be included within any licence issued by DLRL for the works and specified.

4.9.3. Hoardings may also be required by DLRL before any works are undertaken by a Third Party within the DLRL Protection Zone and where applicable DLRL will enforce such rights.

4.9.4. Refer to Appendix G for more detailed requirements in respect of hoardings and temporary fences.

4.10. Security of Railway Boundaries

4.10.1. As a general statement and unless otherwise authorised by DLRL, at no time is the integrity of any Railway boundary fence or other barrier to the Railway to be compromised.

4.10.2. Third parties shall obtain prior written permission from the TPIM before compromising the integrity of any Railway boundary fence or other barrier to the Railway.

4.10.3. The Third Party shall fully comply with any conditions attached to the granting of such permission including but not limited to the installation of a temporary structure at least as secure as the original.

4.10.4. The Third Party shall not store materials or plant against any Railway boundary fence; or other barrier to the Railway where such action:-

- Could cause damage; or
- Could assist or promote trespassers, thieves or vandals to gain access onto the Railway.



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4.11. Temporary Works

- 4.11.1. All temporary works on DLRL Land or within the Protection Zone will require written permission from the TPIM and acceptance of associated impact / risk assessments and method statement as detailed within these requirements before they are executed on site.
- 4.11.2. The TPIM may require drawings and calculations for temporary works before permission can be given.

4.12. Scaffolding

- 4.12.1. Scaffolding on or adjacent to the DLRL is to be erected in accordance with all National Access and Scaffolding Confederation (NASC) guidance requirements.
- 4.12.2. Where scaffolding is to be erected on DLRL Land or within the DLRL Protection Zone the methodology for erection, altering and dismantling of the scaffolding is to be reviewed and accepted by DLRL.
- 4.12.3. Third parties shall submit full details of their proposed scaffolding methodology for review and consideration by the TPIM within a reasonable timeframe, no less than 3 weeks, in advance of any intended activity.
- 4.12.4. The TPIM will provide any guidance required on the interpretation where a conflict or inconsistency is found between these requirements and those contained within the NASC guidance and / or specified standard(s).

4.13. Movement of Heavy Vehicles and Plant

- 4.13.1. The Third Party shall serve notice to DLRL (via the TPIM) as required under the *Road Vehicles (Construction and Use) Regulations* and the *Motor Vehicles (Authorisation of Special Types) General Order* when intending to transport heavy loads on the public highway through the area served by the DLR.
- 4.13.2. The Third Party is advised that access over DLR infrastructure for construction plant and heavy vehicles will be limited to such routes, times and weight restrictions as stipulated in writing by the TPIM as being in the interests of safety and for protecting DLR infrastructure and / or rail services.
- 4.13.3. The Third Party shall be responsible for ensuring that all movements of plant or heavy vehicles subject to these provisions use only the routes so approved and do so at the times stipulated.

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4.14. Crane Working

- 4.14.1. Crane operations involving the oversailing or swinging of loads across the DLR are **NOT** permitted. Further guidance on the use of cranes near the railway is given in Appendix J.
- 4.14.2. The Third Party shall obtain the prior agreement of DLRL (via the TPIM) when intending to use cranes and spreader plates in streets directly over or adjacent to the DLR infrastructure (stations, viaducts, railway tunnels, bridges etc.).

4.15. Conduct of Workforce

- 4.15.1. The Third Party is advised that DLRL has a strict non-smoking policy on the Railway and are requested to observe similar provisions when working within or adjacent to the Protection Zone.
- 4.15.2. In compliance with the *Transport and Works Act 1992* and applicable TfL and / or Franchisee's policies, the Third Party shall take all reasonable measures to prevent their workforce from being under the influence of alcohol, drugs, or other substances and / or having in their possession such items whilst being on DLRL Land.

4.16. General Housekeeping Provisions

- 4.16.1. In the interests of safety, the Third Party shall observe the general housekeeping provisions detailed in Appendix E.

4.17. Record of Information on Completion of the Works

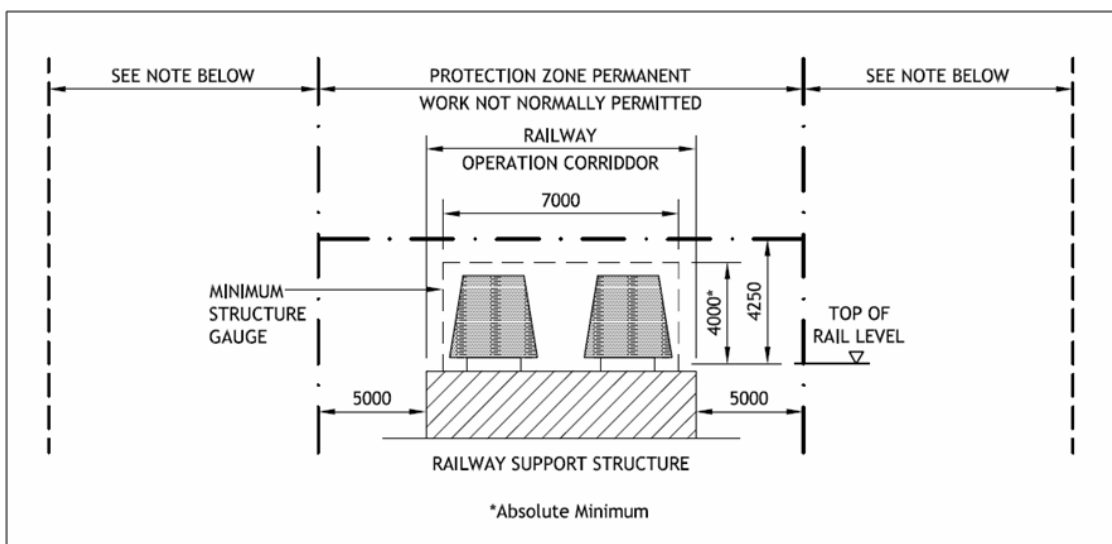
- 4.17.1. The Third Party shall prepare and provide to the TPIM copies of as constructed drawings, surveys, specifications, maintenance manuals and calculations (where relevant), to an agreed format, of all parts of the finished works that have either a direct or indirect effect on DLRL Land or infrastructure.
- 4.17.2. The Third Party is advised that DLRL will have free licence to utilise the information contained within these documents as they so wish in connection with their interests.

APPENDIX A – PROTECTION ZONE AND ZONE OF INFLUENCE

A1 Protection Zone or Zone of Influence

A1.1 The Protection Zone is generally that land and air space within a distance of 5 metres from the outer face of all DLR permanent structures and fence lines and, where on viaduct, the land and air space beneath within which works or associated maintenance activities could affect the safe and efficient operation of the DLR. The extent of the zone and consequent mitigation measures and requirements are dependent upon the activities concerned. The 5 metre zone can sometimes be increased by negotiation with the landowner and formal agreement.

A2 Railway on Viaduct, Embankment, Cutting or at Grade – Works above Ground



It should be noted that this diagram is shown for straight track. For canted track, reference should be made to DLRL's *Vehicle & Structure Gauge* drawings which are available upon request.

The vertical chain dotted lines indicate the Protection Zone within which permanent works will not be permitted except by agreement with DLRL. Provision of temporary works may be considered and require written consent from DLRL.

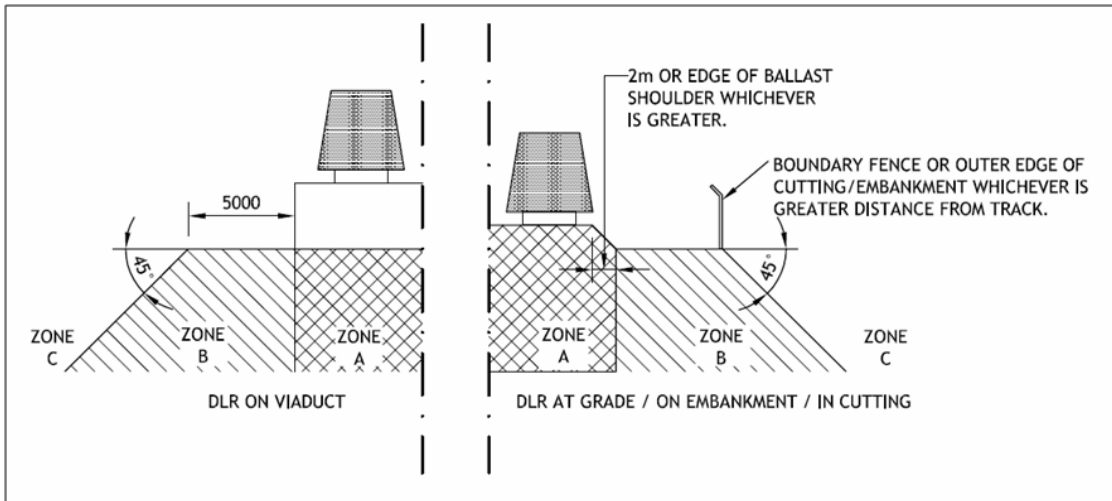
Under exceptional circumstances it may be possible for certain crane movements to be undertaken above and within the horizontal chain dotted line but this will require written consent from DLRL and will need to be done in a Possession or Engineering Hours.



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Beyond the Protection Zone developers are expected to act responsibly with regard to relevant legislation, including Health and Safety, and having full regard to the continuous, safe, efficient, economic operation of the DLR.

A3 Railway on Viaduct, Embankment, Cutting or at Grade – Works Below Ground



- | | |
|---|---|
| <p>Zone A Excavations / Foundations not permitted. If works are unavoidable then detailed proposals must be discussed with DLRL at an early stage.</p> | <p>Any proposal must be submitted in advance and must ensure that structural stability and safety is maintained at all stages of construction and use. Methods of minimising ground movements must be put in place.</p> |
| <p>Zone B Excavations / Foundations to be designed and constructed to minimise effect on the DLR. Temporary works detailed as required.</p> | <p>A monitoring regime and Condition Survey are required. Specialist geotechnical or structural advice may be sought by DLRL</p> |
| <p>Zone C Excavations / Foundations of no concern to DLRL</p> | |

The *Party Wall etc. Act 1996* protects DLR party walls and boundaries and structures generally where such structures and Third Party works fall within the scope and definitions of the Act. In such cases the Third Party will be obliged to comply with the requirements of the Act, irrespective of any consents or licences given by DLRL in respect of such works.



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APPENDIX B – ENGINEERING HOURS

Access arrangements for Third Parties working on or about the Railway during Engineering Hours and shall be undertaken in accordance with DLR's *Working on the Railway Manual (WORM)*.

B1. The following access/approval arrangements must be adhered to:

The maximum periods allowed for engineering hours are shown below:

- Sunday 01.30hrs – 05.30hrs
- Monday 00.30hrs – 04.30hrs
- Tuesday – Saturday 01.30hrs - 04.30hrs

B2. It should be noted that it may be necessary for pre-booked Engineering Hours to be altered at short notice. This is entirely at the discretion of DLRL and the financial risk remains with the Third Party.

- (i) Third Parties must seek the approval of DLRL, who will coordinate the process and provide a weekly plan of all works to be undertaken. The information must be submitted in a timely manner and include a work request form, method statement, risk assessment and the necessary drawings and contact details.
- (ii) The work request form submitted must include dates for the proposed works and include as much detail as possible. Specific mention should be made when any of the following are included (This list is for guidance only):-
 - Making adjustment to, or demolition of, all or part of any Railway structure or equipment.
 - Making connections to, or disconnecting pipes, cables or wires.
 - Using a crane or other mechanical plant or equipment on, or in the vicinity of, the Railway track or supporting structures, or where it will enter the airspace above or below the Railway.
 - Placing an approved rail trolley on the track. If the trolley is not provided by DLRL, details of the device, particularly its braking capacity and maintenance records, must be submitted for approval and the issue of a DLR licence.
 - Making an excavation close to the track or in adjacent non-Railway areas. No excavation of any kind must take place until investigation or



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surveys have been made to establish if services or cables are located in the area.

- Carrying plant or materials across the track.
- (iii) Prior to commencing work, the PICOW must check that they are satisfied that the traction power has been removed by using the tester and prover. The PICOW should then define the areas of his worksite by placing the marker boards.
- (iv) On completion of the Works, the PICOW must inform the CRT when all personnel, plant and materials are clear of the track, and then return to Poplar to sign off in the line clear log.
- (v) The same principles apply for the Lewisham Extension, although approval for works to be undertaken must be obtained from the respective Concessionaire.
- (vi) In the event of an emergency, the DLR Control Room at Beckton should be notified immediately on **020 7538 3440**.

Other methods to be used in contacting the DLR Control Room are:-

- Telephone the CRT 020 7363 9955.
- Contact the Duty Manager on 020 7363 9957 or use dmanagerscc@keolisameydlr.co.uk
- If on or near a station, use the lift or passenger alarms, or press the emergency stop button located in the passenger emergency point on the platform. It should be noted that this emergency stop button only removes the signalling supply and does not remove the traction power supply.

All staff on site must be made aware of the details above by the PICOW prior to commencing any Works.

- (vii) All operatives shall ensure that they are wearing the necessary Personal Protective Equipment (PPE) to carry out particular aspects of their works. However, it is mandatory that high-visibility clothing of an approved colour is worn and all persons who may have cause to be on or near the line wear appropriate safety footwear. Rigger boots are prohibited on the Railway.



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APPENDIX C – INDEMNITY AND INSURANCE

- C1. The Third Party is required to provide an indemnity (as set out in the APA) to DLRL to cover any damage or costs (including consequential costs) which DLRL suffers due to the actions or inactions of the Third Party in connection with the works. These include but are not limited to the following insurances:-
- Public Liability – to cover all expense, liability, loss and claims whatsoever in respect of death or injury to any person;
 - Contractors All-Risk – to cover consequential loss arising from business interruption to DLRL services; and loss of, or damage to property and any other loss, damage, cost or expense which may arise out of; or in consequence of the Third Party, its employees and agents performance or non-performance of the works or the presence or use of any material, plant and equipment.
- C2. The Third Party shall provide indemnity to the amounts specified on the APA and determined having regard to the risks to the Railway.
- C3. The Third Party shall provide satisfactory evidence of the required insurance to the nominated TPIM; and be advised of such in writing before commencing the works.
- C4. Thereafter, the Third Party shall submit evidence no later than the renewal date of such insurance falling due that the insurance has been renewed.
- C5. With respect to works on DLRL land or within the Protection Zone, if during the course of the works, they fail to produce (upon request of DLRL) satisfactory evidence that there remains in force the insurance which is required to be in effect under these requirements, the TPIM will stop the work until such time as satisfactory evidence is provided.



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APPENDIX D – FIRE PRECAUTIONS

D1. Without prejudice to their responsibilities in law or contract, the Third Party **are instructed** to observe the following guidelines:-

- (i) Do not burn waste or other material on site;
- (ii) Do not take heaters or other appliances, such as flame cutting equipment, using gas, oil or petrol onto DLRL Land without the written permission of the TPIM;
- (iii) Remove from site any authorised appliances at the end of the working shift when working on DLRL Land unless permitted by licence;
- (iv) Do not overload power sockets by exceeding their designed capacity at any time;
- (v) Do not use any form of electrical adapters at any time;
- (vi) Ensure that adequate fire extinguishers and other emergency equipment is in place throughout the area of work. These are to be removed from site at the end of each shift unless secured in a manner approved by the TPIM.



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APPENDIX E – GENERAL HOUSEKEEPING PROVISIONS

- E1. In the interests of safety, the Third Party shall observe the general housekeeping provisions below when conducting works, including basic maintenance, that have the potential to (negatively) impact DLR infrastructure or DLR train services:-
- Ensure that method statements demonstrate that sufficient thought has been given to safe working and the minimisation of risks to the Railway, its staff and passengers; as well as to those directly involved in the work;
 - Observe industry good practice throughout the conduct of the works. DLRL expects that all works will be undertaken to the standard expected of a normally competent accredited member of an appropriate trade body;
 - Unless prior permission has been granted in writing by the TPIM, all waste material and rubbish generated from the site is to be removed from DLRL Land at the end of every shift.
- E2. The Third Party is advised that no cables are permitted within any location where they can have the potential to interfere with DLR infrastructure or DLR train services; or where they can cause injury to DLRL staff or passengers. The rationale for this requirement is detailed below:-
- Live rails carry a 750V direct current which could easily be picked up by an extension lead causing severe injury or death;
 - Cables could become entangled with a passing train;
 - The current within the cable could interfere with signalling equipment and therefore with train services.



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APPENDIX F – WORKING ON DLRL LAND

- F1. General requirements to be universally applied when working on DLRL Land are:-
- It is forbidden to interfere with, cover up, obstruct, relocate or in any way reduce the effectiveness of any DLRL property or equipment, without prior written permission from the TPIM;
 - Activities such as hot working or the storage of materials on DLRL Land will require a permit from the DLRL which can be obtained through the TPIM and which may be subject to specific conditions. Applications for such permits are to be made 4 weeks before they are required and where a permit has been issued, it is to be prominently displayed in a position advised by the TPIM (or site delegate) at all times the work is in progress;
 - The workforce are required to wear orange high visibility clothing that complies with BS-EN-471;
 - Pre-existing metal and woodwork on DLRL Land may have been coated at some time with lead-based paints and the Third Party are expected to take this into account when preparing risk assessments and method statements;
 - All standing water encountered on DLRL Land is to be considered contaminated and the Third Party is expected to take all necessary precautions to protect against Leptospirosis (Weil's disease).
- F2. The Third Party shall not assume the availability of a DLRL power supply and should make provisions for the supply of their own electricity supply unless otherwise agreed by DLRL and the Third Party should be aware DLRL's requirements for electricity supply and related requirements are:
- 110V centre tapped to earth and not to exceed 55V to earth;
 - The voltage of any lighting required in tunnels is to not exceed 50V;
 - The voltage of hand held apparatus in confined or damp conditions is not to exceed 25V without the written approval of the TPIM;
 - All electrical work is to be done in a safe manner, properly insulated and installed in a neat and tidy fashion and be properly and clearly labelled;
 - That all cabling below ground is to be low smoke, zero halogen and meets the relevant industry standards and good practice;



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- That unless otherwise acceptable to the TPIM, temporary lighting is to be shaded to avoid glare that could disrupt DLR train services and / or cause discomfort to DLR passengers and staff;
 - That unless otherwise acceptable to the TPIM, temporary lighting is to be disconnected when not in use.
- F3. The Third Party shall take all appropriate precautions to protect the general public, DLR passengers and staff and their own workforce from any form of asbestos which may be encountered during the conduct of their works.
- F4. Where DLRL has knowledge that the presence of asbestos is to be expected and may affect the proposed works, the TPIM will provide relevant details in writing to the Third Party.
- F5. Where so informed, the Third Party shall include appropriate control measures into their method statements and upon completion of the works provide relevant information to the TPIM for subsequent incorporation into risk and asbestos registers.

**UNCONTROLLED WHEN PRINTED****APPENDIX G – HOARDINGS AND TEMPORARY FENCES**

The Third Party is advised that:-

- G1. They should provide all hoardings or temporary fences as are necessary to fully enclose all working and storage areas and that such measures are to be securely fixed and maintained during the works and removed immediately upon completion of the works.
- G2. They should submit the proposed location and design (including materials) of hoardings for the review, consideration and acceptance of the TPIM.
- G3. Where considered necessary, the TPIM will ensure that input is received from relevant DLRL specialist staff and incorporate such as condition(s) of acceptance.
- G4. Where the TPIM permits the use of timber hoardings, it will be subject to the condition that they are treated with a low smoke fire retardant solution.
- G5. They should ensure that the faces of all hoardings which are on display to the public or to which they have access to are to be:-
- Clear of any protruding nails, screws or other fixings;
 - Painted in accordance with specific instructions to be issued by the TPIM;
 - Maintained in a clean and tidy condition;
 - Maintained free from graffiti, unauthorised drawings, signs, posters placards and advertisements.
- G6. They should store all hoardings that may have been temporarily removed for any reason in a position away from pedestrian or vehicular routes and in a location and manner agreed in writing by the TPIM.
- G7. No existing fences are to be used as part of these works without the prior written agreement of the TPIM. Where such an agreement is given, the Third Party shall make good any damage caused to existing fences and such action is to be conducted immediately upon completion of the works.
- G8. They are to ensure that all fence gates are to be kept locked when not in use or when the site is unoccupied.
- G9. The Third Party shall provide a clearly labelled duplicate set of gate keys on or opening onto DLRL Land to the TPIM. The TPIM may also request an additional set



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of gate keys to be provided to a locally based DLR representative where access may be needed to DLR assets or infrastructure in the event of emergencies.

- G10. They shall ensure that all temporary fences are of a design and construction which:-
- Uses approved materials and provide adequate levels of fire protection and that they avoid the use of wooden or flammable materials and that wherever practicable, non-flammable materials are to be used.
 - Excludes and protects the Railway, the general public, DLR passengers and staff from the activities being conducted;
 - To the extent possible, minimises the impact from dirt, dust and debris generated by the works on the Railway, the general public, DLR passengers, staff and neighbours;
 - Minimises the opportunity for thieves, vandals and trespassers to gain access to the work-site;
 - Are vandal-proof and graffiti resistant;
 - Are erected and maintained to the satisfaction of DLRL.



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APPENDIX H – LIFT SHAFTS OVER DLR OPERATIONAL AREAS

Where DLRL has accepted the principle of a lift shaft over Railway Operations Corridor, the TPIM will require additional safeguards to be adopted in the design and construction of the lift. The following additional safeguards apply:-

- H1. The Third Party shall ensure that the lift pit is designed to take full account of all vertical and horizontal nominal loads including any concentrated loads imposed by any supporting lift framework, tower, or guide rails.
- H2. The Third Party shall ensure that the vertical sides of the lift pit adjoining the Railway Operations Corridor are designed to withstand the horizontal loads as shown in Table 1 below.

This load is to be applied as a single point load over an area of 300mm x 300mm in any position on the wall.

Car Counterweight Rated Load (kg)	Horizontal Concentrated Load (kN)
100 - 449	20
450 - 749	25
750 - 1124	30
1125 - 1145	35
1150 - 1799	40
1800 - 2500	45

Table 1 – Horizontal Concentrated Load

- H3. To allow for the possibility of failure of temporary supports when maintaining the car or counterweight, the Third Party shall ensure that the lift pit is designed for the load which might be caused by the car or counterweight falling from a height of 2m above the base of the lift pit.
- H4. The Third Party shall ensure that the construction of the base to the lift pit is designed to withstand a nominal load at any point (150mm x 150mm) from a 5m length of guide rail weighing 24 kg/m falling down the shaft during construction or maintenance.



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- H5. Within related designs, the Third Party shall observe relevant industry standards and good practice such as nominal loads being multiplied by load factors and applied in the worse-case combination of loading.
- H6. To avoid damage to any adjoining lift shaft in the event of a failure of the lift safety gear, which may impose significant loads on the guide rails and supporting structure, the Third Party shall make provision within related design for separate supports for guide rails for each lift.
- H7. The Third Party shall ensure that the construction of the lift pit, including the walls of the pit, is cast in continuous in situ reinforced concrete.
- H8. The Third Party shall ensure:-
- That the lift installation, including suspension, compensation, safety gear and overspeed governors, are designed in accordance with relevant industry standards and good practice;
 - That safety mechanisms are applied to both the lift car and counterweight;
 - Where the car is suspended by wire ropes, a minimum of five (5) steel wire ropes are to be provided.



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APPENDIX I – TREE REMOVAL, SURGERY AND PLANTINGS

11. The Third Party are advised of the following requirements when removing trees or conducting tree surgery activities on DLRL Land:-
- Such activities may only be conducted by DLRL staff and / or contractors acceptable to DLRL;
 - The use of ladders, hoists and similar equipment within DLRL Land will normally only be permitted during Possessions or Engineering Hours unless the work is separated from the track by a means acceptable to DLRL (e.g. solid fence or hoarding);
 - Lopped, pruned and felled material is to be dropped outside of DLRL Land wherever possible. Where this is not possible such material is to be dropped in a designated area that has been agreed by the TPIM;
 - No material is to be burned on site without the prior permission of the TPIM; and then only in a designated area that has been agreed by the TPIM.
12. The Third Party are advised to consider the following requirements when removing trees or conducting tree surgery activities outside of DLRL Land and where any part of the tree, when felled, could be within 5m of the first Railway fence or boundary:-
- (i) Such activities should only be conducted by experienced staff and / or contractors;
 - (ii) Except with the written permission of DLRL (which may include a requirement for the permanent presence of a DLR representative during the conduct of the work), ladders and hoists should not be used where there is a possibility of any part of them falling or toppling onto DLRL Land;
 - (iii) All reasonable measures are to be taken to avoid wind-blown debris from being carried onto the Railway.
13. The Third Party is advised that DLRL generally welcomes the introduction of soft landscaping as an integral element of developments; however requires that careful consideration be given to avoid issues which can disrupt DLR rail services or damage DLR infrastructure, including:-
- (i) Large or sap-laden leaves from certain types of tree, which can cause considerable problems, particularly in the autumn months;



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- (ii) Trees with large root balls, which can block track drainage systems and clog ballast.
- I4. Against that background, the Third Party are advised to enter a process of communication and consultation with DLRL prior to implementing any scheme that includes planting of the following trees:-
- (i) Alder
 - (ii) Aspen
 - (iii) Beech
 - (iv) Eucalyptus
 - (v) Hornbeam
 - (vi) Horse Chestnut
 - (vii) London Plane
 - (viii) Norway Maple
 - (ix) Oak
 - (x) Poplar
 - (xi) Sycamore
 - (xii) Sweet Chestnut
 - (xiii) Willow

**UNCONTROLLED WHEN PRINTED****APPENDIX J – CRANES****J1 General Guidance on the Use of Cranes and Similar Plant**

- J1.1 In using equipment which involves the need to lift or for the purpose of lifting, Third Parties are reminded of the need to comply with current legislation relating to this kind of activity, e.g. *The Lifting Operations and Lifting Equipment Regulations (LOLER)*, and, where relevant, the need to consult British Standards, e.g. BS 7212, BS 2573, BS EN 13001, DD CEN/TS 13001, BS 5975, BS 5744 and BS 7121.
- J1.2 When considering the positioning of cranes or similar tall plant adjacent to the Railway, the objective should be to position them in such a manner that neither the crane jib / mast nor its loads can foul any part of the Railway Operations Corridor (including airspace) during normal operation or in the event of an accident.
- J1.3 The DLR implements a Protection Zone around the Railway for the use of cranes, which is defined as follows:-
- (i) In the event of a collapse, the crane is prevented from falling on or within 5m or 1/10 of the crane height (whichever is the greater) of the Railway Operations Corridor; or
 - (ii) Any part of the load being lifted is prevented from swinging over or within 5m or 1/10 of the crane height (whichever is the greater) of the Railway Operations Corridor.
- J1.4 The precise interpretation of the outer limits of the Railway Operations Corridor will vary, depending upon location, but the following is given as a guide:-
- (i) On elevated viaducts - Outer edge of structure;
 - (ii) On embankments, in cuttings and at grade - Outer cable runs or electrical equipment (where present) or, if not, the nearest sleeper end or derailment upstand;
 - (iii) Stations - Edge of structure or access routes remote from track or the boundary of the concourse (whichever is the greater).

If these measures are not achievable, then the lifting operations must be programmed for Engineering Hours or a substantial protective screen must be installed.

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- J1.5 In addition to complying with statutory requirements relating to cranes, Third Parties will be expected to take full cognisance of current British Standards relating to construction and operation of cranes such as *BS 5744* and *BS 7121 Codes of Practice for Safe Use of Cranes* and guidelines and other examples of safe practice issued by the Health and Safety Executive and / or similar bodies, including *CIRIA C703 Crane Stability on Site, 2nd Edition*.
- J1.6 When considering the safety of the Railway, it is essential to consider the possible modes of failures of cranes, both as a whole and as component parts under the following broad headings:-
- (i) Overloading or mechanical failure;
 - (ii) Inadequate or uneven foundation or support;
 - (iii) Incorrect assembly or use (including lateral pull on jib);
 - (iv) High wind;
 - (v) Sling failure or incorrect slinging.

These causes can result in complete instability, local collapse, or dropping of a load. In many cases, the cause will be complex and any local collapse of a member may result in instability of the whole. Certain conditions are controllable, such as the maximum weight to be lifted and the maximum radius of the lift. Other factors, notably wind, are not controllable and due allowance must be made for the most adverse weather conditions likely under load and when no loads are being lifted. Notwithstanding these causes, cranes and similar tall plant will not be permitted to work on any site or position which is considered to constitute a Risk, Hazard or danger to the Railway.

- J1.7 The following information shall, as a minimum, be provided to DLRL where cranes are to be used:-
- (i) A risk assessment of the proposed lifting operations should be provided covering the erection, use and dismantling of the lifting plant. The assessment should take regard of any possible hazards directly and indirectly to the railway and the control measures required to minimise the risks arising. Use of the crane should include details for any proposed radio communications in the lifting plan.
 - (ii) Engineering design work for crane foundations is to be independently checked and evidence provided to DLRL.

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- (iii) Crane design drawings (layout of crane, general arrangement etc.) to be provided.
- (iv) A tower crane which on completion of its anticipated period of use on site will be greater than 10 years old should not be used near the railway. Exceptions may be considered where a written statement is obtained from the original manufacturer that the crane has been fully checked by them within the previous 6 months prior to the intended date of erection and that it has been found fit for its intended purpose.
- (v) Evidence that the Crane has been properly maintained, tested and certificated.
- (vi) Copies of record documents / certification required under the *Lifting Plant and Equipment (Records of Test and Examination etc.) Regulations* should be provided to DLRL.
- (vii) A method statement and details of controls need to be submitted to and accepted by DLRL before works commence.
- (viii) Evidence of public liability insurance (minimum required amount to be obtained from DLRL).

J1.8 Further guidelines for the use of cranes are shown in the diagrams below:-

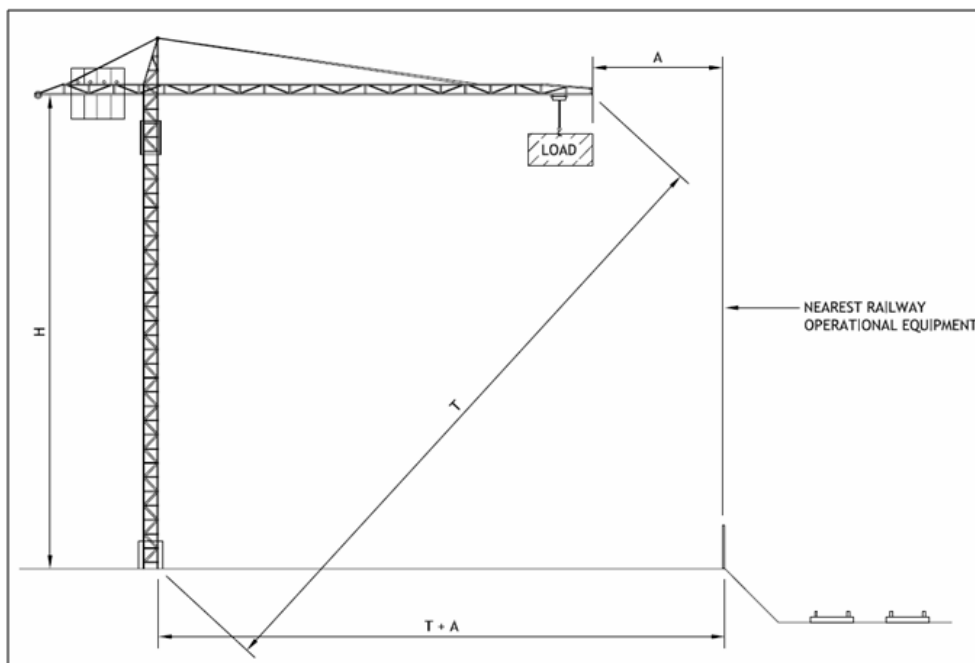


Fig. 1 Freestanding Tower Crane (Horizontal Jib)

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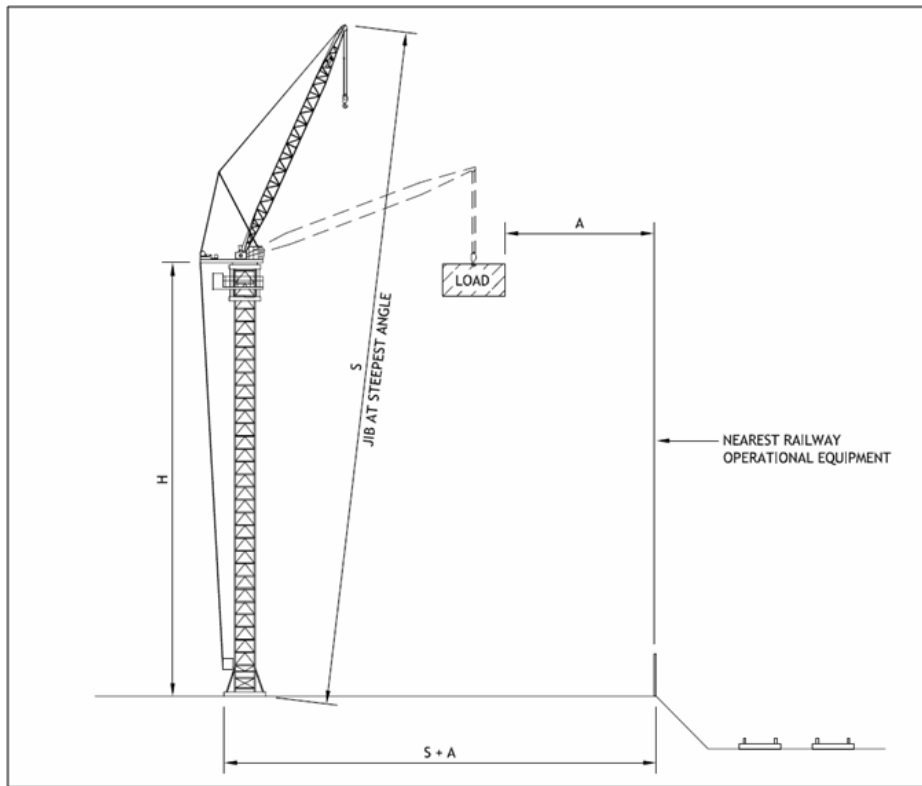


Fig. 2 Freestanding Tower Crane (Luffing Jib)

No part of any lifted load is to be closer than dimension 'A' from railway operation equipment.

Dimension 'A' equals 5m or $H/10$, whichever is greater.

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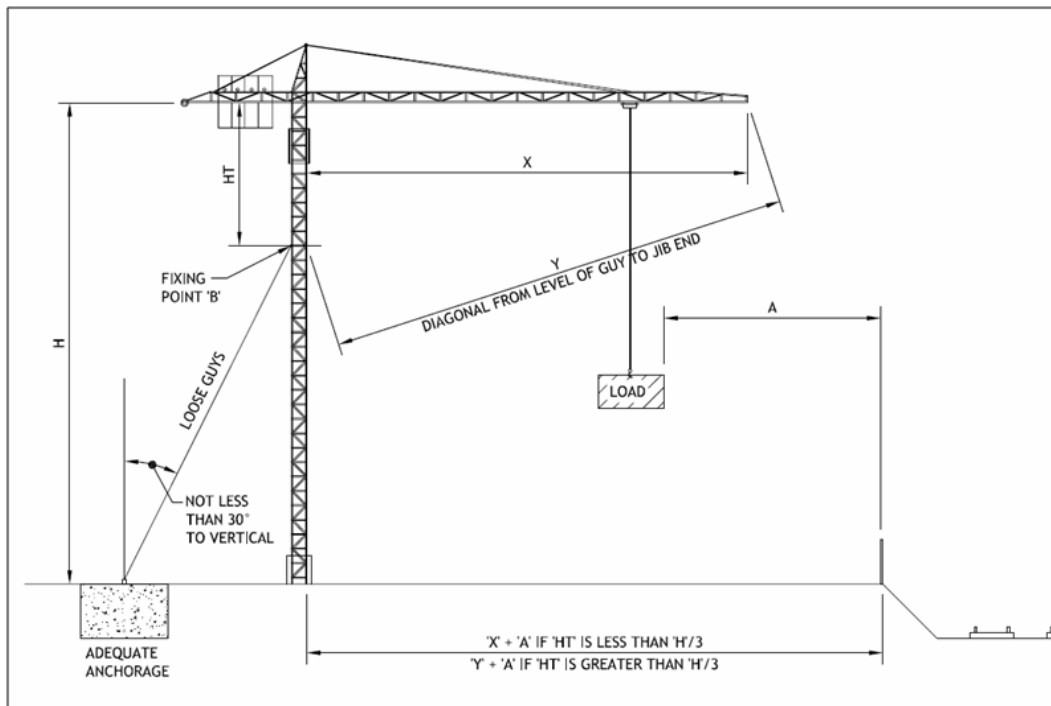


Fig. 3 Gyped Tower Crane

No part of any lifted load is to be closer than dimension 'A' from railway operational equipment.

Dimension 'A' equals 5 metres or $H/10$, whichever is greater.

The maximum permissible tower height 'H' shall be calculated in accordance with BS 2573, Part 1.

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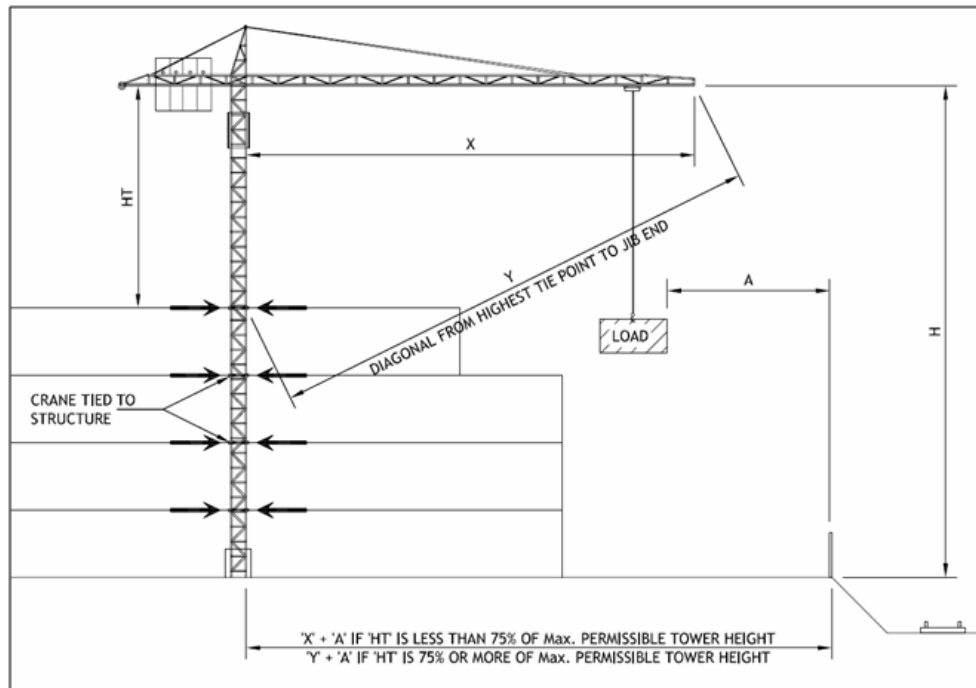
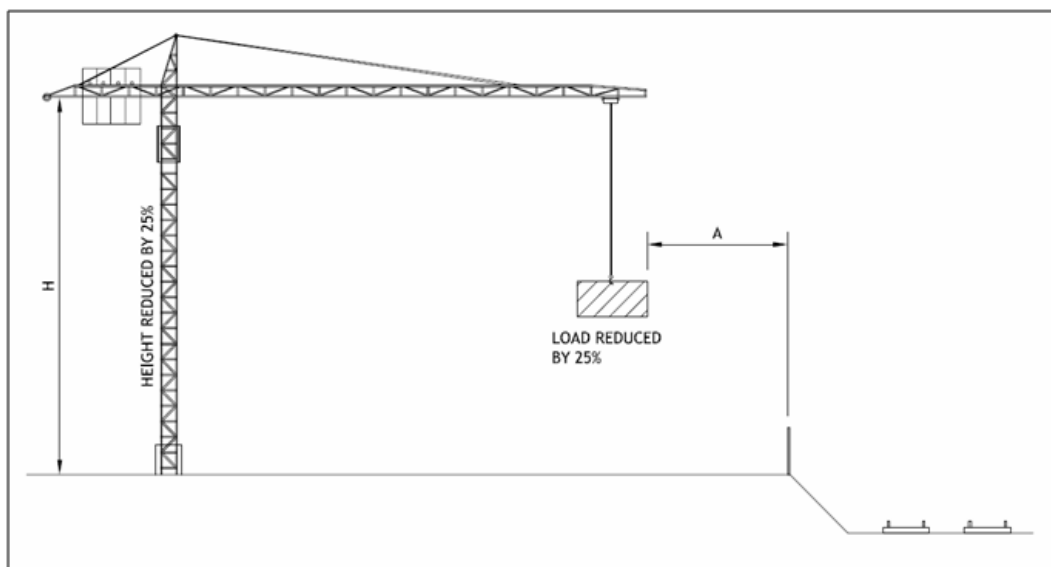


Fig. 4 Tower Crane Tied to a Permanent Structure

No part of any lifted load is to be closer than dimension 'A' from railway operational equipment.

Dimension 'A' equals 5 metres or H/10, whichever is greater.

The maximum permissible tower height 'H' shall be calculated in accordance with BS 2573, Part 1.



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Fig. 5 Freestanding Tower Crane (downgraded)

No part of any lifted load is to be closer than dimension 'A' from railway operational equipment. Dimension 'A' equals 5 metres or $H/10$, whichever is greater.

Crane tower shall be no closer to boundary fence than ' $X + A$ ' where X is the jib length.

'H' shall not be more than 75% of max permissible height when calculated in accordance with BS 2573, Part 1. Max lifted load 75% of allowable under BS 2799, i.e. 60% of test hook load.

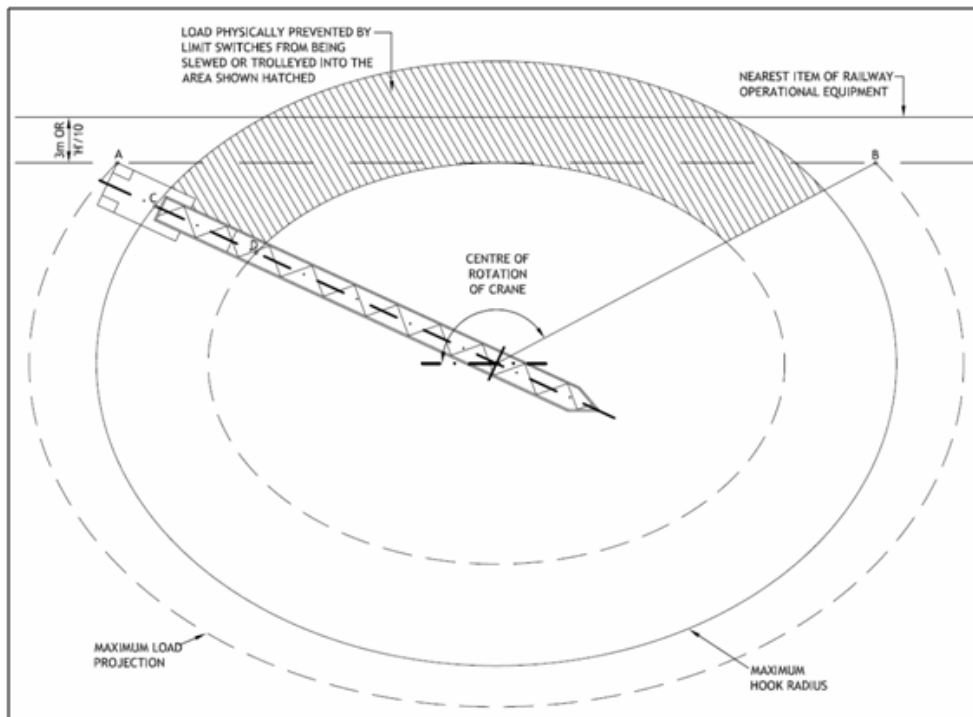


Fig. 6 Limit Switch Requirements



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APPENDIX K – CONCEPTUAL DESIGN STATEMENT

To be made available on request

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APPENDIX L – MOVEMENT MONITORING SPECIFICATION**L1 Introduction**

Instrumentation and monitoring of DLR structures, track and other assets is required within the predicted Zone of Influence before, during and after the Third Party Activity.

The purpose of the monitoring is to safeguard the Railway by:-

- Providing confidence in the construction process;
- Verifying both ground and structures are behaving as predicted;
- Identifying any unexpected trends and anomalies;
- Ensuring that the impacts do not exceed predictions.

The Third Party is to submit proposals for instrumentation and monitoring of the DLR infrastructure and provide all the necessary information to enable DLRL to safeguard the Railway.

L2 In Advance of the Works

The Third Party shall submit, for review by DLRL, the documents listed below:-

L2.1 Instrumentation and Monitoring Plans

These plans should:-

- (i) Include topographic drawings showing proposed works, zones of influence, areas of instrumentation and affected DLR infrastructure. These should include location of the works by address and post code, OS reference, DLR chainage, DLR Asset Reference and project reference grid.
- (ii) Identify critical features such as switches and crossings, breathers, platforms and movement joints.
- (iii) Demonstrate that reference points are outside the Zone of Influence and that there are no clearance or sight line issues.
- (iv) Identify the parameters to be measured together with the expected scale of movement and differential movement together with the expected durations and rates of movement. The plan should also define

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the instrument range, parameters, sign convention and frequency of readings. The predicted effects may be a summary of and reference the Conceptual Design Statement or Ground Movement Assessment.

- (v) Demonstrate the selection of appropriate methods by accuracy, repeatability, frequency of readings, reliability and resilience to environmental factors, access and maintenance requirements.
- (vi) Demonstrate Electromagnetic Compatibility of the instrumentation proposed on or affecting DLR assets.
- (vii) Present a risk assessment of the effects on DLR assets of the proposed works and monitoring instrumentation.
- (viii) A programme of works including temporary works, permanent works and monitoring designs together with approvals, monitoring installation, baselining period, construction programme by phase, and post construction monitoring period.
- (ix) Method statements and inspection test plans for the installation and maintenance of monitoring equipment to DLR assets.

L2.2 Precondition Surveys**L2.2.1 Structure**

A precondition survey, including photographs and measurements, is required to record the status of the asset before the works commence. Attention should be paid to critical features and existing defects that may be sensitive to movement. Findings of the survey should be discussed within the detailed design documents.

DLRL will advise known deficiencies for inclusion in the assessment.

L2.2.2 Track

A track survey before the works will be required to confirm the pre-existing geometry and critical features against which movement caused by the works is to be measured and triggers assessed.

The parameters to be recorded include, as a minimum, the following:-

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- Rail levels at 3m centres
- Horizontal and vertical alignment at 3m centres
- Cant and twist at 3m centres
- Platform gauge at 3m centres
- Track gauge at 30m centres
- Critical features

DLRL will advise known exceedences for inclusion in the assessment. Existing survey information may be available; however it is recommended that the Third Party conducts their own survey for a contemporary record by their methods being used during baseline and the works.

Where an existing deficiency against maintenance limits is identified, corrective action may be undertaken in advance of the Third Party Activities.

Where the track is monolithically attached to the supporting structure track geometry integrity may, by agreement, be confirmed by proxy monitoring via the structure.

Survey points should be marked and remarked as required to ensure accuracy of locating readings from initial survey to completion of the post-works survey period.

L2.3 Monitoring Baseline Report

The minimum requirements for this report include, but are not limited to:-

- (i) Evidence of existing ground, structure and track geometry movements and trends prior to commencement of construction.
- (ii) A cogent record of pre-existing DLR asset movements to enable later identification of those caused by the Third Party Activities.
- (iii) Identify diurnal, thermal, tidal, seasonal, and live load induced movements as background information to better inform review of trends and movements observed during and post construction.

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- (iv) Identify system aberrations, drift, spikes, data range and noise, missed readings, standard deviation and environmental errors.
- (v) Identify existing exceedences that may alter asset protection trigger levels.
- (vi) Trigger levels updated from AiP based on findings of detailed design and exceedences survey.
- (vii) Provide topographic drawings showing proposed works, zones of influence, instrumentation and DLR assets to help locate trends and enable cross referencing to DLR chainages and assets. These should also include coordinates and identification labels of instrumentation.
- (viii) Summarise in a baseline report, and submit periodically (weekly during active works or trend development):-
 - Graphs of monitoring results plotted against trigger levels and time. Each graph is to be referenced to DLR chainage and instrument identification labels;
 - Observations and analysis;
 - Log of events, maintenance, system failures & outages with explanation of cause;
 - A summary of the monitoring system performance during baselining including for each monitored point the number of readings achieved and a statistical analysis of the quality of the data.
- (ix) Rationale and justification for data offsets, re-basing and data processing methods.
- (x) Demonstrate the instrumentation and monitoring system, as operated during the baseline period, is fit for purpose and achieves all aspects of the agreed specification. Where it does not, the Third Party is to propose remediation and the timeline for implementation; acceptance may be conditional on resolving deficiencies.
- (xi) Show prompt correction of instrumentation, data processing and operational process defects.



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L2.4 Movement Response Action Plan (MRAP)

The Third Party shall submit to DLRL for review, and maintain as a live document, an MRAP that outlines and includes, but is not limited to:-

- (i) Personnel and their roles;
- (ii) The procedure for reviewing monitoring results;
- (iii) Trigger levels and response actions;
- (iv) Project and Engineering Review Panel ('ERP') members (including affected stakeholders) and their contact details;
- (v) The procedure for recovery from alarm actions;
- (vi) Include Action Plan for rectifying monitoring deficiencies.

The Third Party shall also demonstrate an auditable process with lines of communication from instrumentation and monitoring systems, data reviewing processes, personnel carrying out the works, stakeholders etc.

L2.5 Emergency Preparedness Plans (EPP)

The Third Party shall submit for review, and maintain as a live document, an EPP that specifies the Third Party's response to incidents affecting or pertinent to the DLR interface, emergency contact scripts and contingency measures that may be enacted.

L3 During the Works

During the works the Third Party shall:-

- (i) Schedule and hold periodic review meetings (including affected stakeholders) to confirm programme, status of works, operation of instrumentation and monitoring, demonstrate that movements are in line with the design expectations and resolve interface issues.
- (ii) Confirm compliance with the accepted documents.
- (iii) Notify affected stakeholders of trigger breaches and hold review groups in line with MRAP and EPP procedures. Enact contingency responses as required.

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- (iv) Undertake periodic maintenance, manual verification and calibration of monitoring systems.
- (v) Implement back-up manual surveys during monitoring system outages; Third Party Activities shall not proceed without functional monitoring in place.
- (vi) Submit rationale and justification for data offsets and data processing methods.
- (vii) Design and assure alterations and additions to the monitoring system in a timely manner to resolve deficiencies before they impact Third Party Activities.
- (viii) Gather evidence to enable production of 'Monitoring Close-out Report'.

L3.1 Weekly Monitoring Summary Report

The Third party shall submit weekly monitoring reports, in a format agreed by DLRL that summarises current and imminent construction activities, graphs, observations and analysis, log of events and monitoring system performance. Reporting frequency may be downgraded by agreement with DLRL for low risk or low rate of change phases of works.

L3.2 Trigger Levels

Trigger levels are defined to alert the Third Party, and in turn DLRL, to changes in the key parameters being measured that may require action. DLRL will advise the Third Party of the specific stakeholders that the readings should be sent to. They are set for:-

- **Design Verification** to confirm the movements observed match the predicted for each phase and cumulatively for the works.
- **Asset Protection** measures to confirm the affected assets are displaced within tolerable limits.
- **Safe Track Geometry** to confirm that the track is within maintenance limits and safe to operate.

Assessment of trigger breaches should account for natural variations in background readings. Data collected during the baseline period correlated to measureable influences should with evidence and agreement of methodology enable correction calculations to be employed to eliminate the variations.



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L3.2.1 Structure Trigger Levels

The effect of works on the DLR’s civil infrastructure assets, their response, method of instrumentation or monitoring and the scale of movements relative to structural capacity necessitate a bespoke assessment.

Structure Displacements			
Trigger Level		Measured Value	Action
<<< Increasing Movement	Clear	< 75% Predicted	Works proceed as planned. Usual visual inspection. Review monitoring system.
	Green	Green Trigger 75% Predicted	Notify Stakeholders. Works proceed as planned.
	Amber	Amber Trigger 100% Predicted	Convene Engineering Review Panel < 24 hours. Engineering Hours inspection and manual verification survey. Review current works, design, monitoring trends and forecasts.
	Red	Red Trigger 125% Predicted	Suspend works immediately. Implement EPP. Convene Engineering Review Panel as soon as practicable. Immediate inspection and manual verification survey. Review current works, design, and trends, forecast. Increase frequency and monitoring extent.
	Black	Black Trigger Structure Serviceability Limit	Suspend Works immediately. Implement EPP. Call CRT and suspend services to traffic (if



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			<p>or</p> <p>observed significant defect</p>	<p>supporting track).</p> <p>Immediate DLR Inspection of asset.</p> <p>Plan recovery.</p> <p>Commence formal investigation.</p>
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L3.2.2 Structure Trigger Level Actions

- Black trigger** relates to the theoretical serviceability limit of the structure and is to be determined from assessment of the weakest component under the most probable scenario and load cases. Breaching a black trigger will require an immediate suspension of the asset from operational use and the line blocked if structure is supporting the railway. Immediate inspection to assess the rail for operational use and convene ERP.

Where defects are observed or trends are forecast towards the trigger level the black alert can be called; actions specified in EPP.

By agreement where only minor effects are predicted the requirement for establishing a numeric value can be omitted.

- Red trigger** relates to movements 25% above predicted and elevates concern with the design, construction, and their interaction with the DLR assets. Site works to be suspended immediately and convene ERP.

No works or construction methods should be proposed that do not have a measurable separation between Red and Black triggers.

- Amber trigger** level is set to the predicted movement for the cumulative and current phase of works. Gives notice that movements have reached design expectations.
- Green trigger** level is set to 75% of the predicted movement for the cumulative and current phase of works as an early notice of trends approaching design expectations.



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L3.2.3 Track Trigger Levels

The effect of works on DLR tracks, their response, method of instrumentation or monitoring, and the scale of movements require a bespoke assessment. However, the trigger levels are predefined as they relate to the tolerable safe geometry of the running rails for the DLR rolling stock.

Relative Horizontal Position is the measured change in horizontal alignment from the assured DLRL design. It is taken perpendicular to the tracks and assumes the changes in geometry are gradual along chainage. Where this is not the case the fault level should be escalated for DLRL / Maintainer to verify the geometry as safe to operate.

Relative Vertical Position is the measured change in rail levels from the Assured Design. It assumes the changes in geometry are gradual along chainage. Where this is not the case the fault level should be escalated for DLRL or the Franchisee to verify the geometry as safe to operate.

Cant is the measured level difference between rails relative to the Assured Design. Platform areas are to maintain zero cant; radius turns maintain a constant cant, and linking transitions a constant change in cant (twist).

Track Relative Horizontal Position (Line)			Track Relative Vertical Position (Level)			Track Relative Rail Level (Cant)		
Fault Level			Measured Value*			Action		
			(positive or negative)					
<<< Increasing Movement	Clear		< 8mm			Works proceed as planned. Usual visual inspection. Review monitoring system.		
	Green		8mm – 12mm			Notify Stakeholders. Works proceed as planned.		



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	Amber	12mm – 15mm	<p>Contact DLRL / Franchisee P-Way Engineer immediately.</p> <p>Convene Engineering Review Panel < 24 hours.</p> <p>Engineering Hours inspection and manual verification survey, including gauge clearance.</p> <p>Review current works, design, trends and forecasts.</p>
	Red	15mm – 30mm	<p>Suspend works immediately. Implement EPP.</p> <p>Convene Engineering Review Panel as soon as practicable.</p> <p>Immediate inspection and manual verification survey, including gauge clearance.</p> <p>Review current works, design, trends and forecasts.</p>
	Black	> 30mm or observed significant defect	<p>Suspend works immediately. Implement EPP.</p> <p>Call CRT and suspend services on the line.</p> <p>Immediate DLR inspection of asset.</p> <p>Plan recovery.</p> <p>Commence formal investigation.</p>

* Measurements to be recorded at 3m intervals.

Care is to be taken to design the monitoring system to correctly report line and level without distortion from thermal longitudinal rail movements.

Relative Rate of Change is the measured deviation from the Assured Design alignment for vertical and horizontal curves. Formation of vertical curves on horizontal alignments can be a significant geometry concern and where identified should be escalated for DLRL / Franchisee to verify the geometry is safe to operate.



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Track Relative Rate of Change			
Fault Level		Measured Value* (+ or - gradient)	Action
<<< Increasing Movement	Clear	0mm	Works proceed as planned. Usual visual inspection. Review monitoring system.
	Green	> 1mm / 3m (1:3000)	Notify Stakeholders. Works proceed as planned.
	Amber	> 2mm / 3m (1:1500)	Contact DLRL / Franchisee P-Way Engineer immediately. Convene Engineering Review Panel < 24 hours. Engineering Hours inspection and manual verification survey, including gauge clearance. Review current works, design, trends and forecasts.
	Red	> 3mm / 3m (1:1000)	Suspend works immediately. Implement EPP. Convene Engineering Review Panel as soon as practicable. Immediate inspection and manual verification survey, including gauge clearance. Review current works, design, trends and forecasts.
	Black	> 5mm / 3m (1:600) or observed significant defect	Suspend works immediately. Implement EPP. Call CRT and suspend services on the line. Immediate DLR inspection of asset. Plan recovery. Commence formal investigation.

* Measurements to be recorded at 3m intervals.



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Note: These parameters are derived from DLR-ENG-STD-MR400 Appendix B.

Twist is measured absolute and is a direct measurement of the change in cant over 3m. For straight track with no cant to transition to a radius bend of constant cant the track will be designed and installed with twist. A track survey before the works will be required to confirm the pre-existing twist and to ascertain the margin of movement before a twist fault is noted.

Track Absolute Twist			
Fault Level		Measured Value (+ or - change in cant over 3m)	Action
<<< Increasing Movement	Clear	> 1:400 (< 7.5mm)	Works proceed as planned. Usual visual inspection. Review monitoring system.
	Green	< 1:400 (> 7.5mm)	Notify Stakeholders. Works proceed as planned.
	Amber	< 1:300 (> 10mm)	Contact DLRL / Franchisee P-Way Engineer immediately. Convene Engineering Review Panel < 24 hours. Engineering Hours inspection and manual verification survey, including gauge clearance. Review current works, design, trends and forecasts. Twist Fault correction < 7 days.
	Red	< 1:200 (> 15mm)	Suspend works immediately and implement EPP. Contact DLRL / Franchisee P-Way Engineer immediately. Convene Engineering Review Panel as soon as practicable. Immediate inspection and manual verification survey, including gauge clearance. Review current works, design,



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			trends and forecasts. Twist Fault correction < 36 hours.
	Black	< 1:133 (22.5mm) or Observed significant defect	Suspend works immediately and implement EPP. Contact CRT and suspend services on the line. Contact DLRL / Franchisee P-Way Engineer immediately for inspection and assessment. Plan recovery. Commence formal investigation.

Platform Gauge is the measurement of the clearance between platform and train. The clearance is to be measured on a plane perpendicular to the track and calculated from changes in rail level (cant) and rail slew (line). Slew of track towards a platform and relative settlement of the closest rail would reduce the platform gauge.

Platform Gauge			
Fault Level		Measured Value (movement towards the platform)	Action
<<< Increasing Movement	Clear	None	Works proceed as planned. Usual visual inspection. Review monitoring system.
	Green	0mm – 3mm	Notify Stakeholders. Works proceed as planned.
	Amber	3mm – 5mm	Contact DLRL / Franchisee P-Way Engineer immediately. Convene Engineering Review Panel < 24 hours. Engineering Hours inspection and manual verification survey, including gauge clearance. Review current works, design,



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			trends and forecasts.
	Red	>5mm	<p>Suspend works immediately. Implement EPP.</p> <p>Contact DLRL / Franchisee P-Way Engineer immediately.</p> <p>Convene Engineering Review Panel as soon as practicable.</p> <p>Immediate inspection and manual verification survey, including gauge clearance.</p> <p>Review current works, design, trends and forecasts.</p>
	Black	Observed significant defect	<p>Suspend works immediately and implement EPP.</p> <p>Contact CRT and suspend services on the line.</p> <p>Contact DLRL / Franchisee P-Way Engineer immediately for inspection and assessment.</p> <p>Plan recovery.</p> <p>Commence formal investigation.</p>

L3.2.4 Track Trigger Level Actions

- **Black trigger** relates to the theoretical serviceability limit of the track under normal operating conditions. Breaching a black trigger will require an immediate line block and inspection to assess the rail for operational use, and convene ERP.

Where defects are observed or trends are forecast towards the trigger level the Black alert can be called; actions specified in EPP.

- **Red trigger** relates to movements significantly exceeding maintenance tolerance and approaching safe operational limits. Identified defects require rectification. Site works to be suspended immediately and convene ERP.

No works or construction methods should be proposed that predict movement reaching Red triggers.



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- **Amber trigger** relates to movements exceeding maintenance tolerance and requiring rectification. For Twist faults correction is required within 36 hours. Convene ERP.
- **Green trigger** level is set as a warning level predicted movement for the cumulative and current phase of works as an early notice of trends approaching design expectations.

L4 Monitoring Close-out Report

L4.1 Minimum Requirements

- (i) Present evidence of recorded changes to ground, structure, and track geometry through and for a sufficient time period after construction to demonstrate that movements have ceased;
- (ii) Present post condition survey;
- (iii) Comparison of actual and predicted movements for each phase of works and cumulatively;
- (iv) Confirmation of compliance to trigger levels and contract limits;
- (v) Verification of temporary and permanent works designs;
- (vi) Evidence the ground, structure and track deformation due to the works. Confirm permanent changes;
- (vii) Inform requirements for remedial works if required.



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APPENDIX M – IMPACT ASSESSMENT

Issues to be considered in the Impact Assessment include but are not limited to:-

- (i) Loading on DLR structures.
- (ii) Effect of foundation works including piling on DLR structures and other assets, including effects on groundwater flows.
- (iii) Whether proposed activities could increase the likelihood of flooding on the Railway.
- (iv) Any proposals to over sail the Railway with temporary or permanent works.
- (v) Proposed lifting operations, whether by cranes or other lifting means, near the Railway.
- (vi) Effect of permanent or temporary works on pedestrian flows at station entrances.