NENG-STR-STD-007

Nexus 3rd Party Engineering Requirements & Guidance

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Contents

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Introduction

This document has been produced in order to collate all Nexus requirements and associated guidance within a single document. This document is applicable to all 3rd party works on, or adjacent to, Nexus infrastructure, or which may have some impact on the infrastructure. The purpose of this document is to ensure that any developments or changes have no negative or unforeseen consequences on the operation of Nexus assets, including their on-going maintenance, future development and lifespan. This guidance is similar in nature to that contained within NR/L2/CIV/096, however parties shall make themselves aware of the unique requirements associated with Nexus infrastructure and asset protection requirements.

A 3rd Party is an individual, member of the public or organisation other than Nexus which promotes, funds, designs, constructs, owns and maintains the works but will not physically change the operation of Nexus infrastructure, however, will interface with it.

In many cases the impact of developments on Nexus infrastructure is clear, however this guidance seeks to clarify those which may be less obvious to 3rd parties. Additionally it looks to provide explanation on relevant Nexus procedures which may be encountered by the developer, including the Engineering Change review process, as well as clarifying costs which may be encountered.

The developer should note however that this is a live document and should be used as a guidance note only. It is the developer's responsibility to clarify with Nexus any requirements which may affect their proposal, as well as ensuring that they have the latest copy of this document. Nexus retain the right to make further review comments on proposals through the planning approval process.

Any enquiries about the contents of this document, or for specific guidance on projects should be sent to 3rdpartyworks@nexus.org.uk. Early engagement by developers and 3rd parties with Nexus Engineering is welcomed by Nexus Engineering to ensure that the requirements of all parties are met satisfactorily within a suitable timeframe.

Who is Nexus?

Nexus is the Passenger Transport Executive (PTE) for Tyne and Wear. It administers funds on behalf of the North East Combined Authority (NECA) which works in partnership with the five local councils in Tyne and Wear and the neighbouring authorities of Northumberland County Council and Durham County Council to integrate all modes of transport within the region.

Nexus' mission statement is: 'Making public transport great for our environment, economy, and communities'.

Nexus plans, provides and promotes public transport to improve the economic prosperity of Tyne and Wear, and the daily lives of its people. It also looks to the future, creating travel networks people will want to use in decades to come. Nexus' aim is to improve quality of life for everyone in Tyne and Wear, by creating better transport networks.

Nexus owns, manages and operates the Metro, the light rail network in Tyne and Wear. The Metro network connects the region's residents with Newcastle International Airport, the national rail network and the city centres of Newcastle and Sunderland. Nexus also owns and operates the Shields Ferry and provides socially necessary bus services through contracts with operators.

The NECA has worked alongside the five district councils of Tyne and Wear, Durham and Northumberland to produce a Transport Manifesto for the region. The manifesto vision complements the achievement of planning policies in Tyne and Wear by helping to deliver sustainable development. The vision is that the region will have good transport that enables economic growth and sustains jobs and communities.

The region's strategic networks will support the efficient movement of people and goods within and beyond Tyne and Wear, and a comprehensive network of pedestrian, cycle and passenger transport links will ensure that everyone has access to employment, training, community services and facilities. Developers should strive to ensure that all developments are well integrated with the local public transport network.

Nexus provides advice on the public transport implications and opportunities of planning applications received via local planning authorities, and is always willing to discuss concepts with 3rd Parties at the pre-application stage. We base the advice we provide on Government guidance, the NECA responsibilities and our in-depth knowledge of the local area and are keen to liaise with and learn from the 3rd party so that we can work together to deliver sustainable outcomes.

Nexus also reviews all relevant planning applications it receives to assess the accessibility of each site. The impact on the transport network, and that the needs of existing and new public transport users are taken into account before making our recommendations to the Case Officer on any necessary planning obligations.

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Planning Process

Nexus wishes to work with developers of significant sites in or near Tyne and Wear to ensure that public transport (and sustainable transport generally) is prioritised in their proposals.

Good provision for sustainable transport is often very cost-effective in the context of an overall project, as it can help the 3rd party to gain planning permission, and is also a significant boost to a site's marketability, whether for office, residential or commercial use. All Tyne and Wear local authorities' planning policies provide strong support for sustainable transport accessibility.

Nexus encourage 3rd parties to contact them using the email address planningliaison@nexus.org.uk, at the pre-planning stage, to discuss how they can help to ensure sustainable transport accessibility to development sites. A copy of the Nexus Planning Liaison Policy can be found at www.nexus.org.uk/planning-liaison-policy .Nexus will work with the 3rd party to ensure that statutory requirements to prevent damage and mitigate risk to Nexus infrastructure and operations are met.

In the event of a lack of pre-planning engagement, Nexus will raise concerns with development proposals, whether arising through submitted details or missing information, through the planning portal directly to the Local Authority. This will typically take longer than pre-application engagement and hence may have an adverse impact on the 3rd parties programmes, for which Nexus are not liable.

Special note about tunnels

Nexus owns and operates the Tyne and Wear Metro light rail network, which includes significant underground tunnels in Newcastle, Gateshead, North Shields and elsewhere. 3rd Parties who develop any sites above or in proximity to the Metro tunnel alignments must contact Nexus well in advance of design work. This requirement also exists for construction work which does not require planning permission (e.g. foundation strengthening etc). General information on the approximate location of tunnels is available on the Nexus website and further detail is available on request.

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Nexus Engineering Change Review Process

The Nexus Engineering Change Procedure is a standardised procedure which all projects within the organisation must follow where changes are being made which affect Nexus assets. The process is similar in nature to that used by Network Rail, however it does not exactly align and 3rd parties should note the Nexus requirements before submission.

The procedure is intended to standardise the information requested and provided, to ensure that the objectives, deliverables, timescales and budgets are clear to all relevant stakeholders and interested parties, at all stages of the projects. This procedure is also intended to ensure that the project documentation complies with the requirements of the operator's licence that Nexus holds under *The Railways and Other Guided Transport Systems (Safety) Regulations 2006 (ROGS)* (as amended).

The Engineering Change Management procedure details the steps to be taken for a proposal to progress from project identification to the implementation stage.

It also provides a framework for interaction between departments with regard to the necessary documentation for change to be undertaken and the hand-over and hand-back of assets.

The Nexus Engineering Change Management Procedure and other documents can be made available upon request.

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Review Process

Within Nexus, enquires from outside parties are directed to the 3rd Party Works team, who will then manage the process. All enquiries should be directed in the first instance to 3rdpartyworks@nexus.org.uk

Designs for developments and proposals shall be processed as outlined in Figure 1 (note this is indicative and may vary depending on the nature of the proposal). 3rd parties are strongly encouraged to meet with Nexus engineers in advance of any submissions to ensure that all requirements are understood, although for repeated, small and simple jobs this may not always be required.

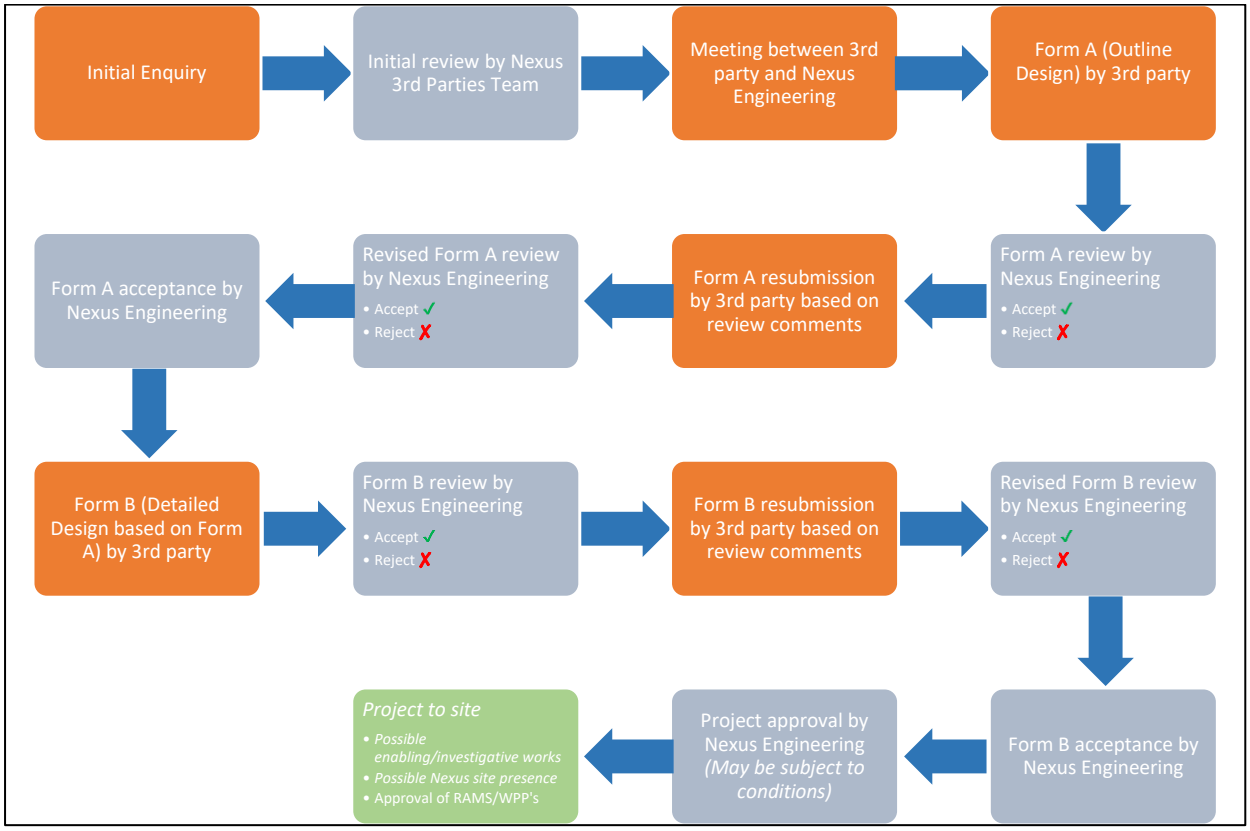

Figure 1 - Indicative 3rd Party Design Review Process

Each stage of the review by Nexus shall require a minimum of 20 working days, which should be allowed for by the 3rd party in their programming. Should additional documents or submissions be provided to Nexus, then these shall each be subject to a further 20 working day review period. Note that Nexus cannot guarantee review timeframes due to internal workloads of staff, and during times of reduced resource or increased internal project workload these timeframes may be exceeded significantly – 3rd parties should ensure that Nexus reviews are not part of their programme critical path.

Meetings can be arranged with Nexus by external parties to discuss the works and ensure that review periods are minimised as far as practicable.

The 3rd party shall ensure that designs are submitted in single, complete packages to Nexus for review with adequate detail to enable full review. Changes from previous iterations shall be highlighted

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clearly on drawings to assist with Nexus reviews, such as by use of revision clouds. Note that Nexus shall not engage in an iterative design process – the 3rd party is responsible for developing their design proposals to align with Nexus requirements.

Nexus Costs

Initial start-up meetings shall incur no cost to the 3rd party, subject to them being held virtually or at Nexus Rail Headquarters (NRHQ) in Gosforth, and at a time agreed by all parties. Further meetings, and all time required for review, shall be charged to the 3rd party at the rates outlined in Table 1.

Staff Role	Cost
Engineer	£99.75/hr
Project Manager	£99.75/hr
Worksite Controller / Supervisor	£716.63

Table 1 – Nexus Costs exclusive of VAT and subject to 20% Nexus Overheads charge (correct as of April 2026)

In some instances, Nexus may require additional support from a specialist engineering consultancy to supplement their internal review of complex schemes. In this instance Nexus shall make the necessary arrangements with a suitably experienced consultant engineer, and the costs of their commission shall be borne in full by the 3rd party. This shall be agreed on a project-by-project basis in advance of appointment.

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Nexus Infrastructure Access Arrangements

Access to Nexus infrastructure is dependent on the infrastructure being accessed, with each area of infrastructure subject to strict access protocol and procedures. Additional training to access Nexus infrastructure is likely to be required.

Under no circumstances shall 3rd parties attempt to access Nexus infrastructure without prior arrangement and agreement.

Nexus Track Access

Access inside Nexus lineside fences requires a pre-planned, suitable Safe System of Work, and typically requires supervision by a Nexus Worksite Controller (WSC).

Any person accessing trackside of the lineside fence should have completed a medical self-certification or examination by a qualified medical centre. They should also have completed a Nexus Personal Track Safety (PTS) course within the past two years and be in possession of a valid PTS card. Note that this is not the same as the Sentinel PTS course required by Network Rail, although Sentinel PTS competency is acceptable if a Nexus bridging briefing is provided on site. Alternatively, they should have a valid Nexus Temporary Visitor Permit (TVP), with photographic ID.

The Nexus tracks are electrified with 1500V DC overhead line equipment (OLE), which is returned to substations through the running rails. All elements of the track and OLE should be assumed to be Live and Dangerous at all times unless an Isolation has been put in place.

Initial Nexus track access arrangements can be found in Nexus handbook module *TH1 - Track Safety Rules for Track Workers*. This can be made available upon request.

Track access will typically be available during Control of Line (CoL) or Extended Control of Line (ECoL), where no trains are running (usually at night or during a weekend blockade). Track access may also be available during operational hours, although this is typically not suitable for most works.

CoL across the Nexus network is available at scheduled times each night, however this is subject to variation depending on train delays, seasonal rail head treatment workings and new fleet testing. Typically 3.5-4 hours working time should be expected per shift, however setting up and removing isolation equipment will reduce this further. Track access availability can be confirmed by the 3rd Parties Team.

The Nexus system typically has a Route Availability of RA0, with vehicle axle loading not exceeding 12.5 tonnes, however, the capacity of structures varies throughout the system and each structure requires individual checks on case-by-case basis. Additionally, in order to access the Nexus system, all rail vehicles must first go through the Nexus Vehicle Acceptance procedure. Nexus 3rd Party team can advise further if required.

Costs for track access are shown in Table 2

Access	Cost
Worksite Controller	£716.63/shift
Look-Out/Site Warden	£716.63/shift
CoL Access	£771.75/shift
CoL Access & Overhead Line Isolation	£2866.50/shift

Table 2- Nexus Costs exclusive of VAT and subject to 20% Nexus Overheads charge (correct as of April 2026)

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3rd parties should note that any additional access to adjacent Network Rail infrastructure shall incur additional costs for separate protection arrangements. The Nexus 3rd Party team can advise further.

Working Adjacent to Nexus Structures

Working under, over or alongside Nexus assets required a pre-planned, suitable Safe System of Work, and may require Nexus technical supervision on site depending on the assets. This is particularly important for bridges, where there is a risk of damaging the structure's deck or foundations by over excavation, or where there is a risk of bridge strike due to the works being undertaken. The 3rd party undertaking the work shall include mitigation measures for these within their RAMS, including the measures set out within this document.

Nexus may require additional site supervision for high-risk activities – the cost of these is the responsibility of the3rd party.

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Engineering Requirements

General

Existing Infrastructure

- Nexus Rail have a limited archive of existing infrastructure. This includes drawings (Design, AFC and As-Builts), O&M manuals, however these are not verified by Nexus and should be used for information only.
- Nexus can provide copies of drawings and documents where available. Note Nexus cannot guarantee the accuracy of the drawings.
- Prior to any work commencing on site dilapidation surveys shall be undertaken of Nexus infrastructure considered by Nexus Engineering to be potentially at risk as a result of the development. This shall be at the 3rd parties cost.
- An Asset Protection Agreement (APA) may be required for any developments or works taking place adjacent to a Nexus asset, which may cause damage or additional risk to that asset. This shall be in a form drawn up by Nexus' legal team, and must be agreed by both parties prior to any works taking place on site. The 3rd party shall be responsible for all associated costs.
- The outline position of all sub-surface Nexus assets shall be shown to scale on the 3rd parties design drawings to assist with Nexus reviews.

Legal costs are shown below:

Document	Cost
APA	£826.88
Bespoke APA	£1929.38
Legal Documents, e.g. Oversailing Licence, Licence for Alteration	Quote will be provided

Table 3- Nexus Costs exclusive of VAT and subject to 20% Nexus Overheads charge (correct as of April 2026)

Design

- No additional loading shall be placed onto existing Nexus infrastructure by any developments. It may be required for the 3rd party to demonstrate this numerically as part of Nexus Engineering Acceptance.
- Any alterations to existing, or installation of new roads (including car parks and any other area in which a vehicle might be reasonably foreseen to be operating) shall have a Vehicle Incursion Assessment carried out. Any areas with a score >70 shall have remedial works undertaken to reduce the score as low as reasonably practicable, with these works incorporated in the 3rd parties design at no cost to Nexus. Further information is available in the DfT guidance – *Managing the Accidental Obstruction of the Railway by Road Vehicles, 2017*.
- The 3rd party shall take all reasonably practicable steps to design-out any subsequent access requirements onto Nexus infrastructure. This may include steps such as repositioning of drainpipes or windows adjacent to Nexus infrastructure to remove the need to access this for maintenance activities.
- Should the development increase the risk of vehicular collision with any structures which might as a result be at risk of partial or complete collapse onto Nexus infrastructure or assets,

the 3rd party shall provide adequate impact protection to these elements as part of their design.

- Where works are planned to take place under a Nexus structure, trial holes may be required to confirm the arrangement or presence of any buried structural elements. These shall be undertaken at the 3rd parties cost and to Nexus requirements and shall be subject to the requirements outlined within this document.

Drainage

- All surface and foul water arising from proposed works must be collected and diverted away from Nexus property. Where detailed plans are not available, any soakaways must be located so as to discharge away from Nexus property.
- There shall be no increase to average or peak flows of surface water run-off leaving towards Nexus infrastructure and assets, including bridges, earthworks, culverts and sumps.
- As part of the 3rd parties drainage design and flood risk assessments, the future effects of climate change shall be conservatively considered to ensure there is no detrimental impact on Nexus infrastructure.
- All surface water run-off and sewage effluent shall be handled in accordance with Local Authority and Northumbrian Water regulations.
- Where possible, attenuation measures shall be included for within a development as required to protect the existing surface water drainage systems from any increase in average or peak loadings due to extreme rainfall events.
- Should attenuation ponds or tanks be located adjacent to Nexus infrastructure, they shall be designed by a competent specialist engineer, and shall include adequate storm capacity and overflow arrangements such that there is no risk of flooding of the adjacent Nexus infrastructure during either normal or exceptional rainfall events.
- Surface water retention ponds/tanks, SUDS or flow control systems shall not be located within 20m of the Nexus boundary where these systems are to be located below existing track level, or within 30m where they are to be located at or above track level. Full overland flow conditions shall be submitted to Nexus for approval prior to any works commencing on site.
- Should the 3rd party propose to use any Nexus-owned assets (culverts, pipes, drains etc) to convey surface water within or away from the development, then the 3rd party shall be responsible for ensuring the structure is fit for purpose and adequate for the proposed flows without increasing the risk to Nexus infrastructure.
- Water storage facilities (including attenuation tanks) shall not be permitted within the 6m easement of the Nexus tunnels

Vegetation

- All trees and other vegetation planted over or adjacent to Nexus infrastructure shall comply with Nexus' Tree and Vegetation requirements.
- Designs with vegetation planted above Nexus infrastructure shall include for a suitable root barrier.
- Where trees or shrubs are to be planted adjacent to Nexus infrastructure, they shall be positioned such that they are a minimum distance equal to their predicted mature height from

the infrastructure. If this is not practicable, root control measures may be a suitable mitigation to permit closer planting, and these shall be outlined within the 3rd parties designs.

- Unmonitored watering systems shall not be included above Nexus infrastructure due to the risk of prolonged unnoticed water release affecting the infrastructure.
- The 3rd party shall be responsible in full for maintenance of the vegetation.
- Where a 3rd party builds adjacent to the Nexus infrastructure, they shall take cognisance of existing vegetation and trees on Nexus infrastructure within their designs, accounting for future possible water requirements.
- Acceptable tree species are as per Table 4.

Acceptable	Not Acceptable
Birch (Betula), Crab Apple (Malus Sylvestris), Field Maple (Acer Campestre), Bird Cherry (Prunus Padus), Wild Pear (Pyrs Communis), Fir Trees – Pines (Pinus), Hawthorne (Cretaegus), (Sorbus), False Acacia (Robinia), Willow Shrubs (Shrubby Salix), Thuja Plicatat “Zebrina”	Acer (Acer pseudoplantanus), Aspen – Poplar (Populus), Small-leaved Lime (Tilia Cordata), Sycamore – Norway Maple (Acer), Horse Chestnut (Aesculus Hippocastanum), Sweet Chestnut (Castanea Sativa), Ash (Fraxinus excelsior), Black poplar (Populus nigra var, betulifolia), Lombardy Poplar (Populus nigra var, italica), Large-leaved lime (Tilia platyphyllos), Common line (Tilia x europea) Mountain Ash – Whitebeams

Table 4 - Acceptable Tree Species

Utilities

- Where possible utilities and services shall not be routed over Nexus assets, and 3rd parties shall make reasonable efforts to redirect them away from Nexus infrastructure.
- Services and utilities (including drainage) across the tunnels should be minimised as far as practicable, and Nexus approval must be gained prior to design approval.
- Nexus may require future cut and cover access to the tunnels, and hence consideration must be given to facilitating this access (including, but not limited to, the installation of pipe valves or cable joints either side of the tunnel footprints, and removable ducting).
- The potential for leaks from drainage or water pipes must be minimised and mitigated as far as practicable, and the 3rd party shall be required to maintain such pipes to further reduce the risk of leaks.
- Gas pipes or other high-risk utilities shall typically not be permitted over or under Nexus infrastructure. Where unavoidable, these shall be located as a suitable distance from the operational railway such that there will be no limitations on Nexus’ operations and maintenance activities, including, but not limited to, welding, hot works.
- Where drainage or water pipes are routed over Nexus infrastructure, they shall be designed as single pipe lengths without joints.
- Control valves shall be provided immediately before the Nexus infrastructure to all pipes to allow any leaks to be controlled without significant disruption.

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- Where utilities are to be routed under Nexus infrastructure, they shall not be affixed to the Nexus structures. In some instances, this may mean that alternative routes or methods are employed, including directional drilling to route services below the Nexus structure.

Lighting

- 3rd party activities shall not adversely affect railway signal sighting via new lighting, glare, new obstructions etc. without appropriate mitigation measures (such as back-shields for lighting) in agreement with Nexus Engineering.
- Lighting columns should be hinged to allow maintenance at ground level where possible to save on preventative maintenance costs and safety of access.

Construction

- No cranes or plant shall oversail Nexus infrastructure without appropriate Safe Systems of Work being in place. This is likely to require Control of Line (CoL) conditions with an overhead line Isolation.
- All plant (including cranes) shall have a collapse radius determined in advance of works, which shall be a minimum of 4m from any Nexus infrastructure, including boundary fences. The collapse radius shall be determined by the crane height plus half the widest width of the largest object being lifted.
- Where lifting operations are planned near to the Nexus boundary, consideration shall be given to the use of tag lines or other means of controlling the loads to prevent incursion within the railway boundary. Measures shall be put in place to prevent tag lines being blown towards the railway or electrified equipment.
- Any works on or near the OLE shall comply with the Nexus Rail High and Low Voltage safety rules.
- Any abnormal vehicles or plant being brought to site shall be routed to avoid any Nexus overbridges or tunnels as far as practicable. Any abnormal load applications shall be processed via Highways England's Electronic Service Delivery for Abnormal Loads (ESDAL2), although due to volume of applications received, these shall not be routinely accepted by Nexus Engineering, instead the haulier shall indemnify against all and any damage or delays to Nexus infrastructure as a result of their operations.
- Any tower lights used shall face away from the railway line, not parallel to or pointing towards. Tower lights to be adequately secured to ensure there is no topple risk towards the railway and should be positioned to avoid distracting stray light entering the railway corridor.
- Noise, dust and smoke mitigation measures to be put in place around Nexus infrastructure for any works.
- Controls shall be put in place to prevent waste being blown towards the railway. This may include the use of covered skips.

Temporary Works

- Any temporary works shall be fully designed in accordance with relevant standards, with a Temporary Works Form (Nexus Engineering Change Management) submitted to, and approved by, Nexus in advance of the works.

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- Boundary fences shall not be damaged by any outside works, nor shall any part of them be removed to facilitate works.
- Should permission be given by Nexus to remove fences (in full or part), these should be replaced on an exact like-for-like basis following the works.
- Scaffolding or other metallic structures erected close to Nexus infrastructure may require bonding with a Voltage Limiting Device (VLD). This shall be fitted by Nexus, with all costs covered by the 3rd party.
- Scaffolds shall be close boarded and sheeted on the Nexus side.
- For scaffolds erected with a collapse radius within 20m of the Nexus tracks, California Bearing Ratio (CBR) testing or similar approved tests shall be undertaken to confirm the ground capacity. Where this is not possible, the scaffold shall be designed assuming a maximum ground bearing capacity of 50kN/m2.
- Typically scaffolds erected adjacent to the railway shall use tube lengths limited to 4m, although this may change depending on exact site arrangements, to be determined by Nexus Engineering.
- Any passenger-facing areas shall have adequate hoardings erected to prevent access and prevent any members of the public from dust or debris arising from the works.
- Any unusual access over, or to, Nexus infrastructure shall require a numerical structural assessment to demonstrate structural adequacy of the assets concerned for the novel loading. This shall be subject to the Nexus Engineering Change Management procedures and review.
- Should the construction works increase the risk of vehicular or plant collision with any structures which might as a result be at risk of partial or complete collapse onto Nexus infrastructure or assets, the 3rd party shall provide adequate impact protection to these elements as part of their temporary works design.

Risk Assessments and Method Statements

- RAMS shall be submitted to Nexus for review in advance of the works
- All documents shall be subject to the Nexus timeframes for review, and this shall be allowed for within the 3rd parties programme.
- RAMS shall be accepted by Nexus prior to works commencing on site.
- In the event of accidents or incidents occurring during the 3rd parties works which affect or has the potential to affect Nexus' infrastructure or operations, the 3rd party shall stand down works and provide Nexus with a full and comprehensive investigation report into the incident. Works shall not recommence until this has been reviewed by Nexus and any additional control measures agreed between both parties. Nexus shall not be responsible for any delays or costs incurred as a result for any parties.

Vibration Monitoring

- Vibration monitoring shall be required for any sub-surface works (such as piling or boring), or for any works which are considered at risk of generating excessive vibrations which may cause detriment to any Nexus assets. This shall be determined by Nexus Engineering, although it is expected that the 3rd party shall make their own preliminary analysis of this requirement.

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- Vibration monitoring is required to be undertaken continuously for any piling within Zone C, as shown in Figure 2.
- Vibration monitoring is required to be undertaken prior to, during piling activities and following the works, for any piling within Zone C and Zone D.
- Base-line monitoring shall be undertaken prior to any works commencing on site to establish datum values for the site.
- The 3rd party is responsible for determining trigger values for monitored vibrations, and producing a mitigation plan should these trigger values be achieved. Note that typical values adopted by Nexus Rail are listed below, however the 3rd party shall verify that these are appropriate for their scheme.
    - If 5 mm/s is reached, a raised level of attention to the works and increased monitoring of vibration is required. Contact is also to be made with the contractor's team to warn of the possible approaching need to stop.
    - If 10 mm/s is reached, then work is to be stopped and the methodology reconsidered. The cause of these relatively higher vibration levels is to be investigated and findings and mitigations provided to Nexus Engineering within 24hours.

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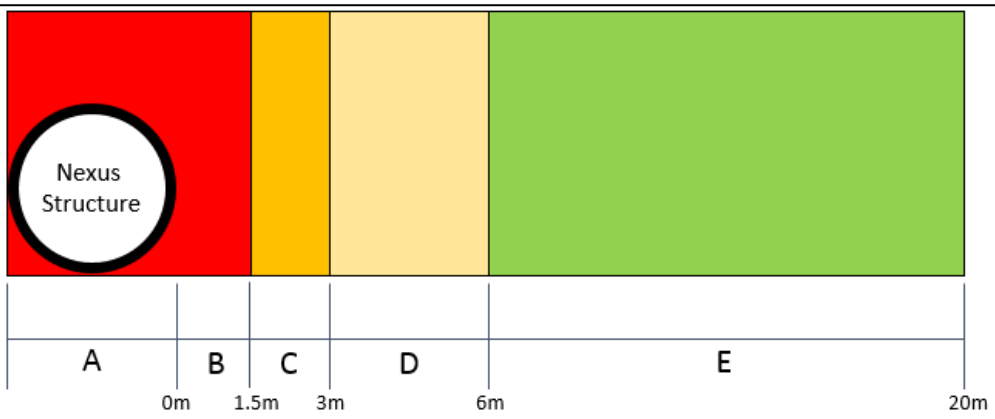
Sub-Surface Structure Requirements

General sub-surface structure zones for construction are shown in Figure 2. Nexus reserve the right to increase the extent of these zones depending on the exact height and design of the proposed structure(s) if it is considered that there is a disproportionate or increased risk to the Nexus infrastructure posed by the development.



Zone	Requirements
A	Footprint of Nexus structure. No piling
B	No piling
C	Typically no piling. Sleeved, end-bearing CFA piles only. No lateral loading.
D	Typically no piling. Sleeved, end-bearing CFA piles only. No lateral loading
E	No percussive piling (Including site investigations)

Figure 2 - Sub-Surface Structure Zones

- Piling below the tunnel foundations requires a Party Wall Agreement and Asset Protection Agreement to be established which should be in place including the dilapidation survey prior to the piling works starting on site.
- The 3rd party shall undertake a full ground investigation prior to works beginning, which shall allow a fully-informed assessment of the ground conditions
- Piling foundation analysis shall be undertaken to ensure there is no extreme settlement of Nexus infrastructure as a result of the works. Nexus Engineering can provide guideline limits, however these vary by structure type and location. Typically this will require the development of a ground model by a specialist geotechnical engineer, with coloured contour plots provided to demonstrate ground movements in both the short and long term in the vicinity of the Nexus assets.
- In the event of numerical analysis determining that settlement of the tunnels may occur as a result of the 3rd parties works, further numerical assessment (for both Ultimate and Serviceability limit state) of the tunnel structures to determine their adequacy for this

settlement, as well as the impact on track geometry, may be required to be undertaken by the designer.

- Should the 3rd party wish to remove overburden from the site, they shall undertake a numerical assessment of heave effects on Nexus sub-surface structures.
- No percussive piling within 20 metres of tunnels and sub-surface structures (including during Site Investigations).
- Typically no piling within 6 metres of tunnels and sub-surface structures.
- Piling within the 6m zone to be CFA sleeved end bearing only, no lateral loadings. Sleeving shall be continued to the level of the tunnel invert as a minimum. Survey/Vibration monitoring of tunnels required 24/7 during piling works.
- Piling design and monitoring arrangements are to be reviewed and agreed with Nexus Rail in advance of any works starting on site.
- Nexus require a minimum total projected exclusion zone of 1.5 metres from the outside surface of the tunnels/substructures to the nearest part of any new building. The exclusion zone must be adhered to at any level above the tunnel foundations, including at ground level required for maintenance, repair and renewal of the tunnels/substructures.
- No loads to be transferred onto the sub-surface structures, either vertically or horizontally, directly or indirectly. The 3rd party is responsible for numerically demonstrating that their design will ensure this is the case.
- No vibration to be transferred to sub-surface structure which might adversely affect safety-critical equipment within the tunnels.
- Record drawings or archive material cannot be guaranteed to be accurate for exact line and level of sub-surface structures, and the 3rd party is responsible for undertaking their own detailed survey where this is required.

Bridge Strikes

Bridge strikes have the potential to present a significant risk to the safety of the operational railway, putting drivers, road users and railway passengers and staff at risk of death or serious injury. Nexus, along with other railway owners, local authorities and the police take bridge strikes extremely seriously, and damage to bridges (or other carrying structures) following a strike may lead to the railway being closed while the structure is examined and repaired. The costs associated with any strike may be charged to the responsible party, including the costs of specialist examination and repair, as well as highway and railway closures.

- All plant carrying out work under or adjacent to the structure shall be fitted with height and slew restrictors to prevent accidental strikes. Banksmen shall be employed where the works are in close proximity to the actual structure.
- Temporary traffic management (TM) shall be carefully planned to ensure that high vehicles are not directed towards other areas of the structures at risk of strike. TM may require the use of goal posts or additional signage for low bridges. This includes where TM for other developments directs traffic towards other Nexus structures.
- In the event of a bridge strike, all traffic and works shall be stopped and the Nexus control contacted. The structures shall be identified along with the nature of the incident. Bridges are

identified by bridge strike plates affixed to abutments, although road names and other descriptors may be required for other structures.

- The Nexus control number shall be included within all RAMS: Service Delivery Manager (SDM) 0191 203 3065 (Days) and Infrastructure Controller (IC) 0191 203 3110 (Nights).

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