

Chapter 6: Construction Strategy & CEMP

6. Construction Strategy & CEMP

6.1. Introduction

This chapter of the ES describes the proposed construction strategy and programme, including all key activities that will be undertaken prior to the operation of the proposed development. This information is required for the purposes of identifying and assessing the potential environmental impacts and likely environmental effects of the proposed development in the technical assessments reported within the three volumes of the ES.

Planning for construction, including potential phasing, is necessarily broad at this stage given that the proposals are subject to a planning application seeking hybrid planning permission and a contractor has not yet been appointed. For this reason, the following chapter is based on reasonable assumptions regarding the construction programme and methodology provided by the Applicant.

6.2. Construction Programme

A detailed development programme has not yet been prepared. To enable assessment of likely environmental effects within the EIA, an indicative programme has been developed by the Applicant. The indicative construction phase programme is set out in **Table 6.2.1** below.

It is currently envisaged that the proposed development will be delivered in multiple phases over an 88-month period, with site preparation and enabling works anticipated to commence in Q3 2023 and the proposed development anticipated to be completed and fully operational in Q4 2030. The first phases of the development (the detailed component) are expected to be complete and operational in 2028.

The existing buildings proposed for demolition are shown on the demolition plan provided in **Figure 6.2.1**.

Table 6.2.1
Indicative Construction Programme

Phase	Start Date	Finish Date	Duration (months)
Site preparation & Enabling Works	Q3 2023	Q2 2027	52
Demolition Works	Q1 2024	Q2 2027	44
Highways Works (detailed component)	Q3 2023	Q2 2027	52
Development Zone - Detailed component construction works	Q2 2024	Q4 2027	48
Development Zone – Outline component construction works	Q1 2025	Q4 2030	72
Landscaping Works within Detailed & Outline Components	Q4 2026	Q4 2030	52
Total			88

Vacant possession would be secured ahead of works commencing on-site.

The final demolition and construction programme would be agreed upon appointment of the contractor and prior to commencement of any works on-site.

6.3. Site Logistics

6.3.1. Hours of Operation

Construction working hours will be limited to between 07:00 and 18:00 Monday to Friday and between 07:00 and 13:00 on Saturday. No works will be undertaken on Sundays, Public Holidays or outside these proposed hours, unless agreed in writing with Wrexham CBC.

6.3.2. Considerate Contractor’s Scheme

The application site and its constituent construction phases will be registered with the UK’s “Considerate Contractor’s Scheme”. This scheme ensures that contractors carry out their operations in a safe and considerate manner, with due regard to pedestrians and site users. A newsletter updating local residents and businesses on site progress and forthcoming works will be issued on a regular basis. Progress photos will also be displayed on a community notice board located on the application site’s hoardings, while contact details will also be displayed to allow any queries or complaints to be lodged by the public.

6.3.3. Site Security and Access

All security operations will be implemented in accordance with the latest British Standards and in full compliance with the Private Security Industry Act 2001 (1). Security arrangements will ensure unauthorised access is prevented at all times to the work areas. All staff/operatives will undertake a detailed project specific induction before being issued with access ID badges.

6.3.4. Transportation of Materials

Access to the application site for Heavy Goods Vehicles (HGVs) will be taken from Bryn Lane. Whilst no long-term road closures are envisaged, short-term closures/lane closures may be required for the highways works to the roundabout. If this is necessary then consent will be obtained from Wrexham CBC.

The routes taken by construction traffic on the local highway network will be the subject of discussions between the contractor and the planning and highway authorities prior to construction commencing and will also be subject to the existing physical and legal restrictions on the movements of large vehicles. At this stage however, it is assumed that the majority of construction HGVs will route to/from the application site from the A534 and Industrial Estate Road.

The number of vehicle movements associated with the construction works is difficult to estimate with certainty on a daily basis, as it will depend upon the preferred construction techniques and will also vary between construction stages. For the purposes of the assessments, it has been assumed that during the peak of construction, up to 116 HGVs (232 two-way movements) and 76 LGVs (152 two-way movements) will access the application site per day.

Where possible, personnel will be encouraged to travel by sustainable modes of public transport, walking and cycling, however it is inevitable that some will need to travel by either works transport from local depots or by car. Where private car journeys are unavoidable, car sharing will be encouraged to minimise the impact on the highway network and a travel plan for the construction workers will be provided.

6.3.5. Site Offices and Welfare Accommodation

It will be necessary during the course of the main construction programme, to provide on-site office and site welfare accommodation in accordance with Construction, Design and Management (CDM) Regulations 2015 (2) Schedule 2.

Site temporary accommodation will consist of all office and welfare facilities for the personnel on-site. This will be designed for the estimated peak number of operatives and site staff when this information is known at prior to construction commencing.

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6.4. Hoarding and Site Establishment

Prior to construction commencing on each phase of the application site, it will be necessary to secure the construction works area by erecting 2.4 m high solid hoarding around the perimeter of the area of works.

Secure access points will be established at all site access and egress locations. Pedestrian access points will generally be located close to the main vehicular access gates with separate pedestrian gates and footpaths provided.

6.5. Construction Works

The key construction works will comprise:

- Site preparation and enabling works;
- Demolition of the two existing residential properties and associated buildings and structures;
- Highways works;
- Earthworks, including laying piling mats, ground improvement, and installation of below ground drainage;
- Substructure works for new buildings, including piling and installation of pile caps and pad foundations;
- Superstructure works for new buildings, including installation of steel frame, roof, cladding, and ground floor slab; and
- External works, including landscaping, access and ground level car parking works.

6.6. Likely Machinery and Plant Requirements

The exact machinery and plant requirements are unknown at present and will be dependent upon the appointed contractor(s).

Where necessary, the assessments in this ES have been based on anticipated plant requirements, methods and their associated noise levels etc. in line with appropriate standards (e.g. British Standard (BS)5228: Noise and vibration control on construction and open sites).

Table 6.6.1 sets out the assumptions that have been made in terms of machinery and plant requirements during the proposed demolition and construction works.

Table 6.6.1
Construction Plant List

Plant	Sound Pressure Level at 10 m, dB(A)	Data Source (BS 5228-1: 2009+A1:2014)	Number of Units
Tracked excavator (44t)	82	Table C.1 ref 12	1
Articulated dump truck	80	Table C.1 ref 11	1
Dozer	75	Table C.2 ref 1	1
Wheeled backhoe loader (8t)	68	Table C.2 ref 8	1
Hand-held hydraulic breaker (20 kg / 69 bar)	93	Table C.1 ref 7	1
Lorry 4-axle wagon	80	Table C.2 ref 34	1
Concrete mixer truck (discharging) and concrete pump (pumping)	75	Table C.4 ref 28	1
Vibratory tamper	63	Table C.4 ref 35	1
Tracked excavator (22t)	78	Table C.2 ref 3	1
Articulated dump truck (25t)	81	Table C.4 ref 1	1

Plant	Sound Pressure Level at 10 m, dB(A)	Data Source (BS 5228-1: 2009+A1:2014)	Number of Units
Crane mounted auger	79	Table C.3 ref 16	1
Generator for welding	73	Table C.3 ref 32	1
Power for site cabins - diesel generator	61	Table C.4 ref 76	1
Diesel generator - Power for welder	66	Table C.4 ref 85	1
Lorry 4-axle wagon	80	Table C.2 ref 34	1
Cutting concrete slabs - Hand-held circular saw (petrol)	79	Table C.4 ref 72	1
Mobile telescopic crane (80t)	77	Table C.4 ref 39	1
Gas cutter	79	Table C.1 ref 18	1
Tracked excavator	80	Table C.5 ref 18	1
Articulated dump truck	81	Table C.5 ref 16	1
Asphalt paver (+ tipper lorry)	75	Table C.5 ref 30	1
Cutting concrete slabs - Hand-held circular saw (petrol)	79	Table C.4 ref 72	1
Telescopic handler	70	Table C.4 ref 55	1
Road roller	80	Table C.5 ref 19	1

6.7. Materials/Resource Use & Waste Management

In accordance with the principles of the UK Government’s ‘Waste Strategy 2010’ and the Welsh Government’s Technical Advice Note (TAN) 21 – ‘Waste’, a principal aim during construction will be to reduce the amount of waste generated and exported from the application site.

The proposed approach will comply with the waste hierarchy whereby the intention is first to minimise, then to treat at source or compact and, finally, to dispose of off-site as necessary. The waste hierarchy is shown in **Figure 6.7.1**.

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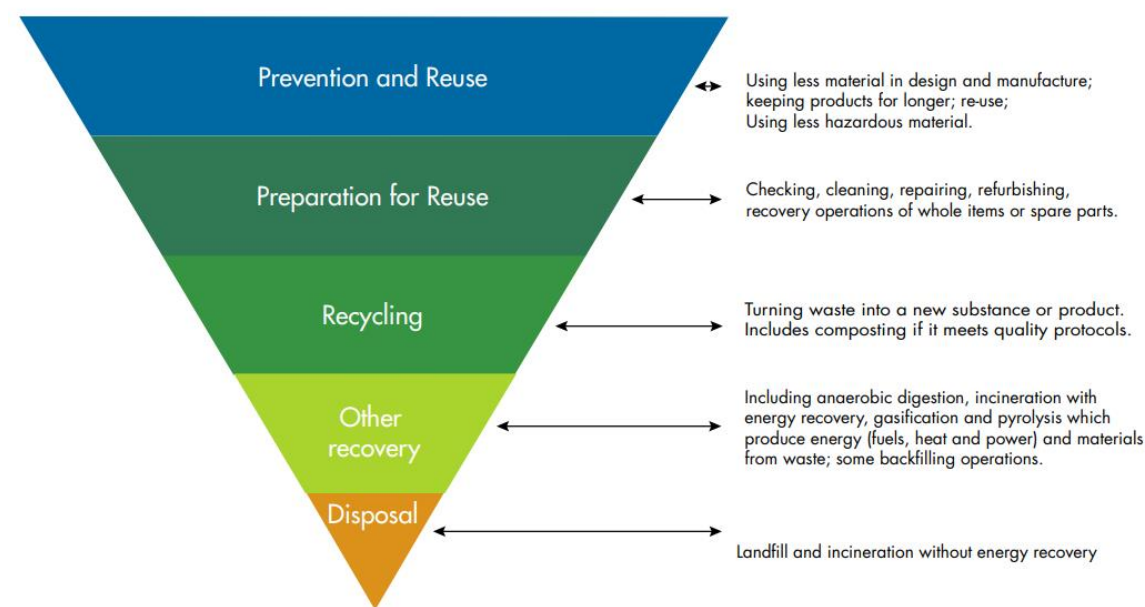


FIGURE 6.7.1
The Waste Hierarchy

The contractor will carry out the works in such a way that, as far as is reasonably practicable, the amount of spoil and waste to be disposed of is minimised.

Any waste arising from the application site will be properly categorised and dealt with in accordance with appropriate legislation. Opportunities for minimising and reducing waste generation will be explored and implemented wherever possible.

Subject to volumetric fill requirements and a future assessment of suitability of re-use (both chemically and geotechnically), some materials may be considered for potential re-use in line with an appropriate end-of-waste protocol such as WRAP Quality Protocol for Aggregates from Inert Waste, U1 Exemption or a Materials Management Plan in accordance with the CL:AIRE Definition of Waste Code of Practice (DoWCoP). This would reduce the quantity of waste to be taken off-site and minimise material requirements.

Any areas of poor-quality soils that may be encountered are likely to require off-site disposal at an appropriately licensed facility, although it is noted that these are likely to be extremely limited given the former uses of the application site. Measures to ensure the appropriate management of waste produced during the construction phase will be included within a CEMP.

6.8. Decommissioning and Deconstruction of Proposed Development

The proposed development would target a 50-year design life. It is anticipated that the deconstruction of the new buildings would use similar methods to those used during the demolition of the existing buildings on-site. Safe working practices would be devised and implemented during the demolition period. The stages of deconstruction for each building within the proposed development would be as follows:

- Erect hoardings;
- Soft strip;
- Remove plant from roof, and all risers;
- Dismantle the façade cladding. This would be undertaken from external climbing platforms; and
- Dismantle the superstructure in separate floor elements. Initially the concrete floors and columns would be removed on a floor by floor basis. This sequence would be repeated until the superstructure is down to the ground floor level.

6.9. Construction Environmental Management Plan (CEMP)

All works on-site will be undertaken in accordance with Best Practice and will be governed by a CEMP. This document will provide the management framework required for the planning and implementation of construction activities in accordance with the environmental commitments identified within this ES. It will also address the requirements of any subsequent planning conditions imposed by Wrexham CBC. Its purpose is to avoid or minimise the risks of adverse impacts on environmental resources and local residents and businesses.

It is anticipated that the CEMP will be secured by planning condition to any future consent.

6.9.1. Measures to be included in the CEMP

This section summarises the measures to be included within the CEMP in due course, as per the recommendations made within the technical chapters of this ES (Volume II), and within the technical appendices in ES Volume III.

Transport

The measures shown in **Table 6.9.2** are proposed to minimise transport impacts during the construction stage.

Table 6.9.1
Transport Construction Mitigation Measures to be Implemented During the Construction Phase

Transport Construction Mitigation
Develop and implement a Construction Traffic Management Plan (CTMP) to reduce the effects of HGVs and worker vehicles throughout construction. As part of this, traffic management measures specifically designed to protect vulnerable road users such as pedestrians will be implemented; these measures include clearly delineated pedestrian routes and set hours of operation to reduce the likelihood of pedestrian / vehicle interaction. It must be additionally noted that adverse effects of construction will be temporary, and closely managed and monitored throughout the construction period

Air Quality

The best practice measures shown in **Table 6.9.2** are proposed to minimise air quality impacts during the construction stage.

Table 6.9.2
Air Quality Construction Mitigation Measures to be Implemented During the Construction Phase

Development Element	Mitigation Measure
Communication	– Develop and implement a stakeholder communications plan that includes community engagement before work commences on-site. – Display the name and contact details of person(s) accountable for air quality and dust issues on the application site boundary. This may be the environment manager/engineer or the site manager. – Display the head or regional office contact information. – Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority.
Site Management	– Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. – Make the complaints log available to the local authority upon request. – Record any exceptional incidents that cause dust and/or emissions, either on- or off- site, and the action taken to resolve the situation in the log book.
Monitoring	– Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the Local Authority upon request.

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Development Element	Mitigation Measure
	– Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
Site preparation	– Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible – Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. – Fully enclose site or specific operations where there is a high potential for dust production and they are active for an extensive period. – Avoid site runoff of water or mud. – Keep site fencing, barriers and scaffolding clean using wet methods. – Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used. – Cover, seed or fence stockpiles to prevent wind whipping.
Operating Vehicle/ Machinery and Sustainable Travel	– Ensure all vehicles switch off engines when stationary - no idling vehicles. – Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. – Produce a Construction Logistics Plan (CLP) to manage the sustainable delivery of goods and materials.
Operations	– Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques. – Ensure an adequate water supply on the site for effective dust suppression, using non-potable water where possible and appropriate. – Use enclosed chutes and conveyors and covered skips. – Minimise drop heights and use fine water sprays wherever appropriate. – Ensure equipment is available to clean any dry spillages, and clean up spillages as soon as reasonably practicable using wet cleaning methods
Waste Management	– Avoid bonfires and burning of waste materials.
Earthworks	– Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. – Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil as soon as practicable. – Only remove cover in small areas during work and not all at once.
Construction	– Avoid scabbling (roughening of concrete surfaces) if possible. – Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out. – Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems
Trackout	– Use water-assisted dust sweeper on access and local roads, if required. – Avoid dry sweeping of large areas. – Ensure vehicles entering and leaving site are covered to prevent escape of materials. – Record all inspections of haul routes and any subsequent action in a site log book. – Inspect haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably possible. – Implement a wheel washing system, if required. – Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. – Access gates to be located at least 10 m from receptors where possible.

Noise and Vibration

The best practice measures provided in **Table 6.9.3** are proposed to minimise Noise and Vibration impacts during the construction stage. These would be secured through the CEMP.

Table 6.9.3
Noise & Vibration Construction Mitigation Measures

Noise & Vibration Construction Mitigation
Best Practicable Means (BPM) as defined in Section 72 of the Control of Pollution Act 1974 will be employed to keep the level of noise and vibration generated on site as low as reasonably practicable. Measures to be considered in implementing BPM will be consistent with recommendations of BS 5228-1 and BS 5228-2 and will include but not be limited to: – Careful programming to ensure activities which may generate significant noise are planned well in advance and sensitive receptors are notified of the works; – Identification and use of low noise techniques. For example, equipment that breaks concrete by munching or similar, rather than by percussion. Where construction plant is known to generate significant levels of noise then it is to be used sparingly and the construction activity is to be closely monitored to minimise noise levels; – All plant brought on to site should comply with the relevant EC/UK noise limits applicable to that equipment or should be no noisier than would be expected based on the noise levels quoted in BS 5228-1. Plant should be properly maintained and operated in accordance with manufacturers’ recommendations; – Where feasible, all stationary plant should be located so that the noise at all occupied sensitive receptors is minimised and, if practicable, every item of static plant when in operation should be sound attenuated using methods based on the guidance and advice given in BS 5228-1 (e.g. local screening); – Items of plant on the site operating intermittently should be shut down in the intervening periods between use; – Adoption of a noise monitoring regime and the establishment of noise Action Levels in consultation with Wrexham CBC, above which consideration would be given to the use of alternative techniques and/or other means of controlling noise levels; – Use of hoarding to the required height and density appropriate to the noise sensitivity of the application site; and – Implementation of a Construction Logistics Plan (CLP) to pre-plan and manage traffic associated with the works to minimise disturbance to sensitive receptors. The CLP would include aspects such as operation of a ‘Just in Time’ policy for the delivery and supply of materials for the work to minimise the disruption to the local community. Implementation of a Construction Traffic Management Plan to reduce the effects of HGVs and worker vehicles throughout construction. As part of this, traffic management measures designed to mitigate noise effects to sensitive receptors will be implemented: these measures include set hours of operation, and traffic routing and scheduling of vehicle movements. Implementation of a CEMP to reduce vibration effects of from HGVs and excavation demolition and construction activities throughout the construction stage. Careful programming should be implemented to ensure activities which may generate noise and vibration are planned well in advance and sensitive receptors are notified of the works.

Biodiversity

The CEMP will implement the measures set out in **Table 6.9.4** to minimise potential effects to ecological receptors.

Table 6.9.4
Biodiversity Construction Mitigation Measures

Biodiversity Construction Mitigation
Implementation of the following measures within British Standard 42020: 2013 Biodiversity: Code of Practice for Planning and Development to minimize any potential localized indirect impacts from potential pollution events from construction machinery, runoff, lighting and dust arisings: – Minimum 8 m buffer zone around retained ponds; – Best practice measures to reduce noise, dust and vibration; and – Measures to reduce incidence of contamination e.g. silt fencing, no refuelling near ponds. Works will be undertaken in accordance with the mitigation strategy forming part of any European Protected Species Mitigation Licences (EPSML) obtained from NRW. An EPSML would be required for GCN, and could also be required for the following species, should they be found to be present within the application site: – Lesser Silver Water Beetle (LSWB);

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Biodiversity Construction Mitigation

- Roosting bats; and
- Badgers.

A sensitive lighting strategy will be employed throughout the construction period. This would include measures such as:

- Minimizing requirement for artificial lighting as far as is reasonable practicable both spatially and temporally;
- Focusing lighting towards work areas only;
- Directing lighting away from key habitat features such as ponds, trees and linear habitat features e.g. hedgerows, with an increase of less than 1 Lux within 10 m of these features;
- Maintaining dark corridors around application site boundaries;
- Preferential use of LED and warm white lighting; and
- No upward light spill.

Buildings will be demolished in winter (November – March) when bats are least likely to be present. If this is not possible, buildings would be demolished using Reasonable Avoidance Measures (RAMs) and following a pre-commencement check of the buildings by a bat licensed ecologist. Removal of potential roost features (PRFs) by hand may be required if deemed appropriate following this check.

Trees assessed as having low suitability for roosting bats will be removed via a soft fell under the supervision of a bat licensed ecologist. In respect of habitats to be retained, exclusion zones will be created, within which construction activities will not occur. In this regard, root protection areas (RPAs) will be suitably fenced off for trees to be retained. In addition to the RPAs, a wider construction exclusion zone (CEZ) will be established for the veteran tree in the centre of the application site. Surrounding tree cover and waterbodies to the east of the veteran tree will be retained to preserve the immediate environment around the tree and avoid changes to existing shelter, shading and hydrology.

All excavations will be covered overnight or would have a ramp included so that nocturnal species do not get trapped within them.

Clearance of suitable nesting habitat will be undertaken outside of the typical nesting season (considered to be March to August inclusive). Where this is not possible and works need to be carried out during the bird breeding season, a nesting bird check of vegetation to be cleared or buildings to be demolished must be undertaken by an experienced ecologist no more than 24 hours prior to clearance. If any active bird nests are discovered these would be given a minimum standoff of 5 m (this may increase depending on the species/proposed works and location) within which no potentially disturbing works would take place until the young have fledged and the nest vacated. A second nesting bird check would then be undertaken to ensure the tree/vegetation does not contain any further active nests prior to felling/removal works taking place.

Ground Conditions and Contamination

Table 6.9.5 sets out the CEMP requirements relevant to ground conditions and contamination.

Table 6.9.5
Ground Conditions and Contamination Construction Mitigation Measures

Ground Conditions and Contamination Mitigation measure

Asbestos Containing Materials (ACM) surveys will be completed on existing buildings, prior to the commencement of demolition works, to identify if asbestos is present. Where present, demolition would be preceded by the removal of asbestos by licensed contractors as required by the Control of Asbestos Regulations (2012)

Chemicals, fuels and oils will be stored correctly in line with best practice and legislation, utilising secondary containment, bunds and drip trays as appropriate.

Designated refueling areas will be assigned for vehicles and equipment to minimise the risk of spills entering the environment.

Concrete washout will be managed appropriately.

Ground Conditions and Contamination Mitigation measure

A Pollution Incident Control Plan will be produced and will include the detailed procedures for the response to a pollution incident and consideration of any required dewatering activities.

Emergency response spill kits will be provided at appropriate signposted locations within the construction site. Training will be provided for staff to ensure detailed procedures for the response to a pollution incident are known.

Prior to the start of any works on-site, ground Investigation will be carried out to confirm the anticipated ground and groundwater conditions indicated by the Preliminary Risk Assessment. The proposed ground investigation will include testing of existing soils in order to confirm the presence/absence of any contamination present. If required, a remediation strategy would be prepared to record how the remediation works would be undertaken to ensure the site is 'Suitable for Use' and will not present a risk to human health, groundwater, or the built environment. Mitigation measures that would be included within the remediation strategy would include:

- Removal of any contamination hot spots;
- In-situ or off site remediation of contaminated soils or groundwater;
- Requirements for clean cover systems within areas of soft landscaping; and
- The relevant compliance criteria suitable for the proposed end use (including for imported material) as well as any monitoring required for verification.

The proposed development design (including concrete design & infrastructure specification, as well as the requirement for clean cover & landscaping and gas protection measures) will also be informed by the findings of the ground investigation.

Due to the potential for ground gas and depleted oxygen, construction and maintenance workers undertaking sub surface works will refer to relevant Occupational Health guidance of working in hypoxic environments and employ appropriate protection and control measures.

Built Heritage

The best practice measures shown in **Table 6.9.6** are proposed to minimise built heritage impacts during the construction stage. Refer to the standalone Heritage Impact Assessment for further information.

Table 6.9.6
Built Heritage Construction Mitigation Measures

Built Heritage Construction Mitigation

The loss of Important hedgerows will be mitigated by preservation through record in the form of a targeted archaeological survey to record the hedgerow profiles, associated earthworks and stratigraphic makeup, as well as to enable finds recovery which would help understand the historic development of the application site.

6.10. Works Cited

1. legislation.co.uk. Private Security Industry Act 2001. [Online] [Cited: 20 March 2018.] <https://www.legislation.gov.uk/ukpga/2001/12/contents>.
2. —. The Construction (Design and Management) Regulations 2015. [Online] [Cited: 20 March 2018.] <http://www.legislation.gov.uk/uksi/2015/51/contents/made>.