Chapter 10: Mitigation and Monitoring

INTRODUCTION

10.1 In this chapter, Table 10.1 and Table 10.2 present the environmental mitigation and monitoring measures required for the Proposed Development, as identified as a result of the Environmental Impact Assessment (EIA) process and described within this Environmental Statement (ES). The environmental mitigation and monitoring measures presented include those which are standard measures / commitments that would be adopted as a matter of course to meet best practice guidance in relation to the demolition and construction works; and any additional, project bespoke mitigation measures and monitoring that have been identified as being required by the EIA.

10.2 Table 10.1 does not address any environmental design measures which have been identified over the course of the design evolution and EIA process, and have been subsequently embedded into the design of the Proposed Development. Securing these measures will be via planning consent of the scheme sought for approval.

10.3 The environmental mitigation and monitoring measures presented in Table 10.1 and Table 10.2 are measures that Woking Borough Council (WBC) will need to secure for the project, either using Planning Conditions (related to the Planning Permission (as relevant)) or through the S106 Agreement Heads of Terms. The following schedule is structured to describe the environmental mitigation and monitoring measures for the Proposed Development that:

- Will be implemented throughout the demolition and construction works (Table 10.1); and
- Will be implemented / undertaken once the Proposed Development is built and in operation / use (Table 10.2).

10.4 The mitigation and monitoring measures have been developed through coordination with the Applicant, Design Team and EIA technical specialists to ensure the environmental mitigation and monitoring measures suggested are deliverable and are considered appropriate in terms of their ability to mitigate likely significant adverse environmental effects associated with the Proposed Development. While tailored to the Proposed Development, none of the mitigation and monitoring measures which have been identified are non-standard and as such, the effects of their implementation are well understood.

10.5 It is noted that in support of the planning application, a number of other documents have been prepared and submitted in regard to matters such as operational commitments and design quality. Where relevant to the EIA, these are presented in Table 10.1 and Table 10.2 below.

Table 10.1 Mitigation and Monitoring Schedule – Pre-Commencement, Demolition and Construction

ENVIRONMENTAL MITIGATION	ES REFERENCE	PROPOSED MECHANISM TO SECURE
ENVIRONMENTAL MANAGEMENT PLANS		
The following plans are to be prepared, submitted and approved by the local planning authority as part of Pre-Commencement activities: – Construction Management Plan (CEMP), to include the following ▪ Noise and Vibrations Controls; ▪ Dust Management Plan; and ▪ Neighbour and Public Relations Strategy. – Site Waste Management Plan (SWMP). – Construction Logistics Plan; – Geo-environmental Investigation – Action Plan. The detail regarding the requirements for each of the above plans is listed below under Demolition, Construction and Refurbishment when it is expected that they each will be implemented by the Principal Contractor.	***ES Volume 1, Chapter 5: Demolition and Construction***	Planning Condition
Registration with the 'Considerate Constructors Scheme'.		
POST-GEO-ENVIRONMENTAL INVESTIGATION ACTIONS		
Intrusive investigation is undertaken to further assess the potential pollutant linkages identified. The investigation will include installation of monitoring wells for ground gas monitoring and/or groundwater sampling.	**Geo-Environmental and Geotechnical Assessment (Ground Investigation) Report** (Standalone Report)	Planning Condition
SURVEYS AND CONSENTS / LICENCES		
The following pre-commencement surveys and investigations are envisaged: – Asbestos surveys; – Nesting birds / bats survey; – Condition survey of any adjoining party walls, boundary walls, and public highways; – Structural surveys (pre-demolition appraisal) of existing construction; – Utility surveys to determine the position of any assets; – Buried services ground penetration survey to determine existing service routes and validate the above utility survey information; – CCTV survey of the surface water and foul water drainage to confirm size and condition; – Condition survey of perimeter roads; and	***ES Volume 1, Chapter 5: Demolition and Construction***	Planning Condition

ENVIRONMENTAL MITIGATION	ES REFERENCE	PROPOSED MECHANISM TO SECURE
– Archaeological watching brief for all substructure works.		
All necessary consents and licences required to commence any on-site activity will be obtained ahead of the works commencing, giving the appropriate notice period. These will include: – Communication with the various parties regarding the use tower cranes (particularly oversailing rights), as the site is located adjacent to public and private third-party land. Construction activities that have the potential to generate a direct impact on the land under public and private ownership will be agreed with the owners, including (but not limited to) hoarding positions, temporary footpath diversions, connections / diversions of any private drainage or utilities, and temporary unloading on the roads. The Applicant and Principal Contractor will develop a good working relationship with WBC and the community through the planning stages; this relationship will be maintained; – Connections to existing statutory services and main sewers; – Licenses for the discharge of water from the site into the public sewer, if required; – Party Wall Act notices and agreements, if required; – Approval of a CEMP, including any specific agreements relating to the control and monitoring of construction logistics and aspects such as demolition and construction noise; and – Section 80 Demolition Notice application(s) to the Local Authority Building Control, triggered following planning consent with the works being undertaken under a Section 81 Counter Notice.		
CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)		
Throughout the project, the Contractors will ensure the following: – 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 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 WBC; – Make the complaints log available to WBC when asked; – Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to WBC when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary; and – Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	***ES Volume 1, Chapter 5: Demolition and Construction***	Planning Condition
Implementation and compliance with the approved CEMP adhering to the following minimum requirements: – A broad plan of the works, highlighting the various stages and their context within the project, including a full schedule of materials and manpower resources, as well as plant and equipment schedules; – Detailed site layout arrangements (including requirements for temporary works) showing locations of site offices, ancillary buildings, plant, wheel-washing facilities, stacking bays, car parking;· – Plans for storage, accommodation, vehicular movements, delivery and access; – Site logistics and operations; – Site working hours;· – Health and safety, procedures for site inductions;· – Prohibited or restricted operations (locations, hours, etc.); – Details of plant to be used and associated noise levels;· – Programme and phasing details of the works indicating the predicted noise and vibration levels for each activity at specified noise sensitive sites for each phase of the works. Where work phases overlap the cumulative noise and vibration impacts shall be predicted; – Demolition and construction activities will be controlled to limit noise emissions. 'Best Practicable Means' will be used to control and reduce levels in accordance with a Section 61 application of the Control of Pollution Act – Details of operations that are likely to result in disturbance, with an indication of the expected duration of each phase with key dates, including a procedure for prior notification to the WBC and relevant statutory and non-statutory (including neighbours) parties so that local arrangements can be agreed;· – Training to ensure that all workforce and employees are aware of procedures to reduce and mitigate impacts;· – A procedure to ensure communication is maintained with the WBC and the local community to provide information on any operations likely to cause disturbance (through, for example, meetings and newsletters);· – Provisions for affected parties to register complaints and the procedures for responding to complaints;· – Measures for the protection ecological resources (including tree protection); (SEE·**ECOLOGY**) – Approaches to screening, including the erection of hoarding around the works site. The boundary of each phase's construction area will be established, and the minimum of 2.4m high, solid perimeter hoarding will be erected around the site, along the boundary line. The hoarding will remain fixed in position until handover and occupation of each phase. Safe site access routes onto Kingfield Road and Westfield Avenue will be established; – Measures to control and monitor air pollution, considering the Mayor of London and London Council's guidance document 'The Control of Dust and Emissions from Construction and Demolition' (see below CE**MP - DUST MANAGEMENT PLAN**); – Provisions for reporting to the WBC; – Safety for highway users, cyclists and pedestrians; – Protection of heritage assets and procedures for dealing with uncovered archaeological sites; – Waste minimisation and management procedures;· – Site remediation and procedures for dealing with contaminated material; – Measures for the protection of water resources and preventing contaminated runoff, settlement facilities and oil / petrol interceptors; – Procedures for dealing with unexploded ordnance; – Energy conservation measures; – Minimising lighting and light spill; being sensitive to the position and direction of lighting in relation to neighbouring residences;· – Storage of any skips, oil and chemical storage, etc.;		

ENVIRONMENTAL MITIGATION	ES REFERENCE	PROPOSED MECHANISM TO SECURE
– Details of the emergency incident procedure; – Approval of discharge arrangements into the foul water sewer with Thames Water Utilities Limited (TWUL); – Use of Personal Protective Equipment (PPE); – Access requirements for enclosed spaces below ground, particularly in relation to vapour / gas migration in such enclosed spaces; – Emergency procedures and fire exit routes from the site will be identified within a fire safety plan. Throughout the course of the construction works these will be regularly inspected and maintained. The fire safety plan will be updated regularly as construction works progress, particularly as areas become progressively completed, and as the means of escape from the evolving building change. Fire alarm points and extinguishers will be situated at each floor of the buildings at the stair cores and within main corridors. – Manage Neighbourhood and Public Relations (see below CEMP – NEIGHBOURHOOD AND PUBLIC RELATIONS STRATEGY). – Traffic and construction logistics, including measures to reduce vehicle movements;· – Details of access and egress and proposed routes for HGVs (site access points in predominantly residential areas must be avoided, unless there is no other reasonable alternative in which case any impact on the residential amenity must be minimised); – The Contractor will incorporate the following measures into the demolition and construction works, to avoid noise related impacts from construction traffic: ▪ Vehicles will not wait or queue up with engines running on the site or the public highway; ▪ Vehicles will be properly maintained to comply with noise emissions standards; ▪ Deliveries will be restricted to be within working hours of the site; and ▪ Design and routing of access routes will minimise vehicle noise and the need to perform reversing manoeuvres. – All hazardous materials (such as fluorescent tubes, fridges and air conditioning units) will be identified and removed, and any live services will be terminated, before the soft stripping of the buildings and subsequent removal of internal debris commences.		
DUST MANAGEMENT PLAN		
The following is a set of best-practice measures from the Institute of Air Quality Management (IAQM) guidance (IAQM, 2016) that should be incorporated into the specification for the works. These measures should ideally be written into a Dust Management Plan. Some of the measures may only be necessary during specific phases of work, or during activities with a high potential to produce dust, and the list should be refined and expanded upon in liaison with the construction contractor when producing the Dust Management Plan. **Communications** – Develop and implement a stakeholder communications plan that includes community engagement before and during work on site; – Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environmental manager / engineer or the site manager; and – Display the head or regional office contact information. **Dust Management Plan** – Develop and implement a Dust Management Plan (DMP) approved by WBC which documents the mitigation measures to be applied, and the procedures for their implementation and management. **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 WBC when asked; – Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the log book; and – Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport / deliveries which might be using the same strategic road network routes. **Monitoring** – Undertake daily on-site and off-site inspections where receptors (including roads) are nearby, to monitor dust. Record inspection results, and make the log available to WBC when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of the site boundary, with cleaning to be provided if necessary; – Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to WBC when asked; – 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; and – Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with WBC. Where possible, commence baseline monitoring at least three months before work commences on site or, if it is a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction (IAQM, 2018). **Preparing and Maintaining the Site** – Plan the 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 the site is 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 on site. If they are being re-used on-site cover as described below; and – Cover, seed, or fence stockpiles to prevent wind whipping. **Operating Vehicle / Machinery and Sustainable Travel** – Ensure all vehicles switch off their 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; – Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate); – Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials; and – Implement a Travel Plan that supports and encourages sustainable staff travel (public transport, cycling, walking, and car-sharing).	***ES Volume 1, Chapter 5: Demolition and Construction***	Planning Condition

ENVIRONMENTAL MITIGATION	ES REFERENCE	PROPOSED MECHANISM TO SECURE
Operations – Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems; – Ensure an adequate water supply on the site for effective dust / particulate matter suppression / mitigation, using non-potable water where possible and appropriate; – Use enclosed chutes, conveyors and covered skips; – Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and – Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods. **Waste Management** – Avoid bonfires and burning of waste materials. **Measures Specific to Demolition** – Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust); – Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground; – Avoid explosive blasting, using appropriate manual or mechanical alternatives; and – Bag and remove any biological debris or damp down such material before demolition. **Measures Specific to 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; and – Only remove the cover from small areas during work, not all at once. **Measures Specific to 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, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place; – Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery; and – For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust. **Measures Specific to Trackout** – Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use; – Avoid dry sweeping of large areas; – Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport; – Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable; – Record all inspections of haul routes and any subsequent action in a site log book; – Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems or mobile water bowsers, and regularly cleaned; – Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable); – 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; and – Access gates should be located at least 10m from receptors, where possible.		
NEIGHBOUR AND PUBLIC RELATIONS STRATEGY		
Implementation and compliance with the approved 'Neighbour and Public Relations Strategy', to include the following minimum requirements: <u>Initial Contact:</u> – Once full planning permission has been obtained and contractors have been appointed, formal contact will be established with the nearest neighbours and those who could potentially be affected by the construction works; <u>Contact during Works Period</u> – A single point of contact for neighbour and public relations will be established, with a senior member of the project staff nominated for the role. Contact details for this single point of contact will be displayed on the site hoarding. Outside normal working hours, site security will act as the main point of contact via a dedicated phone number. Security will alert the staff contact if necessary (available 24 hours). Should there be any complaints, these will be logged, fully investigated and reported to the relevant department within WBC as soon as possible. The complainant will be informed as to what action has been taken; and Contact with neighbours and the general public throughout the construction programme will be pro-actively maintained, with regular meetings held on no less than on a quarterly basis to update neighbours and the general public. Brief news sheets will be issued that will report on progress of construction works and will be maintained on site hoarding.	***ES Volume 1, Chapter 5: Demolition and Construction***	Planning Condition
SITE WASTE MANAGEMENT PLAN		

ENVIRONMENTAL MITIGATION	ES REFERENCE	PROPOSED MECHANISM TO SECURE
Implementation and compliance with the approved SWMP adhering to the following minimum requirements: – A 'just-in-time' material delivery system to avoid materials being stockpiled and spoiling during bad weather; – Development of a logistics plan for the project, to ensure that due consideration is given to material requirements throughout the construction phase. This will enable efficient management of the delivery and storage of materials and will ensure that the most effective logistic methods are adopted; – Appropriate handling and disposal of pile arisings, concrete, pastes and/or grouts during the laying of foundations will be undertaken; – Consideration of material quantity requirements to avoid over-ordering and generation of waste materials; – Designated storage area for new building materials, to reduce the risk of contamination / spoiling; – Undertake a Waste Characterisation assessment as part of remediation works if the Remediation Strategy identifies this is required. – Aim to maximise the use of reclaimed or recycled materials throughout the design where feasible; – Segregation of waste at source where practical; – Segregation of waste streams. At a minimum, containers/skips for hazardous/non-hazardous waste and plasterboard waste should be provided on-site; – Skips will be clearly colour-coded and signposted to reduce risk of cross contamination; – Provision of training for site personnel regarding the correct disposal of materials; – All waste generated will be stored in designated areas isolated from surface drainage; – Waste containers will be covered, to prevent dust and litter from escaping and rainwater from accumulating; – Regular inspection of waste containers, and replacement when full; – Agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme; – Engage with the supply chain to source products and materials that use minimal packaging and segregate packaging for re-use; – Re-use of materials onsite wherever feasible, in line with the Waste Hierarchy; – Re-use and recycling of materials off-site where re-use on-site is not practical (e.g. through use of an off-site waste segregation facility and re-sale for direct re-use or re-processing); – Engage with the supply chain to source products which use minimal packaging, and segregate packaging for re-use; – Risk of infestation by pests or vermin is to be minimised by making adequate arrangements for the disposal of food and other material that may attract pests; – Burning of wastes or unwanted materials will not be permitted on-site. – All liquids and solids of a potentially hazardous nature (e.g. diesel fuel, oils and solvents) are to be stored in designated locations with specific measures to prevent leakage and release of their contents, include the siting of storage area away from surface water drains, on an impermeable base with an impermeable bund that has no outflow and is of adequate capacity to contain 110% of the contents, in accordance with the EA's requirements. Any tanks storing more than 200 litres of oil on-site, would have secondary bunding.	***ES Volume 1, Chapter 5: Demolition and Construction***	Planning Condition
ARBORICULTURE		
Site Specific Issues The site is the subject of Area Tree Preservation Order ref. 626/0154/1973 and does not appear to have been resurveyed since 1971. The site and surrounding area will have altered substantially since that time and a detailed resurvey of the site will be necessary and should be undertaken by the Council in order to confirm the locations of protected trees. However, until this has been carried out, as a precaution, it should be the default position that all trees on site are assumed to be protected. In the case that the trees are protected, any works to these trees must first have the prior written consent of Woking Borough Council[1], unless full planning permission specifically detailing the proposed works has been granted and has not expired. Consent should be sought by the submission of a tree works application, details of which can be found on The Planning Portal national planning application service.	**Arboricultural Impact Assessment** (standalone report)	Planning Condition
Tree Works The following tree pruning, and removal operations will be required prior to the commencement of demolition and construction works in order to facilitate access for development. – Trees T1, T4, T5, T6, T17, T19, G1, G2, G3 andG4 will require removal. – Woodland block W1 will require the removal of 25% of its northern canopy extents. A Tree Retention and Removal Plan showing an indicative area requiring removal is provided in Appendix 3 of this Report. – T2 will require lower lateral branches in its south-east and west canopy quadrants, crown lifting to a height of 3m above ground level. – T3 will require lower lateral branches in its southern canopy quadrant, crown lifting to a height of 4m above ground level. – Pedunculate oak trees T10 and T11 will require lateral branches in their south-east canopy quadrants shortening in length by 2.5m. Although not specifically required for the purposes of evaluating design proposals and layouts, preliminary recommendations for tree management are provided below: – Trees T2, T22, T27, T28 and group G8 should have any retained deadwood removed from their canopy extents as a health and safety precaution – All ivy clad trees for which inspection was inhibited should have the ivy cleared and then re-inspected by a trained and competent arboriculturalist; and – Trees T18 and T29 should be removed due to their poor condition. All tree works and ivy removal, should give due consideration to the potential presence of protected species, including breeding birds and roosting bats. The Preliminary Ecological Appraisal (The Ecology Consultancy, 2019) and any subsequent ecological reports should be consulted prior to the commencement of works. Arisings from tree works (e.g. wood piles and standing dead trunks) can provide valuable habitats for wildlife. As such, consideration should be given to their retention on site in areas unlikely to cause issues to public health and safety. It is recommended that building and road footprints are carefully planned to generally avoid the need for excessive tree surgery. All design layouts should ensure that there is sufficient space between the canopy and the building line to allow construction buffers, scaffolding, future building maintenance and access ensuring a satisfactory spatial quality. All tree pruning should be carefully planned and undertaken in accordance with BS 3998: 2010 Recommendation for Tree Works. Any recommendations highlighting the management of potentially hazardous trees should be reviewed as soon as is practically possible.		
Mitigation		

[1] This restriction does not apply to trees protected by Tree Preservation Orders if the tree in question is dead, if the works are necessary to remove an immediate risk of serious harm or for the removal of dead branches from a living tree. In these situations, written notice should be given to the council at least five working days prior to the date of the commencement of works. For full details on Tree Preservation order restrictions and exceptions, see The Town and Country Planning (Tree Preservation) (England) Regulations 2012.

ENVIRONMENTAL MITIGATION	ES REFERENCE	PROPOSED MECHANISM TO SECURE
A scheme of soft landscaping Ref: A241-ER-GA Landscape General Arrangement (Arc Landscape Design, 2019), has been prepared and includes tree planting details which address the potential loss of visual public amenity where tree removal has been deemed unavoidable. The tree selection should be appropriate to the site and chosen from a species palette in accordance with local tree planting policies, as well as being in accordance with any recommendations provided in the Preliminary Ecological Appraisal and any subsequent ecology reports. Often the need for future remedial pruning or tree removal can be avoided through careful species selection and planning during the design of the mitigation planting scheme. The positioning of mitigation planting in relation to new or existing buildings should take full account of the final canopy height and spread of all trees included in the planting scheme. Buildings should ideally be located a sufficient distance from the predicted canopy line and RPA to avoid future pressure to undertake remedial pruning or tree removal. **Edge planting and mitigation tree works for W1** Removal of the northern edge of W1 will require significant numbers of new planting to separate the woodland edge from the proposed development site. This will protect the newly exposed edge from wind throw, while also providing a wildlife buffer between the woodland and new David Lloyd complex and residential properties.. This will likely require the removal of an additional 5m buffer between site and woodland boundaries in order to create space to install the proposed edge planting. Additionally, it may be prudent to undertake selective reductions to established trees forming the new woodland edge, shaping the canopy structure to reduce wind loading and shear stress on established trees. Planting and mitigation pruning should be staged into layers, separating the new woodland edge from the proposed site. – The first layer should comprise a continuous hedgerow layer of mixed native shrubs to be planted directly adjacent to the southern boundary of the development site, to act as an initial windbreak and wildlife vector. The hedgerow layer should be interspersed with standard native trees of smaller species, i.e. field maple, to be planted at even intervals, providing diversity and structure to the woodland edge. – A secondary layer of evenly spaced heavy/extra heavy standard trees of larger species, i.e. oak should be planted behind the hedgerow layer to provide a second stage of shelter belt/windbreaking. New tree planting should be interspersed with mixed native shrubs to provide weed suppression and wildlife continuity. – Existing trees on the woodland edge should be selectively reduced in order to achieve a continuous canopy line with the new trees in the secondary layer. Where appropriate, gaps created within the existing woodland canopy line should be bolstered with the planting of additional heavy standards interspersed between existing, established trees to form one continuous canopy. Recommended mitigation works to the new woodland edge should be undertaken and completed prior to the commencement of any demolition or construction works on site. Once planted, new edge planting should be barriered off from demolition and construction works using protective fencing in accordance with figure 2 of BS 5837:2012. New edge planting should be included in a schedule of aftercare and maintenance, including irrigation, as well as protection and formative pruning during establishment. Specifications for aftercare should be appropriate to the proposed planting and should be in compliance with Section 11 of BS 8545:2014 Trees from nursery to establishment in the landscape-Recommendations.		
Issues For The Arboricultural Method Statement The location of new buildings should take into consideration the maximum canopy height and width of all trees to be retained. Buildings should ideally be situated beyond the RPAs of the trees to be retained and allow sufficient distance from the existing canopy line to avoid future pressure to undertake remedial pruning or tree removal. Where the location of buildings inside the RPA is unavoidable, special engineering of foundations will be required and presented in a future method statement. In order to minimise disturbance in the RPAs of retained trees, excavation into the soil or soil regrading should not be a requirement of finalised construction layouts, existing levels should remain intact and should be protected from overloading to prevent soil compaction. Protective fencing should be installed accordance with figure 2 of BS 5837:2012 to enable the safe retention of trees to be retained. The positioning of tree protection and the establishment of construction exclusion zones (CEZ) should initially be based upon the root protection areas as described in Appendix 1 and should be in place prior to the commencement of works. All works should be undertaken from outside the RPA wherever possible. Where working in an RPA is unavoidable, ground protective measures fully compliant with section 6.2 of BS 5837: 2012 and agreed by the consulting arboriculturalist should be implemented. Where construction of new buildings or hardstanding inside RPAs is likely to significantly impact a trees physiological or structural condition, specialist methods of construction should be developed and specified as part of the Arboricultural Method Statement.		
ECOLOGY		
– **CEMP**: A Construction Environmental Management Plan (CEMP) will be produced prior to the start of demolition and construction works, which will detail all mitigation measures to be undertaken during the construction of the site and will include the mitigation measures outlined below. – **Bats**: Best practice guidance for low potential trees is for them to be removed following precautionary mitigation measures, typically by soft-felling the trees under ecological supervision. While the potential for effects cannot be ruled out, the risk of killing/injury is significantly reduced, and appropriate roost compensation can be provided as necessary. Lighting at night will be strictly controlled during construction and no trees or hedges will be lit. Although there will be no significant effects on bats, prior to the felling of trees with low bat roosting potential, at least five bat boxes suitable for a variety of species and roost types will be installed on retained trees within the woodland at least 15m from the edge of the woodland. In the unlikely event that roosting bats are disturbed during vegetation clearance the bat boxes can be used to put the bat(s) in if captured and would form compensatory roosts. – **Reptiles**: Standard mitigation in the form of a supervised two-stage vegetation cut March-October will be undertaken to reduce the risk of killing or injuring of reptiles to displace them to adjacent suitable habitat. To further mitigate effects, any log or brash piles and scrub will be removed by hand under the supervision of an ecologist. The pulling up of the root balls of any removed trees or scrub on or near the northern boundary of the site will be undertaken outside of the hibernation season for reptiles (i.e. root removal works will be undertaken March to October inclusive in temperatures 10oC or higher) under the supervision of an ecologist, who will also be checking for stag beetle larvae. New log and brash piles and potentially a hibernaculum will be created in the woodland or on the boundary with the railway using material from the clearance of the site. – **Birds**: Mitigation will be employed in the form of avoiding clearing trees and scrub during the nesting bird season or where not possible, only clearing trees and scrub following a nesting bird check by an ecologist who confirms that no active nests are present. – **Hedgehog**: Any log or brash piles and thick scrub within the construction zone will be cleared by hand under the supervision of an ecologist to mitigate the potential killing/injury of hedgehog. New log and brash piles will be created using material from site, to be located in undisturbed areas of retained woodland to ensure suitable refuge for hedgehog exists on site following construction. – **Common toad**:. Any log or brash piles, thick scrub and leaf litter within the construction zone will be cleared by hand under the supervision of an ecologist to mitigate the potential killing/injury of common toad. New log and brash piles will be created using material from site, to be located in undisturbed areas of retained woodland to ensure suitable refuge for common toad exists on site following construction. – **Stag beetle**: Although there will be no significant effects (i.e. negligible effect) on stag beetle, any deadwood within the construction zone will be carefully moved by hand to an unaffected area of the site within the woodland under the supervision of an ecologist and stumps removed from site partially reburied at the margin of retained woodland. Partially buried (upright, at least half their length) log piles using wood from the clearance of trees on site will be added to unaffected areas of the woodland, which is unlikely to alter the effect (not significant (negligible)) on stag beetle and other invertebrates. If logs from outside the site are used, they will be untreated. <u>Other protected species</u> In the unlikely event that any other protected species are found during management works on site, the works must stop immediately and advice sought from a suitably qualified ecologist on how to proceed. Recommendation (not required mitigation) - At least five bird boxes erected in the woodland and ten bird boxes for house sparrow on new buildings would constitute an enhancement for birds.	***ES Volume 2, Appendix: Ecology (Annex 2 – Updated Preliminary Ecological Appraisal)***	Planning Condition

ENVIRONMENTAL MITIGATION	ES REFERENCE	PROPOSED MECHANISM TO SECURE
ARCHAEOLOGY		
A watching brief in accordance with an approved Written Scheme of Investigation (WSI) during ground works.	***ES Volume 2, Appendix: EIA Methodology (Annex 8 – Updated Historic Environment Assessment)***	Planning Condition
CLIMATE CHANGE		
A Site Waste Management Plan (SWWP) will be developed prior to construction, outlining waste management plans for excavation and construction onsite. Opportunities to retain and reuse material generated by the site enabling works will be explored and exploited where available. The selection of sustainable material with a low environmental impact and their sustainable procurement are to be a key parameter in the specification of material, together with their end-of-life disposal. Consideration will be given to materials specified, with the BRE's Green Guide to Specification and Environmental Product Declaration (EPDs) as methods available to guide this process. Materials are to be locally sourced, and from recycled sources where viable and in line with the proposed design intent. Full consideration of the sites environmental context when specifying external materials will be given, providing long-lasting robust landscape. The design team will investigate various constructability techniques, including pre-fabrication and end-of-life disassembly.	***ES Volume 2, Appendix: EIA Methodology (Annex 4 – Greenhouse Gas Emissions Assessment)***	Planning Condition

Table 10.2 Mitigation and Monitoring Schedule – Completed Development

ENVIRONMENTAL MITIGATION	ES REFERENCE	Proposed Mechanism to Secure
HIGHWAYS AND TRANSPORT		
A Travel Plan for the David Lloyd Leisure Centre has been produced and submitted as a standalone report for the planning application.	**David Lloyd Workplace Travel Plan** (Standalone Report)	Planning Condition
AIR QUALITY		
– Using Air Source Heat Pumps within the David Lloyd Leisure Centre to reduce the heating demand required from the energy plant; and – Providing pedestrian and cycle access to the Proposed Development, including cycle parking (20 spaces associated with the proposed David Lloyd Leisure Centre).	***ES Volume 1, Chapter 7: Air Quality***	Planning Condition
NOISE AND VIBRATION		
– The mitigation measures required to achieve appropriate internal and external noise levels, in line with the recommendations in BS 8233:2014 – Any noise producing building services plant associated with the Proposed Development will be controlled in accordance with the guidance found in BS 4142:2014 and the Local Authorities general requirements	***ES Volume 2, Appendix: EIA Methodology (Annex 6 – Residential Planning Noise and Vibration Report)***	Planning Condition
DAYLIGHT, SUNLIGHT, OVERSHADOWING, LIGHT POLLUTION & SOLAR GLARE		
Light Pollution: A lighting scheme will be produced, which will be reviewed by an ecologist to ensure lighting impacts on bats are minimised. Where necessary, the lighting scheme will be adjusted in accordance with Institute of Lighting Professionals (ILP) and Bat Conservation Trust (BCT) guidance on lighting[2]. There will be no lighting of retained vegetation such as the woodland.	***ES Volume 1, Chapter 6: Ecology***	Planning Condition
ECOLOGY		
Thames Basins Heaths SPA, Thursley, Ash, Pirbright and Chobham SAC, Smart's and Prey Heaths SSSI, Mayford Meadows LNR: The appropriate payment to WBC towards strategic Suitable Alternative Natural Greenspace (SANG) will be made. **LEMP**: A Landscape Ecological Management Plan (LEMP) will be produced, which will set out how new and retained habitats will be managed for the benefit of ecological features. **Bats**: Barriers to public access into the woodland in the form of scrub planting on the boundaries of the woodland will be put in place, which will mitigate the possible disturbance/vandalism of potential bat roosts within the woodland. A lighting scheme will be produced, which will be reviewed by an ecologist to ensure lighting impacts on bats are minimised. Where necessary, the lighting scheme will be adjusted in accordance with Institute of Lighting Professionals (ILP) and Bat Conservation Trust (BCT) guidance on lighting.. There will be no lighting of retained vegetation such as the woodland. **Birds**: Other than minor general management measures such as cleaning of bird boxes, which will be detailed in the LEMP, no additional mitigation for birds following construction is proposed or required. **Hedgehog**: Holes/gaps approximately 10x10cm in garden and other boundaries will allow movement of hedgehogs, which have large ranges, through vegetated parts of the Proposed Development. **Common toad**: There will be no significant effects on common toad following completion of the development. However, the holes/gaps in garden boundaries provided for hedgehog will also allow movement of common toad, frogs and other wildlife through vegetated parts of the new development. **Stag beetle**: Although there will be no significant effects on stag beetle, the measures proposed to control vandalism and lighting for roosting bats (i.e. dense scrub planting at woodland edges and no lighting of vegetation) would also mitigate the same impacts for stag beetle.	***ES Volume 1, Chapter 6: Ecology***	Planning Condition
CLIMATE CHANGE		
A Workplace Travel Plan (WTP) has been developed for the Proposed Development which sets out an overarching objective; "to put in place the management tools deemed necessary to enable employees and visitors of the David Lloyd Club to make more informed decisions about their travel, which minimises the adverse effects of their travel on the environment. This is achieved by setting out a strategy for eliminating the barriers keeping employees and visitors from using sustainable modes which in effect self manages single-occupancy vehicle use." The Proposed Development will achieve an overall total on-site carbon reduction of 31.1% relative to Part L of the Building Regulations, with a 39.8% improvement for the residential section, which complies with the Part L1A and L2A building regulations. To achieve to reductions, the following measures are proposed to minimise energy consumption, as set out in the residential Energy Strategy17 and Sustainability Statement : The proposed building fabric is designed to exceed the minimum fabric requirements of Building Regulations Part L, where possible and feasible. Building fenestration balances the need of good daylight, without leading to excessive summer time solar gain; The project is designed for natural ventilation, when climate allows, with mechanical ventilation with heat recovery (MVHR) systems providing ventilation when natural ventilation is not appropriate; and a range of low and zero carbon technologies will be implemented including Air Source Heat Pumps and photovoltaics. Improve the U-values beyond the NCM valves required by Building Regulations in order to reduce heat loss from the building; solar shading to windows will reduce the solar gains to the building, which can reduce or potentially eliminate the requirement for comfort cooling; use of LED lighting to increase efficiency in the lighting of the building; A CHP plant will be installed to generate usable heat and power for the leisure centre. CHP typically achieves a 35% reduction in primary energy usage compared with power stations and heat only boilers; and Air Source Heat Pumps will be installed to reduce the heating requirements from the proposed boiler plant. Facilities throughout the Proposed Development will be provided with recycling facilities that will allow for source separation of waste within dwellings and non-residential buildings. This will cause indirect reductions in GHG emissions through reduced GHG emissions within the manufacturing process of goods.	***ES Volume 2, Appendix: EIA Methodology (Annex 4 – Greenhouse Gas Emissions Assessment)*** **Energy Strategy** (Standalone Report)	Planning Condition

[2] Miles, J., Ferguson, J., Smith, N. and Fox, H. (2018). *Bats and artificial lighting in the UK. Guidance Note 08/18*. Institution of Lighting Professionals.