

3.0 DESCRIPTION OF DEVELOPMENT

3.1 INTRODUCTION

- 3.1.1 This chapter outlines the main characteristics of the Proposed Development that have been assessed as part of the EIA, covering both the construction and operational phases of the development.
- 3.1.2 To set the proposals in context, this Chapter begins with a description of the existing site and local geographical and spatial context in relation to key receptors identified as part of the EIA and technical assessments.
- 3.1.3 As this ES supports a detailed planning application, this Chapter includes details of design and built development which form the basis of the assessments presented in this ES. This chapter also outlines the details of mitigation measures embedded within the scheme design to reduce any potential effects associated with the Proposed Development.

3.2 THE SITE AND LOCAL CONTEXT

- 3.2.1 The Proposed Development is located approximately 2.5km west of Havant, Hampshire (central grid reference SU690069) as shown on Figure 1.1. Havant is a town in the south east corner of Hampshire and has an estimated total resident population of approximately 45,800.
- 3.2.2 The total land take for the scheme is approximately 26.751 ha. The site is bound to the west by College Road, to the north by HSDC South Downs College, to the east by the A3(M) and existing agricultural land and Portsmouth golf course to the south. The Site is located to the north of Portsdown Hill, decreasing in elevation to the south towards Purbook.

Nearby uses and Facilities

- 3.2.3 The site is located close to local amenities, with a post office, convenience store, public house, pharmacy and doctor's surgery all within approximately 15 minutes' walk from the site.
- 3.2.4 To the north is the neighbourhood of Stakes within the town of Waterlooville which is approximately 8 miles north of Portsmouth. Stakes contains a number of community facilities including Oaklands Catholic School and Crookhorn College and a number of shops.
- 3.2.5 East of the Site is the neighbourhood of Bedhampton containing a superstore and retail shops adjacent to the east of the A3(M). West of the Site is the neighbourhood of Widley containing community services of a surgery, community centre, post office, Morelands Primary School and Purbrook Park School.

Highways and Public Access

- 3.2.6 The south, the Site is bounded by Portsdown Hill Road (B2177) which contains Wayfarer's Walk PRoW. Approximately 1km further south, the A3(M) meets the A27 Havant Bypass overlooking Langstone Harbour and Chalkdock Lake, part of the Langstone Channel.

- 3.2.7 To the east the Site is bounded by Scratchface Lane and the A3(M). College Road forms the western boundary of the Site.
- 3.2.8 A Public Right of Way ('PRoW') (route 28) lines the north of the site connecting the pedestrian bridge over the A3(M) along Scratchface Lane to the South Downs College and Purbrook Way.
- 3.2.9 The nearest railway station is Bedhampton which is located approximately 3.1km east of the site. The station is within cycling distance of the site (10 ½ minutes). The station provides regular services towards Portsmouth, Southsea, Littlehampton and London Waterloo. The services also provide connections to local stations including Hilsea, Fratton, Havant, Rowlands Castle, Petersfield, Warblington and Emsworth.
- 3.2.10 The nearest (northbound and southbound) bus stops to the site are located on College Road circa 150m north of the site. The services from each of these stops include buses to Portsmouth City Centre, Southsea, Gosport, Havant, Petersfield and Hambledon. Additional bus stops are located along Purbrook Way to the north of the site.

Landscape and Heritage

- 3.2.11 The Site is located on the north side of Portsdown Hill and is broadly reflective of this description and displays many of the key characteristics, including irregular fields bounded by mixed-species hedgerows and woodland.
- 3.2.12 The site is not located within a Conservation Area or within an AONB, however there is a Scheduled Ancient Monument (SAM) comprising Littlepark Roman Villa which is located on the north eastern section of the site. The path of a Roman road has also been identified within the site. Beyond this is the settlement of Bedhampton which is located approximately 1km north-west of Havant. Within the study area there are two further Scheduled Monuments. Bevi's Grave Long Barrow (NHLE: 1012831) is located approximately 260m south of the Site on Portsdown Hill. Fort Purbrook (NHLE: 1001842), including the covered-way to the east, is southwest of the Site.

Ecology

- 3.2.13 The Site is not covered by any ecological or landscape designations. The nearest designated sites are located 1.3km to the south including the Chichester and Langstone Harbour a designated Ramsar site, Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI), along with Solent Maritime Special Area of Conservation (SAC) and Solent and Isle of Wight Lagoons SAC.

Land Use

- 3.2.14 The Site is characterised by large semi-improved grassland fields currently in agricultural use.

Surface, Groundwater and Water Resources

- 3.2.15 The nearest EA designated Main River is situated to the east of the Site, just beyond the A3(M) motorway. There is also an ordinary watercourse located to the south of the Site, which flows along part of the southern boundary.
- 3.2.16 According to the Environment Agency's flood maps, the Site lies wholly within Flood Zone 1, considered to be at low risk from fluvial and tidal flooding. Groundwater mapping published by the

- Environment Agency indicates that the Site is largely located within Inner Zone – subsurface activity (Zone 1c) of the Groundwater Protection Zone.
- 3.2.17 The south eastern section of the Site is characterised as Source Protection Zone for Drinking Water, number 1 - Bedhampton and Havant Springs.
- 3.2.18 British Geological Society maps indicate that the majority of the Site is underlain by the London Clay Formation with no recorded superficial deposit. A small portion of the north eastern part of the Site is indicated to be underlain by the Wittering Formation. The Site overlays a Secondary A Aquifer for bedrock.

3.3 DEVELOPMENT PROPOSALS

- 3.3.1 For the purposes of the ES, the development proposal section identifies both the construction and operational design features which effect the environment or contribute to the overall environmental impact of the scheme. Given the nature of the development to provide long term housing, the effects of decommissioning have not been considered.

Schedule of Development Proposed

- 3.3.2 The proposals are for a full planning application seeking permission for:
‘Detailed application for mixed use residential development comprising 628 dwellings, community centre, allotments, public open space including play areas, new junction to College Road, related internal access roads, footways and cycleways, pumping station and drainage basins.’
- 3.3.3 The site red line boundary is shown on Figure 1.1 in Chapter 1. The planning application boundary for the site, covers a total of 26.751 ha (66.102 ac).
- 3.3.4 These proposals are depicted on the planning layout shown on Figure 3.1, which has been tested to demonstrate how it is intended to develop the detailed elements of the scheme. The extent of Proposed Development parameters are identified on the plans contained in Figure 3.2 – 3.5, which include;
- Figure 3.2 - Land Use Plan– plan shows proposed land uses across the Site;
 - Figure 3.3 – Housing Mix Plan – plan shows proposed typology of each residential dwelling;
 - Figure 3.4 – Buildings Heights Plan – plan shows proposed building heights of each residential dwelling;
 - Figure 3.5 - Landscape Masterplan – plan shows existing/retained landscaping and ecological features.
- 3.3.5 These plans along with the schedule of development define the Proposed Development and form the basis for the EIA undertaken by each topic.

Scheme Layout

- 3.3.6 The detailed layout proposed is illustrated on Figure 3.1. The Proposed Development includes the following;

- Provision of residential neighbourhoods located centrally and to the south of the site, with a new access junction with College Road;
- Provision of a large area of informal open space to the north;
- Inclusion of an acoustic fence along the eastern boundary to mitigate noise from the A3(M);
- Provision of a community centre centrally within the site adjacent to open space provision with good pedestrian access to the wider development;
- Provision of allotments to the east of the site;
- Creation of a series of public open spaces and play spaces throughout the development connected by attractive formal and informal pedestrian links;
- A hierarchical network of internal streets extending from the main access from College Road to the west
- Retention of boundary vegetation and trees; and
- Proposed significant additional tree, hedge and vegetation planting.

Land Use Parameters

- 3.3.7 The land use plan showing the locations of the development plots within the redline boundary are shown on Figure 3.2 – Land Use Plan. This provides the zoned locations for the residential dwellings and associated infrastructure proposed in detail. The schedule of land use areas proposed as illustrated on Figure 3.2 are broken down in Table 3.1 below:

Table 3.1 Land Use Area Schedule		
Development Type	Acres	Hectares
Residential Area	38.040	15.394
Open Space (Inc. Existing Vegetation)	21.544	8.718
Play Areas	1.068	0.432
Orchard Planting	0.690	0.279
Infrastructure	0.183	0.074
Roman Villa	1.032	0.418
Community Centre	0.050	0.020
Proposed SuDS	3.096	1.253
Proposed Pump/Sub Station	0.040	0.016
Allotments	0.359	0.145

Residential Uses

- 3.3.8 The development will provide 628 dwellings, of which 30% will be towards affordable housing. The development will provide a mix of dwellings in terms of size and tenure as illustrated on Figure 3.3. The mix will range from 1-bedroom apartments up to 5-bedroom dwellings and is listed in Table 3.2 below.

Table 3.2 Proposed Residential Mix

Dwelling size	No. of market dwellings	No. of affordable dwelling
1 Bedroom Flat	11	39
2 Bedroom Flat	72	66
2 Bedroom Coach House	13	13
2 Bedroom Duplex	8	-
2 Bedroom House	37	19
3 Bedroom House	220	49
4 Bedroom House	73	2
5 Bedroom House	6	-
TOTAL:	440	188

Building Height Parameters

3.3.9 A range of building heights are proposed across the Site, with the scale and massing designed to respond to both surrounding uses and to the location of housing within the hierarchy of proposed streets within the Site. The building height parameters are illustrated on Figure 3.4. The proposed development will include 2 and 3 storey dwellings across the site with garages at single storey.

Density

3.3.10 The proposed density strategy accommodates an average of 40.9 dph across the site. This seeks to respect the existing context with similar adjacent densities and has been co-ordinated with the road hierarchy, surrounding landscape strategy, and building heights strategy.

Transport Context and Site Access

- 3.3.11 The Site is well located with regards to the local road network and public facilities/services. Connecting with the A3M, the proposed development will include road connections within its site boundaries.
- 3.3.12 The vehicular site access into the development will be taken from College Road, allowing the principal route to meander through the centre of the site, with lower order roads connecting from it. An emergency access is also provided to the south the main access.
- 3.3.13 The proposed development has been designed to enable fire vehicles to get within 45m of all points of each building. Fire vehicles will enter the site via the main signalised access and either continue along the main spine road or utilise an emergency access near the site access to allow secondary access. This route would be restricted for all vehicles except fire tenders, forming an additional cycle / pedestrian access into the site.
- 3.3.14 Pedestrian access points are proposed around the site to maximise sustainable connections and permeability, connecting to the existing Public Right of Way.

Open Space Provision

3.3.15 The landscape masterplan illustrated on Figure 3.5 demonstrates how the development will be broken up by a sequence of spaces of varying types and character. It provides open spaces, including existing vegetation, surrounding the development. The proposed development includes a total provision of 9.39 hectares of public open space. The table 3.3 below sets out details of the typology and size of provision across the site.

Table 3.3 Open Space Schedule

Typology	Provision (in hectares)
Amenity Green Space	1.63
Public Park and Gardens	2.16
Natural and semi-natural green space	4.79
Provision for children and young people	0.39
Allotments, community gardens and orchards	0.42

Other land uses: Community Centre

3.3.16 A community centre (approximately 201.1 sq. m) will be provided within the development to offer a community function with opportunity for nursery space. The community centre will provide 5 dedicated parking spaces.

Figure 3.1 Planning Layout



Figure 3.2 Land Use Parameter Plan

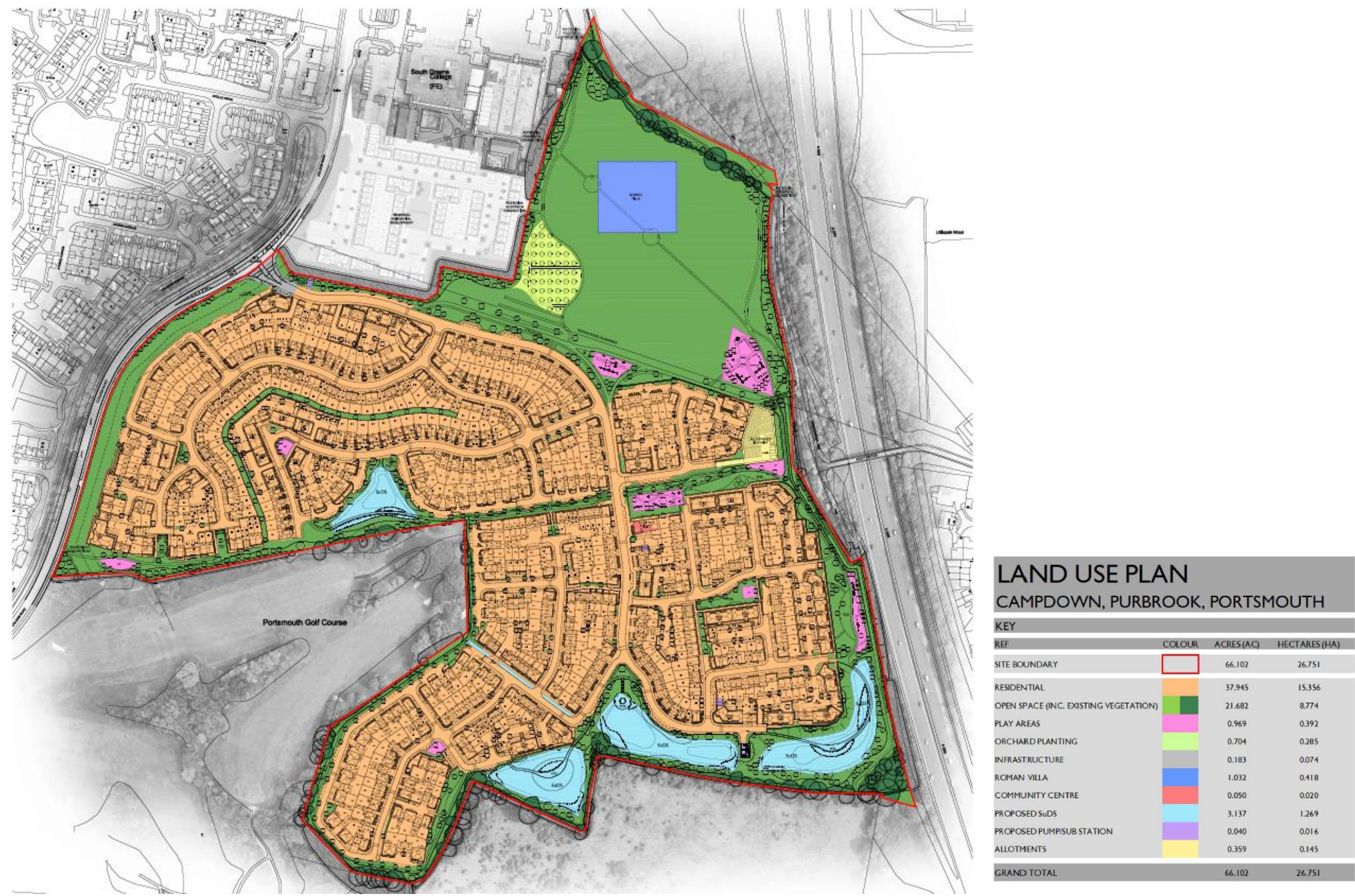


Figure 3.3 Housing Mix Plan



Figure 3.4 Building Heights Plan



Figure 3.5 Landscape Masterplan



3.4 EMBEDDED MITIGATION

Traffic and Transport

- 3.4.1 The design of the Proposed Development has been informed by the likely trip generation and traffic impacts, and the masterplan therefore incorporates elements of mitigation against the associated traffic impact.
- 3.4.2 The Proposed Development includes a small percentage of land uses, which if not provided, residents would travel elsewhere to access. By providing these on-site, the need for residents to travel off-site (and therefore onto the existing highway) is reduced. This also provides facilities for existing residents, who will also benefit from improved pedestrian/cycle access to the Site.
- 3.4.3 The Proposed Development would implement a new signalised crossing point over College Road leading to Atlantis Avenue at the site access, along with a second dropped kerbs and tactile paving point further south down College Road by the bus stop. A new bus stop will be provided with a high-quality bus shelter as part of the S278 measures package. The new facility would therefore reduce the walking distances between the southern section of the site and the amenities located in Crookhorn Village.
- 3.4.4 The design of the access arrangements to the Site itself have taken into consideration delay to motorists using the existing roads, by modelling the proposed arrangements in junction capacity software. This demonstrates that the site access would operate with ample spare capacity, and also features a pedestrian only green time which would allow pedestrians to cross all arms simultaneously.
- 3.4.5 The A3(M) roundabouts operate over capacity in the baseline scenarios and therefore mitigation measures have been explored to improve the capacity. These improvements are summarised below;
- 3.4.6 The A3(M) roundabout junction does not operate over capacity (albeit close) as part of future scenarios, however the presence of committed developments reduces available capacity at the junction. During discussions with HCC, it was noted that the mitigation proposed as part of the previous application to the A3(M) roundabouts would not result in significant capacity improvements, and therefore HCC would prefer that improvements were undertaken to the pedestrian / cycle infrastructure instead. There is already a continuous footway along the northern side of the carriageway, therefore it is proposed that the existing informal crossing over the B&Q access is enhanced by implementing tactile paving. No plan has been provided for this yet whilst HCC agreement is sought.
- 3.4.7 The Crookhorn Lane/Portsdown Hill Road junction to the south of the site is currently provided as a priority junction. Improvement works to increase the capacity and operation of this junction have been explored and include widening the two Crookhorn Lane arms and signalling the junction. Extensive email liaison with the PCC highway officers has been undertaken to amend the design of this junction to prioritise pedestrian and cyclists, which has been incorporated into the design

Air Quality

- 3.4.8 There are no design features of note regarding Air Quality within the submitted design.

Archaeology and Cultural Heritage

- 3.4.9 There will be no development around the Roman villa area north of the Roman road and no development over the area of the Scheduled Monument, including the projected line of the Roman road through the Site. The entire proposed development is to take place south of the Roman road, thereby ensuring the *in-situ* preservation of this heritage asset.
- 3.4.10 Between the two Scheduled Monuments buildings are predominately two storeys, three storey structures placed between the monuments have been proposed where the ground level at the site is lowest. Views to the south towards Bevi's Grave, across the development area from the location of the villa site would comprise the roofscape of the Roman Road Quarter, which would be diffused by the tree line along the south side of the Roman road, once established.
- 3.4.11 At present the alignment of the Roman road within the landscape is largely imperceptible. The proposal looks to form a tree line along the road's southern side, this would not only diffuse the transition between the development and SAM spaces, and reinstate the historic character of the area, but would also demarcate the alignment of the road in an unobtrusive way, securing its placement within the landscape. With the addition of a relevant information panel at the site and this demarcation, the asset would be enhanced through the visual reinstatement and promotion of its presence. Enhancing perception and public engagement with the asset for a wider audience.
- 3.4.12 The impact of the development edge against the setting of the SAM villa site has been mitigated through the landscape led design. The proposal has incorporated a cycle path along the southern side of the route of the Roman road, and a public open green space to the central south side of the Roman road, with a triangular plan form. The road network in this area and the arrangement of the buildings is sinuous in nature, allowing for a softened boundary edge between the development and the heritage assets. The block plan of the proposed development has also been led by the historic landscape. Viewing corridors and block alignment draw the eye towards Bevi's Grave and the villa site, instilling a synergy between the two historic places.

Landscape and Visual

- 3.4.13 The development has been designed through the iterative design process. Previous iterations were considered and dismissed during the design process (including one during a previous application) on the basis that they would have a major impact on some of the key features of the site. These key features included the view across to Portsdown Hill and the general character of the northern section of the site, including the Roman Villa SAM. Refer to appendix 8.1 drawing GLS_050_110_1108. It takes into account inherent mitigation measures following a preliminary review of the development proposals and completion of the desktop studies in relation to potential adverse landscape and visual effects, with the aim of minimising these potential effects.
- 3.4.14 The mitigation measures include the following:
- Introduction of public open space in the northern section of the site, encompassing the Roman Villa SAM and Roman Road. Any introduced features are located outside of the SAM extent and will be in keeping with the Roman theme of the site.

- Strategic location of dwellings on the lower contours of the site, to ensure open views between the Roman Villa SAM in the north and Bevis' Grave SAM and Portsdown Hill to the south are retained.
- Introduction of educational material to inform visitors of the SAM and its importance in the landscape.
- Introduction of a range of open space within the development, as well as street tree planting throughout the development to aid with integration and softening of the development.
- Introduction of hedge and tree planting along College Road, taking account of the restrictions associated with the gas easement, to create a green frontage to the development and aid with integration.
- Overall retention and strengthening of existing tree and hedgerow planting to the site boundaries to increase biodiversity and aid with visual integration as well as enhancing and restoring historic field boundaries.
- Retention of the existing PRoW within an area of open space and the inclusion of additional footpaths through and around the development enhancing the sustainable transport network.
- Minimise intervention to existing topography, with roads and dwellings following the natural rise and fall of the site, where possible.

Ecology

- 3.4.15 The impacts will be assessed against the proposals for the site including the embedded mitigation measures described below. These measures have been 'designed-in' to the development proposals to reduce the ecological impacts of the scheme or are standard construction measures.
- 3.4.16 Within the southern and western central boundaries of the site, SuDs measures will be incorporated to reduce run off and reduce surface water flooding.
- 3.4.17 Within the northern section of the site to protect the ancient monument, no works are proposed with the retention and enhancement of the existing grassland, woodland, scrub and hedgerows. This retained area will also ensure a suitable buffer is in place for the adjacent SINC.
- 3.4.18 The boundary habitat along the northern boundary, with sections of the eastern and southern boundary habitats are to be retained on site, with connectivity to the off-site habitat corridors to the west, north, and east. The retained habitats are to be protected during the construction phase by erecting tree protection fencing with a 5 m buffer to prevent construction impacts on trees and hedgerows and their root protection zones. Protection fencing will be to BS5837:2012, Tree Protection Plan (Barrell Ref – 21141-2).
- 3.4.19 The landscape plan GLS-050_110_1300 ensures that the retained boundary habitats are further fostered by native species and provide a mosaic of habitat types. In addition, the incorporation of open spaces, 8.7ha, will ensure that the boundary woodlands have additional protection by way of buffer planting. In addition, the eastern boundary will have enhancement by infilling planting

ensuring connectivity along the A3 corridor. Additional connectivity to SINCS will be maintained and enhanced by native planting of hedgerows, trees and shrubs.

- 3.4.20 Lighting proposals will be in line with ILP and BCT Guidance note 08 to reduce the impacts on local bat species and nocturnal species. The site layout ensures retention of dark corridors within the northern, north-western, north-eastern and south-eastern boundaries of the site.
- 3.4.21 The development will include a payment per-dwelling in line with the Solent Recreation Mitigation Strategy charging schedule.

Noise

- 3.4.22 An acoustic fence ranging from 3 – 4 m in height (minimum surface density 15kg/m²) has been included along the eastern site boundary with the A3(M) to minimise the impact of road traffic noise on this part of the site.
- 3.4.23 The building fabric of the dwellings included in the proposed development is designed to ensure acceptable internal noise levels are achieved within the new dwellings. Where necessary, this will include acoustically rated glazing and alternative means of ventilation.
- 3.4.24 The proposed residential properties on the western site boundary are oriented to face towards College Road, allowing rear gardens to be screened from road traffic noise.
- 3.4.25 Apartment blocks have been located along the eastern site boundary and these will provide screening to more westerly parts of the site. These apartments will be provided with a mechanical ventilation and recovery (MVHR) system.

Water Environment

- 3.4.26 The design of the new developments will seek to locate the roads and houses in areas of higher elevations on the site, well above the levels of the existing watercourse and potential surface water flow paths. This ensures the flood risk to the development residents remains as low to negligible by taking a site sequential based approach in positioning key elements of the development.
- 3.4.27 The proposed levels of the new development will seek to ensure that any exceedance flow paths of surface water from storm events is directed away from the new houses and to areas of low risk within the site.
- 3.4.28 The design of the development proposals implements attenuation basins with bio-retention wetland areas within the inlet and outlet forebays. These attenuation basins will have the benefit of providing temporary storage of surface water run-off from the areas of the site being re-developed and slowly release these flows back into the downstream existing watercourse at the Mean Annual Average Greenfield run-off rates. This will provide the benefit of reducing the peak run-off from the site during severe storm events and thus reduce the risk of flooding downstream.
- 3.4.29 As the development will incorporate a number of SuDS system within the site, treatment of surface water is provided at the source within these development parcels within the proposed basins and associated bio-retention areas. This ensures that discharge leaving the site has no adverse effect to the downstream watercourses nor to the underlying Secondary Aquifer.

3.5 CONSTRUCTION PROPOSALS

Construction

3.5.1 Construction of the Proposed Development will involve the following stages:

- Enabling works (earthworks);
- Landscape and ground profiling;
- Installation of drainage;
- Construction of foundations;
- Construction of dwellings and non-residential development;
- Installation of services and commissioning;
- Construction of on-site highways; and,
- Construction of off-site highway improvements.

Phasing/ Timetable of Events and Indicative Programme

- 3.5.2 Under the current programme, it is expected that construction will take place between 2024/2025 and 2030. The total construction period used in the ES is therefore 5 years, subject to granting of planning permission.
- 3.5.3 The selected main contractor will be required to prepare a detailed construction and procurement programme identifying key tasks and milestones to ensure that enhancement of the project is properly resourced and sequenced in accordance with the overall project duration.
- 3.5.4 The main contractor will be encouraged to use local labour, sub-contractors and suppliers during the construction process; however, specialist work portions may have to be sourced from wherever the appropriate skill base resides.

Site Preparation

- 3.5.5 In order to prepare for the commencement of the Proposed Development, the construction compound area (s) will be established in Year 1 of the construction works for each phase. This area will accommodate construction offices, welfare facilities and compounds, as well as workforce parking, a materials lay-down area and on-site fabrication.
- In considering the location and setup of Site project offices and welfare facilities, the following will apply:
 - All reasonable precautions will be taken for the operation of plant and equipment, to avoid nuisance and excess noise impact on the surrounding residents / neighbours;
 - The visual intrusion of construction activities on nearby residents and users of local facilities and amenities will be contained and limited as far as practical;
 - Emergency response plans for all phases of construction;
 - Measures such as exclusion zones / hoardings / fencing / temporary screening will be used to reduce noise and visual intrusion will be set in place as far as practicable.

- Transport infrastructure provision and the installation / diversion of new / utility supplies; and,
- The standard of fencing / screening during construction on phases / plot Sites will be selected in order to maintain effective Site security.

Construction Activities

- 3.5.6 A number of assumptions have been made in terms of the construction processes and activities to be undertaken as part of the Proposed Development. The methods of construction are assumed to be typical masonry and timber framed buildings and it is assumed that there will be no onsite piling, sandblasting, mobile crushing equipment.
- 3.5.7 In order to assess the worst case scenario as part of the ES, assumptions have been made in terms of the procedure for construction which can be broken down into the following phases:

Table 3.4 Typical Plant List

Phase Description	Activity
Groundworks and Site Establishment	Wheeled Mobile Crane
	Delivery Wagons
	Generator
	Tracked Excavators
	Hand Tools
	Dump Trucks
	Dozer (Towing Roller)
Construction of Proposed Development (including all ancillary works)	Dump Trucks
	Tracked Excavators
	Concrete mixer truck and pump
	Delivery Wagons
	Small cement mixer
	Wheeled mobile telescopic crane
	Lifting platform
	Telescopic handler
	Compressor for power tools
	Generator for Lighting
	Hand Tools
	Circular saw
	Road Planer
	Tipper lorry

	Asphalt paver
	Vibratory roller and plate

Predicted Traffic Movements During Construction

- 3.5.8 The main deliveries and Site traffic will be related to the following:
- Daily site staff and labour;
 - Movements arising from the groundworks and any demolition;
 - Aggregate and concrete deliveries for early activities;
 - Deliveries of building components and services equipment;
 - Periodic inspections, visitors and inspectors; and,
 - Disposal of waste material.
- 3.5.9 The main contractor will be required to develop a Travel Plan to ensure that staff travel to and from the Site does not result in adverse traffic impacts during the construction phases of development.
- 3.5.10 It is proposed that the construction traffic will be managed to minimise peak hour congestion where possible and a clear road signage strategy will be provided to minimise the impact on the existing surrounding community.
- 3.5.11 Further details regarding construction traffic are contained in Chapter 5 of this ES.

On Site Traffic management

- 3.5.12 The proximity of the Site to the Strategic Road Network (SRN) is such that HGV movements associated with the Construction phase of the Proposed Development will not be required to travel through residential areas. A road signage strategy will be devised to ensure that all construction traffic follows the prescribed route from the A3(M) Junction 4, along Purbrook Way and southbound along College Road to the Site. The phasing plan is such that construction vehicles will only ever enter the Site through the one point of vehicular access onto College Road.
- 3.5.13 Management of traffic within the Site will be the subject of detailed construction logistics planning, to be undertaken at a later stage once further detailed planning is undertaken and the Principal Contractor is identified. Appropriate management of any demolition and construction traffic will be undertaken, including:
- The use of appropriate and approved routes for construction vehicles including approved routing plans;
 - The management of working hours and delivery times to minimise disturbance caused by traffic (e.g., avoiding deliveries during peak hours);
 - Covering loads coming to and leaving the development;
 - Provision of wheel washing / vehicle cleaning facilities on site; and
 - Inspection of local highway network and cleaning as necessary.

- 3.5.14 The above measures will be secured by a suitably worded planning condition for a Construction Environment Management Plan. All activity planning and construction works will be undertaken in accordance with the requirements of legislation, regulations, and best practice guidelines.

Working Practices

- 3.5.15 Prior to the commencement of construction, an adequately developed principal contractor's 'Construction Phase Plan' will be prepared including:
- Pre-construction Health and Safety Information as required by the CDM Regulations 2015; of the proposals. This is a requirement of the EIA Regulations which in Schedule 4, Paragraph 4 require a description of the aspects of the environment likely to be significantly affected by the development (HMSO, 2017);
 - Pre-construction Site Waste Management Plan and Site Waste Management Plan (SWMP); and,
 - Construction Environmental Management Plan (CEMP).
- 3.5.16 In addition, the following document will be prepared/revised as necessary by the CDM Co-ordinator:
- Construction Phase CDM Health and Safety Plan as required by the CDM Regulations 2015.
- 3.5.17 The construction works will be monitored by an Employers Agent, who will also liaise with the various environmental and other advisers who will have input into the project.
- 3.5.18 The base environmental effects assessment reported within this ES assumes the project will be constructed in accordance with industry standard techniques and mandatory minimum standards and assumes suitably experienced contractors will be appointed to design, construct and commission the development. A non-exhaustive list of key standard working techniques/practices taken into account in the base assessment is provided in the following sub-sections.

Construction Works Times

- 3.5.19 Construction activities on the Site will normally be carried out between 08.00 hours to 18.00 hours Monday to Friday and 08.00 hours to 13.00 hours on Saturdays, with no such activities on a Sunday or a Public or Bank Holiday. Any works required to take place outside of these periods will be agreed in advance with HBC.

Construction Materials

- 3.5.20 No materials will be used in the Proposed Development that by their nature or application, or use contravene any British Standard or Code of Practice, or which contravenes the recommendations of Good Practice in the Selection of Construction Materials (Ove Arup and Partners, 1997) as well as the updated version Good Practice in the Selection of Construction Materials (Hoare Lee and Partners, 2011).

Construction Water Supply and Use

- 3.5.21 Water usage during construction will be used for the purposes listed below and will utilise where possible, local grid connections. If this is not possible, water will be supplied by bowser.
- 3.5.22 The CEMP will include a plan and specific method statements for how water efficiency will be achieved. This could include measures such as:

- Auto isolation of cleaning devices (hoses): The contractor will ensure flow from cleaning devices auto-isolates once it is no longer in use. This ensures there is no possibility of an unused cleaning device being left operational when it is not in use. The contractor will look to identify the high-pressure washer system which provides the required level of cleaning, with the lowest water pressure (to maximise the water savings on offer).
- Dust suppression activity: The contractor will only use water for dust suppression when on site temporary/permanent road conditions require it in order to limit water use over the duration of the project.
- Road sweeping: The contractor will only use a road sweeper system with built in water recycling.
- Washing of ready-mix concrete wagons: If a batching plant is set up on site, and washing of wagons will be undertaken on site then this must occur in a designated hard standing area with waste water collection sump, and the waste water will then be re-used as an ingredient in the concrete mixing process, up to the maximum amount which can be used.
- Commissioning and testing of services: The contractor will follow the advice in the relevant Building Services Research and Information Association (BSRIA) guidance. The water used for flushing building services should be isolated as soon as possible after the flush water turns clear.

Construction Compound

- 3.5.23 A contractor's working area will be made available, and the location will be clearly delineated on the Site and agreed with HBC to ensure that no unnecessary disturbance is caused to any sensitive areas. The erection of site hoardings, vehicular plant activity and subsequent vehicle movements would be evident during construction although minimised in comparison to the size of the site.

Safe Storage of Fuel/Oil

- 3.5.24 Particular attention will be given to the storage and use of fuels for the plant on Site. Drainage within the temporary, secure, Site compound, where construction vehicles will park and where any diesel fuel will be stored, will be directed to an oil interceptor to prevent pollution if any spillage occurs. Diesel storage and refueling will be within a designated area or self-bunded tank.
- 3.5.25 This is regarded by Tetra Tech as industry standard practice and also includes mandatory legal requirements which are considered as integral to the development being assessed in this ES.

Construction Noise and Vibration

- 3.5.26 Phasing of construction works is a critical means of mitigation in itself. By careful development of a programme of works it will be possible to minimise the duration of noise exposure from a particular phase and utilise open areas as buffer zones of new buildings as screening. For example, early construction of buildings on the eastern boundary of the Site could provide highly effective noise screening between the main body of the site and dwellings on surrounding areas.
- 3.5.27 The main contractor will refer to the guidance provided within BS5228:2009+A1:2014 in order to minimise disruption during construction. Additionally, the principal form of noise control will

comprise site working hours according to any conditions within the planning consent and avoiding unsocial working hours where possible. If there is the requirement to undertake 'noisy' work outside of the agreed hours, further consultation would be undertaken with HBC to obtain prior agreement that the proposed works would be acceptable.

- 3.5.28 Appropriate hours of work (e.g., heavy machinery, construction) in areas located near residential properties would be agreed with the Local Authority. The following normal construction hours are proposed.
- Monday to Friday: 08:00 to 18:00
 - Saturday: 08:00 to 13:00
 - Sunday, Public & Bank holidays: no noisy working
- 3.5.29 These hours should be rigorously observed for any operations which are likely to generate noise levels noticeable by neighbouring residents. Any exceptions deemed essential to the works which need to be authorised by the Local Authority must also be communicated with the residents.
- 3.5.30 In conjunction with effective communication of site activities and scheduling, liaison with local residents is essential in cultivating a positive attitude in the community. A dedicated telephone number and designated staff contact should be made available to respond to any complaints or queries, with a messaging service for out of hours enquiries. Information on current and forthcoming activities should be made as freely available as possible.
- 3.5.31 Further details regarding the likely noise and vibration effects of the Proposed Development are contained within Chapter 10 of this ES. This includes examples of noise control measures during the construction phase that should, as a minimum, form part of the CEMP.

Construction Air Quality and Dust

- 3.5.32 The Greater London Authority's Supplementary Planning Guidance, which is used as a benchmark for developments across the UK, suggests a number of mitigation measures that should be adopted in order to minimise impacts from dusts and fine particles. Appropriate measures that will be included in a Construction Environmental Management Plan (CEMP) at the Reserved Matters application.
- 3.5.33 The works to deliver the scheme will require a number of construction activities that traditionally raise issues of air quality, in particular dust and air borne matter. Other than negligible tailpipe emissions from onsite construction vehicles and equipment, the main emissions during construction are likely to be dust and particulate matter generated during earth moving (particularly during dry months), from re-suspended dust on haul roads and from wind whipping of friable excavated material.
- 3.5.34 Readers should refer to the supporting Air Quality Assessment for a detailed appraisal of potential air quality impacts and mitigation. However, the main potential effects of particulates / dust are:
- Visual – dust plume, reduced visibility, coating and soiling of surfaces leading to annoyance, loss of amenity, the need to clean surfaces;
 - Physical and/or chemical contamination and corrosion of artefacts;
 - Coating of vegetation and soil contamination;

- Health effects due to inhalation e.g., asthma or irritation of the eyes; and
 - Vectors for other contaminants associated with the former use.
- 3.5.35 Care will be taken regarding dust emissions so that they are kept to a practicable minimum, especially when working in the vicinity of residential or commercial properties in the vicinity of the Site. Suppression and mitigation will be required during dry conditions with the following dust reduction measures being employed:
- Sheeting of vehicles transporting materials to and from Site;
 - Limiting the speed of general vehicles within the Site;
 - Temporary surfacing to haul roads where possible within the programme;
 - Haul roads to be regularly cleaned;
 - Provision of wheel washing facilities at access points onto local roads; and,
 - Drop heights minimised and all skips enclosed where possible.
- 3.5.36 No materials arising from the demolition of existing structures on-site, the construction of the road or any material from incidental works will be burnt on the Site.
- 3.5.37 The main contractor will comply with the BRE Code of Practice to control dust from construction and demolition activities, unless agreed otherwise with the LPA. The requirements of the code will apply to all work at the Site, access roads and adjacent roads.
- 3.5.38 Further details regarding the likely air quality effects of the Proposed Development are contained within Chapter 6 of this ES. This includes examples of control measures during the construction phase that should, as a minimum, form part of the CEMP.

Construction landscape and visual impact

- 3.5.39 The following elements will be included to minimise the impacts of the construction phase of the development on the landscape and visual receptors:
- Early planting of hedgerow and tree planting around the perimeters of the site
 - Introduction of hoarding in a colour suitable to tie into the existing environment
 - Exclusion of the northern POS within the development site hoarding, to minimise impact on the PRow use. Temporary fencing in this area should only be used for the construction of the play area and orchard.
- 3.5.40 These mitigation measures should be further detailed in the CEMP and approved by the LPA prior to commencement.
- 3.5.41 Trees will be protected in accordance with BS5837 Trees in Relation to Construction. Prior to commencement of the construction works, the main contractor will be required to erect temporary protective fencing around Tree Protection Zones in accordance with the approved Tree Protection Plan. Construction works in the vicinity of retained trees within the Site and on adjacent land shall be carried out in accordance with recommendations in ‘BS5837:2012 Trees in relation to design, demolition and construction’ and approved Arboricultural Method Statement to safeguard trees and

hedges. Landscape planting and topsoiling works within retained tree root protection areas shall be carried out in accordance with ‘BS3998:2010 Recommendations for tree work’ and generally.

- 3.5.42 Further details of the landscape and visual impacts during the construction phase of the development are provided in Chapter 8 of this ES.

Construction Archaeology/Heritage Mitigation

- 3.5.43 In order to reduce any adverse impacts upon the setting and heritage value of heritage assets in the vicinity of the Site during the construction, standard environmental controls will be put in place to manage temporary factors such as noise and dust, and construction activities should be screened from view, as far as practicable, by suitable boundary treatments to construction areas.

Construction Ecological Mitigation

- 3.5.44 To protect any retained ecological features the CEMP should include the following measures:
- An Ecological Clerk of Works (ECoW) will be appointed and retained as part of the construction team to brief them on ecological issues and protection of existing wildlife habitat;
 - Provision of an Ecological Management Plan;
 - Provision of an Arboricultural Method Statement;
 - Identification and securing of root protection zones of retained trees and hedgerows in accordance with BS5837:2012 – Trees in Relation to Construction;
 - All vegetation clearance will be undertaken outside of the bird nesting season i.e. between September and early February unless immediately preceded by a nesting bird check by the ECoW;
 - Prior to all work in ecologically sensitive areas (i.e. areas with vegetation) construction workers will be briefed on ecological issues at the site and on the protection of existing wildlife habitat;
 - All trees with low suitability for roosting bats will be subject to pre-works inspection by the ECoW or suitably qualified bat ecologist, followed by soft-felling under ecological supervision.
 - External lighting proposals for the construction phase will be subject to review by a suitably qualified ecologist to ensure avoidance of light spill on to ecologically sensitive habitats used by bats and other nocturnal wildlife;
 - Where trees and vegetation are proposed to be retained, appropriate tree and root protection measures will be installed prior to the commencement of works on site to ensure that such features are not damaged, and inspected by the ECoW;
 - Stockpiling of materials will be kept to a minimum and restricted to specific designated sites such as the designated construction compound;
 - Waste materials will be removed from the Site and disposed of at the earliest opportunity;

- Pits, trenches and other excavations to be covered at night or an escape ramp provided, to avoid wildlife becoming trapped;
- A detailed construction-phase drainage strategy will detail how any potential sedimentation or pollution from construction activities will be prevented;
- Semi-permanent reptile exclusion fencing will be installed along the margin of the northern open space which will act as a receptor site;
- Small areas to be lost (c. 75m in length) to enable access will be subject to fingertip searches and directional habitat clearance under the close supervision of the ECoW during the active reptile season (March – September inclusive) to avoid the risk of accidental killing or injury.

3.5.45 In addition, a Construction Environmental Management Plan (CEMP) will be produced prior to any site clearance or preparation works taking place within the Site. The CEMP is expected to form a pre-commencement planning condition for the site.

3.5.46 For legal compliance and to support future reserved matters applications, update habitat and protected species surveys will be carried out, where required. Where relevant, results of these surveys will be used to inform licence applications and any new mitigation that is required.

3.5.47 Further details of the ecological impacts during the construction phase of the development are provided in Chapter 9 of this ES.

Construction Drainage

3.5.48 The temporary construction drainage system and neighbouring water courses will be visually inspected on a pre-agreed basis during construction to detect any problems with function and any changes in colour or turbidity, or for olfactory evidence which may indicate a temporary reduction in water quality. If on a visual inspection the drainage appears to be polluted or excessively turbid, the EA will be contacted regarding the appropriate action and the source of the pollution should be identified if possible and the spillage/containment procedure specified in the CEMP followed.

3.5.49 The site facilities will include messing and toilet facilities for the site workers contained within the construction compound. The design of the temporary foul drainage collection system is expected to utilise temporary connections to the nearest foul drainage system.

3.5.50 Discharge consents will be required for temporary discharges to ground or surface water from the construction site under the Water Resources Act 1991. It is assumed that any required water related consents will be in place before works commence and it is the responsibility of the developer and contractor to ensure that this is the case. The surface water and foul water drainage measures proposed will be further developed in consultation with the EA. This is not embedded mitigation but is stated here for clarity

Construction Lighting

3.5.51 To ensure that construction lighting does not affect nocturnal wildlife or the amenity of residents or create a statutory nuisance under the Environmental Protection Act 1990 (as amended) external lighting will be designed and positioned to:

- Provide the minimum light levels necessary for safe working;
- Avoid disturbance to adjoining residents and occupiers;
- Avoid creating dazzle or distraction for drivers using adjacent highways or the railway;
- Seek to minimise light spillage or pollution; and
- Ensure that excess light does not fall on sensitive ecological habitats.

3.5.52 Energy efficient options for site facilities will be incorporated wherever possible. These may include energy efficient light bulbs and automatic controls. BS 5489 Parts 1 and 9 (Road Lighting) and Institute of Lighting Engineers (ILE) guidance notes for reduction of light pollution will be complied with.

Construction Waste

3.5.53 The Proposed Development will actively seek to reduce the amount of waste sent to landfill during the construction phase through sustainable design and procurement together with the reuse or recycling of materials, wherever possible.

3.5.54 Waste will be managed in accordance with the Waste Hierarchy, and as such waste minimisation will be given the highest priority. The reuse and recovery of waste will be encouraged by proactively identifying opportunities for the on-site reuse of materials (for example in landscape contouring), and by appointing a waste contractor who can demonstrate high levels of recycling. Energy recovery will be the preferred option for managing residual waste from construction works and only residual waste which has no potential for energy recovery will be sent for landfill disposal. All reasonable measures will be taken to ensure that levels of residual waste sent to landfill are kept to a minimum.

3.5.55 It is an ambition to use resources which have been sourced locally, where these are available, and also to use sustainable means of transport (such as rail), where possible. Construction materials will be procured which have a high proportion of recycled material, where this is practicable and does not adversely affect the integrity and durability of the materials.

3.5.56 Modern methods of design and construction using pre-fabricated units will help keep waste arisings to a minimum. The frames and envelopes will be pre-fabricated with formwork remaining on site. All construction waste produced during the site preparation works that cannot be re-used on site will be segregated and recycled. Efficient building forms and services will be used that will minimise the volumes and numbers of on-site manufactured components required to reduce the potential for waste generation. Scaffolding, hoarding and shuttering will be disassembled and used on other phases of the project and then removed from site for use on subsequent construction projects.

3.5.57 Construction sites will be laid out to ensure that there is sufficient space for waste from the construction phase to be segregated into separate containers and stored prior to removal and off-site management. However, the regular removal of waste and recycling will minimise the amount of external space required for waste storage both in the construction and operational phases of the developments.

3.5.58 Under the Duty of Care Regulations producers of waste have a legal obligation to ensure wastes are handled responsibly and in line with relevant legislation and guidance. The strict management of waste during the construction phase of each development by site operatives Training sessions for relevant construction staff.

Health and Safety

- 3.5.59 All work will be undertaken to relevant Health and Safety legislation. The project will be supervised in accordance with the revised Construction Design and Management Regulations 2015 (CDM). Risk Assessment will be undertaken for each work package prior to activities taking place. A CDM Health and Safety File will be prepared and, after completion of the construction works, will be handed over to the applicant.

3.6 SECURING ENVIRONMENTAL MANAGEMENT - THE ENVIRONMENTAL MANAGEMENT PLAN AFTER OPERATION

- 3.6.1 The applicant has identified environmental management practices through the iterative EIA process. It is expected that the environmental management practices identified in this ES will be secured via a planning condition should the application be approved. An Environmental Management Plan (EMP) would be prepared from the mitigation information provided within the topic chapters which form the preliminary EMP.
- 3.6.2 The following are expected to apply to ensure that the scheme is implemented throughout construction and operation.

Construction

- 3.6.3 The contract between the applicant and the company contracted to construct the development will specify the measures to be taken to reduce or mitigate the environmental effect of the construction process, to be agreed with the regulators within a CEMP. These measures will consist of three main types:
- Conditions to be adhered to under the planning permission;
 - Any requirements of the Environmental Agency or any other regulatory organisation; and,
 - And other relevant mitigation measures identified in this ES.
- 3.6.4 The CEMP file will be prepared and, after completion of the construction works, handed over to the applicant.

Operation

- 3.6.5 The site will be managed by Employer's Agent whose duties will include compliance with statutory environmental requirements.
- 3.6.6 Effective communication underpins the whole system of environmental management, ensuring appropriate information passes between the applicant, the contracted developer staff and the consultants and contractors whom they engage. This ensures that environmental considerations are fully integrated into the management of the development throughout construction, and during the operation phase.