

3 APPLICATION SITE & PROPOSED DEVELOPMENT

3.1 INTRODUCTION

This chapter describes the application site location, existing land uses and features. It also provides an overview of the wider area to place it in the context of its surrounding environment. Greater detail on the existing environment is provided in the baseline conditions sections contained within the technical chapters of this ES, ES Volume III and the appendices in ES Volume IV.

This chapter also describes the physical characteristics of the development, including the land use requirements during the construction and operational phases, to enable the likely significant effects of the proposed development to be identified.

3.2 SITE LOCATION

The Application Site

The application site, which extends to circa 75.20 hectares (ha), is centred on NGR 549741, 159317 and located approximately 4km north-east of Sevenoaks and 8km south-east of Orpington on the edge of the North Downs, within the administrative boundary of Sevenoaks District Council (SDC). The location of the application site is shown in Figure 1.1 at the rear of Chapter 1 Introduction.

The application site is located within an area dominated by farmland and scattered villages, most notably the villages of Halstead, Knockholt and Knockholt Pound. Residential properties are also located along Crow Drive and Star Hill Road immediately to the northeast and southwest of the site, respectively. Land within the Applicant's ownership adjoins the application site, covering an additional circa 56.69ha of mainly woodland and grassland, as shown at Figure 1.1. The land within the Applicant's ownership that lies beyond the application site is referred to as the 'wider Survey Area'.

The main access into the application site is via Crow Drive off the A224 Polhill Road/London Road in the north-eastern part of the site. There is an additional hours restricted access to the application site off Star Hill. The A224 connects to the M25 motorway at Junction 5, which is located approximately 700m south of the site, although as the M25 motorway continues to the east of the application site in parallel with the A224, the M25 extends within 90m from the site, at the closest point. Crow Drive leads to Crow Road, which extends through the application site (unclassified road) to Star Hill Road (C road classification) to the south-west of the site.

3.3 HISTORICAL USE OF THE SITE

Prior to 1895, the application site predominantly supported rich woodland. In March 1889 the London Defence Scheme was announced and identified the application site as one of the 13 sites for mobilisation centres along the North Downs. Sometime between 1895 and 1897, Fort Halstead was constructed on site after its design in 1894. Fort Halstead was the largest and most costly of these mobilisation centres and was never used for its intended purpose.

In 1937 Fort Halstead was repurchased by the War Office to accommodate the rocketry work of the All Round Defence (ARD). Several of the Fort's casemates and magazines were altered and further buildings were built within the Fort. Following the success of this initial work, in 1938 under the directorship of Alwyn Crow, Fort Halstead became the separate Projectile Development Establishment (PDE). One of the earliest buildings constructed for the PDE was an experimental filling shed, erected in 1938 for filling cordite rocket motors. The pioneering work undertaken by Sir Alwyn Crow at the Fort led to the development of explosive and armament technologies, such as Unrotated Projectiles which were widely used in the D-Day operations.

During World War II in order to avoid the Blitz, the Armaments Design Department and Research Department moved to Fort Halstead from Woolwich. The site also accommodated the Ministry of Supply which co-ordinated the supply of equipment to the British Armed Forces. Military and civilian staff at the Fort increased from 1000 to 3000 between 1939 and 1942.

The arrival of these departments at Fort Halstead saw large scale development, which would facilitate the Site's use as a top-secret research and development facility.

In January 1947, the British cabinet decided to proceed with the development of the atomic bomb under the direction of William Penney, Chief Superintendent Armaments Research (CSAR) at Fort Halstead. To mask its true purpose the atomic work was codenamed High Explosives Research (HER). Following the departure of the HER programme, conventional research continued apace at Fort Halstead.

Historical mapping and further information on the historical uses of the application site are included in the Historic Environment Assessment report, and the Phase 1 Environmental Assessment, contained within Appendix 8, ES Volume III.

3.4 RECENT PLANNING HISTORY

The land at Fort Halstead (the 'application site') is subject to an extant outline planning permission granted on 31st December 2015 (Ref. SE/15/00628/OUT), for mixed use development of up to 450 residential units, 27,000 square metres (sq m) business area, a hotel of up to 80 beds, a village centre (Use Classes A1-A3, B1a, D1 and D2), and use of the Fort Area and bunkers as an historic interpretation centre (Use Class D1).

The extant outline planning permission was the subject of an Environmental Statement (ES) produced by Waterman Group, (hereafter, the '2015 ES').

3.5 CURRENT SITE USE AND FEATURES

Overview of the Current Site Use

The application site is currently occupied in large part by the Defence Science and Technology Laboratory (DSTL) and in part by QinetiQ, a specialist defence company, which provides scientific and technical research services to the Ministry of Defence (MoD). Due to the current

consolidation and relocation of DSTL, the majority of the application site will be vacant thereafter and available for redevelopment. Although QinetiQ intend to remain on the application site subject to the improvement of its premises as part of the redevelopment.

Approximately 285 buildings are present on the site, with the main part (excluding the Fort Scheduled Monument) identified in SDC's adopted Core Strategy [1] as a Major Developed Site (MDS) for employment (as per Policy EMP2 and Policy EMP3 within the Allocations and Development Management Plan [2]). Figure 1.2 at the rear of Chapter 1 Introduction shows the existing buildings on the application site and assigns a key reference number to each of those buildings. This ES uses these reference numbers when referring to relevant buildings. The MDS coincides broadly with the extent of the built environment and employment-related development on the application site, which covers an area of approximately 40.1ha.

There are circa 38 buildings that are considered heritage assets of varying sensitivity across the application site, these include one Scheduled Monument (the Fort) that includes eight separate structures and four listed buildings (two of which are listed Grade II and the other two at Grade II*). There are no other built heritage designations, national or local (e.g. registered parks, conservation areas, locally listed buildings, etc.) on the application site.

3.6 APPLICATION SITE CONTEXT

Transport

Highway Network

As described previously, Crow Drive off the A224 Polhill Road/London Road crosses the application site from southwest to northeast and is the main access to the site.

The highway network has the following characteristics:

- The A224 is a single carriageway road, which to the north provides access to the M25 (junction 4), to Orpington via Badgers Mount, and to Bromley via Old London Road and the A21. To the south it provides the main access route into Sevenoaks.
- Within the vicinity of the application site the A224 is subject to a 50 mph speed limit. The road has lighting infrastructure and facilities but, at the time of writing, it is currently unlit because the lights were switched off for a research experiment. The A224 has limited footway provision: to the north of the application site there is a footway on the east side of the carriageway, and to the south there are no footways.
- The Star Hill Road access provides a convenient means of access to the local villages of Knockholt and Knockholt Pound. It also provides an alternative route towards Dunton Green and Sevenoaks. It is a relatively narrow rural lane with no footway or lighting but is an existing bus route.

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The highway network surrounding Fort Halstead is relatively free of congestion, even at peak times. Traffic surveys have been undertaken in 2005, 2007, 2008, 2010 and 2014, and these indicate that the local road network, including the A224 and A21 are operating well within their link capacities. Baseline junction assessments have also been undertaken which suggest that there are no major highway capacity issues at any of the junctions within the immediate vicinity of the application site. Only the junction of A224/A21/M25 link road is nearing capacity at peak times.

Furthermore, observations of junction 4 of the M25 suggest that it is also operating well within capacity during the morning and evening peak periods.

The main traffic hotspots in the area have been highlighted by the Sevenoaks District Transport Strategy and are:

- A224/A25 Riverhead roundabouts;
- A21/A25 Bat and Ball traffic lights; and
- M25 Junction 5.

These junctions are all relatively distant from the Fort Halstead site. The Sevenoaks District Transport Strategy also notes that congestion at the two A25 junctions is restricted to the peak hour with no spreading of congestion to other time periods. It also notes that traffic congestion at these junctions is, at least in part, related to the lack of east facing slip roads providing access between the A21 and the M26.

Further details regarding the surrounding highway network and its capacity is addressed in Chapter 10 Transportation of this ES.

Bus Services

DSTL, provide a private peak period shuttle bus between the application site, and, Knockholt and Orpington railway stations. There are three buses during the morning peak and three during the evening peak.

There are three more bus services in the vicinity of the application site that give access to a number of destinations and during the weekday peak period including Orpington, Sevenoaks, Bromley, Tunbridge Wells, Dunton Green, Riverhead, Chipstead and Kemsing. There is also a school day service to Knowle Academy.

Rail Services

Dunston Green Railway Station is located approximately 2.2 kilometres to the south-east of the application site and serves as the closest station for network rail services that can be reached by public transport from the site.

Knockholt Railway Station is approximately 3.5 kilometres away to the northwest and can also be reached by public bus service from the application site. There is a cycle route from this station to the application site which is relatively flat and one of the few existing cycle facilities within the district. Orpington Station is also located to the northwest of the application site approximately 7.5 kilometres away. A public bus service also runs between this station and the current Fort Halstead site.

Travellers to/from other destinations on national rail can access the application site by bus.

Pedestrian Facilities

Generally, existing pedestrian links to the current Fort Halstead site entrances are relatively poor, however, there are a number of footpath links and rights of way, including a direct link to the North Downs Way, surrounding the application site which provide a good connection to the countryside. This network of leisure routes is generally un-surfaced and unlit and are therefore not suitable as commuter/school access routes.

The existing pedestrian routes by type are:

- Access to Knockholt Pound is via Star Hill Road. This is a relatively narrow country lane with no dedicated footways or lighting. There is also an existing public right of way that links the Site to the junction of Star Hill Lane / Birchwood Lane, much closer to the centre of Knockholt Pound. This is also un-surfaced and with no lighting;
- Access to Halstead is via Otford Lane which is also a narrow, unlit country lane; and
- The A224 London Road to the north of Otford Lane has a footway on its east side and this provides a safe pedestrian access to existing facilities that are located along that road. These include two restaurants and a retail shop close to the junction with Otford Lane. Further to the north, the footway also provides access to the large Polhill Garden Centre.

Cycle Facilities

As with pedestrian routes, there are also relatively limited cycle facilities. Since the application site is located on top of a chalk escarpment, there is a steep hill to negotiate in order to access the site from Sevenoaks. However, the cycle route to Knockholt station is relatively flat, and there are advisory cycle lanes on Old London Road, one of the few existing cycle facilities within the district.

Further information on the existing transport, connectivity and highway network is contained within Chapter 10 Transportation of the ES and the Transport Assessment, provided in Appendix 3.3, ES Volume III.

Topography

Topographically, the application site and the wider Survey Area is dominated by a chalk escarpment that extends in a south-west/north-east direction. The application site is located on the top of the chalk escarpment ridge and is elevated above the surrounding area. Much of the site is relatively flat, with ground elevations ranging from approximately 160m Above Ordnance Datum (AOD) in the north-eastern part of the site to 220m towards the western part of the site across a relatively large area. However, the southern part of the site slopes steeply from 210m to 180m.

A stand-alone Slope Stability Report is provided within Appendix 3.4, ES Vol III.

Ground Conditions

Geology

The geology at the application site consists of Clay-with-Flints formation overlying Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation (undifferentiated). The application site contains over 300 structures including offices, laboratories, warehouses, a firing range, explosive storage facilities, machine shops, x-ray facilities, a fuel station, burning grounds, a waste compound and storage tanks. Due to the developed nature of the site, the majority of the ground will have been disturbed, and Made Ground (i.e. fill material) is expected beneath parts of the site and surrounding area.

Historically the application site has been occupied by QinetiQ and DSTL providing research into weapons systems, explosives, propellants and other military operations. Within the site boundary there are two plant nurseries, a number of buried tanks and potentially infilled land (Made Ground). In addition, radioactive materials have been stored and used at the site.

Human Health risk drivers including elevated metals, PAH and petroleum hydrocarbons have been identified in various locations across the site and asbestos fibres have been identified throughout the Made Ground across the site. Earthworks, including removal / crushing of concrete floor slabs, basement excavations, foundations and areas of external hardstanding, could disturb and expose workers, future residents and neighbours to localised ground contamination through dermal contact, inhalation and/or ingestion pathways. Damage to the infrastructure could also occur if foundations are in direct contact with the elevated contaminants present. However, it is considered that remediation of these risks will be achievable using standard techniques.

Hydrogeology

As identified within the Environment Agency scoping comments (ref: KT/2018/125012/01-L01) the site overlies a chalk aquifer. The groundwater body beneath the site (West Kent Darent and Cray Chalk) is currently (2016 Cycle 2) classified under the Water Framework Directive as 'poor'. The water body is currently poor status due to the agriculture and rural land management sector, urban and transport sector and the water industry.

Groundwater associated with principal aquifers was not encountered during previous site investigations. Based on BGS Hydrogeological map of the Chalk and Lower Greensand of Kent, Sheet 3b, 1970, ground water level is anticipated to be approximately at least 90m bgl.

There are no mapped watercourses within the site boundary and no active licensed surface water abstractions or discharges within 1km of the site. The desk study information indicates the proposed development is in Flood Zone 1 (with a low probability of flooding from rivers or the sea). In addition, the site is not located within a groundwater Source Protection Zone (SPZ).

Further information on the ground conditions at the site is contained within the Chapter 13 Ground Conditions & Contamination and provided at Appendix 13, ES Volume 13.1.

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Water Environment

Hydrology

The nearest surface water feature to the application site is Twitton Brook located approximately 1.3 kilometres to the east of the application site. In addition, the River Darent is located circa 1.6 kilometres east at its closest point and leads to Longford/Chipstead Lake located approximately 2.25 kilometres south of the application site.

The water quality of the River Darent has been classified by the Environment Agency under their regional River Basin Management Plan (RBMP) as having 'moderate' ecological potential and 'good' chemical status.

Flood Risk

According to the Environment Agency 'Flood Map for Planning (Rivers and Sea)', the application site is located in Flood Zone 1 (Low Probability). Flood Zone 1 represents land assessed as having less than a 1 in 1,000 (0.1%) annual probability of flooding from rivers or the sea. The nearest area that falls within Flood Zones 2 and 3 is approximately 1.6 km to the east of the application site.

The Environment Agency's online geo-spatial records do not show the application site to have been subject to historic flooding. The closest record of historic flooding, according to the data, is approximately 2 km east of the site.

The Environment Agency Long Term Flood Risk mapping delineates risk from pluvial sources (i.e. flooding caused by rainwater exceeding capacity of drainage systems). The mapping identifies the majority of the application site to be at Very Low risk of pluvial flooding with small pockets of land throughout the site to be at Low to High risk of such flooding. Environment Agency mapping indicates that the application site is not at risk of flooding from rivers or as a result of reservoir failure.

Further information on flood risk and drainage is contained within the Flood Risk Assessment (including SUDS Assessment and Drainage Strategy), provided in Chapter 14 Water Resources & Flood Risk and Appendix 14 in ES Volume III.

Landscape & Heritage Designations

Heritage Designations

There are no World Heritage Sites or Registered Battlefields within the application site or study area.

The scheduled fort of Fort Halstead [NHLE 1004214] is located within the south-eastern boundary of the application site. The fort was originally built between 1895 and 1897 as part of a group of fortifications designed to defend London from possible invasion by the Triple Alliance (Germany, Austria-Hungary and Italy). The monument comprises of a polygonal assembly point and store together with a concrete revetted moat. Vaulted barracks can be noted on the western side of the interior and a magazine is located to the eastern side.

The Grade II* listed Chevening Registered Park and Garden [NHLE 1000258] is located approximately 0.5km south-west of the application site and partially lies within the south-eastern of the Study area. The asset comprises gardens, pleasure grounds and a park surrounding seventeenth century Chevening House.

There are a further 113 non-designated heritage assets (including known archaeological sites and findspots) present within the Study area.

Further information on the heritage designations in the area surrounding the application site is contained in Chapter 8 Historic Environment and the Historic Environment Assessment, provided in Appendix 8, ES Volume III.

Landscape Designations

The application site is located to the north-west of Sevenoaks, on a wooded escarpment of the Kent Downs.

The proposed development has the potential to affect the character of the application site, and the character of the surrounding landscape. There is also potential for views to the application site from surrounding areas.

The site falls within the Kent Downs Area of Outstanding Natural Beauty (AONB), and the proposed scheme has the potential to affect the natural beauty and special qualities of this designated landscape. The AONB is characterised by its dramatic and diverse topography, chalk and greensand escarpments, expansive open plateau, hidden dry valleys, steep-sided river valleys, white cliffs and foreshore. Settlements and woodland, which comprises much of the area immediately adjacent to the site boundary, form key features of the area.

As reported in Chapter 7 Landscape & Visual, the application site lies within the North Downs National Character Area (NCA) and Knockholt: Darent Valley Landscape Character Area (LCA) as defined in the Kent Landscape Character Assessment [3] which both comprise woodlands, escarpments and densely settled areas as key features. The Kent Downs chalk escarpment and low lying flood plain of the River Darent valley are key features that shape the composition of the landscape surrounding the site.

Further information on the landscape character areas in the area surrounding the application site is contained in Chapter 7 Landscape & Visual and Appendix 7.1 ES Volume III.

Biodiversity

There are no statutory designated sites of international importance within 5 km of the application site and no statutory designated sites of national importance within 2 km of the application site. Six statutory designated sites of local importance are located within 2 km of the site:

- Chevening Estate Local Wildlife Site, adjacent to southwestern boundary;
- Woodlands West of Shoreham, Local Wildlife Site, encompasses several parcels of ancient semi-natural and replanted woodland, 10 m east of the application site;

- Polhill Bank Kent Wildlife Trust Site, 150 m northeast of the application site;
- Crown Meadow Wood Kent Wildlife Trust Site, 890 m southeast of the application site;
- Chevening Churchyard Local Wildlife Site, 920 m southwest of the application site; and
- Woods and Pasture at Pratt's Bottom Local Wildlife Site No information provided, 1,360 m northwest of the application site.

The application site supports 16 habitat types including amenity grassland, bracken, broad-leaved plantation woodland, grassland and scrub.

The most notable habitat types on site are considered to be the woodland and grassland communities, and the numerous scattered mature trees. The surrounding ancient woodland is particularly notable, comprising a complex mosaic of different woodland types, including: semi-natural ancient woodland, replanted woodland (mixed woodland in places) and broadleaved plantation found to the south west. The majority of the woodland has lacked effective management which has restricted the diversity of species and limited the development of a structured understorey and ground flora. The grassland mosaics found in the southern and western regions of the landholding are fairly species-rich. Other habitat types on site are generally of limited intrinsic value but do provide habitat for a range of notable faunal species.

The application site also supports protected species such as reptiles, badger, breeding birds and roosting or foraging bats. The 2018 Breeding Bird Survey (Appendix 9.6 ES Vol III) identified that the wider site supports a total of 44 breeding species, of which the most notable are species of woodland and woodland edge habitats such as nightingale, spotted flycatcher, mistle thrush and song thrush.

Further information on the ecological baseline is contained within Chapter 9 Biodiversity and Appendix 9 in ES Volume III.

Air Quality

As required by the Environment Act (1995) [24], the local authority have undertaken a Review and Assessment of air quality within their administrative area. The closest designated Air Quality Management Area (AQMA) to the application site is an area following the M25 throughout the District extending 200m either side of the motorway centreline between J5 and 6, 80m between J3 and 5 and 140m between J2 and 3 declared for annual mean NO₂ and 24-hour mean PM10.

The application site is not located within an AQMA, on the basis that PM10 and NO₂ concentrations are not considered likely to exceed the national Air Quality Objectives (AQOs).

Further information on the current air quality conditions at the application site and in the surrounding area is contained within the Air Quality Impact Assessment, provided in Chapter 11 Air Quality and Appendix 11, ES Volume III.

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3.7 THE NEED FOR DEVELOPMENT

The departure of DSTL requires a pro-active approach to ensure the site continues to have a development future. Inherent in this is ensuring that QinetiQ is provided with certainty around its ongoing operations at the site.

The uplift in unit numbers to 750 (from the extant consented permission of 450) is considered to represent a sustainable solution for the site and will help to foster the creation of a viable new community, which is appropriate in scale for the location and in the interest of responding to SDC's housing need and creating a mixed and balanced community.

In addition, the re-development of the application site seeks to secure and provide a long-term strategy for the management of ecology and heritage assets, enabling public access for the latter.

Building on the area's employment use, the Applicant's long-term vision for Fort Halstead village is to ensure that:

- Provision will be made to retain QinetiQ on site (c.200 jobs) and create c.1,200 new jobs through the creation of two new employment zones of office/research & development, light industrial space, flexible mixed-use office and innovation space in the new Village Centre;
- The space provided will support existing businesses in need of new high quality space and attract new employers to the District, boosting the local economy;
- The Village Centre hub will provide mixed-use community space, nursery and useable managed open space for a range of recreational uses;
- The site will be accessible to the public via footpath and bridleway connections to provide access not only to the built development, jobs, homes and services but also the open recreational land for the enjoyment of the local landscape;
- The residential provision will provide a range of much-needed market and affordable housing types, including the potential for over-55 housing. The site will contribute to meeting Sevenoaks District Council's housing need during the Local Plan period;
- A number of off-site measures are proposed which will enhance the local area and network, and the re-routing of an existing bus service and provision of a specific community bus provision to support non-car modes of transport; and
- Major utilities will be upgraded, including water, electricity and high speed broadband to improve performance and meet the needs of the site.

3.8 THE PROPOSED DEVELOPMENT

The proposals are for a mixed-use development. The full description of development as it appears on the hybrid planning application is as follows:

In detail:

- Demolition of existing buildings;

- Change of use and works to buildings Q13 and Q14 (including landscaping and public realm);
- Primary and secondary accesses.

In outline:

- Development of business space (use classes B1a/b/c) of up to 27,659 sq m GEA;
- Works within the 'X' enclave relating to energetic testing operations, including fencing, access, car parking;
- Development of up to 750 residential dwellings;
- Development of a mixed-use village centre (use classes A1/A3/A4/A5/B1a/D1/D2);
- Development of a one form entry primary school;
- Change of use of Fort Area and bunkers to Historic Interpretation Centre (use class D1) with workshop space;
- Roads, pedestrian and cycle routes, public transport infrastructure, car parking, utilities infrastructure, drainage;
- Landscaping, landforming and ecological mitigation works.

The following sections describe the various elements of the scheme that are relevant to the assessment of its environmental effects. Further detail is provided in the Planning Statement and Design & Access Statement, which both accompany the planning application.

The Defence Science and Technology Laboratory (DSTL) is currently vacating the application site and therefore, has already undertaken demolition of some of the decommissioned buildings which are surplus to requirements as well as associated remediation works on the plots of the demolished buildings. The detailed programme and sequence of future demolition and remediation works by DSTL are currently unknown, although it is expected that some further selective demolition would take place before DSTL fully vacates the application site. Remaining buildings and magazines that would require demolition to facilitate the proposed development together with the removal of floor slabs, foundations and redundant infrastructure, would likely be demolished and removed in a single programme of demolition by the appointed Contractor. The detailed demolition programme would be confirmed between the appointed Contractor and Sevenoaks District Council (SDC) on a plot by plot basis.

Across the proposed development, minimum heights are anticipated to be circa two storeys (10m) with maximum heights up to four storeys (19.5m). Residential units will typically vary from 2 to 3 storeys with a maximum height of 14.5m, mixed use provision (including independent living provision) will vary from 3 to 4 storeys (maximum height of 16m) and employment uses will vary from 2.5 storeys to 4 storeys (maximum height of 16m).

The parameter plans for the proposed development are as follows and included to the rear of this Chapter:

- Figure 3.1 Land Use and Green Infrastructure Plan;

- Figure 3.2 Building Heights Plan;
- Figure 3.3 Access and Movement Plan; and
- Figure 3.4 Demolition Plan.

In addition to the parameter plans the following indicative plans have been provided:

- Figure 3.5 Illustrative Masterplan
- Figure 3.6 Indicative Phasing Plan

Residential units

Up to 750 mixed tenure homes in a variety of sizes are proposed for the application site which will be located within distinct residential neighbourhoods.

Innovation and education hub

The Innovation and Education Hub is located along the southern part of the site, wrapping around the Fort and QinetiQ consolidated demise. The employment area and primary school are an integral part of the Village Centre and its location is easily accessible from every home which will encourage activity and vibrance making the commercial uses in this location more viable.

The employment areas will include a range of buildings with varying footprint areas, providing flexible accommodation for office, research & development as well as light industry.

At the centre of the main employment area is a one form entry primary school. This primary school will serve the new residents, reducing the need to travel outside of the development via car for the school run.

Village Centre

The Village Centre forms the heart of the development as both an employment area and a community hub for the new residents. It sits to the north of the Fort, encompasses the retained and refurbished 'Q' buildings as well as providing a new village green to the east of Penney Road. The village centre will provide a range of uses and facilities for the new community including a food store; café; community hub with space for a GP consulting room; a gym; flexible workspace; a nursery as well as space which can accommodate older people's housing.

A clear sequence of open spaces from the Fort to the Green Link including the Village Square and Village Green, will be provided with continuous shared footway/cycleway with a minimum width of 3m wide. An equipped play area will also be provided in the Village Green.

The detailed component of the planning application for buildings Q13 and Q14 is set out in a number of drawings that may be found at **Appendix 3.5 ES Vol III**.

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Non-Residential Floorspace Schedule

A summary floor space schedule for the non-residential uses is provided below in Table 1.

Table 1
Non-Residential Floorspace Schedule (Gross External Area (GEA))

SUMMARY SCHEDULE	USE CLASS	INCLUDING PRIMARY SCHOOL	EXCLUDING PRIMARY SCHOOL
Mixed Uses in the Village Centre (sqm)	A / B / D classes	1,312	1,312
Employment Uses (sqm)	B classes	26,870	28,218
IFE Primary School (Ha)	D1	1.06 Ha	-
QinetiQ (sqm)	B classes	6,007	6,007
Fort Area (sqm)	D1	1,794	1,794
Retained Bunkers (sqm)	D1	500	500

Site Access & Parking

Vehicle Access

The Crow Drive access from Polhill will remain as the main access to and from the new village at Fort Halstead. A new roundabout has been designed to improve the quality of that access and the design was agreed in principle with Kent County Council Highways. The scheme will improve access and egress to/from the site and has sufficient capacity to cater for the whole Fort Halstead development.

Kent County Council Highways (KCCH) has confirmed that they will require the existing secondary access onto Star Hill Road to be retained in order to provide best practice for masterplanning and suitable arrangements in the event of the main access becoming blocked by either an accident or due to road works.

The masterplan has been designed to encourage the new community to use the main Polhill access through the use of appropriate traffic calming measures combined with a more circuitous route to the secondary access.

In order to enhance safety, a new 40 mph speed limit together with a new entry treatment is proposed for Star Hill Road—this will need to be formalised following the grant of planning permission with KCCH. Visibility splays will also be improved at the Star Hill site access, again to enhance safety.

Vehicle Parking

The amount of parking provided for residential and employment areas will be dependent on the character area within the proposed development. A mixture of on-plot between dwellings, on-plot corner and shared courtyard

parking will be provided for residents. Garages or car ports will also be provided for particular residential accommodation. On-street visitor parking will be provided throughout the residential and employment areas with a maximum of three parallel parking bays without landscaping between with marked bays of a minimum of 2.4 metres wide and 6 metres long.

For mixed-use and employment buildings in the village centre, parking will be provided with parking areas to be positioned behind buildings and away from key frontages to avoid dominating public open spaces with vehicles.

Cycle & Pedestrian Access

The development proposals include the provision of a new link (referred to as the 'green link'), which provides a shared pedestrian and cycle network throughout the application site including the east-west link which is an off-road route between the Polhill Site access and Knockholt Pound. Cycle routes are proposed along the primary, secondary roads and through the green infrastructure.

Convenient cycle storage facilities will be provided as part of the open space within the innovation and education hub.

The scheme incorporates enhanced safety of access for both pedestrians and cycles.

A framework travel plan submitted as part of the planning application, is provided at **Appendix 10.1, ES Vol III**. This will include a package of measures aimed at encouraging the use of non-car modes. It will also include details for monitoring trip generation for the new Fort Halstead village and identify a remedial strategy should mode share targets not be achieved.

All existing Public Rights of Way around the Site will be retained and enhanced. This includes partial upgrade of Footpath SR172 between the Site and Knockholt Pound to a cycle path; partial removal of the security fence; new connections to the green links within the Site; and a programme of management to make sure that all footpaths are accessible and in good state of repair.

Greenspace, Landscaping & Public Realm Works

The proposed development has been designed to fall within existing built environment/brownfield land where possible, with impacts on existing greenspace minimised.

The village centre will encompass a village green that will act as the green heart of the development bringing together employment, residential and recreational uses and anchoring the landscape whilst contributing to a modern village character.

Green corridors will link the green heart of the development to the wider landscape and will allow for the retention of existing vegetation and will create new opportunities for recreation, ecology and drainage.

The application site contains many features that are characteristic of the landscape, such as woodland, trees and chalk grassland. These features will be retained and enhanced through an appropriate management regime.

The Ancient Woodland will be offset from built development by a buffer of at least 15m. This, in accordance with Natural England guidance and consultation, is to protect the ecological integrity of the woodland by creating new woodland edge habitat and discouraging access. The buffers will comprise a transition of habitats, including an amenity/footpath zone closest to the residential area; an intermediate grassland/wildflower zone; and woodland/woodland edge planting zone. The structural diversity of the Ancient Woodland would also be enhanced through appropriate management, such as canopy thinning, re-coppicing and planting of native species.

Although it is not possible at the Outline Planning Application stage to definitively say which trees will be retained/removed, it is considered that the trees within the proposed green spaces generally have higher potential for retention (subject to requirements for footpaths, play space, drainage features etc); whilst trees within the proposed development parcels have lower potential for retention (subject to the location of amenity space and private gardens). By overlaying the tree survey information with the Parameter Plans—as shown on the plan opposite—it has been calculated that approximately 89.8% of the Category A have high potential for retention.

The area of chalk grassland on the scarp slope will be retained and enhanced through an appropriate management regime. This will include a carefully designed programme of sheep grazing (where possible) and cutting regimes, with arising's removed from the grassland habitat upon the unimproved calcareous grassland present within the south of the application site, and management of encroaching trees and scrub to provide a habitat mosaic and maximise the ecological value of this area. Other areas of semi-improved grassland and neutral grassland will also be retained and enhanced, increasing the overall biodiversity value of the Site.

The character and appearance of the application site will also be enhanced by a comprehensive green infrastructure strategy. A Village Green will be provided at the heart of the settlement, adjacent to the Village Centre, providing opportunities for recreation and events. Connected to the Village Green are a series of 'Green fingers' extending throughout the residential area, providing areas of public open space, pedestrian links, allowing for tree retention, and providing habitat corridors between areas of Ancient Woodland. The green fingers are also important from a place making perspective, creating an attractive residential environment and providing distinction between different neighbourhoods.

Three of the existing bunkers within the application site, which are not designated but reflect the application site's modern military heritage, will be retained and incorporated within the proposed open space (known as 'bunker park'). The heritage features form an important part of the green infrastructure strategy and positively contribute to the overall character of the application site.

In addition, new ponds will be created within areas of open space to provide drainage features, enhance biodiversity and provide amenity benefit.

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Lighting

The proposed lighting requirements for the Development would be required to comply the following standards and guidance documents:

- UK Parliament, 1990; The Environmental Protection Act 1990;
- Clean Neighbourhoods Act (Section 102) and Environment Act 2005 (Sections 79, 80, and 82);
- BS-EN 12464-2:2014; Lighting of work places - Outdoor work places;
- BS 5489:2003 Part 1; Code of Practice for the design of Road Lighting;
- BS-EN 13201:2003 Parts 1-4; Road Lighting;
- Chartered Institute of Building Services Engineers (CIBSE) Lighting Guide 6:1992; Outdoor Environment;
- Institution of Lighting Professionals (ILP formerly ILE); Guidance Notes for the reduction of Light Pollution;
- Sevenoaks District Council, Development Management Policies;
- Sevenoaks District Council, Policy EN31, Outdoor Lighting;
- Sevenoaks District Council, Policy EN5, Outdoor Lighting;
- Manual for Streets, DCLG 2007;
- Lighting in the Countryside, DCLG1997;
- National Planning Policy Framework;
- Bat Conservation Trust (Version 3, May 2009); ILE Bats and Lighting in the UK.

In accordance with the standards and guidelines, the illuminance levels outlined in Table 2 have been specified to provide indicative lighting levels for the Development which would be used to give an outline understanding of the expected illumination levels.

Table 2
Development Illumination Levels

PUBLICATION	HORIZONTAL ILLUMINANCE	
	AVERAGE	MINIMUM LUX / UNIFORMITY
Development Site Access Roads		
BS 5489-1:2013 - Code of practice for the design of road lighting Part 1: Lighting of roads and public amenity areas, Class S424	5 lux	1 lux
Proposed Car Park Areas		
BS 5489-1:2013 - Code of practice for the design of road lighting Part 1: Lighting of roads and public amenity areas	5 lux	0.25 Uo
Pedestrian Circulation Areas		

BS EN 12464-2:2014 Lighting of work places – 5 lux 0.25 Uo
Part 2: Outdoor Work Places –
Walkways exclusively for pedestrians (Ref: 5.1.1)

Industrial Areas		
Short-term handling of large units and raw materials, loading and unloading of solid bulk goods (Ref: 5.7.1)	20 lux	0.25 Uo
Continuous handling of large units and raw materials, loading and unloading of freight, lifting and descending location for cranes, open loading platforms (Ref: 5.7.2)	50 lux	0.4 Uo

The design would incorporate the illuminance levels specified within Table 1 Development Illumination Levels, but would be subject to further detailed design during the design stage. Whilst the design addresses the strict light control, no compromise would be made in respect of safety in the health, safety and welfare of operatives and visitors.

Light pollution can take differing forms and is a very subjective matter. Measures to reduce light pollution would be considered during the Development design. Examples of these are:

- Including as standard LED light sources to reduce overall lighting requirements by improving colour definition;
- Limiting upward light by specifying lighting units which emit no upward light as standard;
- Recommending and designing lighting levels to meet the lowest possible lighting levels required as standard; and
- Providing as uniform design as possible.

In addition, in relation to sky glow, luminaire intensity and light intrusion, the aiming and selection of luminaires with good reflectors would reduce overspill and line of sight intensity.

Road junction lighting is subject to detailed design as to the lighting type and illumination level requirements. Private Residential light both internal and external cannot be fully controlled or mitigated and will contribute towards levels of light spill.

Further details may be found at the Summary Lighting Assessment (2019) which is provided at Appendix 3.2 and Lighting Assessment (2015) in Appendix 3.3, Vol III of this ES.

Arboriculture

The site contains native and naturalised scattered trees of all ages and species dominated by English oak, sweet chestnut, silver birch and common ash. The whole site is included within woodland Tree Preservation Order 4 (2016). The site is also surrounded on all sides by woodland which has

either been planted or existed originally as Ancient Replanted Woodland and Ancient and Semi-Natural Woodlands to provide screening of the Fort Halstead site.

Centrally, tree cover is scattered around the complex of buildings and is of high to moderate quality with mature canopy proportions which would have provided camouflage from aerial view during the site’s military presence. Trees have generally been managed in a sympathetic manner with minimal intervention which had resulted in a large proportion of high-quality trees with few notable defects. The trees surveyed were generally in good health and exhibited minor defects such as minor deadwood and small hanging branches.

As stated previously in this chapter, it has been calculated that approximately 89.8% of the Category A have high potential for retention.

An arboricultural impact assessment has been undertaken to assess the potential impacts that the proposed development may have upon the site’s tree stock. Further details may be found at the Arboricultural Impact Assessment and Tree Retention Report which is provided at Appendix 3.1, Vol III of this ES.

Waste Management

Refuse stores and collection points have been designed into the layout and conveniently located for both residents for refuse vehicles on bin collection day. Refuse swept path analysis has been checked to ensure the development is accessible to refuse vehicles. Composting facilities are also available near the community garden.

Energy Strategy

To identify total energy demand and CO₂ emissions for the proposed development, energy modelling in compliance with Building Regulations Part L 2013 was completed on each indicative unit type. The energy demand derived from this assessment was then multiplied by the floor area for each unit type to establish the related CO₂ emissions. The CO₂ emissions for each type were then summed to give the total baseline regulated emissions for the development and at each stage of the energy hierarchy.

Site CO₂ Emissions

The energy strategy gives focus to the anticipated significant savings that could be achieved under the proposed building regulations scenario, as these regulations will be in place at the time of delivery.

Therefore, the following energy strategy is proposed:

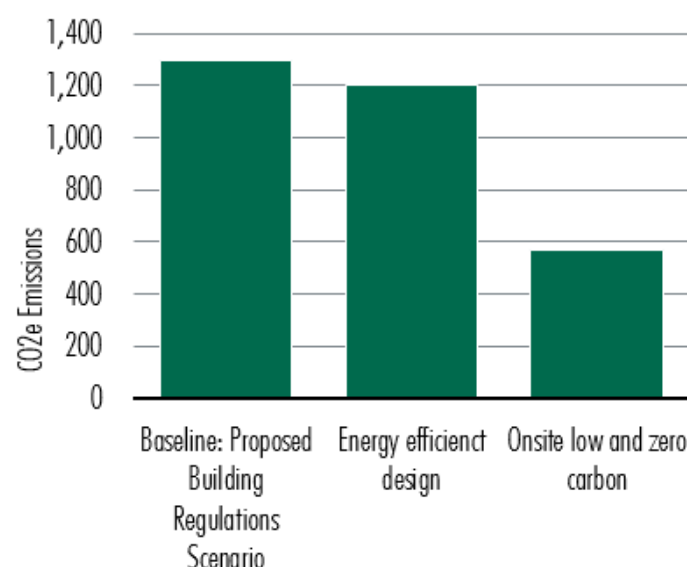
- Buildings will be designed with high levels of energy efficiency. This is likely to include low fabric and window U-values, low air leakage and thermal bridging. These specifications will ensure that the development achieves a 7% improvement over a proposed building regulations scenario.

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- Air Source Heat Pumps and 1,120m² of solar PV, equating to a 160kWp solar PV system is specified, achieving a 49% improvement over a proposed building regulations scenario.
- Cumulatively, the energy strategy specifications achieve a 56% reduction over a proposed building regulations scenario

The savings against the proposed building regulations baseline CO₂ emissions are illustrated in Figure 1 below:

Figure 1
Development Carbon Emissions



The carbon emissions for the proposed development, the anticipated carbon savings, and, the amount of solar PV required to achieve the stated carbon savings, would be subject to a further review as the design progresses into the detailed design stages or at future reserved matters applications, to ensure that they reflect the latest design proposals and reflect latest cost/viability calculations.

Utilities Infrastructure

Water Supply - Existing

The existing Thames Water supply enters the site at the North-Western corner near the end of the footpath leading from Knockholt Pound village.

The water supply is metered by Thames Water and from this point it becomes a private supply which is currently maintained and managed by DSTL.

Water Supply - Proposed

Relatively early in the development process the off-site existing residential properties that are currently provided with potable water through the will be provided with a new Thames Water supply which will allow them to be separate and not dependant on the existing DSTL site. This supply will also

provide Fire Hydrants in the footpaths allowing the Fire Brigade access to water in the normal way.

Surface Water Drainage - Existing

The existing surface water drainage system from each building and the road gullies, combines into a series of piped systems discharging into natural soakaways or into open culverts which discharge onto the open land or wooded areas around the perimeter of the site.

Surface Water Drainage - Proposed

The site is underlain by a layer of clay estimated to be between circa 0m and 12m in thickness. Upper, middle and lower chalk formations, classified as Principal Aquifers, are located beneath the clay.

A strategy for the disposal of surface water has been developed based on the infiltration rate achieved from falling head tests undertaken. The proposed catchments for each of the borehole and attention systems is based on the natural topography of the site and availability of open space that avoids any impact on the existing trees and the ancient woodland that bounds the site.

Foul Drainage - Existing

Foul water drainage from the entire site is via a gravity system which connects to the main sewer in Polhill. The network of drainage generally flows towards, and combines with, the residential area system. From this point to the Polhill sewer, the system has been adopted by Thames Water. The upstream part of the system within the DSTL secured area, is currently privately owned.

Electrical Supplies - Existing

The existing UKPN High Voltage electrical supply emanates from the A224 East of the site. Buried cables cut through the fields rising the hill to the South of the quarry before entering the secure area of the site just North of the fort. The High Voltage incomer and metering panel is located in building A23.

From this point, a private High Voltage network connects to several transformers generally located in compounds around the secured DSTL part of the site, each providing a low voltage network serving the various buildings in the area of the substation.

Telecom Services - Existing

The existing telecom services are distributed via a below ground network of cable ducts distributing both incoming telecom services and data services between buildings.

Foul Drainage, Telecoms and Electrical Services - Proposed

The other utility services to the existing off-site residential properties, including electricity, drainage, and telecoms, are supplied separately to the DSTL site and will remain unaffected by the proposed development.

The development site will be provided with new utility services with power, water and foul drainage for each building being directly connected to the relevant utility provider.

All properties will have a utilities electrical meter which will allow the occupier to choose and switch – when required – their electricity provider.

All buildings (New and Existing) on the final development will be supported with new infrastructure directly by the Utility providers.

3.9 ASSOCIATED DEVELOPMENT

It is envisaged that off-site enabling works will be predominantly related to highways works and will include the Otford Lane/A224 Junction - roundabout improvement scheme that was approved as part of the 2015 OPA. Further details regarding this are provided in Chapter 10 Transportation and have been assessed as appropriate within this ES.

WORKS CITED

- [1] Sevenoaks District Council, "Local Development Framework: Core Strategy," February 2011.
- [2] Sevenoaks District Council, "Allocations and Development Management Plan," February 2015.
- [3] Kent County Council, "The Landscape Assessment of Kent, <https://www.kent.gov.uk/about-the-council/strategies-andpolicies/>," October 2014.