5 CONSTRUCTION STRATEGY

5.1 INTRODUCTION

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

Planning for demolition and construction is necessarily broad at this stage, as the Demolition Method Statement (DMS) and Construction Method Statements (CMS), as well as specifications, have not yet been prepared and a contractor not yet appointed. As such, it may be subject to modification during any future detailed demolition and construction planning. For this reason, the following chapter is based on reasonable assumptions in the demolition and construction programme, and the collective experience of the design team, who have provided the construction methodology and programme information set out in this chapter.

5.2 SUMMARY OF ANTICIPATED WORKS

The proposed development comprises the demolition of the majority of the existing buildings with the exception of those buildings listed in Table 5.1.

Table 5.1
List of Buildings to be Retained

BUILDING SERIES	BUILDING NUMBERS
A Series	A1, A3, A10, A11, A13, A14
F Series	F1-F4, F8, F11, F12, F14-F16
M Series	M4-M6, M20 -M24
Q Series	Q13, Q14
R Series	R58, R59
S Series	S14, S17.2
X Series	X2-X9, X11-X13, X15.3, X19, X24, X24.1-X24.3 X29, X32.1, X34, X35, X35A, X38, X40, X43.1, X43.2, X48, X52, X57, X58, X60-X73, X78-X82

The existing buildings anticipated to be demolished are shown in Figure 3.4, Chapter 3 Application Site & Proposed Development.

The construction of new buildings providing a variety of proposed uses will be accompanied by the change of use and works to existing buildings including the restoration of a listed building, and improvements to both vehicular and pedestrian/cycle access. The demolition and construction works will be undertaken in several phases which include demolition, remediation, site preparation and construction.

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 by DSTL is currently unknown, although it was expected that some further selective demolition would take place between before DSTL fully vacates the application site. Remediation would be undertaken where necessary by the Applicant and / or developers, for more sensitive end uses such as residential, the school and open spaces.

5.3 CONSTRUCTION PHASE PROGRAMME

For the purposes of the ES, it has been assumed that construction is anticipated to commence in 2020, with the 'opening year' for the first phase of development 2024, and all development within the site completed in 2031.

The anticipated construction programme is shown in Error! Reference source not found.. Throughout this ES, reference to the 'construction phase' is considered to include the demolition works.

The current expectation is that the demolition, remediation and construction works would take place over approximately 11 years although construction work would not be continuous over that period. This programme includes all enabling work, required to allow efficient access to the site. The programme is considered to be based on reasonable assumptions in terms of the sequencing of works and site logistics and is considered to be achievable.

5.4 SITE LOGISTICS

Hours of Operation

All 'noisy activities' such as piling must be carried out within the following 'restricted hours':

- 08:00 to 18:00 Mondays to Fridays; and
- 08:00 to 14:00 during Saturdays; and
- At no other times, including Sundays or Public Holidays.

No work is to be undertaken on Sundays or Public Holidays, unless written consent is obtained from SDC for extreme emergency cases. In this scenario the Contractor would similarly advise nearby residents through letter communication. The contractor will apply for a Section 61 prior working agreement, or dispensation.

It is recognised that there may be circumstances where the restriction on hours of work cannot be adhered to. Where this is unavoidable, the Contractor would be required to fully justify any proposed deviation from these operating periods, provide written justification to SDC, and notify neighbours in writing, before works outside normal hours commence.

5.5 OUTLINE CONSTRUCTION WORKS METHODOLOGY

Demolition & Enabling Works

Any remaining buildings following DSTL's departure, together with 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 as and when the buildings are vacated by DSTL.

Given the age of the existing buildings on site there is potential for Asbestos to be present within the structures. Site investigations will check for other hazardous materials.

Once any hazardous materials have been removed and any live services terminated and confirmed as such, the soft strip of all fixtures and fittings within the existing spaces will be carried out. Stripping will be carried out by trained operatives using hand-held tools and small machines in a continuous stripping exercise. The works will be accessed from the existing floor level, Mechanical Elevated Working Platforms (MEWPs), or from aluminium towers.

Combustible materials will be removed first, before ceiling hangers, trunking, conduit, pipework and other non-structural metalwork are cut out using oxygen/propane burning equipment, angle grinders or mechanical dismantling. A 'Hot-Works' permit to work system will be enforced when any works of this nature are undertaken, and fire extinguishers will be prominent. Hot works will cease two hours before the end of a working shift and the area thoroughly checked prior to breaks or to leaving site. Oxygen and Propane bottles will be stored upright in a lockable cage.

By regularly removing the accumulated debris, the potential fire risk that loose combustible material creates is minimised / removed. Rubbish arising from the soft strip will be segregated into recyclable streams and deposited into skips / container lorries within the loading areas for removal.

The existing 3m high perimeter fence currently secured by DSTL would be retained throughout the demolition and construction works to minimise the risk of unauthorised access to the application site and safeguard the health and safety of Site workers, visitors and the public. Utility infrastructure associated with the QinetiQ area and also access to this area would be maintained throughout the demolition phase.

Site Surveys

In advance of the demolition of individual buildings, a number of detailed surveys would be undertaken, including:

- asbestos surveys within the relevant buildings;
- internal and external surveys/recording of the relevant heritage buildings and Scheduled Monument (form, appearance and setting) in consultation with Historic England, SDC and KCC; and

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- ecology surveys (such as bats, badgers, reptiles and dormice) and tree surveys, where required and in consultation with Natural England.

Following the demolition of buildings and in advance of construction, the following detailed surveys would be undertaken on the plots, including:

- Site Investigation(s) to further delineate ground contamination (including ground gas) and determine geotechnical properties;
- Unexploded ordnance survey;
- Archaeological investigations; and
- Drainage surveys.

All statutory SDC consents and licences required to commence any on site activity will also be obtained ahead of the works commencing and given the appropriate notice period. Applications will include but not necessarily be limited to:

- Notices for works on the highway in accordance with the Highways Act 1980 and Road Traffic Act 1998;
- Hoarding and scaffold licences for works on the perimeter boundary;
- Temporary Traffic Order (TTO) for any alterations to road junctions, if found necessary;
- Construction notices;
- Section 80 Demolition Notice;
- Section 61 (noise) prior agreement application;
- Connections to existing statutory services and main sewers;
- Licence for discharge of water from the site into the public sewer; and
- Approval of the final Construction Environmental Management Plan (CEMP), Demolition Method Statement, Construction Method Statement, Site Waste Management Plan (SWMP) and any other supporting documents and plans.

Following demolition and during the preparation and construction works relating to specific areas of the application site (as described below), the habitats that are to be retained within the specific area would be managed appropriately so that the value of habitats does not change from that reported in the Ecological Appraisal. Trees to be retained on or around each area would be protected in accordance with BS 5837 – 'Trees in Relation to Construction', whereby protective fencing would be erected to prevent accidental damage by establishing root protection zones.

The fencing would remain in place for the duration of the demolition and construction works on or around such an area under construction.

Remediation

DSTL will remediate the application site directly to an industrial/commercial end land use and/or possibly, in order to achieve the necessary standard for more sensitive end uses (such as residential with gardens), in collaboration with the developers. Otherwise, remediation would be undertaken where necessary by the Applicant and/or developers, for more sensitive end uses such as residential and open spaces. Remediation would be undertaken, where necessary and appropriate for particular parts of the application site and/or end uses, following further detailed Site Investigations carried out post-demolition, to ensure that those parts of the application site are suitable for the proposed residential land use.

An Outline Remediation Strategy Appendix 13.2, Vol III of this ES has been developed to describe the likely methodologies and procedures for the implementation of remedial measures. Following further Site Investigations and updated risk assessments reflecting the detailed design of the proposed development, a detailed Remediation Method Statement would be prepared for each plot of the proposed development (where appropriate) in consultation with statutory consultees.

Site Preparation

Perimeter timber hoarding (typically 2.4m high) would be erected to secure the buildings and/or the area under construction or the construction activities taking place, in accordance with Health and Safety Executive (HSE) standards. Access and egress points would be lit during the hours of darkness and maintained for the duration of the works (if necessary) and would be sensitively lit in accordance with the considerations of ecology and the AONB to restrict light spill and glare.

Segregated access for pedestrian and vehicle entrances would be provided at the access and egress point (Crow Drive) to the application site. QinetiQ would continue to operate throughout the construction programme and therefore provision shall be made to allow safe pedestrian and vehicular access (including lorries) to the X Area during QinetiQ's operating hours. Where possible, vehicular access to the QinetiQ area shall be maintained by Crow Drive and Polhill Road junction.

Road sweeping facilities would be provided and wheel-wash / vehicle wash-down facilities would be installed at this location near to the current canteen. The appointed Contractor's compound and offices would also likely be sited at this location. Site operatives would use the existing car park on the application site that lies outside the existing perimeter security fence.

Construction traffic routes would be agreed with KCC. However, it is anticipated that construction traffic would access / egress the application site along Crow Drive from the A224 Polhill Road / London Road and the M25 motorway. No construction traffic would access / egress the site from Star Hill Road, unless otherwise agreed with SDC.

Construction Works

Owing to the variations in the topography on the application site, ground re-profiling would be required. Excavations would also be required to accommodate the utility infrastructure and sustainable drainage systems.

Construction of QinetiQ's security fence and utility infrastructure would commence early in the programme and is anticipated to be completed by the time DSTL fully vacate the site, to allow for the continued operation of QinetiQ.

No major construction works would take place in QinetiQ's blast zone, although because infrastructure would be separate from the remainder of the proposed development, sustainable drainage measures would likely be located in the blast zone. This would likely be followed by the implementation of utility infrastructure and access roads associated with the proposed development. Roads and junctions would be constructed to serve the new employment use, residential areas along Crow Road and the village centre. Concurrently, the buildings to be retained would be refurbished to a shell and core stage, together with the refurbishment (shrub and selective tree removal and repair) of the Scheduled Monument.

However, it is anticipated that the completion of the Scheduled Monument would be subsequently postponed until the last phase of residential development has been completed. Residential development plots would be phased, together with the internal roads, green infrastructure (including tree planting) and sustainable drainage systems. Indicative phasing of the proposed development is shown on Figure 3.6.

Footpath / cycleway and bus facilities would largely be implemented after the first phase of residential development is completed. The new build elements of the employment uses would be developed as demand dictates and would be completed to serviced plots and shell and core only.

Development of the school would be undertaken in accordance with appropriate design standards further to subsequent detailed design.

Materials, Resource Use & Traffic

At this point in the design process it is not possible to accurately quantify the amount of materials arising from the demolition works. However, it is anticipated that the waste materials would include: concrete; brick; glass; metal; timber; plasterboard; hard-standing / tarmac; asbestos and earth spoil.

Excavated materials would be tested against Waste Acceptance Criteria (WAC) to determine the classification of the material. Where possible, inert material would be reused on the application site for fill such as under proposed roads, hard-standing or in landscaped areas to minimise the volume of material exported off-site. It is anticipated that approximately 18,000m^3 of material would be retained on the site and 26,500m^3 would be required to be moved off site.

The number of HGVs required for all other works (utilities, roads, and construction) has been based on rates from previous experience.

Construction traffic movements are detailed in full and assessed in Appendix 10.1 Transport Assessment Vol III of this ES and Chapter 10 Transportation of this ES.

In addition to the HGV movements, there will also be car and light goods vehicles movements during the demolition and construction phases, mainly associated with workers coming onto the site and other deliveries. The number of workers per day at any given time for each of the different works (clearance, utilities, roads, and construction) has again been derived from previous project experience and professional judgement. It has been further

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assumed that all worker movements are by car/van with an occupancy factor of 1.5.

All construction-related vehicles have been also assigned two trips a day (outbound and return).

For the demolition and construction works, 269.5 working days a year have been considered (49 weeks of 5.5 days of work per week).

The likely traffic flows and HGV content have been estimated based upon the following assumptions:

For the clearance works, it is known that about 87,000m^3 of contaminated material would need to be removed and some 26,500m^2 of buildings would need to be demolished.

The number of HGVs required for demolition has been calculated assuming 1 ton of demolition material per square metre demolished, an average of 17 ton load per HGV, and 15% extra HGVs for other demolition contingency.

For the 87,000m^3 of contaminated material, the number of HGVs has been calculated as an average of the calculations made by volume (assuming a bulk factor of 1.3 and 14 m^3 of HGV capacity) and by weight (assuming 1.4 kg/m^3 density and 17 ton load per HGV). 1.1

It is further assumed in accordance with the phasing plan (Figure 3.6, Chapter 3 Application Site & Proposed Development of this ES) that:

- the clearance works progress linearly over the clearance period;
- the construction of new residential development is undertaken at a rate of approximately 100 units per annum from 2023;
- the construction of the commercial development would be undertaken over a 6- year period as a worst-case assumption.

An analysis of the construction schedule shows that there are two phases, each lasting approximately one year, when traffic associated with construction/demolition is likely to be greatest. These periods have been are as follows:

- 2023, when the utilities' works much of the development would be under way along with the major road works, refurbishment of the retained buildings and construction of new commercial and residential phases. It has been assumed that the retained QinetiQ operations would be occupied along 50 residential units; and
- 2024, when construction of the primary school could potentially take place alongside new commercial and residential phases. In terms of occupation in addition to what has been stated above for 2023, it has been assumed that there would be an update of 200 jobs and 100 additional residential units would be occupied.

The highest volume of construction/demolition traffic is generated in 2023, when the most intensive construction works (mainly roads and utilities) take place. A total of 230 construction related vehicle movements are generated per day, of which 109 are HGVs. This represents approximately 11 HGVs per hour on an average weekday if these trips are assumed evenly distributed over the ten working hours (08:00 to 18:00).

This represents a negligible impact on the local highway network. Furthermore, the Construction Management Plan will ensure that these trips are spread out and avoid the peak hours.

Whilst it is no longer mandatory to produce a Site Waste Management Plan (SWMP), it remains best practice. Accordingly, a SWMP would be developed on a Site-wide basis by the main Contractor and agreed with relevant authorities prior to demolition and construction works commencing on the Site. The SWMP would prescribe:

- procedures and commitments for minimising non-hazardous waste in line with the benchmark;
- procedures for handling any hazardous waste;
- procedures for sorting, reusing and recycling construction waste into defined waste groups either on site or through a specialist licensed external contractor.

Plant and Equipment

The following plant and equipment is anticipated to be used as part of atypical demolition and construction process:

- Excavator and Breakers
- Cutters, Drills and Small Tools
- Tipper Trucks
- Concrete Splitters and Crushers
- Scaffolding and Hydraulic Access Platforms
- Small Cranes and Hoists
- Heavy Good Vehicles / Vans
- Skip and Skip Trucks
- Hydraulic Benders & Cutters
- Ready Mix Concrete Lorries

Site Waste Management

Construction Waste Management Strategy

In accordance with the principles of the UK Government's 'Waste Strategy 2010', a principal aim during demolition and construction will be to reduce the amount of waste generated and exported from the site.

The proposed approach will comply with the waste hierarchy whereby the intention is first to minimise, then to treat at source or compact and, finally, to dispose of off-site as necessary. The waste hierarchy is shown in **Figure 5.3**.

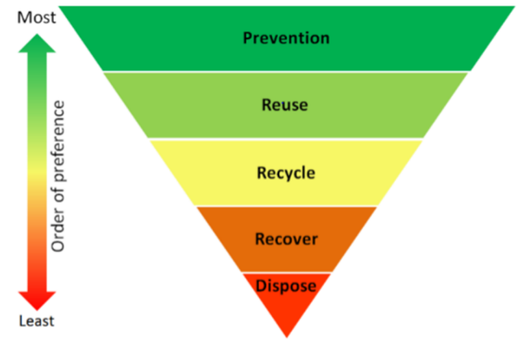

Figure 5.4
The Waste Hierarchy

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

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

- Agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme;
- Implementation of a 'just-in-time' material delivery system to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste;
- Attention to material quantity requirements to avoid over-ordering and generation of waste materials;
- Re-use of materials wherever feasible (e.g. re-use of crushed concrete from demolition for the piling platform or hardstandings off site; re-use of excavated sub-soil for fill or landscaping);
- The Government has set broad targets for the use of reclaimed aggregate, and in keeping with best practice, Contractors will be required to maximise the proportion of materials recycled;
- Segregation of waste at source;
- Re-use and recycling of materials off-site where re-use on-site is not practical (e.g. through use of an off-site waste segregation facility and re-sale for direct re-use or re-processing);
- Identification and use of online reuse platforms that support reuse of materials in their highest value; and
- Identification of overall recycling rates, reuse targets and overall landfill diversion rates.

The disposal of all waste or other materials removed from the site will be in accordance with the requirements of the Environment Agency, Control of Pollution Act (COPA) 1974, Environment Act 1995, Special Waste

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Regulations 1996, Duty of Care Regulations 1991 and the Waste Management Regulations 2011.

A Site Waste Management Plan (SWMP) will be provided within the final CEMP in due course.

Considerate Contractor's Scheme

The site and its constituent construction works will be registered with the UK's "Considerate Contractor's Scheme" by the principle contractor. This scheme ensures that contractors carry out their operations in a safe and considerate manner; with due regard to pedestrians and site users.

Site Security & Access

All security operations will be implemented in accordance with the latest British Standards and in full compliance with the Private Security Industry Act 2001 [1].

Site Offices & Welfare Accommodation

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

The locations will be identified in advance and agreed with SDC as part of the detailed construction and demolition logistics programming. It is anticipated that further information and details on this will be submitted, pursuant to planning conditions in relation to construction and demolition management.

WORKS CITED

[1] legislation.co.uk, "Private Security Industry Act 2001," [Online]. Available: https://www.legislation.gov.uk/ukpga/2001/12/contents. [Accessed 20 March 2018].

[2] legislation.co.uk, "The Construction (Design and Management) Regulations 2015," [Online]. Available: http://www.legislation.gov.uk/uksi/2015/51/contents/made. [Accessed 20 March 2018].