

Issue Date: June 2010	UNCLASSIFIED DIRECTORATE MAJOR PROJECT	Issue: FINAL 2
Executive Summary	Hydrus Defence Exempt Environmental Appraisal	MER- 110-021924

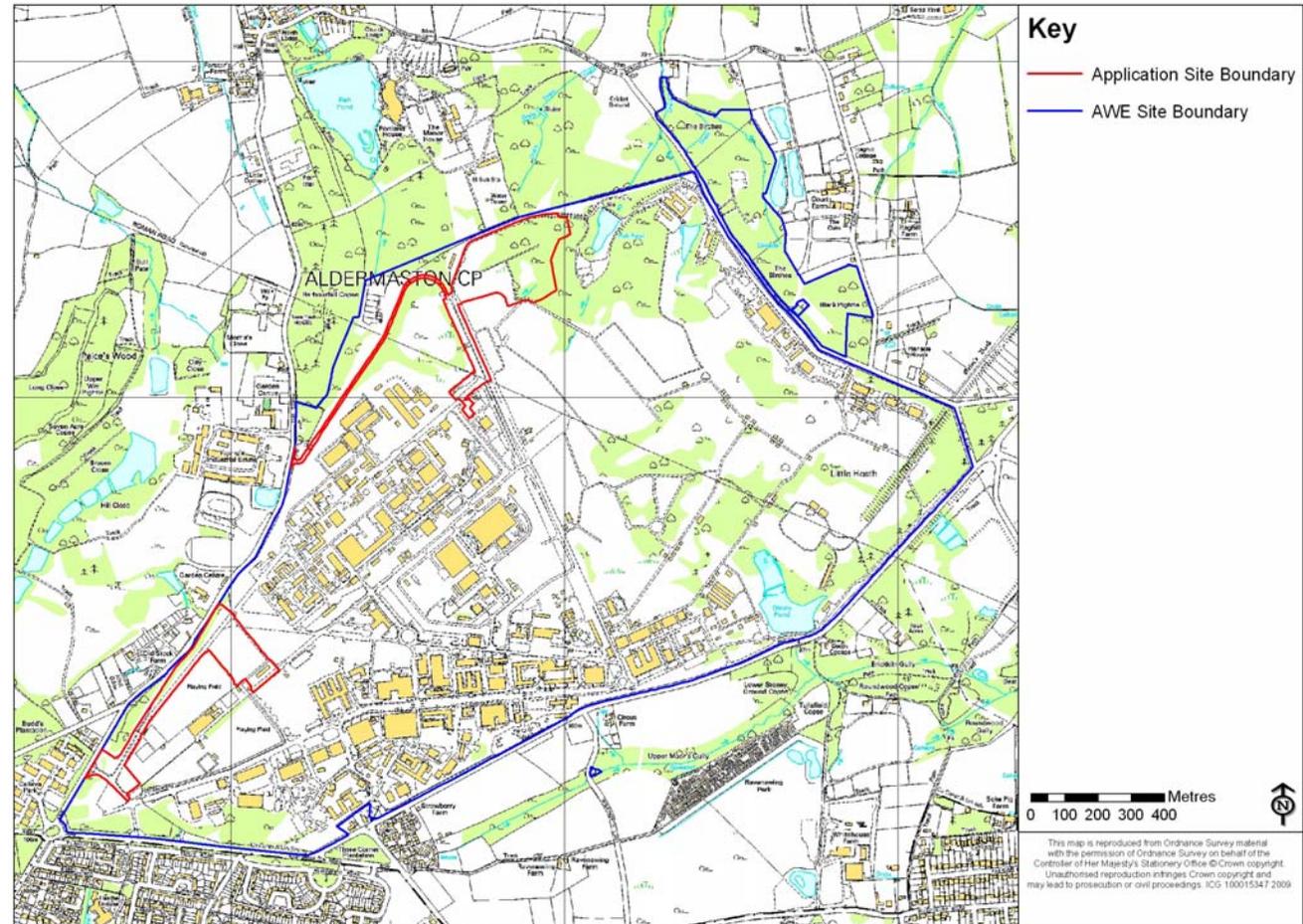
EXECUTIVE SUMMARY

1. Introduction

The Ministry of Defence (MoD) hereafter referred to as 'the Applicant' is seeking detailed planning permission for the redevelopment of part of the Atomic Weapons Establishment (AWE) site at Aldermaston, Berkshire. Detailed planning permission is being sought for a replacement hydrodynamics research facility, hereafter referred to as the 'Proposed Development'. The Proposed Development, known as Hydrus, will provide a research facility comprising an Operations Building (with Lightning Protection System), a Support Building, and an associated Electrical Substation, Sustainable Drainage System and landscape measures. The Proposed Development will also use two existing temporary construction compounds within the AWE Aldermaston Site.

The Application Site comprises two parts and covers a total area of 14.03 hectares (ha); shown in Figure 1. The Hydrus Development Site comprises previously developed 'brownfield' land that was cleared as part of the on-going demolition and clearance programme, which is mainly covered by grassland and sparse short vegetation (see Figure 2).

Figure 1: Application Site Red Line Boundary



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The Secretary of State for Communities and Local Government has considered the proposals for the Proposed Development and under direction of Regulation 4 (4)(a)(ii) of the Town and Country Planning (Environmental Impact Assessment) (Amendment) (England) Regulations 2008, determined that the requirements of those Regulations shall not apply for this application.

A Defence Exempt Environmental Appraisal (DEEA) has been undertaken which includes all the necessary information to allow an informed decision to be made on the merits of the planning application.

The DEEA considers the environmental impacts of the Proposed Development during site preparation, construction and operational phases, and has considered the likely impact of the Proposed Development on its surroundings, neighbours, wider area and overall context. The DEEA also details a number of mitigation measures, which have been developed to avoid, remove or reduce any potential adverse impacts on the environment. Where mitigation measures have been identified, these have been included in the project design wherever possible. In cases where no mitigation is required, this is stated. Impacts that remain following the implementation of mitigation measures are termed 'residual impacts'. These residual impacts are classified in accordance with a standard set of significance criteria.

The DEEA comprises two volumes:

Volume I - DEEA: This document forms the main body of the DEEA and presents the results of environmental investigations, impacts arising and proposed mitigation measures.

Volume II - DEEA Technical Appendices: The Technical Appendices provide detail on the assessments undertaken and information used to inform the DEEA Volume I.

This Executive Summary provides an overview of the findings of the DEEA.

The full assessment of the environmental impacts associated with the Proposed Development is presented within the DEEA Volumes I and II.

The DEEA is available for viewing by the public during normal office hours at the West Berkshire Council Planning Department. Comments on the planning application should be forwarded to West Berkshire Council at:

Planning Department
West Berkshire Council
Council Offices
Market Street
Newbury,
RG14 5LD

Copies of the DEEA can be purchased from West Berkshire Council at a cost of £10 for the Executive

Summary, £100 for Volume I and £125 for Volume II. This is also available electronically on the West Berkshire Council's website.

2. DEEA Methodology

The DEEA process ensures that potential impacts of a new development are taken into account when considering a planning application. It provides a systematic analysis and presentation of information on the main anticipated environmental issues relating to the Proposed Development.

The DEEA has been prepared to establish the likely significant effects that would occur on existing baseline conditions within the Application Site and the local area as a result of the construction and operation of the Proposed Development.

The DEEA has been prepared in accordance with current best practice and is based on:

- The establishment of baseline environmental conditions in and around the Application Site;
- Consultation with statutory and non-statutory consultees;
- Review of secondary information, previous environmental studies and publicly available information;
- Assessment of the relevant national, regional and local planning policy and guidance;
- Physical surveys and monitoring;

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- Preparation of desk-top studies;
- Modelling and assessment; and
- Expert judgement.

The DEEA has considered the positive and negative, short and long-term impacts of the Proposed Development on the baseline environmental and socio-economic conditions of the Application Site and its surrounds. The significance of any impacts has been identified and measures for avoiding or minimising adverse impacts have been incorporated into the final design.

The significance of residual impacts has been evaluated with reference to accepted criteria and legislation where available. Where it has not been possible to quantify impacts, qualitative assessments have been carried out, based on professional experience and judgement. Impacts have been classified as being adverse, negligible or beneficial in significance and of minor, moderate or major in magnitude.

3. Planning Policy Context

The Proposed Development has been assessed against relevant national, regional and local planning policies.

National policy and guidance emphasises the need to take environmental and social issues into consideration as a routine part of all proposed developments.

The overriding objective in national policy and advice is one of sustainable development with an emphasis on the efficient use of land and the location of development proposals where they can be close to good public transportation, pedestrian and cycle links/facilities.

Regional level policy takes these objectives further by encouraging new development in and around urban areas throughout the South East, ensuring that new developments are well designed and consistent with the overall strategy. The Proposed Development would meet these objectives.

Local policy was also assessed in regards to 'saved' policies of the adopted West Berkshire Local Plan, which is used for development control purposes throughout the District. The approach of the Local Plan is to support development relating to existing uses where it is needed to maintain continued use.

4. Alternatives and Design Evolution

Analysis of alternatives is a key part of the process and serves to ensure that environmental considerations are built into the project design at the earliest possible stage.

Four broad alternatives were originally considered for hydrodynamics research, these were:

- "Do nothing";

- Refurbish existing facilities;
- Relocation of the Facility "offsite"; and
- New Build / Replacement Facility.

The consolidated design of the Proposed Development and its location within the AWE Aldermaston Site is considered the best option in response to the environmental assessments and consultations, and to ensure all of AWE's requirements are fulfilled.

Alternative sites within AWE Aldermaston were considered and once the site was established the layout and design evolved. Over the course of each of the design stages, the Proposed Development has evolved through consultation and a progression of ideas that have led to its present scale and form.

In particular, consultations with English Heritage and West Berkshire Council recognised the need to take account of the potential impact of the Proposed Development on Aldermaston Court Registered Park and Garden and Listed Building (now used as an hotel) to the north of the Hydrus Development Site. Several design options were considered in order to minimise the potential impacts, responding directly to the consultee comments. This has included the deliberate centring of the Operations Building and Lightning Protection System (LPS) masts on the axis of a remnant historic Oak avenue within Aldermaston Court to the north, to produce a strong and deliberate relationship. The LPS masts have also been carefully engineered to provide

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circular section masts with a gently tapering shape, diminishing to the smallest dimension at the tip as could reasonably be achieved.

5. The Proposed Development

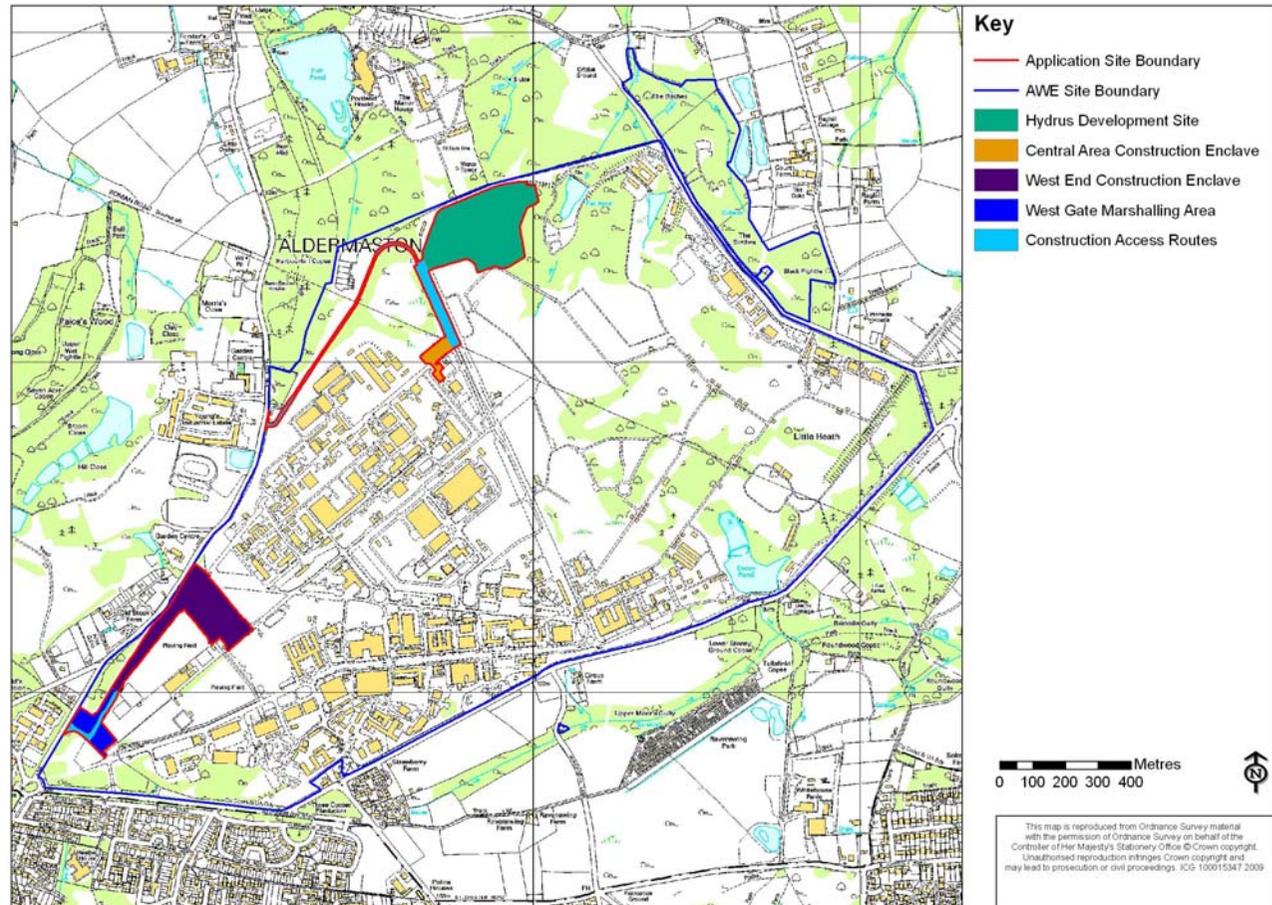
The Proposed Development covers area of 14.03 ha of the AWE Aldermaston Site. The red line boundary of the Application Site is shown in Figure 1, and the Application Site Areas are shown in Figure 2.

The Proposed Development consists of the following main elements:

- The permanent facilities;
- The use of two existing construction enclaves, the Central Area Construction Enclave (CACE) and the West End Construction Enclave (WECE); and
- The permanent external works including landscaping and Sustainable Drainage System (SuDS).

The permanent features of the Proposed Development will be located in an area known as the Hydrus Development Site (see Figure 2) for the purposes of this application. This comprises 6.47ha of the 14.03ha Application Site. The permanent features include the Operations Building (with LPS), Support Building and Electrical Substation. The remaining parts of the Application Site will be used as currently, to support existing construction

Figure 2: Application Site Areas



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activities. 'Development' therefore will only take place on about 46% of the Application Site.

Environmental resources within CACE have been assessed as part of the High Explosives Fabrication Facility (HEFF) planning application which was granted planning permission from West Berkshire Council in February 2008 (Planning Reference: 07/02438/COMIND). Resources within WECE have been assessed as part of the New Office Accommodation (NOA) planning application which was granted planning permission from West Berkshire Council in February 2007 (Planning Reference: 06/02326/COMIND). The Proposed Development does not include any changes to the existing use of the CACE and WECE, and therefore no additional potential impacts will be introduced. Consequently, these areas are not considered in the assessment, which principally focuses on the proposed Hydrus Development Site.

The temporary features required during construction are described at section 6 below.

The Proposed Development (see Figures 3 to 8) will consolidate the hydrodynamic research facility at AWE Aldermaston, into one purpose-built facility designed to modern safety case standards. The scheme allows rationalisation of the floor space currently used by existing operations, creating an opportunity to improve working conditions for employees and the overall environmental performance. No new operations will be undertaken. Up to 50 operational staff will work at the Hydrus

Facility, all of whom currently work at AWE Aldermaston.

The proposed Hydrus Facility will typically be used to conduct 10 experiments per year (also termed firings). It should be noted that the number of experiments will be lower than conducted in the existing facility due to the enhanced diagnostics capability.

Two types of firings will be undertaken at the proposed Hydrus Facility (within the Operations Building), to provide varying levels of diagnostic information, these are:

- Open Firings: An experiment conducted within a hardened structure which provides safety and waste management control of materials; and
- Contained / Closed Firings: An experiment conducted within a containment vessel located within the hardened structure which provides additional safety and waste management control of hazardous and radioactive materials.

The Operations Building will comprise an eight-sided structure beneath a circular shallow-domed roof with a maximum roof height of 20.0m Above Ground Level (AGL) (120.3m Above Ordnance Datum (AOD)). Three exhaust stacks and an array of air extract vents will extend through the roof. The three exhaust stacks will extend to a maximum of 23.5m AGL (123.8m AOD). The Operations Building

will cover a gross external area (GEA) footprint of 9,621m² providing floor space of approximately 14,176m².

The Lightning Protection System will comprise eight masts with a maximum height of 40.0m AGL (140.3m AOD). The masts will measure 1.8m in diameter at their base and will taper to 0.5m in diameter at their apex. The catenary cable fixing height will be at 37.0m AGL (137.3m AOD) with a likely lower cable sag height of approximately 31.5m AGL (131.8m AOD).

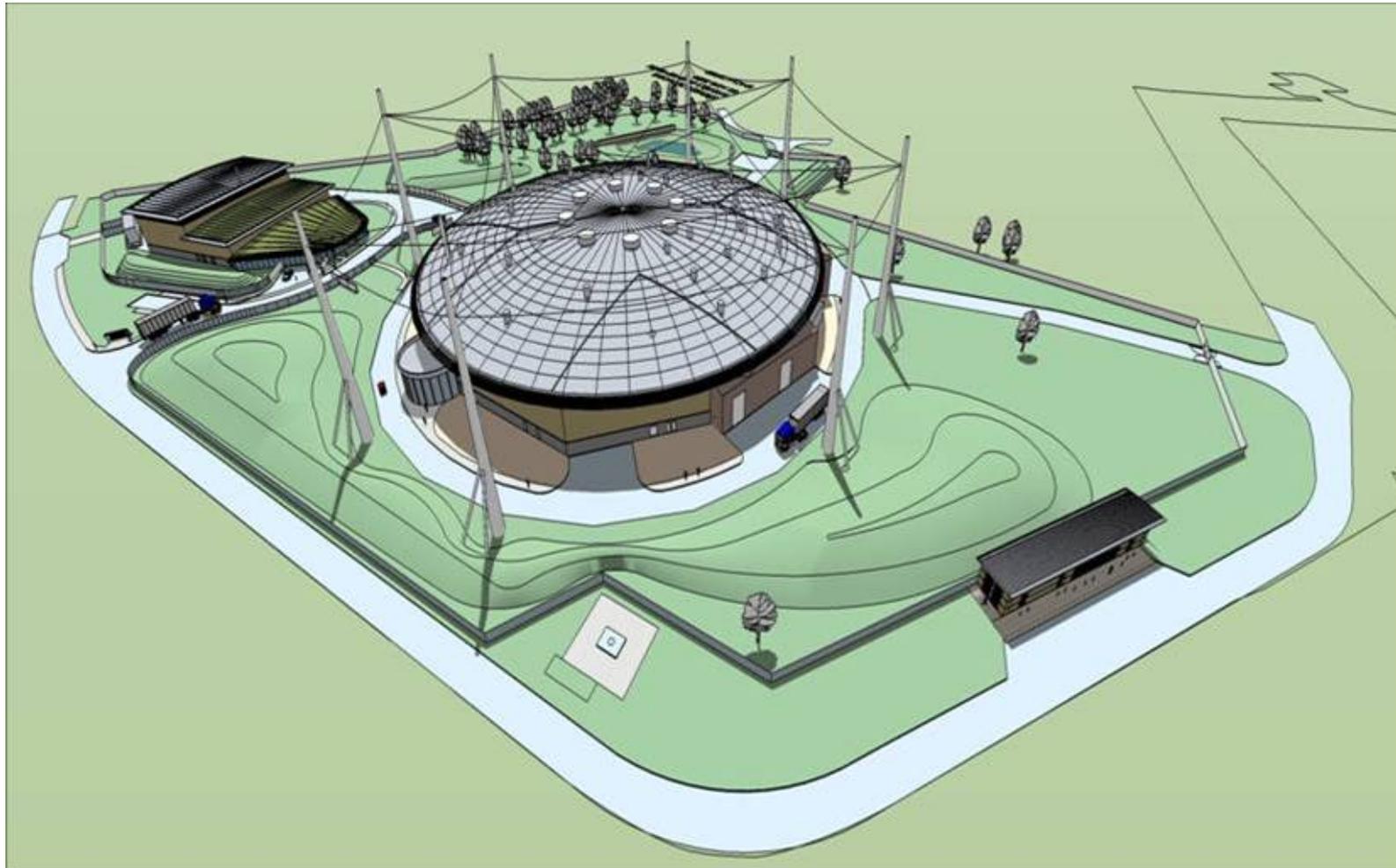
The Operations Building will house five main functions; Industrial, Plant, Laboratory, Personnel and Waste Management.

The majority of the floor space of the Operations Building will be dedicated to industrial functions and accommodating plant. The industrial functions will be located on the ground floor in the southern half of the Operations Building. This area contains three Induction Voltage Adders (IVAs), or x-ray machines, and an equipment handling crane for use during test events.

The Hydrus Facility will typically be used to conduct 10 hydrodynamic research experiments per year, which entail firing and test firing of controlled explosions during normal working hours. This includes a rapid ventilation system that will be operated during or following a test event for a period of 1 hour, and the test event comprising detonation

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Figure 4: Three Dimensional View of Hydrus Development Site



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Figure 5: Internal View of IVA Hall

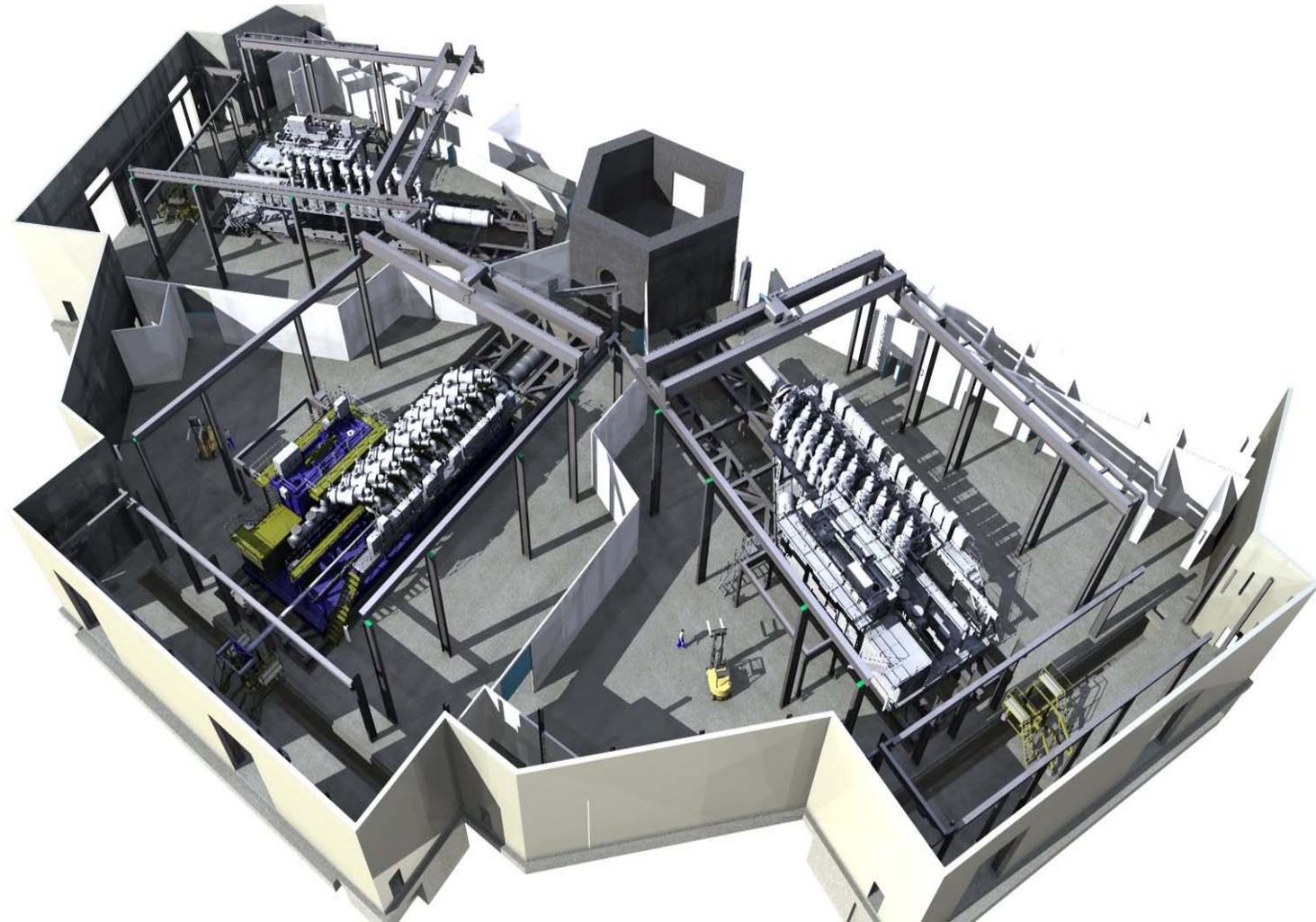


Figure 6: Operations Building Elevations A and B

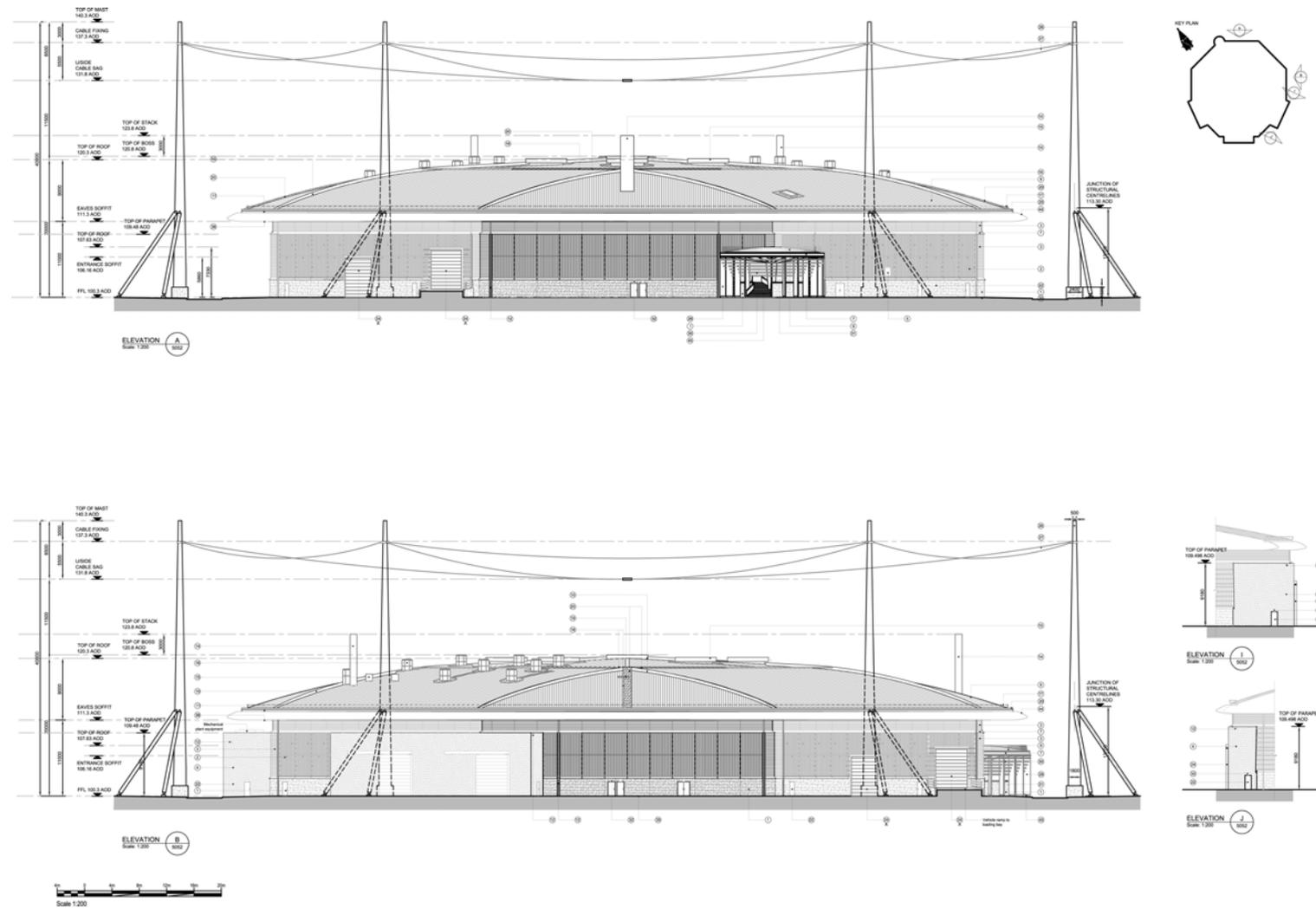


Figure 7: Support Building Elevations

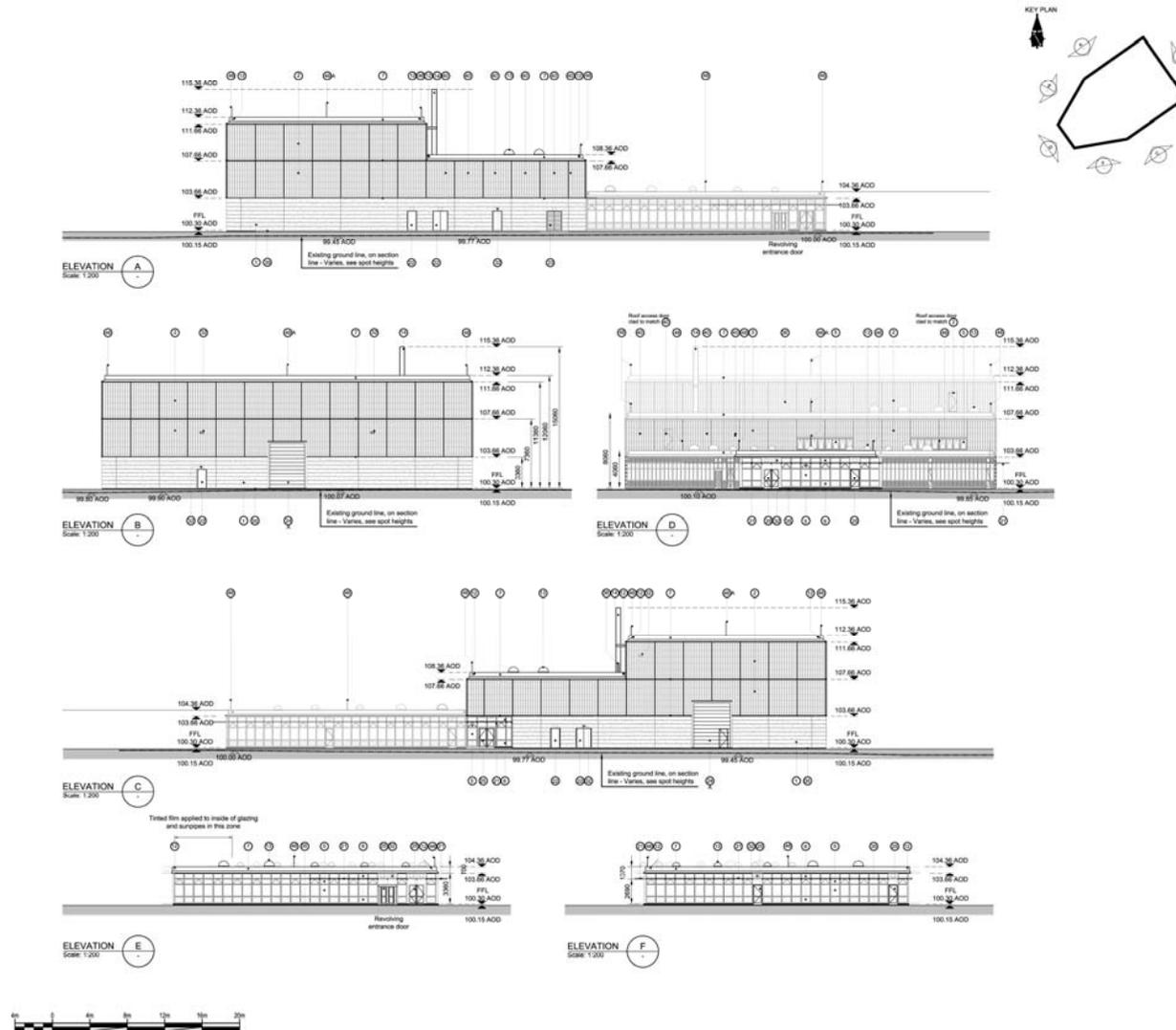
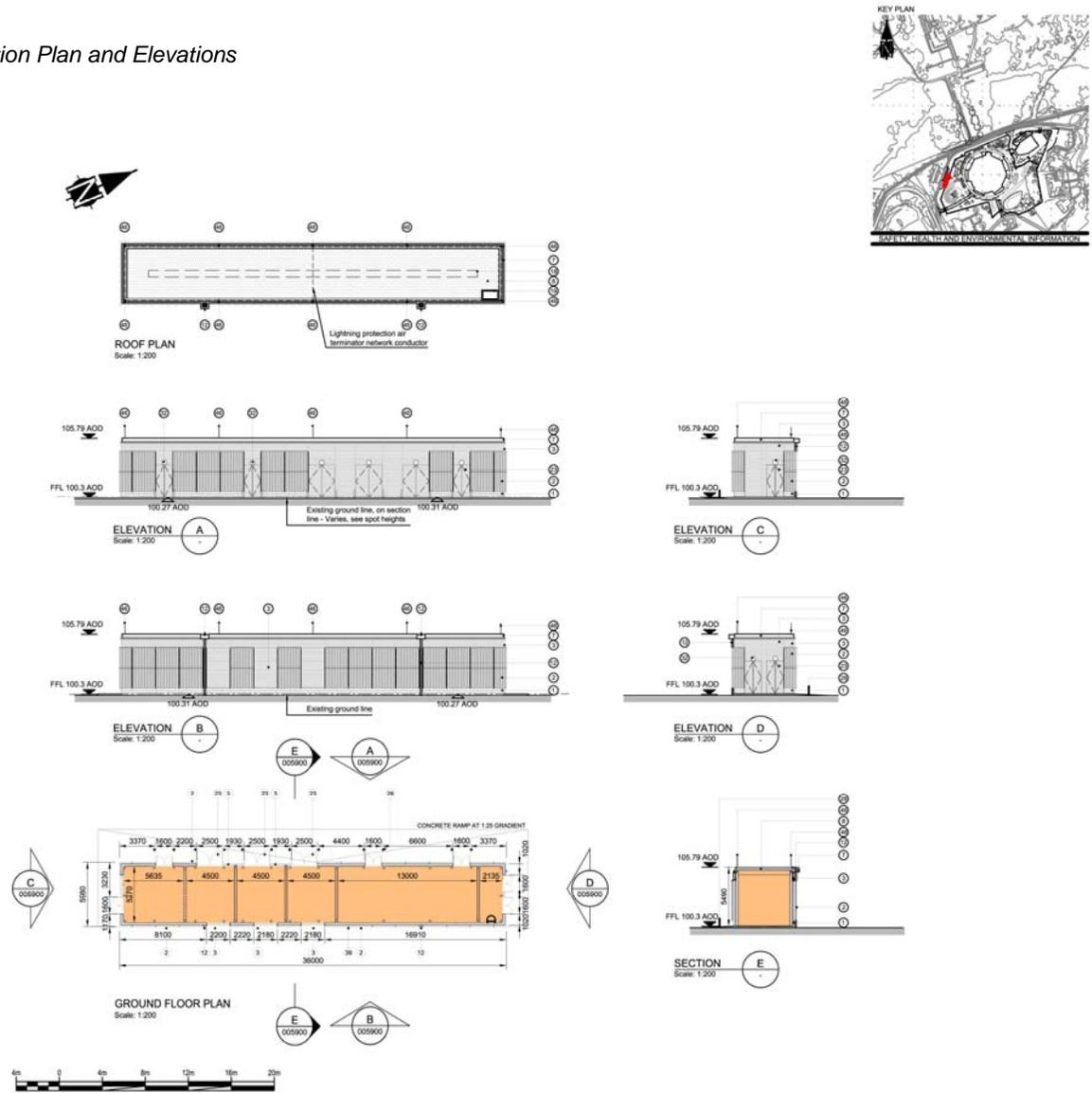


Figure 8: Electrical Substation Plan and Elevations



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of conventional explosives simultaneously with x-ray generators. An audible warning will be sounded to alert AWE personnel before and after each test event.

The prime function of the Support Building is to allow the safe control and operation of the processes within the Operations Building. It will be located approximately 45m to the northeast of the Operations Building. The Support Building will comprise a six-sided structure providing a floor area of 2,515m² and will encompass a partial first floor of 289m².

The Electrical Substation will be located approximately 45m to the west of the Operations Building and will be located outside of the Hydrus Facility's safety fence (which will isolate the Operations Building and Support Building from the surrounding area). The Electrical Substation will cover a footprint of 216 m² and have a maximum roof height of 5.49m AGL (105.79m AOD).

A comprehensive scheme of landscape measures will enhance the amenity, setting and biodiversity of the Hydrus Development Site. This will include grassed mounds with hedgerow planting wrapping around the Operations Building. Groups of semi-mature trees and woodland blocks will also be placed around the Hydrus Development Site, and wet grassland planting will be introduced into the SuDS detention basin. Overall there will be a substantial increase in tree cover across the Hydrus Development Site.

The tiered roof sections of the Support Building and the roof of the Electrical Substation will each incorporate a living Sedum 'green' roof adding to the biodiversity interest of the site whilst providing surface water benefits as part of the SuDS.

6. Construction Phase

It is envisaged that the whole scheme will take approximately 60 months to complete. This includes up to 6 months for site establishment. Construction of the Operations Building will take 49 months in total (19 months for the south side and 30 months for the north side). The Support Building and Electrical Substation will also be built during this period. External works and landscape implementation will take up to 12 months and will overlap with the testing and commissioning phase.

The existing facility will continue to be fully operational until the Hydrus Facility is fully commissioned. Once the Hydrus Facility is fully commissioned it will gradually take over operations from the existing facility.

The construction phase can be split into three key elements which are briefly summarised as follows:

- 1) *Site Establishment* – this will involve the creation of a construction enclave to isolate Hydrus Development Site construction activities from the main AWE Aldermaston Site. This will be in place for the start of construction phase.

- 2) *Construction* – Construction of the permanent features will follow a standard construction process comprising: substructure works; superstructure works, cladding and roofing; fit-out; commissioning and completion.

- 3) *Integrated Testing and Commissioning.*

Three construction enclaves will be used during the construction phase. These are shown on Figure 2 and include:

- Hydrus Development Site – the areas within which the permanent features of the Proposed Development will be built. A construction area will be established temporarily within the western part of the Hydrus Development Site;
- West End Construction Enclave (WECE) – WECE lies about 1.2km to the southwest of the Hydrus Development Site within the AWE Aldermaston Site boundary. This existing enclave was granted planning permission and was established as part of the New Office Accommodation (NOA) scheme. It is about 5.38ha in area; and
- Central Area Construction Enclave (CACE) – CACE is about 250m to the southwest of the Hydrus Development Site and was granted planning permission as part of the High Explosives Fabrication Facility (HEFF). It is about 0.53ha in area.

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Environmental impacts can arise either from day-to-day construction operations, or from normal and abnormal operations, or accidents.

AWE has committed to a Code of Construction Practice (CoCP). This CoCP explains the overall approach by AWE to manage and control effectively overall environmental impact arising from the construction activities involved with the Proposed Development.

Throughout all phases of construction a 'good housekeeping' policy will be applied, as outlined in the AWE CoCP. Construction working hours will generally be 07:00 to 19:00 on weekdays and 07:00 to 16:00 on Saturdays (when required). All work areas will be kept tidy and road surfaces will be kept in a good condition and cleaned. Relevant measures and controls will be employed on the Hydrus Development Site to minimise noise and airborne dust. In order to reduce the risk of pollution, plant and equipment will be continuously maintained. All site works will comply with relevant Environment Agency Pollution Prevention Guidelines.

7. Ground Conditions

A detailed assessment of the baseline environmental conditions (ground and groundwater conditions and related land contamination) was undertaken at the Hydrus Development Site. This information has been used to develop an understanding of baseline conditions for the

Application Site. The information has been reviewed in the context of the Proposed Development to create a Conceptual Site Model and evaluate the short, medium and long term, direct and indirect, permanent and temporary, adverse and beneficial impacts associated with it.

Many intrusive ground investigations have been undertaken at AWE Aldermaston, some of which cover parts of the Application Site and more specifically the Hydrus Development Site. Investigations have provided a database of soil and groundwater chemistry, soil gas and radiological data.

Ground investigation information provided has been qualitatively and quantitatively assessed depending on the proposed future use(s) of the site as permanent or temporary.

Provided that proposed mitigation is implemented, based on available information, the soil and groundwater contamination on site is considered not to represent unacceptable risks to human health or the environment. The Hydrus Development Site is considered to exhibit forms and general levels of contamination that are broadly typical of sites that have been involved in some or long term 'industrial' type use. The underlying ground conditions and observed levels of contamination have been shown not to present any significant health and environmental risks requiring additional mitigation measures. It is therefore considered that the Proposed Development can be implemented without

significant adverse impacts. As the Proposed Development offers the opportunity to better understand ground conditions and to deal with any individual cases of contamination there are beneficial impacts for the ground at the Hydrus Development Site.

8. Water

An assessment of the impacts of the Proposed Development on identified water environment features during both construction and operational phases has been prepared.

There are no main water bodies within the Hydrus Development Site, but a small surface water ditch crosses the southern part of the site.

Potential impacts to the water environment are associated with changes in surface water run-off rates (resulting from construction activities and increases in hardstanding area) and potential for increased discharge rates to surrounding watercourses. In addition, the Proposed Development has the potential to reduce flood storage capacity, contaminate surface waters and groundwater and create additional water resource demands.

The Proposed Development will be served by a Sustainable Drainage System (SuDS) to collect surface water (particularly in the event of surface water flooding) and allow silt settlement prior to discharge off-site during construction and operation.

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The Proposed Development is not expected to have any significant impacts on the surface water quality, either directly through surface water discharges to sewer or indirectly via flood run-off flows through the implementation of the SuDS strategy.

With mitigation, the significance of the residual impacts during construction is predicted to be negligible for receptors as a result of 'normal and foreseeable' construction activities.

Once mitigation measures are implemented, the significance of residual impacts arising from the operational phase of the Proposed Development and infrastructure are predicted to be negligible for all sensitive receptors identified.

9. Transport

An assessment of the impact of the Proposed Development on the surrounding transport network has been carried out.

Baseline transport data, including traffic data, pedestrian and cycle provision, passenger transport provision and personal injury accident data were identified from surveys and published data.

The Proposed Development will provide a facility that will replace activities carried out elsewhere on the AWE Aldermaston Site. It is estimated that up to 50 operational staff will work in the building all of whom currently work at AWE Aldermaston. Accordingly, the application proposals will not

generate any additional operational worker vehicle movements over and above the existing facilities and the only additional vehicle movements will be generated by construction activity.

Good pedestrian and cycle linkages to the AWE Aldermaston Site, together with travel plan initiatives, secured as part of the New Office Accommodation development planning consent, have been and will continue to be implemented by the assessment years. This includes the provision of controlled crossing facilities and foot / cycleways between Aldermaston Wharf and Aldermaston Village, and Heath End roundabout and Aldermaston Village. Having regard to the improvements and initiatives, together with the vehicle trips that are predicted to be generated, it is not considered necessary to implement any further mitigation measures over and above these improvements and initiatives.

The potential residual impact from the construction and operation of the Proposed Development, on pedestrians, cyclists, passenger transport users and car drivers has been assessed and is considered to be negligible for severance, road safety, amenity and delay.

10. Air Quality

An assessment of the potential changes in local air quality as a result of the construction and operation of the Proposed Development has been undertaken.

There are three aspects of the development that are assessed:

- Dust emissions during construction operations;
- Emissions from construction vehicles using the local roads; and
- Once operational, the emissions associated with the operation of the facility during firings.

These assessments are set in the context of the relevant planning policies, the appropriate significance criteria and the existing ambient (or background) conditions.

For dust generating construction activities at a low level (i.e. on the ground) and in the open-air the resultant plume of dust particles will tend to very rapidly decrease in concentration as particles are dispersed in the ambient or 'background' air, and are removed onto exposed surfaces by gravity and wind. Consequently, after a few tens of metres from the Hydrus Development Site boundary dust levels are unlikely to vary significantly from the normal range (which can be quite wide).

All residential properties are located well away from the Hydrus Development Site boundary. The closest receptor to the Hydrus Development Site is the Manor House Hotel, which is approximately 300 metres to the north north-west of the Proposed Development. Therefore residential properties are unlikely to be affected by any dust that may arise

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due to construction. The impact is likely to be negligible and the effect is not significant.

Local air quality in the vicinity of the Hydrus Development Site is considered to be good. Measured concentrations of pollutants known as PM₁₀ (particulate matter) and Nitrogen Dioxide (NO₂) meet the respective air quality objectives. Concentrations of NO₂ and PM₁₀ from haulage vehicles are expected to have a negligible impact in terms of air quality.

There will be no change in the number of staff vehicle movements during the operation of the Proposed Development and consequently there will be no operational traffic impact upon local air quality.

No significant long-term residual air quality impacts are expected. Temporary residual effects would occur during the construction phase of the Proposed Development, and from emission during the operational phase. However, all impacts are predicted to be below the relevant guidelines set out in Air Quality Strategy objectives and Environmental Assessment Levels.

All discharges will be mitigated through the use of modern techniques and comply with modern standards as assessed following 'As Low as Reasonably Practicable' (ALARP) and Best Available Technique' (BAT). The Proposed Development is a purpose built facility, and discharges will be less than current discharge levels

due to modern systems and controls. The new Hydrus Facility will replace the existing research facility and as such should represent a benefit in terms of air quality.

Overall, the Proposed Development is not predicted to have significant air quality effects at any sensitive receptors.

11. Noise & Vibration

An assessment has been carried out to determine the impact of noise and vibration associated with the Proposed Development. The assessment was based upon the results of baseline noise monitoring around the AWE Aldermaston Site perimeter and at sensitive receptors, and the prediction of expected noise and vibration levels during the construction and operational phases of the Proposed Development.

The assessment has considered construction works noise, construction traffic noise, construction vibration and operational noise including transportation, plant noise, and noise from firings.

Construction impacts are considered to be of negligible significance with the proposed mitigation measures implemented. Although construction impacts are unlikely to affect off-site noise and vibration sensitive receptors (NSRs), construction impacts do have the potential to affect on-site AWE Aldermaston noise and vibration sensitive receptors. However, appropriate mitigation measures will be

implemented to minimise any potential noise and vibration impacts during construction.

Operational effects from traffic generated by the Proposed Development will be unchanged and therefore are not significant.

There is fixed plant associated with the Operations Building and the Support Building, including an Electricity Substation, which will operate on a 24 hour basis. Noise from these operational plant sources will therefore exist for the majority of the time when tests are not being undertaken and have the potential to affect background noise levels at NSRs.

The mitigation designed into the plant and buildings is not predicted to increase ambient noise levels at NSRs.

There will be a minor impact at the Manor House Hotel during test operation and negligible impacts at three other receptors, but these will only occur approximately 10 times each year and will take place during normal working hours only.

Although there would be a minor adverse impact at the Manor House Hotel during operation of plant within the Hydrus Facility, no significant long-term residual impacts are predicted. Temporary effects would occur during the construction phase of the Proposed Development, but no related permanent residual effects have been identified beyond the construction phase.

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Overall, the Proposed Development is not predicted to have significant noise and vibration impacts on local NSRs.

12. Socio-Economics

An assessment of the socio-economic impacts of the Proposed Development has been undertaken. The assessment involved an economic impact assessment, including impact of the employment on the labour market and on the aerospace and defence sector. A review of other socio-economic impacts on supporting infrastructure such as the housing market, open space, libraries, retail, and leisure facilities has also been undertaken.

It is estimated that the Proposed Development will generate approximately 75 net additional employment positions during the construction phase. This includes 59 new jobs in the local area, 16 new jobs in the wider South East region. This is considered to have a minor beneficial impact on the local economy over the medium term.

The Proposed Development will employ approximately 50 people during operation, all of whom are existing employees transferring to the proposed Hydrus Facility. Overall, therefore, the Proposed Development will safeguard 50 jobs in the local and regional area, which is considered to be of negligible impact.

The Proposed Development will modernise and upgrade the capabilities of the old facilities, enabling

the evolution of the AWE Aldermaston Site into a centre of world-class scientific and technical excellence. It will therefore enable AWE to develop world-class facilities that will help attract and retain skilled staff in a competitive global marketplace.

In summary, it is likely that the Proposed Development will have an overall positive socio-economic impact on the local and regional economy and would be a positive step towards meeting some of the strategic objectives of regional and local planning policy. The Proposed Development will help secure the long-term viability of AWE Aldermaston for the local area, and enable the 'Western Wedge' of the M4 corridor to maintain its reputation as a world-class high-technology economy.

13. Landscape and Visual

The landscape and visual effects associated with the construction and operation of the Proposed Development have been assessed. This has considered published landscape character assessments and local assessments prepared for the AWE Aldermaston Site.

A computer generated Zone of Theoretical Visibility (ZTV) has assisted preparation of the visual assessment. Short, middle and long distance views toward the Proposed Development have been considered including those from the Wessex Downs Area of Outstanding Natural Beauty, residential properties and employment premises (including the

Manor House Hotel), and publicly accessible rights of way and Open Access Land. Night time views have also been assessed.

The Proposed Development is located adjacent to the northern edge of the AWE Aldermaston Site. Its central location along this vegetated boundary means that in views from the south, west and east, the buildings and LPS masts will, in most cases, be seen in the context of the existing built development and infrastructure on the AWE Aldermaston Site, such as the chimney stacks (48.9m tall; 150.8m AOD) associated with the existing Boiler House located adjacent to the AWE Aldermaston eastern boundary, and also with the 33.9m high chimney stacks at the new Energy Centre to the south west of the Proposed Development, in the central area of the AWE Aldermaston Site.

The modern design of the new buildings and structures, together with the landscape proposals (which will provide an attractive hard and soft landscape setting to the development), including the retention of the existing copse and other trees, will result in a neutral effect on the local character of the site.

There will be some temporary adverse visual effects resulting from the construction activity including cranes and additional temporary lighting.

The permanent visual effects of this development will relate to the introduction of the building rooflines (20m and 12m above ground level (AGL)) and the

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LPS masts (40m AGL) as additional elements on the AWE Aldermaston/Tadley village ridgeline just above the tree canopy in some short to long distant views. However, these will be seen in the context of the existing AWE Aldermaston buildings.

In summary there will be no long term adverse landscape effects and no significant adverse visual effects as a result of the Proposed Development.

14. Cultural Heritage and Archaeology

The cultural heritage and archaeology assessment has addressed any relevant direct impacts on heritage assets, as well as the potential impacts on their settings. The assessment also addresses temporary impacts that could arise in the context of the construction process, and covers historic buildings and areas as well as visible and below-ground archaeological remains. The impacts are assessed with regard to the current baseline position and mitigation measures.

The Hydrus Development Site lies in close proximity to the Grade II Registered Park of Aldermaston Court (a Grade II* Listed building), and lies within the AWE Aldermaston Site. AWE Aldermaston occupies the site of a former Second World War (WWII) airfield and was the principal centre for Britain's Cold War nuclear weapons programme. The Registered Park is already affected by WWII and post-war development within its grounds, as

well as views toward AWE Aldermaston. The Listed building now forms the Manor House Hotel.

The assessment has drawn upon fieldwork and also previous studies prepared for the AWE Aldermaston Site, including archaeological trial trenching across the Hydrus Development Site. The county archaeologist has indicated that no further archaeological work is necessary given previous site disturbance and apparently very low archaeological potential.

The largest residual impacts of the Proposed Development will be on the historic character of the AWE Aldermaston Site and on the historic setting of Aldermaston Court Registered Park and Garden. Taking into account the baseline conditions and also the mitigation measures which will be implemented, the residual effect of the scheme on the heritage asset will be minor adverse.

15. Ecology

The AWE Aldermaston Site as a whole supports a diversity of flora and fauna, including legally protected species and those identified as priorities for conservation within national and local Biodiversity Action Plans (BAP).

The baseline was informed by a desk study and a "Phase 1" habitat survey undertaken in March and July 2009 and protected species surveys through 2006 to 2009. The findings of these surveys have been used to assess the impact of the Proposed

Development on the existing ecological and nature conservation interest of the Hydrus Development Site.

Most of the Hydrus Development Site consists of neutral grassland which in places can be considered flower-rich with patches of acid grassland. This grassland has developed over aggregate and broken ground and is effectively 'brownfield' in nature. A small deciduous copse is located in the southeast corner of the site with a field layer dominated by Bramble. There are scattered trees over the remainder of the site and a veteran Oak is located adjacent to the copse. A small running wet ditch crosses the southern part of the Hydrus Development Site.

The significance of any ecological impact has been determined in terms of the importance/value and sensitivity of the habitats and species that would be affected. It should be noted that whilst some residual impacts may be positive (taking account mitigation and enhancement measures such as the SuDS and green roofs), to adhere to Institute of Ecology and Environmental Management (IEEM) guidelines the assessment always concludes with the highest level of impact.

Therefore whilst ecological enhancements are included as part of the Proposed Development and offer some benefit, in accordance with the IEEM guidelines it must be concluded that the Proposed Development will have a slight adverse effect on the

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ecology present within the Hydrus Development Site, as this is the highest level of impact overall.

Once the mitigation / enhancement measures have reached maturity there will be an overall benefit to the Hydrus Development Site ecology and biodiversity. This benefit will be secured through the Landscape and Biodiversity Management Plan.

16. Sustainability

A sustainability appraisal has been completed for the Proposed Development in accordance with the Sustainability Appraisal Handbook for the MoD Estates, the results of which have fed into the development of the scheme and the Environmental Appraisal.

In addition, the Proposed Development has adopted the Defence Related Environmental Assessment Method (DREAM) assessment approach.

The key beneficial impacts of the scheme in relation to sustainability can be summarised as follows:

- Use of a partially previously developed site;
- Provision of modern buildings together with retention of existing trees and additional landscaping that will result in a scheme that is visually integrated into the context of AWE Aldermaston;

- High quality environmental design that achieves a DREAM Excellent score;
- A development that uses energy efficient building techniques and a reduction in carbon emissions compared to the relevant Building Regulations;
- Provision of water-efficient water fittings;
- Minimisation of noise sources during construction and operation;
- The incorporation of pollution prevention measures such as oil separators/interceptors;
- Provision of a building (the Support Building) that is accessible to all, including the disabled, and a development that overall promotes pedestrian and cycle access;
- Maximisation of recycling and implementation of the best practicable environmental options for non-recyclable residual waste;
- Commitment by contractor to:
 - Develop and implement a Site Waste Management Plan (SWMP);
 - Prepare and implement a Construction Environmental Management Plan (CEMP);
 - Sign up to the Considerate Constructors Scheme; and
 - Reduce construction site impacts.

- Provision of a development that will not generate additional car travel and that incorporates sustainable transport measures such as secure safe, waterproof cycle storage space and a travel plan; and
- Provision of a development that is economically sustainable in terms of maintaining existing jobs and the creation of additional temporary employment during construction.

17. Cumulative Impacts

An assessment of the potential effects of the Proposed Development in combination with other development has been undertaken. The cumulative impact assessment considered the changes caused by reasonably foreseeable future developments together with the proposed scheme.

The cumulative scenario assessed comprises proposals detailed in the AWE Site Development Context Plan 2008 (SDCP08), and developments external to AWE Aldermaston considered to have a potential for cumulative impacts.

By addressing the cumulative impacts from the Proposed Development, it is considered that there will be temporary adverse impact interactions during the construction stage.

When addressing the combined effects of the Proposed Development and the proposals contained within the SDCP08, it is considered that

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the provision of the Proposed Development, and modern buildings in a landscaped setting will have positive impacts particularly in relation to the quality of the built and landscaped environment and socio-economics.

18. Residual Impacts and Conclusion

The construction phase will lead to a number of short-term minor adverse residual impacts. Long-term operation of the Proposed Development will generally have a negligible impact upon the majority of environmental receptors, with a range of positive impacts including benefits in terms of socio-economics and landscape.

The overall conclusion of the DEEA is that the Proposed Development will be a positive step towards meeting a number of the strategic objectives of regional and local policy. The Proposed Development will help secure the long-term viability of AWE Aldermaston for the local area and will provide a number of employment opportunities during the construction phase, and will safeguard existing employment during the operational phase.