

## **Describe the basic measures for improving how energy efficient your activities**

Ark has a rigorous design process to ensure that its data centres remain innovative, progressive, environmentally friendly, secure and energy efficient. The company recognises the importance of the Design and Development function in ensuring our organisations activities are as energy efficient as possible. This includes the utilisation of free cooling whenever possible through to installing energy efficient plant equipment or the use of solar panels.

Energy planning activities undertaken by Ark on an ongoing basis and are included in regular energy reviews. The aim of these activities is to create a method through which energy usage is continually reviewed to create achievable, yet challenging energy objectives which will lead to more effective energy use and consumption. In carrying out these activities, we will live by the values stated in our Energy Policy and fulfil the pre-determined requirements stated in our Climate Change Agreement and EU-ETS.

In addition, we actively engage with our clients to ensure that their activities also support the energy efficiency of the datacentres.



23 Jun 2017  
CCA Register Ref: DATC/T00025-VAR-2

Sector Identifier: DATC  
Ark Data Centres Limited (Companies House 05656968)  
TU Identifier: DATC/T00025

Spring Park  
Corsham  
Wiltshire  
SN13 9GB  
England  
psquire@arkdatacentres.co.uk

**CLIMATE CHANGE AGREEMENTS SCHEME  
UNDERLYING AGREEMENT VARIATION APPROVAL**

Dear Mr Philip Squire

We are writing to inform Ark Data Centres Limited (Companies House 05656968) (“you”) that the recent request to vary your underlying agreement was approved on 23 Jun 2017. This relates to the following target unit, agreement and variation:

Current Underlying Agreement Identifier:	DATC/T00025 v2
Target Unit:	DATC/T00025 – Ark Data Centres Limited (Companies House 05656968)
Variation:	Change to site

If you require any clarification of the above, please contact your Sector Association in the first instance. If you need to contact the Administrator for any supporting information, please use the following link:

[cca-help@environment-agency.gov.uk](mailto:cca-help@environment-agency.gov.uk)

Yours faithfully



CCA Team

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## Resource Efficiency

### 5067-C-Resource Efficiency Procedure

Revision History:

Version	Date	Author	Revisions/Changes.
1.0	27-04-2015	T Bainbridge	Document created.
1.1	11-04-2016	M Ferris	Document updated with minor changes.
1.2	17-03-2017	M Ferris	Footer updated and other minor changes.

## Resource Efficiency

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### 1. Purpose

To set out the standards required by Ark for the management of resource efficiency on all sites. The minimum standard required by this specification is compliance with legal requirements.

### 2. Scope, Applicability and Responsibility

This specification applies to all Ark activities which consume natural resources. This includes activities carried out by third parties working on behalf of Ark. Third parties using their own procedures for resource efficiency on behalf of Ark must ensure their own systems meet this specification. Responsibility for the implementation of this specification lies with Campus Operations Manager.

### 3. Environmental Issues

Data centre Design	Operational Energy Use	Travel	Water	Raw Materials
Design Team	Data centre Equipment Back-up power Office Equipment	Staff and Contractor Travel Business Travel	Water consumption Rainwater harvesting	Maintenance Consumables Office Consumables Procurement Waste minimisation

### 4. Applicable Legislation

Ark maintains a Compliance Register which contains documented information of its compliance obligations, which are considered when establishing, implementing, maintaining and continually improving aspects related to resource efficiency in addition to the wider environmental management system. For full details, please refer to document 5126-R-Combined Legal Register on D2.

### 5. Specification

#### 5.1 Data Centre Design

Data centres are to be designed and built in accordance with the BREEAM Data centres standard in order to achieve at least a Very Good rating.

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## Resource Efficiency

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BREEAM requirements shall be considered at the earliest possible stage in the design process in order to maximise the achievable number of credits.

The Design team must ensure they are aware of the impact of changes in the design on the BREEAM score throughout the design process.

Ark must ensure members of the Design team are fully equipped with the knowledge of recent technological innovations in data centre design to ensure cutting edge provision for clients.

### 5.2 Operational Energy Management

Prior to each data centre becoming fully operational the following processes must be completed in order to ensure effective and efficient operation:

- Failure Mode and Effect Analysis
- Integrated Systems Testing
- Systems Certification
- Development and testing of complete set of Standard Operating Procedures
- Development and testing of complete set of Emergency Operating Procedures
- Training

A comprehensive set of handover documentation must be provided on handover.

Once fully operational, server and building performance should be optimised through the use of the Energy Management Systems and Building Management Systems in place.

Data centres must be operated with a view to achieving the relevant PUE target.

A switch-off practice should be adopted in all office areas with the aim of ensuring all equipment is switched off or defaults to 'sleep' settings when not in use.

### 5.3 Travel Carbon Management

Facilities should be provided to enable staff and contractors to travel to site using sustainable forms of transport should they choose to. For example electric car charging points and facilities for cyclists are provided where possible.

Consideration of the environmental impact of business travel must be given when arranging meetings. Ark employees should consider the following:

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Subject & Type	Resource Efficiency Procedure	Author	Les Russell
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Page number	2 of 4	Version	1.2
Doc Id	5067-C-Resource Efficiency Procedure	D2 Ref	<a href="#">8005e9d2</a>

## Resource Efficiency

- Is travel essential – can the meeting be held via conference/video call?
- If travel is unavoidable choose the most appropriate location to minimise travel by all parties
- Is it practical to use public transport
- Is there an opportunity to car-share

### 5.4 Water Use Efficiency

Water efficient technologies with regard to data centre cooling and domestic facilities should be incorporated into the design of each data centre.

Campus-wide water use and the costs of water use must be monitored and tracked on a monthly basis. Wherever possible, water sub-metering should also be employed to measure and monitor water use in specific area, for example to monitor the effectiveness of rainwater harvesting systems.

### 5.5 Procurement

Environmental considerations must be taken into account in procurement decisions.

### 5.6 Waste Minimisation

Once resources have reached the end of their useful life for Ark, their value as a resource must be maximised by aiming for a closed loop disposal solution. In effect this means resources that have become wastes to Ark should go on to be used productively elsewhere through application of the highest possible option on the waste hierarchy.

## 6. Training

All staff, contractors and visitors coming on to a campus must be made aware through the induction process of the need to use resources efficiently using the facilities provided.

The competency of individuals responsible for specific impacts should be assessed and training provided where necessary.

## 7. Performance Monitoring

Performance against this specification will be monitored in the following ways:

- Achievement of BREEAM Very Good rating on all new builds
- Achievement of target PUE
- Monitoring of towns water and harvested rainwater use
- Effectiveness of environmental considerations in the procurement process

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Page number	3 of 4	Version	1.2
Doc Id	5067-C-Resource Efficiency Procedure	D2 Ref	<a href="#">8005e9d2</a>

## Resource Efficiency

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- Periodically through the Internal Audit process

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Subject & Type	Resource Efficiency Procedure	Author	Les Russell
Effective Date	17 March 2017	Authorised by	Doug Aikman
Page number	4 of 4	Version	1.2
Doc Id	5067-C-Resource Efficiency Procedure	D2 Ref	<a href="#">8005e9d2</a>

Additional Document List – Appendix 14

Question Reference	Document Title	Document Reference
Part B2 - 5c	Technical Note	Appendix 15 – Technical Note
Part B3 – 6e	Waste Management Process	Appendix 16 - Waste Management Process
Part B3 – 5a	Environmental Statement	Appendix 17 – SP Environmental Statement NTS
Part 3b – Appendix 1	Cogeneration (combined heat and power) Statement	Appendix 19 - Cogeneration (combined heat and power) Statement
	Various	Appendix 20 – Generator Data
	Various	Appendix 21 – Fuel Tank Information
	Various	Appendix 22 – Noise Information
	Various	Appendix 23 – Surface Water Information
	Various	Appendix 24 – Trade Effluent
	Various	Appendix 25 – Air Quality

## Installation Overview

The installations are four Data Centres powered by mains electricity with an array of backup diesel powered generators that operate should the mains electricity supply be interrupted. The Data Centre installations are four Data Centre facilities housed in distinct separate buildings (SQ17, P1, P2 and P3 (under construction)) at Ark Data Centres' Spring Park site, with plans for the development of another data centre (P4). Data Centres SQ7, P1 and P2 have LV back-up diesel generators located adjacent to each building. Data Centres P3 (and P4 in the future) will be supported by HV back-up generators located in a centralised "HV Generator Farm". The move to a centralised HV Generator Farm as the back-up electricity supply system for data centres P3 and P4 is in line with Ark's focus on energy and resource efficiency. The centralised HV Generation Farm means that Ark may ultimately deploy upto 24 No 2.5MVA back-up diesel generators (60MVA of on site generation) to replace the 48MVA HV grid supply to the southern half of the Spring Park Site. The original LV back-up generation strategy would result in the installation of upto 38 back-up diesel generator sets and an installed capacity of circa 85MVA of on-site back-up generation. The proposed approach therefore leads to a 31% reduction in of installed back-up generation capacity, but more importantly, the HV generation approach means the installed capacity can be installed as the demand grows across the facilities, rather than as the facilities themselves are constructed. This is reflected in the fact that only 6 HV back-up generators are being installed for P3, rather than the 9 that would have been installed at LV.

Plans showing the location of the campus, currently installed back-up generators, future installations and the current emission points are included in this permit application.

Ark Data Centres provide data centre facilities that securely and efficiently house and maintain ICT infrastructure and host data on behalf of clients who lease data centre capacity. Security, 24/7 availability and efficiency are key features of Ark's data centre services.

The backup diesel generator arrays associated with each data centre facility only operate to produce electricity for the data centres should the mains electricity supply be interrupted; their operation for this purpose is very infrequent. The generators are also tested monthly to ensure they are ready for use in the event of a mains failure. Two types of testing are carried out: "on-load maintenance testing" (OnLM)T when the generators are run to support the operating facility; "off-load maintenance testing" (OfLMT) when the generators are started and run for 8 minutes to confirm that the generators start. This testing is the same for both the LV back-up generators and the HV back-up generators and is described in more detail in the Spring Park Energy and Emissions Management Plan, which is included as part of the permit application.

All backup generators are powered by diesel. The combustion of diesel in the event of a mains electricity supply outage, or for generator testing, are the only activities operated by Ark Data Centres Limited at Spring Park that gives rise to the production of CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>x</sub> and particulate emissions.



# Waste Management Process

Document Id: 5062-C-Waste Management Procedure

Revision History:

Version	Date	Author	Revisions/Changes.
1.0	27-04-2015	T Bainbridge	Document created.
1.1	19-04-2016	M Ferris	Document updated with minor changes.
1.2	24-03-2017	M Ferris	Footer updated and other minor changes.
1.3	31-05-2018	L Russell	Updated document to capture Waster Operative activities and general narrative updates throughout.

## Waste Management Process

### 1. Purpose

To set out the standards for waste management at all of Ark's sites. The minimum standard required by this specification is compliance with legal requirements.

### 2. Scope, Applicability and Responsibility

This specification applies to all waste produced on site as part of Ark's operations and includes waste produced by third parties working on behalf of Ark. Third parties using their own procedures for waste management on behalf of Ark must ensure their own systems meet this specification. Responsibility for the implementation of this specification lies with Ark's Campus Manager.

### 3. Environmental Issues

Non-Hazardous	Recyclables	Hazardous	WEEE	Landscaping	Client Waste	Documentation
General non-hazardous non-recyclable waste	Mixed Recyclables  Shredded Paper	Hazardous waste such as chemicals, oily waste, batteries, etc.	Waste electronic and electrical equipment	Green Waste	Packaging	Carriers licenses, transfer and consignment notes

### 4. Applicable Legislation

Ark maintains a Legal Register which contains documented information of its compliance obligations. These are considered when establishing, implementing, maintaining and continually improving aspects related to waste management in addition to the wider environmental management system. For full details, please refer to document 5126-R-Combined Legal Register on D2.

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Page number	1 of 5	Version	1.3
Doc Id	5062-C-Waste Management Procedure	D2 Ref	<a href="#">8005ea0c</a>

## Waste Management Process

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### 5. Specification

#### 5.1 Waste Management Plan

A documented waste management plan is maintained for all activities within the campus boundary which identifies:

- operations and activities that generate waste
- the waste state (solid, liquid, gas)
- the type of waste (e.g. cardboard, plastic, oils, etc.)
- the class of waste (e.g. hazardous, directive, etc.)
- how and where the waste is segregated and contained
- the European Waste Catalogue (EWC) code
- the waste carrier(s)
- the waste carrier(s) registration/permit/licence
- the destination of the waste (from initial to final destination)
- the type of waste treatment and/or disposal
- the waste management facilities licence number and expiry date
- the quantity of waste generated monthly/annually
- the monthly/annual cost of dealing with the waste

The waste management plan is specific to each campus and is reviewed in accordance with the documents review cycle.

#### 5.2 Waste Storage

Wastes should be segregated at source wherever possible. Facilities are in place to ensure:

- Hazardous and non-hazardous wastes are not mixed
- Different hazardous wastes are not mixed
- Recyclable materials (e.g Cardboard) are segregated

Waste containers must:

- be robust and compatible with the waste stream
- where applicable, provide protection from the elements
- be labelled with a description of the waste content and, where appropriate, hazard warnings
- be banded if for the storage of liquid wastes
- be secure for the storage of hazardous waste

Waste Storage Areas:

- must not exceed their stated capacity
- must, where appropriate, have suitable spill control kits and emergency equipment
- must be covered by the pest control and housekeeping programs

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Effective Date	31 May 2018	Authorised by	Doug Aikman
Page number	2 of 5	Version	1.3
Doc Id	5062-C-Waste Management Procedure	D2 Ref	<a href="#">8005ea0c</a>

## Waste Management Process

- must have controls in place to prevent the pollution of controlled waters with solid or liquid waste as identified through risk assessment
- when outdoors, must be secure and only accessible to authorised personnel

### 5.3 Waste Disposal Options

Waste treatment and disposal routes have been selected for each waste stream and represent the best available environmental option. The waste management hierarchy provides the framework for decision making and has four basic levels:

- **Reduction (minimisation)** - It is better not to produce waste in the first place. If possible, the amount of waste should be reduced by implementing waste minimisation techniques. Waste minimisation also covers the use of less environmentally harmful materials by substitution.
- **Reuse** - The reuse of materials can result in major cost savings. Can the waste stream be made reusable, for example, by using reusable transit packaging?
- **Recycling/Recovery** - Many wastes can be reprocessed or recycled for reuse into new products, or the energy can be recovered from them by using them as fuel.
- **Disposal** - Disposal is generally the least desirable option and involves either containment (landfill, deep injection) or destruction (incineration, chemical or biological treatment) of the waste.

Waste disposal options are reviewed periodically (at least every 4 years) with a view to further minimising generation of waste and improving the environmental impact of disposal where possible.

To Support our recycling activities, Ark have recruited a Waste Operative at each site that focus on ensuring the waste is loaded into the appropriate skip to minimise any contamination and maximise recycling of waste such as cardboard. The Waste Operatives daily routine is documented in 14019-B-Waste Operative Daily Routine.

### 5.4 Waste Carriers

All waste leaving a campus must be carried only by a licensed waste carrier. An inventory of approved waste carriers is held which includes the following information:

- Valid carriers license or exemption and expiry date
- Waste management facilities used by carriers and their appropriate waste management license or exemptions

This inventory is reviewed and updated annually, or as new carriers are brought in.

Wherever possible, periodic physical site inspection audits and assessments of waste contractors and disposal facilities will be carried out.

Anyone arranging disposal of waste on Ark's behalf should be a registered broker.

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## Waste Management Process

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### 5.5 Waste Documentation

Each waste movement must have an accompanying waste transfer note/consignment note. Records of all waste transfer notes/consignment notes must be maintained and contain the following:

- the Standard Industry Code (SIC) of the business, which is **68209** for Ark Data Centres Limited
- the quantity of waste transferred (by weight where possible)
- a description of the waste, including the appropriate 6 figure European Waste Catalogue (EWC) code
- how the waste is packed (e.g. on pallets, in a skip)
- where (location) and when (time) the uplift took place
- the name and address of the carrier and the waste management facility (these may be the same)
- confirmation of application of the Waste Hierarchy
- authorised signatures from both parties (Ark or their representative and the waste carrier)

Waste transfer notes must be retained for at least 2 years.

### 5.6 Hazardous Waste

Hazardous wastes must be completely segregated from each other and all non-hazardous wastes. The Campus Manager ensures that each site is registered with the Environment Agency as Hazardous Waste Producers if more than 500kg of hazardous waste is disposed from that site annually. This registration must be updated annually.

Each hazardous waste consignment note must have:

- a designated, unique code based on the site's registration code as a producer of hazardous waste
- the standard industrial classification (SIC) code

Completed copies of waste consignment notes (quarterly returns) should be received by Ark or its representatives from the consignee(s), within one month from the end of the quarter within which the waste was accepted. It should be checked that these returns match up with the consignment note records of all hazardous waste movements in each quarter.

Records of all hazardous waste consignment notes must be retained for at least 3 years.

### 5.7 WEEE

Storage, segregation and disposal measures are applied to WEEE as set out above for all wastes, both hazardous and non-hazardous. Categories of WEEE include large and small

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Page number	4 of 5	Version	1.3
Doc Id	5062-C-Waste Management Procedure	D2 Ref	<a href="#">8005ea0c</a>

## Waste Management Process

household appliances; IT and telecommunications equipment; consumer equipment; lighting equipment; electrical and electronic tools (except large-scale stationary industrial tools); toys, leisure and sports equipment; medical devices; monitoring and control instruments; and automatic dispensers.

If WEEE was purchased before 13 August 2005, and is being replaced with new equipment fulfilling the same function, then the producer of the new equipment is responsible for the collection, treatment and recycling of the old equipment, regardless of whether they were the original manufacturer.

If WEEE was purchased before 13 August 2005 and is not being replaced, the user is responsible for financing and arranging treatment in accordance with the WEEE Regulations and existing waste management legislation, including the Duty of Care and the Hazardous Waste Regulations.

If WEEE was purchased after 13 August 2005, then the producer of that equipment is responsible for its collection, treatment and recycling when you dispose of it.

Producers are allowed to negotiate with business users to ask them to agree to taking on all or part of the cost of disposal. This is a commercial decision which forms part of the negotiation of the supply contract.

### 5.8 Client Waste

Ark is a registered waste broker and may therefore arrange the disposal of a client's waste.

If any waste treatment such as crushing or baling is carried out on site, the appropriate exemption must be registered with the Environment Agency.

## 6. Training

All staff, contractors and visitors coming on to a campus are made aware through the induction process of the need to segregate wastes appropriately using the facilities provided.

Individuals responsible for arranging the disposal of wastes should be adequately competent in the legal requirements for the completion of waste documentation.

## 7. Performance Monitoring

Performance against this specification will be monitored in the following ways:

- Regular inspection of waste storage areas
- Periodically through Internal Audits
- Collation of waste figures

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Spring Park (Corsham) Limited

**Proposed Business & Technology Park**  
at  
Spring Park, Corsham, North Wiltshire

## **Environmental Statement Non-Technical Summary**

November 2007

Prepared for Spring Park (Corsham) Limited by GVA Grimley Ltd in association with Wardell Armstrong LLP, IMA Transport Planning and the Landscape Agency

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## **Preface**

An application for outline planning permission to develop new business space (offices and data centres) has been made at the Spring Park site (formerly known as Spring Quarry or Corsham Media Park), near Corsham, North Wiltshire. The application is accompanied by a series of reports which explain the proposed development and the effects it is likely to trigger.

An Environmental Statement has been prepared on behalf of the applicants (Spring Park Corsham Limited) to record the potential effects of the scheme on the environment, and set out the measures available to reduce or improve these effects. This document presents a Non-Technical Summary of that statement.

Copies of the full Environmental Statement can be inspected at:

Planning Services  
North Wiltshire District Council  
Monkton Park  
Chippenham  
Wiltshire  
SN15 1ER  
Telephone 01249 706444

Further copies of this non-technical summary can be obtained there free of charge. Additional copies of the full Environmental Statement are also available at a cost of £200. Copies are also available in CD Format free of charge.

# Contents

## Preface

<b>A</b>	<b>INTRODUCTION .....</b>	<b>3</b>
A1	BACKGROUND TO THE ENVIRONMENTAL STATEMENT .....	4
A2	THE PROPOSED DEVELOPMENT .....	5
A3	THE SITE & SURROUNDINGS .....	7
A4	PLANNING POLICY CONTEXT .....	8
<b>B</b>	<b>ASSESSMENT &amp; ANALYSIS .....</b>	<b>9</b>
B1	LAND USE & SOILS .....	10
B2	GEOLOGY & GROUND CONDITIONS .....	11
B3	HYDROLOGY & HYDROGEOLOGY .....	12
B4	TRAFFIC, HIGHWAYS & ACCESS .....	14
B5	AIR QUALITY .....	15
B6	NOISE & VIBRATION .....	16
B7	ECOLOGY & WILDLIFE .....	17
B8	LANDSCAPE & VISUAL IMPACT ASSESSMENT .....	19
B9	ARCHAEOLOGICAL & CULTURAL HERITAGE .....	21
B10	WASTE & RECYCLING .....	22
B11	SOCIO-ECONOMIC IMPACT .....	23
<b>C</b>	<b>CONCLUSIONS .....</b>	<b>24</b>
C	CONCLUSIONS .....	25
<b>APPENDIX</b>		
<b>Figure A1.1</b>	Strategic Location	
<b>Figure A1.2</b>	Site & Surrounding Area	
<b>Figure A1.3</b>	Site Extent (Redline Boundary)	
<b>Figure A2.1</b>	Concept Plan	
<b>Figure A2.2</b>	Illustrative Zoning Plan (Option 1)	
<b>Figure A2.3</b>	Illustrative Zoning Plan (Option 2)	

# **A INTRODUCTION**

## **A1 BACKGROUND TO THE ENVIRONMENTAL STATEMENT**

- A1.1 This Non-technical Summary (NTS) summarises the Environmental Statement (ES), which accompanies the outline planning application for the comprehensive redevelopment of the former Spring Quarry site on the edge of Corsham, Wiltshire. The application is made on behalf of Spring Park (Corsham) Limited (SPCL) and proposes a mixture of offices, research and development facilities, and/or data processing and storage centres within a parkland setting. Drawings A1.1, A1.2 and A1.3 (appended to this statement) show the strategic location, local context and redline boundary of the site which SPCL has renamed Spring Park.
- A1.2 The Environmental Impact Assessment process is governed by legislation<sup>1</sup> and informed by non-statutory guidance. It is common-sense based and asks those responsible for the process to identify, describe and assess the significant effects that a development project is likely to cause on the environment and those who occupy or enjoy it.

### **CONSULTANT TEAM**

- A1.3 This NTS (and the ES it summarises) has been compiled by GVA Grimley (which has also added sections on background, planning policy and socio-economic issues) with input from Wardell Armstrong on geology, ground conditions and contamination; drainage, flooding and water issues; air quality; noise ecology and wildlife; archaeology and cultural heritage; waste and recycling; The Landscape Agency Design on landscape and visual impact; and IMA Transport Planning on traffic, highways and access.

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<sup>1</sup> Principally the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (SI 293). These are called the Regulations from this point on in this statement.

## A2 THE PROPOSED DEVELOPMENT

- A2.1 The application made for the site is for outline planning permission for a new business and technology centre.
- A2.2 A basic concept for the site has been prepared to assess the impacts of the proposed development. This is shown on Figure A2.1 at the end of this summary. Illustrative zoning plans outlining the proposed development strategy are attached as Figures A2.2 and A2.3. These subdivide the site into a series of development parcels where buildings will be located together with their associated yards, car parks access roads and landscaping. The plans have been informed by the investigations described in the ES and by national, regional and local planning policy.
- A2.3 The development will have the following key characteristics:
- a) between 50,000 and 60,000 square metres<sup>2</sup> of office, research and development facilities and/or data processing and storage centres (which fall within Use Classes B1 or B8 of the Town and Country Planning Use Classes (Amendment) Order 2005)<sup>3</sup>;
  - b) these uses will be accommodated in a series of buildings rising to a maximum of three storeys (16 metres) in height;
  - c) principal ancillary uses will include car parking to serve the new buildings, although some other on site services may be provided (including a pavilion which may accommodate a café, a crèche and/or other support facilities);
  - d) the buildings will sit in a parkland setting established by the retention of existing trees together with the provision of new landscaping;
  - e) a single point of vehicular access to the Park is proposed from Westwells Road linking to a central spine road;
  - f) secure fenced environments will be provided for both the buildings and their associated external plant compounds;
  - g) a new electricity substation to serve the site with power is proposed; and
  - h) a sustainable urban (surface) water drainage system will be installed which will be wholly contained in the site.
- A2.4 The development will require the clearance of some existing buildings on the site, the provision, improvement or replacement of existing services and the clearance of some existing vegetation. Some off site improvements to the highway and public transport network may also be required.
- A2.5 The two concept drawings both show a division between the front of the site (the part closest to Westwells Road) and the back (the part furthest from the road). The front part will be used for offices and the back or rear will be used for data storage and processing centres. They also show a generally similar development “footprint” or site coverage of between 50 and 60% of the overall site area (with the building footprints making up around 20 - 30% of the total site area).

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<sup>2</sup>Neither a precise figure or a division between the amount of office space and the amount of data centre space is available at this time

<sup>3</sup> From the outside, data storage facilities share similar characteristics to offices (although they have far fewer windows). They are used to process and store digital data in secure and controlled environments.

- A2.6 The main difference between the plans relates to the treatment of the data centre area (at the rear of the site) – either 3 larger buildings or a series of 7 smaller buildings, all with building heights of about 16 metres.
- A2.7 The scheme with the larger 3 buildings has been used as the focus of the assessment of environmental impacts mainly because common sense suggests that the larger buildings have the potential to trigger slightly higher levels of impact. As a result, if this scheme proves to be acceptable, then the scheme with smaller units will be too.
- A2.8 As part of the evolution of the proposals, alternative development options and sites were considered. This exercise highlighted that given the characteristics of the site (principally ecological and arboricultural issues), the proposals represent a deliverable solution that responds to, and realises, the site's potential. Equally, the business uses proposed are supported by North Wiltshire District Council. A recent independent study of employment land supply in the district has identified that there are very few other sites that could accommodate the level of development proposed.
- A2.9 The combined or cumulative impacts of the proposals have also been considered. These include minor schemes (proposals on the adjacent Ark Continuity Site) and two major schemes (proposals by the Ministry of Defence at Basil Hill, and a new housing development proposed by Persimmon Homes known as Katherine Park).

## A3 THE SITE & SURROUNDINGS

### Characteristics and History

- A3.1 The Spring Park site extends to 11.75 hectares (29.03 acres) in size. It includes a mixture of existing buildings, hardstanding areas and yards, estate roads and open grassed areas together with some woodland. Part of the site sits on top of Spring Quarry, an old bathstone mine. Whilst some of the site is currently open and green, this disguises the fact that the site was used by the MoD until 1995 and comprises largely of made ground and previously used or developed land.
- A3.2 The site is situated to the south west of the town of Corsham. It is bordered to the north by existing MoD land and to the south by open land. Westwells Road forms the eastern boundary and a plastics factory is located adjacent to the south east boundary. The nearest residential properties lie to the south east of the site across Westwells Road.
- A3.3 In 2000, planning permission was granted for the construction of Corsham Media Park on the site. Development proposals in the surrounding area include the MoD's proposals at Basil Hill, on the other side of Westwells Road. Here full planning permission exists for a new military communications and information technology campus.

### Access

- A3.4 Access to the site is currently provided directly from Westwells Road in the form of a wide T Junction. Westwells Road connects the site to the wider network – the B3109 to the north and the A4. Pedestrian and cycle access also comes from Westwells Road. There are no public rights of way through the site and access is strictly controlled around the site. The wider area is served by public transport.

### Neighbours and neighbouring uses

- A3.5 To the north Spring Park is bordered by part of the Rudloe MoD Estate (known as Number 2). This area accommodates a series of buildings of various ages, types and qualities. None of the properties are residential.
- A3.6 To the east of the site (beyond Westwells Road) lies the Basil Hill site. A cul-de-sac of houses also lies to the east together with a small amount of properties on Westwells Road which are the closest houses to the site.
- A3.7 To the south of the site, there is established woodland and mainly open farmland beyond. To the west, the site borders the Ark Continuity site (which is to be used for smaller scale data storage and processing).

### The Natural Environment

- A3.8 The land within the site comprises rough grassland (which sits on "made" ground), together with buildings and hardstanding, amenity grassland, tall ruderals, scrub and perennial vegetation. Two areas of woodland are also present together with some scattered mature trees. None of the trees on the site are protected. The habitats within the site have the potential to support a variety of wildlife including breeding birds and bats.
- A3.9 The site is not subject to, or bounded by, any statutory nature conservation or landscape designations.

## A4 PLANNING POLICY CONTEXT

- A4.1 The development of the site for employment is fully supported by the national, regional and local planning policy context relating to the site.
- A4.2 National planning policy asks developers to deliver jobs and better opportunities that are compatible with the local and surrounding environment. It also requires developers to take a positive approach to innovative, high quality designs that will make urban areas better places to live and work, whilst at the same time protecting the quality of the countryside. New development must respect local biodiversity, geological conservation and provide opportunities for people to work near where they live to reduce the need to reduce commuting. There is also a general preference to develop previously developed and use land instead of undeveloped or greenfield land.
- A4.3 Regional planning policy guidance sets out a sequential approach to the location of development, with new development focused at urban areas, especially where this will achieve more self contained and balanced communities. The application site is at the edge of a main settlement and comprises largely previously used or developed land (where planning permission already exists for business development). The site also lies within the northern part of the region where both existing and emerging regional guidance emphasises the need to realise economic potential to add to regional prosperity.
- A4.4 At a local level, the current local plan recognises that the site is an important part of the supply of land that is to be developed for new business space. The significance of the site has recently been reinforced by an independent review of employment land for North Wiltshire District which concludes that Spring Park is one of a small number of strategic sites capable of meeting employment needs to 2016 and beyond.
- A4.5 Local planning policy also makes it clear that development proposals should not have an acceptable impact on the environment. The assessment of the environmental impact of the scheme is considered in the remainder of this summary (and in the main body of the full environmental statement).

## **B ASSESSMENT & ANALYSIS**

The majority of the Environmental Statement records the results of detailed investigations of the site and the area in which it sits. These investigations are explained on a topic by topic basis according to the part of the effect that is triggered by the construction and operation of development. These topics (which were agreed with the District Council) focus on the impact of the development on:

- Land use and soils
- The geology of the site and ground conditions there
- Hydrology and hydrogeology (namely the impact of development on surface and ground water, including flooding)
- Traffic and transportation networks
- Air quality
- Noise levels and vibration
- Ecology and wildlife
- The landscape and local views
- Archaeology and cultural heritage
- Waste and recycling
- The economy

The headlines from these investigations are explained in the next part of this summary.

## **B1 LAND USE & SOILS**

### **INTRODUCTION**

- B1.1 The application site has been previously used as a MoD facility and as explained in the next section of this summary, natural soils are absent from large areas of the site.

### **POTENTIAL IMPACTS**

- B1.2 The principal impact of the proposed development in terms of land use and soils will be the change in the land use.

#### **Land Use**

- B1.3 The site currently accommodates a range of former MoD buildings. The majority of these are under used or currently vacant although the MoD occupies a two storey building on the eastern edge of the site close to the main access. None of the buildings are listed.
- B1.4 The redevelopment scheme will replace the existing buildings with a modern business and technology park. This will comprise offices, research and development facilities together with data processing and storage centres. The new facilities will sit within a parkland setting established by the retention of existing trees together with the provision of new landscaping.
- B1.5 The proposed development will significantly improve the application site by making most effective use of this mainly previously used site. The scheme will replace an unsightly and run-down former MoD site with a modern business park within a parkland setting, which will provide a substantial amount of new employment. It is considered that the resultant impact upon land use will be beneficial and therefore no mitigation measures will be necessary.

#### **Soils**

- B1.6 Given that there are only limited areas of natural soils within the application site, effects upon soils will be negligible. Appropriate measures will be taken during construction in order to ensure that soils are preserved and retained on site for re-use within landscaping works

## **B2 GEOLOGY & GROUND CONDITIONS**

### **Geological settings**

- B2.1 Parts of the site (including the main open areas) comprises made ground deposit associated with the arisings from the former underground mine workings which lie beneath the site. This consists of brown clay and silty sand with limestone fragments, ash and clinker. Occasional pockets of waste materials (including asbestos ceiling panels, concrete and demolition rubble, metal cables / wire, glass, porcelain, polythene, plastic and ash) were also identified.

### **Mining**

- B2.6 Historical mapping indicates that commercial extraction of Bath Stone beneath part of the site commenced in 1875. The mine is reported as being very stable and is subject to the management and controls imposed by the Management and Administration of Safety and Health at Mines and associated Code of Practice and legislation.

### **Ground Contamination**

- B2.7 Preliminary site investigation works between 1999 and 2002 identified potential sources of contamination and the presence of 'localized, low-level' soil contamination, both above and below ground. The significance of the impact of the proposed development on ground contamination is likely to be low. However, before development commences this will need to be confirmed through further site investigation.

### **Mitigation Measures**

- B2.8 These investigations will allow any risks to be assessed and a strategy will be produced identifying the measures necessary to reduce the risk posed by ground contamination at the site to acceptable levels. Mitigation measures may include the excavation and removal of contaminated material and disposal at a licensed landfill facility, and the use of clean inert materials as a barrier to break the pollutant linkage pathway.

### **Residual impacts**

- B2.9 Given the implementation of appropriate site investigation, risk assessment and remediation strategy to address the site's contamination setting, no residual impacts are anticipated.

## **B3 HYDROLOGY & HYDROGEOLOGY**

- B3.1 An assessment has been undertaken of the potential impacts of the Spring Park development in relation to surface and ground water.
- B3.2 The application site falls within the River Avon catchment, which is predominantly rural, but includes some areas that are experiencing urban development pressures that threaten to increase the risk of flooding. Currently the site comprises former industrial buildings and hardstanding, with areas of woodland and rough grassland.
- B3.3 The development site lies close to the top of a hill with an average height of 100m AOD. The Environment Agency indicative floodplain maps show that the development site is at low risk of flooding and, therefore, is an area where all development types are usually appropriate. The site lies outside of any zones at risk of flooding.
- B3.4 Despite this it is important to consider the factors that could increase flood risk:
- a. Flooding could potentially occur if heavy rainfall on the fields surrounding the site exceeds the infiltration capacity of the soil. The site is, however, located close to the top of Box Hill so there is little land higher than the site from which overland flow could originate.
  - b. Flooding could potentially occur on site from localised, high intensity storms of a relatively short duration that might exceed the capacity of the local highway drainage network on Westwells Road. The risk of flooding from this source is, however, considered negligible due to the site's location close to the top of Box Hill where the catchment area for the sewers is very small.
  - c. Flooding can occur when prolonged rainfall causes the groundwater table to rise to the point where it affects development on a site. On the application site, however, the groundwater is known to be generally below the floor level in the Quarry complex. It will, therefore, not impact on any development which takes place at surface level or above.

### **IMPACT ASSESSMENT & MITIGATION**

- B3.5 There are three principal impacts which may arise from the proposed development – short term impacts from the construction phase of the project, long term impacts associated with the construction of large areas of impermeable surface and increased vehicle use, and long term impacts related to the operation of the completed development. There is also the potential that any contaminants present on the site may impact groundwater.
- B3.6 At Spring Park, potential impacts can be minimised or overcome by employing good construction management practices and implementing the relevant codes of practice for construction sites.
- B3.7 Contractors will be required, as a minimum, to take the following precautions:
- a) Prevent illegal entry of fuels, cement, concrete or debris into any watercourse;

- b) Manage any effluent/silty water resulting from dewatering or excavations prior to discharging into a watercourse or sewer;
- c) Maintain site roads/haulage routes in a condition free from debris;
- d) Locate, bund and protect fuel or chemical storage areas (leaking and empty drums should be removed from site); and
- e) Clean and wash lorries, equipment and site roads (not allowing washings to enter a drain).

B3.11 To manage the effects of the development on surface water, the drainage system will be designed in accordance with the principles and guidance set out by UK guidance. Moreover, the risk of flooding both on and off the site will be mitigated by limiting water runoff from hard to soft landscaping.

B3.12 Provided that good practice measures in respect of surface and foul waters are implemented there should be minimal residual impact of the proposed development.

B3.13 Overall, the assessment indicates that the proposed development should have no significant impact on surface and/or groundwater at the site. Furthermore, it should be possible to improve the current situation and manage the surface waters adequately within the proposed development.

## **B4 TRAFFIC, HIGHWAYS & ACCESS**

B4.1 A full Transport Assessment (TA) has been submitted in support of the planning application. The TA addresses the transport impacts of the proposed development on the surrounding transport network and was summarised within the ES. The findings are outlined below.

### **IMPACT ASSESSMENT AND MITIGATION**

- B4.2 The proposed Spring Park development will give rise to increased demand for travel to and from the site. This will, when combined with traffic from other committed developments (mainly Basil Hill and Katherine Park) and background traffic growth, give rise to capacity issues at a number of junctions in the vicinity of the site. The Basil Hill planning permission requires the MoD to provide mitigation measures at a number of junctions and these have been designed to mitigate the effects of the Spring Park development.
- B4.3 It has been agreed with the County and District Councils that Spring Park should consider the combined impacts of developments on the Westwells Road/Bradford Road/Leafy Lane junction and the A365/B3109 Fiveways junction. These would, in their existing format, operate over capacity, and the development would give rise to queuing and congestion in the traditional weekday peak periods.
- B4.4 As a result junction improvements are proposed to mitigate the effects of the development.
- B4.5 In addition to these improvements, improvements are proposed to the surrounding footway, cycleway and public transport network. These measures will facilitate travel to the site by non-car modes which will assist in minimising the traffic impacts of the development.
- B4.6 In terms of the construction phase, the routing of deliveries to the site will be agreed with the Council before development starts and the agreed routing will be written into all construction contracts to avoid the use of inappropriate roads by large delivery vehicles.
- B4.7 With the mitigation measures proposed, it is considered that any residual impacts from the development will be negligible. Transportation matters are considered in detail within a separate Transportation Assessment which supports the application.

## **B5 AIR QUALITY**

- B5.1 The suitability of the application site for the proposed development in terms of air pollution has been assessed, together with the impact of the development proposals on the air quality at the site nearby.
- B5.2 An assessment of the air quality impact from vehicles has been carried out using the screening method described in the Highways Agency publication Design Manual for Roads and Bridges (DMRB).

### **IMPACT ASSESSMENT & MITIGATION**

- B5.3 The results of the DMRB screening assessment, based on existing and future traffic flows 'with' and 'without' development, indicate that air quality standards at sensitive site users closest to the roads modelled are not expected to be exceeded.
- B5.4 Generally the results demonstrate that whilst traffic flows will increase with time, levels of pollutants will decrease as technological improvements are made to vehicles. In addition, when compared to a projected improvement in ambient air quality, emissions from the development will not lead to a significant deterioration in air quality.
- B5.5 During construction works gaseous emissions will consist of exhaust gases arising from plant and vehicles used in the operations and will therefore vary in concentration and distribution as site development proceeds. There will be a potential for only very minor adverse impact on air quality during construction operations. This will be very localised and last only for the short term. Construction vehicles from the site using the public highway are also unlikely to have a noticeable effect on air quality at the site, mainly because there will be few of these compared to the general traffic flow near the site.
- B5.6 Following completion of construction, gaseous emissions will arise from the use of the business premises on site. Emissions will also arise from road vehicles visiting and leaving the site. There will be a potential for only a very minor adverse impact on air quality during the occupation of the business properties. The residual impact after application of mitigation measures will be localised and minor.
- B5.7 Dust will be generated during some demolition and construction operations, creating a local source of pollution. Although this could trigger a localised adverse impact for people and property nearby in the form of increased rates of dust deposition during construction operations, the residual impact after application of mitigation measures will be minor and short term.
- B5.8 The construction and operation of the adjacent Ark Continuity site is unlikely to have any significant impact on air quality with the implementation of appropriate mitigation measures to control dust emissions during construction and through careful building design.

## B6 NOISE & VIBRATION

### INTRODUCTION

- B6.1 Assessments of the possible noise impacts of the proposed scheme during construction and after completion have been undertaken, including baseline noise surveys. The potential for ground-borne vibration from road traffic and construction activities associated with the proposals has also been assessed. Both assessments have examined the effects of the development and the approved scheme for the Basil Hill site across Westwells Road.

### IMPACTS ASSESSMENT & MITIGATION

#### Noise

- B6.2 Increases in levels of road traffic noise can arise if the volume of traffic grows by a considerable margin. The proposed development and the future complete Basil Hill development will result in changes in road traffic in the surrounding area.
- B6.3 The future road traffic noise predictions indicate that no significant long term adverse direct noise impacts are anticipated as a result of the proposed development (any substantial increases in noise are anticipated to come from larger vehicles associated with the approved Basil Hill scheme). It is also anticipated that Basil Hill and Spring Park schemes will be built, and occupied, in stages and over time therefore the receptors should experience a gradual, and not sudden, increase in noise levels.
- B6.4 Demolition and construction has the potential to give rise to adverse impacts on noise levels away from the site. However, the impact will be localised and will last only for the construction stage. The local authority can also attach noise limits on the demolition and construction operations if works are adversely affecting the amenity of the area.
- B6.5 With careful design, the completed development should not give rise to any unacceptable noise impacts. This is due to the inherently quiet nature of most of the proposed development and, where any potentially noisy air conditioning units are proposed, the use of noise control through design and the use of other noise mitigation measures will be used as appropriate.

#### Vibration

- B6.6 No vibration monitoring has been undertaken at the Spring Park site. However, should any particularly heavy plant need to operate in close proximity to an occupied residence during the demolition and construction works, the worst potential effect is that transient vibrations could be felt by users of the building. Structural damage would be very unlikely to occur.
- B6.7 There could be potential for ground borne vibration to occur as a result of any proposed piling operations, however with the implementation of appropriate measures it is anticipated that vibration can be managed to acceptable levels.

## **B7 ECOLOGY & WILDLIFE**

### **INTRODUCTION**

- B7.1 The Environmental Statement records the results of an ecological impact assessment of the proposed development at Spring Park and the cumulative effects with regard to proposed developments nearby.
- B7.2 Baseline information on current conditions has been gathered from consultations with statutory and non-statutory nature conservation bodies and from the results of flora and fauna surveys. An Extended Phase 1 habitat survey of the site has also been undertaken, together with an assessment of the potential for protected species (such as badger, bats, dormice, great crested newt, otter, water vole and breeding birds).

### **IMPACT ASSESSMENT & MITIGATION**

- B7.3 Background information on relevant wildlife designations and records of species that are rare (at national or local level) or nationally scarce within 2 km of the application site, were requested from Natural England and the Wiltshire and Swindon Biological Records Centre (WSBRC). In addition, Natural England's website and the Multi Agency Geographic Information for the Countryside (MAGIC) website were also reviewed. North Wiltshire District Council was contacted for information on Tree Preservation Orders.
- B7.4 Whilst the site itself is not protected, there are two Sites of Special Scientific Interest (SSSI) and one Special Area of conservation (SAC) located within 2km. Box Mine SSSI / Bath and Bradford-on-Avon SAC is located approximately 0.6km to the west of the site and is notified because of the bat species present in the network of man-made tunnels. The site is considered to be of international importance for nature conservation. Corsham Railway Cutting SSSI is located approximately 0.7km to the north east of the site and is notified due to the geology of the site. This designation is considered to be of national importance.
- B7.5 Within 2km of the site there are 13 Sites of Nature Conservation Importance, including 6 areas of Ancient Woodland, which are considered to be of regional / county importance for nature conservation.
- B7.6 The woodland outside but adjoining part of the south eastern boundary of the site is designated as a Tree Preservation Order and is considered to be of regional / county importance for nature conservation.
- B7.7 An Extended Phase 1 Habitat Survey was undertaken in 2005 and updated in 2007.
- B7.8 The Habitats on the site comprise semi-improved grassland, planted woodland, scrub and mature trees which are considered to be of local importance for nature conservation. These habitats have the potential to support breeding birds, bats and reptiles. With appropriate mitigation, the loss of these habitats is considered to be a probable residual impact of negligible significance.
- B7.9 The areas of hardstanding, disturbed ground, beech hedgerow and amenity grassland are considered to be of negligible importance for nature conservation.

- B7.10 There are records of great crested newts approximately 0.23km to the north east of the site at Basil Hill Barracks. The habitats within the application site have the potential to provide foraging habitat and refuges for this species. However, Westwells Road is considered to be a significant barrier to dispersal and consequently the proposed development is considered to be a probable impact of negligible significance.
- B7.11 The semi-improved grassland and disturbed ground habitats have the potential to provide suitable foraging and basking habitats and refuges for common reptiles. Although no presence / absence survey has been undertaken, slow worm and common lizard have been reported on the site. With appropriate mitigation, which will focus on preventing harm to individuals and include the creation of new habitat and refuges, the residual impact on these species is considered to be negligible.
- B7.12 No evidence of badger activity was observed on the site, however the habitats within the site have the potential to provide suitable foraging habitat for this species.
- B7.13 The habitats within the site have the potential to provide suitable nesting habitat for a variety of species. Barn Owl and Kestrel were noted in buildings during the 2005 bat surveys. With appropriate mitigation, such as the timing of works and creation of new habitat, the proposed re-development of the site is considered to be a residual impact of negligible significance.
- B7.14 Bat surveys were undertaken in 2005 and updated in 2007. Evidence of bat activity was observed in buildings CM20, CM21, SQ9 and SQ10. Although no roosting activity was observed during the 2005 or 2007 surveys, some of the mature trees on the site also have the potential to be used as bats roosts. Evidence of bat activity, including lesser and greater horseshoe bats, was also observed within buildings on the adjacent Ark Continuity Site. The habitats within the site also have the potential to be used as foraging and navigation routes. With appropriate works, under licence from Natural England, the proposed re-development of the site is considered to be an impact of negligible significance to bats.

## B8 LANDSCAPE & VISUAL IMPACT ASSESSMENT

- B8.1 The Environmental Statement includes a comprehensive section which identifies and evaluates the existing landscape and visual resources of the site and the surrounding area and assesses the predicted landscape and visual impacts of the development. The section considers the potential direct and indirect impacts of the development, along with the mitigation measures required to prevent, reduce or counteract the impacts.
- B8.2 Whilst only an outline application, the concept for the site allows the development to respect local context and landscape character in accordance with the adopted development plan. This includes connecting the site with the surrounding landscape character; respecting existing residential privacy; respecting the local character of the area through scale, massing and layout; and limiting building height.

### IMPACTS ASSESSMENT & MITIGATION

#### *Landscape Character*

- B8.3 The proposals do not fundamentally or significantly affect the character of the open countryside to the south and west of the site. There is no change to the landform or interrelationship between land and sky.
- B8.4 The proposed scheme has the potential to improve the urban fringe character that the site sits within. This can be achieved through the provision of additional native landscape planting which helps to tie the site in with the rural character of the surrounding countryside. The development also enhances the appearance of the site, replacing the old MoD buildings with contemporary buildings and softening the appearance of the ventilation shafts on the site.
- B8.5 The retention of good quality trees on the site and the planting of additional trees and wildlife corridors help to enhance the landscape character of the site and the features upon it.
- B8.6 Whilst the short term, temporary landscape impacts during the demolition and construction are predominantly *low adverse* in nature, the residual impacts are therefore largely *beneficial*.

#### *Visual Effects*

- B8.7 Views from the wider countryside to the south and west of the site remain unaffected by the proposals, except during the demolition and construction stage, when cranes and higher level activities will be visible above the skyline. The sensitivity of visual receptors to the south and east is lowered by their distance from the site, and the context of the site sitting within a wider panoramic context from the visual receptors assessed.
- B8.8 The proposals have a more pronounced impact locally, with the proposed office buildings on the site frontage influencing views from Westwells Road and Westwells. However, the residual impacts upon receptors to the south east of the site, including properties of Westwells fronting Westwells Road, are mainly *beneficial*. This is largely as a result of the potential for landscaping along the eastern site boundary, which as it matures will

provide a soft, green edge to the site, improving the existing view across the site. The mature tree planting would be higher than the proposed buildings, altering the skyline and filtering views of the development.

- B8.9 Where proposed buildings will break the skyline when viewed from Westwells and Westwells Road, the residual visual impact depends on the detailed proposals for development and landscaping that come forward. The most likely outcome is positive given the scope for improving the quality of Westwells Road. This also reflects the fact that, upon maturation of the proposed landscape buffer planting, the proposed buildings will not be the highest or most dominant visual feature / focus within any of the views assessed and that there are no locally important views either to or from designated landscapes.

## **B9 ARCHAEOLOGICAL & CULTURAL HERITAGE**

B9.1 The Environmental Statement records an assessment of the potential impacts of the Spring Park development on the archaeological and cultural resource.

### **IMPACTS ASSESSMENT & MITIGATION**

B9.2 The proposed development has been assessed through desk-based assessment and site inspection. There is limited evidence of prehistoric and Roman settlement in the region, but the study area and site appear to be of low archaeological sensitivity. There are no statutory or non-statutory archaeological sites within the application area. Eleven listed buildings are within the search area and neither the buildings nor their settings will be affected by the proposed development.

B9.3 The site may have been quarried since at least the 17<sup>th</sup> century. However, subsequent mining and development is likely to have removed any traces of such activity, as well as any earlier remains. There is considered to be no potential for impact on buried archaeology.

B9.4 Within the application area are earthworks created by the MoD and several buildings which are functionally linked with an underground complex of national heritage importance. An archaeological photographic recording survey has been proposed to mitigate the loss of these features and buildings.

## **B10 WASTE & RECYCLING**

### **INTRODUCTION**

B10.1 The ES considers the potential waste management effects associated with both the construction and use of the proposed development. The overall aim of the proposed development will be to encourage sustainable waste management and construction methods that demonstrate good practice and legislative compliance.

### **IMPACT ASSESSMENT & MITIGATION**

B10.2 As with all development projects, waste will be generated in connection with demolition and construction operations and following the completion of the proposed development.

B10.3 Construction operations for the proposed development will generate concrete, asphalt, brick, glass, timber and roofing tiles, as well as packaging materials such as plastics and paper. These materials are likely to be disposed of off-site as wastes. Any unused paints, timber treatments etc may also require off-site disposal. The completed development will generate quantities of commercial / industrial waste materials. Those waste materials which cannot be recycled are likely to require disposal off-site to landfill.

B10.4 Demolition operations for the proposed redevelopment are likely to generate the following materials: concrete, bricks, steel, and corrugated sheeting (various ferrous and non-ferrous materials), asbestos cement, tiles and glass. The recycling and reuse of these materials on-site is the most environmentally sustainable option. The quantity of waste materials which will arise from the demolition and construction operations cannot be precisely quantified at this stage.

B10.5 Based on the development expected on the site, the total amount of waste produced during demolition would represent a very small fraction (around 0.1%) of the total construction and demolition (C&D) waste produced in the region. Therefore, this is considered to generate a minor impact.

B10.6 Waste materials from the application site are likely to be disposed of to landfills in the local area. The impact is therefore likely to have effect at a local or district scale rather than at a regional level.

B10.7 Once complete, development expected on the site will generate less than half of one percent of the of the commercial and industrial waste managed in the Wiltshire County Council and Swindon Borough Council (as stated in the Wiltshire and Swindon Waste Local Plan 2011). 80% of the waste generated is likely to be recyclable and, overall, the impacts on landfill availability are likely to be relatively minor.

## **B11 SOCIO-ECONOMIC IMPACT**

### **INTRODUCTION**

- B11.1 As well as the effects upon the physical environment, an assessment of the environmental impact of a proposed development needs to consider the socio- economic impact that it will have upon the local community and the wider economy. For Spring Park the assessment looked at the policy context; population and demographics; economic activity; education and health.

### **POLICY CONTEXT**

- B11.2 The proposals are being brought forward within a highly positive economic and planning policy landscape. Broadening the economic base and developing new employment opportunities in key emerging sectors is recognised at each tier of policy making as key to the future of the area.
- B11.3 Furthermore, the redevelopment of MoD sites is supported by the adopted local plan, which also identifies Corsham as one of six areas in which new development in North Wiltshire should be concentrated. Provision of new employment opportunities in Corsham should also assist in fulfilling the ambition, set out in the Regional Spatial Strategy, of making the area more self sufficient and help prevent it from becoming a dormitory area to Swindon, Bath and Bristol.

### **IMPACT ASSESSMENT & MITIGATION**

- B11.4 The proposals will lead to the creation of around 2700 direct and indirect new. Between 1,000 and 1500 of these jobs will be provided on site with the full development of Spring Park. The others will be (full time equivalent) construction jobs or jobs which are created elsewhere in spin off enterprises or as a result of the increase in income generated. This will provide a significant boost to the local economy and the wider sub-region.
- B11.5 The impact of the proposed development is anticipated to be very positive and there is no need for mitigation measures. The proposed development could potentially lead to an increase in demand for housing and community infrastructure, which could be considered as the only negative socio-economic impact resulting from the scheme. However, it is anticipated that the new jobs will be occupied by people from across the sub-region and, therefore, any such impacts are likely to be dispersed and manageable. These impacts are anticipated to be marginal when compared with the overall socio-economic impact of the proposed development which is expected to be highly positive.

## **C CONCLUSIONS**

## **C CONCLUSIONS**

### **Introduction**

- C.1 The assessment of the potential environmental effects of the proposed development identifies a range of effects. These have been comprehensively addressed.

### **Land Use & Soils**

- C.2 The proposed development will significantly improve the application site by making most effective use of this largely previously used and developed land. The scheme will deliver clear benefits to amenity - replacing an unsightly former MoD site with a sensitively designed modern business park within a parkland setting. The resulting impact upon land use will be beneficial and no mitigation measures will be necessary. The limited soil resource on site will, where appropriate, be preserved and retained for re-use.

### **Geology, Ground Conditions & Contamination**

- C.3 Parts of the site comprises made ground associated with the arisings from the former underground mine workings which lie beneath the site. The mine is reported as very stable and is subject to an appropriate management regime. Preliminary site investigation works identified potential sources of contamination and the presence of 'localized, low-level' soil contamination at the site.
- C.4 Following completion of further detailed site investigations, a strategy will be produced identifying the remedial measures necessary to reduce the risk posed by ground contamination at the site to acceptable levels. As a result of the implementation of this strategy, no residual impacts are anticipated.

### **Hydrology & Hydrogeology**

- C.5 The site is an area where there is only a very limited risk of flooding. The development should not increase the risk of flooding elsewhere. Any new development scheme can change surface water regimes and mean that there is potential for any contaminants present on the site to reach the groundwater. However, at Spring Park potential impacts can be minimised or overcome by employing good construction management practices and implementing the relevant codes of practice for construction sites.
- C.6 Provided that these measures are implemented there should be minimal residual impact of the proposed development. Overall, the proposed development should have no significant impact on surface and/or groundwater at the site. In fact, it should be possible to improve the current situation and manage the surface waters adequately within the proposed development.

### **Traffic, Highways & Access**

- C.7 The impact of the scheme on local transportation network has been comprehensively addressed in a separate transportation assessment which has been submitted with the application.

- C.8 The assessment looks at the combined effects of the Spring Park scheme and the Ministry of Defence's Basil Hill project on the opposite side of Westwells Road. It also looks at how the accessibility of the area can be improved for those travelling on foot, by bike or those using public transport.
- C.9 As with most significant development projects, improvements to the surrounding transport network are required to accommodate the expected levels of development (and to make the site more accessible). A series of improvements have been identified to key junctions which will mean that the impact of both developments on traffic flows around the site and the surrounding area will be negligible.

#### **Air Quality**

- C.10 There will be potential for only very minor adverse impact on air quality and dust deposition during construction operations. This will be very localised and only last for a short time. Similar impacts could occur during the operational phase of the development and again with mitigation measures residual impacts will be localised and minor. Air quality changes from traffic generated by the development are not expected to be significant.

#### **Noise & Vibration**

- C.11 No significant long term adverse direct noise impacts are anticipated as a result of the proposed development. During demolition and construction, adverse noise impacts will be localised and short term in nature, and can be managed through appropriate mitigation.
- C.12 For the development itself, noise impacts are expected to be minor. More substantial impacts are expected from the approved development at Basil Hill on the opposite side of Westwells Road. The two developments will be built, and occupied, in stages and therefore any increase in noise levels will be gradual and not sudden. Any potential short term increases in cumulative noise levels during the demolition and construction phases can be minimised through appropriate mitigation measures.
- C.13 The potential for ground borne vibration as a result of any proposed piling operations can be mitigated to acceptable levels.

#### **Ecology & Wildlife**

- C.14 The habitats on the site comprise semi-improved grassland, planted woodland, scrub and mature trees which are considered to be of local importance for nature conservation. These habitats have the potential to support breeding birds, bats and reptiles. With appropriate mitigation, the residual impacts on habitat and species are considered to be of negligible significance.

#### **Landscape & Visual Impact**

- C.15 The proposals will replace the old MoD buildings with contemporary buildings and soften the appearance of the ventilation shafts on site. The character of the open countryside to the south and west of the site will be unaffected as will the interrelationship between land and sky. The scheme will provide positive enhancements to the structure of the site and its urban fringe character, with the residual impacts of the scheme being beneficial. Views from the wider countryside to the south and west of the site remain unaffected by the proposals, and localised residual impacts will be mainly beneficial as a result of the landscape buffer planting.

### **Archaeology & Cultural Heritage**

- C.16 There are no statutory or non-statutory archaeological sites within the application area. No listed buildings within the search area will be affected by the proposed development. Due to the site's history as a mine, it is considered that there is no potential for impact on buried archaeology. An archaeological photographic recording survey has been proposed to mitigate the loss of MoD earthworks and buildings which are linked with an underground complex of national heritage importance.

### **Waste & Recycling**

- C.17 Waste will be generated in connection with demolition and construction operations and following the completion of the proposed development. Those waste materials which cannot be recycled and re-used on-site are likely to require disposal off-site to landfills. The impact is likely to be at a local or district scale. Once complete, the impacts of the development on landfill availability are likely to be relatively minor overall.

### **Socio – Economic Impact**

- C.18 The impact of the proposed development is anticipated to be positive and hence there is no need for mitigation measures. The proposals will lead to the creation of around 2700 direct and indirect new jobs (on the site and elsewhere). These will occur during the construction and operational phases of development and will provide a significant boost to the local economy. Any increased pressure on housing and community infrastructure arising from the scheme is likely to be dispersed and manageable against an overall highly positive socio-economic impact.

### **Mitigation & Residual Impacts**

- C.19 Mitigation measures have been identified within the Environmental Statement where the assessments have identified adverse impacts arising from the proposed development. Following the implementation of appropriate mitigation, the residual environmental impact of the proposed development has been established. These impacts, along with the mitigation measures proposed, are summarised in Tables C.1 and C.2. These relate to the construction and operational phases of the proposed development respectively.

**Table C1: Summary of Residual Effects  
Construction Phase**

Receptor / Environmental Resources	Description of Effect	Nature of Impact*	Mitigation Measures	Residual Significance
Land Use & Soils	Disruption and loss of natural soils during construction operations	St, T, D, Adverse	<p>Sub soils to be removed, where appropriate, prior to the start of construction operations.</p> <p>Topsoil and subsoil to be stripped and stored separately in mounds.</p> <p>If the soil is to be stored for a period of more than six months, the stockpile will be seeded with a deep rooting grass to maintain the soil structure and prevent the growth of weed species.</p> <p>Soils will be reused in the landscaped areas of the development.</p>	Negligible
Geology, Ground Conditions & Contamination	Potential disturbance of contaminated land during excavation	Lt, D, P, Adverse	<p>Further detailed site investigation and risks assessment prior the start of the construction phase is required. Following the investigation a detail remediation strategy has to be submitted and approved by competent authority.</p> <p>Excavation and removal of contaminated material from identified contaminated hotspots</p>	Negligible
	Ground gas released on site	St, InD, T, Adverse	<p>Further detailed site investigation and risk assessment prior the start of the construction phase is required. Following the investigation a detail remediation strategy to be submitted and approved by competent authority.</p>	Negligible
	Contaminated leachate/ liquids/ perched groundwater on site	Lt, D, P, Adverse	<p>Placement of clean inert materials as a clean cover material engineered to create a barrier to break the pollutant linkage pathway between contaminated materials and possible receptors</p>	Negligible
Drainage, Flooding & Water	Contamination of surface and ground water during construction due to possible introduction of contaminants arising from spillage of fuels.	Lt, D, T, Adverse	<p>Contamination can be minimised or overcome by employing good construction management practises and implementing the relevant codes of practice for construction sites</p>	Negligible
	Increased suspended sediment due to run off surface water and deposition of fine particles affecting streams and/or flow capacity within sewers.	St, D, T, Adverse	<p>Wash lorries, equipment and roads and maintain site roads/haulage routes in a condition free from debris. Also it would be necessary to manage any effluent water resulting from dewatering or excavations.</p>	Negligible
	Increased risk of disturbance of potential contaminants present in the ground which may leach into groundwater during construction phase.	Lt, D, P, Adverse	<p>Contamination can be minimised or overcome by employing good construction management practises and implementing the relevant codes of practice for construction sites like</p>	Negligible
Traffic, Highways & Access	Increase in HGV construction traffic on the surrounding highway network	St, T, D, Minor	<p>Construction traffic management plan to be agreed with the planning authority including routing of vehicles</p>	Negligible
Air Quality	Dust and air emissions during demolition and construction phases	St, T, D Adverse	<p>Careful and good site practices will minimise potential generation of dust and emissions.</p> <p>Ensure plant and equipment is kept in good working order.</p> <p>Avoiding use of faulty site plant.</p>	Lt - Negligible
Noise and Vibration	Demolition and construction noise	St, T, D Major and moderate adverse impacts	<p>The impact will be localised and short term in nature, being only for the duration of the operations.</p> <p>Careful and good site practices will minimise potential noise emissions.</p>	Lt - negligible
	Demolition and construction vibration	St, T, D minor adverse	<p>During construction no mitigation required except vibration monitoring during any piling works.</p>	Lt – negligible
Ecology & Wildlife	Direct Habitat loss of amenity grassland, semi-improved grassland / tall ruderals hardstanding and beech hedgerow	Lt, D, P, Negligible - minor	<p>Creation of new areas of open space and appropriate management</p>	Negligible
	Partials loss of mature trees / planted woodland	Lt, D, P, Negligible - minor		Negligible
	Bats – loss of potential roosting and foraging habitat	Lt, D, P, Major	<p>Bat Licence Application Required</p> <p>Timing of work and creation of new habitat</p>	Minor
	Birds – Direct loss of breeding sites	St, D, T, Negligible	<p>Timing of works / pre-clearance checks and creation of new habitat</p>	Negligible

Receptor / Environmental Resources	Description of Effect	Nature of Impact*	Mitigation Measures	Residual Significance
	Reptiles - Disturbance and Potential loss of habitat	St, D, T, Minor	<b>Capture and Exclusion (Pre-construction survey required)</b>	Negligible
<b>Landscape &amp; Visual Impact</b>	<i>On-site tree stock</i> – Loss of trees to allow for development.	Lt, P, D Low Adverse	<b>Protection of good quality trees in accordance with BS5837. Establish advance tree planting where possible during construction phase.</b>	Low Adverse
	<i>Woodland to south and east</i> -Potential damage to woodland trees along southern boundary.	Lt, P, D Low Adverse	<b>Ensure protection with tree protection fencing in accordance with BS5837.</b>	Negligible
	<i>Urban fringe setting</i> - Increased haulage. Potential visual and noise disturbance from demolition works. Possible alterations to point of site access.	St, T & P, D & InD Low Adverse	<b>Selection of haulage routes to minimise disturbance. Erection of hoarding around site boundaries.</b>	Low Adverse
	<i>Countryside setting</i> - Construction of buildings on skyline.	St, T, D Low Adverse	<b>Limit presence of cranes and higher level activity to necessary works only.</b>	Low Adverse
	Visual impact upon users of Westwells Road	St, T, D Minor–Moderate Adverse	<b>Minimise construction activity and storage to north and eastern boundaries. Limit presence of cranes and higher level activity to necessary works only. Establish landscape buffer planting prior to works, where possible.</b>	Minor-Moderate Adverse
	Visual Impact upon properties of Westwells facing Westwells Road	St, T, D Moderate-High Adverse	<b>Minimise construction activity and storage to north and eastern boundaries. Limit presence of cranes and higher level activity to necessary works only. Establish landscape buffer planting prior to works, where possible.</b>	Minor-Moderate Adverse
	Visual Impact upon users of public footpaths in the open countryside to the south.	St, T, D Minor Adverse	<b>Limit presence of cranes and higher level activity to necessary works only.</b>	Minor Adverse
<b>Archaeology &amp; Cultural Heritage</b>	Loss of 20 <sup>th</sup> century military archaeology	P, D, Moderate adverse,	<b>Photographic building survey and written report</b>	None
<b>Waste &amp; Recycling</b>	Generation of on site recyclable materials from demolition and construction	St, D, T Moderate Adverse	<b>Using best demolition and construction practices to enhance reuse of materials on site</b>	None
	Generation of non on site recyclable waste from demolition and construction	St, D, T, Moderate Adverse	<b>Dispose of non recyclable materials in licensed landfills</b>	Minor Adverse
	Generation of Hazardous material like asbestos during demolition	St, D, T, Adverse	<b>Collection of hazardous materials by licensed contractors</b>	Minor Adverse
<b>Socio-economic</b>	Direct provision of employment opportunities and impact on local economy	Lt-P-D-InD	<b>No mitigation required.</b>	Beneficial.
	Supply chain effect - indirect employment creation and impact on local economy.	Lt-P-InD	<b>No mitigation required.</b>	Major beneficial.

Key to Impacts: St – Short Term / Lt – Long Term / T – Temporary / P – Permanent / D – Direct / InD – Indirect

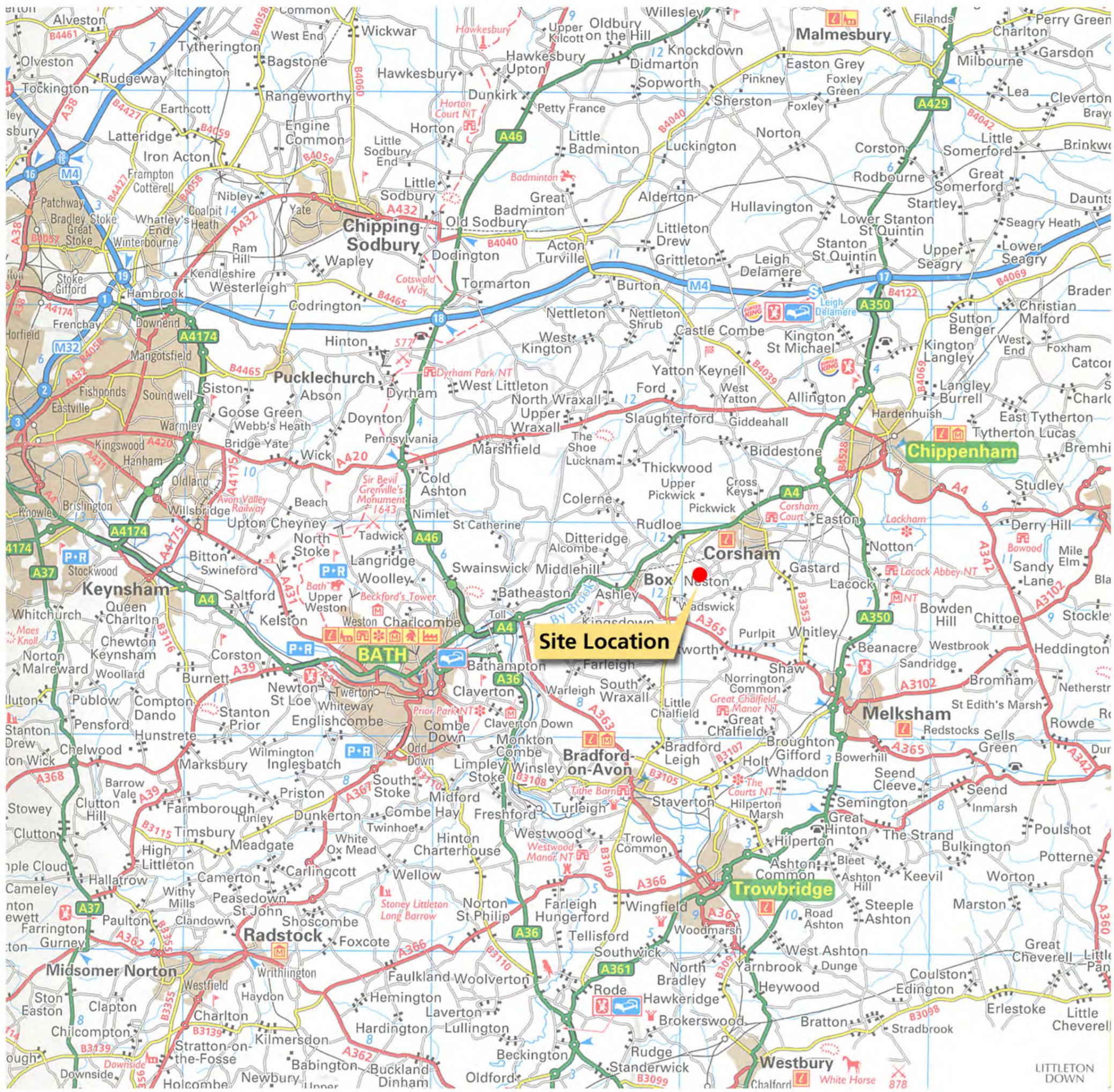
**Table C2: Summary of Residual Effects  
Operational Phase**

Receptor / Environmental Resources	Description of Effect	Nature of Impact*	Mitigation Measures	Residual Significance
Land Use	Change in current land use: from former aircraft engine factory and military base to a business and technology park comprising offices, research and development facilities and data processing and storage centres in a landscaped parkland setting.	Lt, P, D, Beneficial	<b>The site is currently previously used land and its redevelopment will have a positive effect and does not require mitigation.</b>	Beneficial
Geology, Ground Conditions & Contamination	Potential health risk for occupants of the proposed development due to ground contamination	Lt, P, D, Adverse	<b>Further investigation is required. Following the investigation a remediation strategy to be submitted and approved by competent authority.</b>	Negligible
	Potential health risk for occupants of the proposed development due to ground gas	Lt, P, InD, Adverse	<b>Further investigation is required. Following the investigation a detail remediation strategy has to be submitted and approved by competent authority.</b>	Negligible
	Contamination ground water due to possible introduction of contaminants arising from spillage of fuels.	Lt, P, D, Adverse	<b>Further investigation is required. Following the investigation a detail remediation strategy has to be submitted and approved by competent authority.</b>	Negligible
Drainage, Flooding & Water	Contamination of surface and ground water due to possible introduction of contaminants arising from spillage of fuels.	Lt, P, D, Adverse	<b>Where the risk of pollution rise from operational activities, pollution can be prevented through the use of best management practices.</b>	Negligible
	Increase of flooding risk during heavy rainfall due to increasing proportion of impermeable surfacing on site.	Lt, P, D, Adverse	<b>Sustainable urban drainage system (SUDS) techniques used to design or implementing drainage and foul system in accordance with EA and Water Company. SUDS methods may include the use of swales, ponds and permeable paving.</b>	Beneficial
	Increased suspended sediment in surface water and deposition of fine particles affecting streams and/or flow capacity within sewers.	St, T, D, Adverse	<b>Sediment and fine particles can be reduced by passive treatment systems (filter strips or ponds or vegetative systems planted) within the drainage system.</b>	Negligible
Traffic, Highways & Access	Increased traffic on surrounding highway network leading to junctions operating over capacity with resultant queuing and delays	Lt, D, Adverse	<b>Non-car access improvements and travel plans proposed to reduce demand for car travel to the development and junction improvements proposed which will accommodate predicted development traffic.</b>	Negligible
Air Quality	Post construction effects from air emissions – traffic arising from development - employment uses	Lt, T, D, Negligible	<b>None required, however the general adoption of wider strategic measures included in air quality action plans is recommended. Building Design to ensure energy efficiency and low emissions.</b>	Negligible
Noise & Vibration	Post construction traffic vibration	St, T, D minor adverse	<b>No significant vibration expected as a result of road traffic, therefore no mitigation required.</b>	Negligible
	Post construction effects from noise emissions – noise from development	St, T, D minor adverse	<b>B1 type class uses proposed. Air conditioning units to be designed following advice contained in BS 4142 to ensure no noise complaints.</b>	Negligible
	Effects of changes in road traffic noise level	Lt, P, D – minor adverse	<b>The future road traffic noise predictions indicate that no significant long term adverse direct impacts or cumulative impacts are anticipated from the proposed development. Mitigation measures are not considered necessary.</b>	Minor adverse
Ecology & Wildlife	Potential increase of disturbance to species	Lt, D, P, Negligible	<b>Landscape strategy on the proposed development provides opportunities for wildlife</b>	Negligible
Landscape & Visual Impact	<i>On-site tree stock</i> – Loss of trees to allow for development.	Lt, P, D Low Adverse	<b>Retention of good quality trees and enhancement of tree stock on the site through additional tree and woodland planting.</b>	Low Beneficial
	<i>Woodland to south and east</i> - Connecting site with existing woodland areas, with green corridors.	Lt, P, D Low Beneficial	<b>N/A</b>	Low Beneficial
	<i>Urban fringe setting</i> - Redevelopment of the site to include office buildings, data centres and associated infrastructure and landscaping.	Lt, P, D Low Beneficial	<b>Planting of native woodland landscape buffer strip to frontage with Westwells Road, adjacent to Westwells.</b>	Low Beneficial
	<i>Countryside setting</i> - Construction of buildings on skyline.	Lt, P, D Low Adverse	<b>Limit height of buildings, so as not to break the skyline of the wooded areas to the south, east and west of the site.</b>	Negligible
	Visual impact upon users of Westwells Road	Lt, P, D Minor-High Adverse	<b>Ensure that materials and styling of proposed office buildings are of a high quality, avoid light coloured renders and are not heavily glazed on the upper storey, where possible. Use brise soleil where appropriate to reduce reflective glare. Use broken or stepped rooflines to reduce massing and visual scale of office buildings. Planting of native landscape buffers to north and eastern boundaries.</b>	Negligible – Moderate Beneficial

Receptor / Environmental Resources	Description of Effect	Nature of Impact*	Mitigation Measures	Residual Significance
	Visual Impact upon properties of Westwells facing Westwells Road	Lt, P, D Minor-High Adverse	<b>Ensure that materials and styling of proposed office buildings are of a high quality, avoid light coloured renders and are not heavily glazed on the upper storey, where possible. Use brise soleil where appropriate to reduce reflective glare. Use broken or stepped rooflines to reduce massing and visual scale of office buildings. Planting of native landscape buffers to north and eastern boundaries.</b>	Moderate Beneficial
	Visual Impact upon users of public footpaths in the open countryside to the south.	Lt, P, D Minor Adverse - Negligible	<b>Ensure that materials and styling of proposed office buildings are of a high quality, avoid light coloured renders and are not heavily glazed on the upper storey, where possible. Use brise soleil where appropriate to reduce reflective glare. Use broken or stepped rooflines to reduce massing and visual scale of office buildings.</b>	Negligible
<b>Archaeology &amp; Cultural Heritage</b>	N/A	N/A	<b>N/A</b>	None
<b>Waste &amp; Recycling</b>	Disposal of waste generated by completed development suitable for recycling / reuse.	Lt, P, D Minor Adverse	<b>Collection of recyclable materials by local contractors</b>	Negligible
	Disposal of waste generated by completed development unsuitable for recycling / reuse.	Lt, P, D Minor Adverse	<b>Dispose of waste material in local landfills</b>	Minor Adverse
<b>Socio-economic</b>	Direct provision of employment opportunities and impact on local economy	Lt-P-D	<b>No mitigation required.</b>	Major Beneficial
	Impact on public services and infrastructure - possible increased demand for housing and community infrastructure.	Lt-P-InD	<b>No mitigation required.</b>	No significant effect.
	Contributes towards economic regeneration and is compatible with all levels of economic and planning policy	Lt-P-D-InD	<b>No mitigation required.</b>	Major beneficial.
	Supply chain effect - indirect employment creation and impact on local economy.	Lt-P-InD	<b>No mitigation required.</b>	Major beneficial.

Key to Impacts: St – Short Term / Lt – Long Term / T – Temporary / P – Permanent / D – Direct / InD - Indirect

# **APPENDIX**



**Site Location**

**BroadwayMalyan**

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---

Client  
**Spring Park (Corsham) Limited**

Project  
**Spring Park** 

Description  
**Strategic Location**

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Status  
**Planning**

Scale <b>NTS@A3</b>	Drawn <b>JBM</b>	Date <b>Nov 2007</b>
Job number <b>25493</b>	Drawing number <b>A1.1</b>	Revision <b>P1</b>



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Client: **Spring Park (Corsham) Limited**

Project: **Spring Park** 

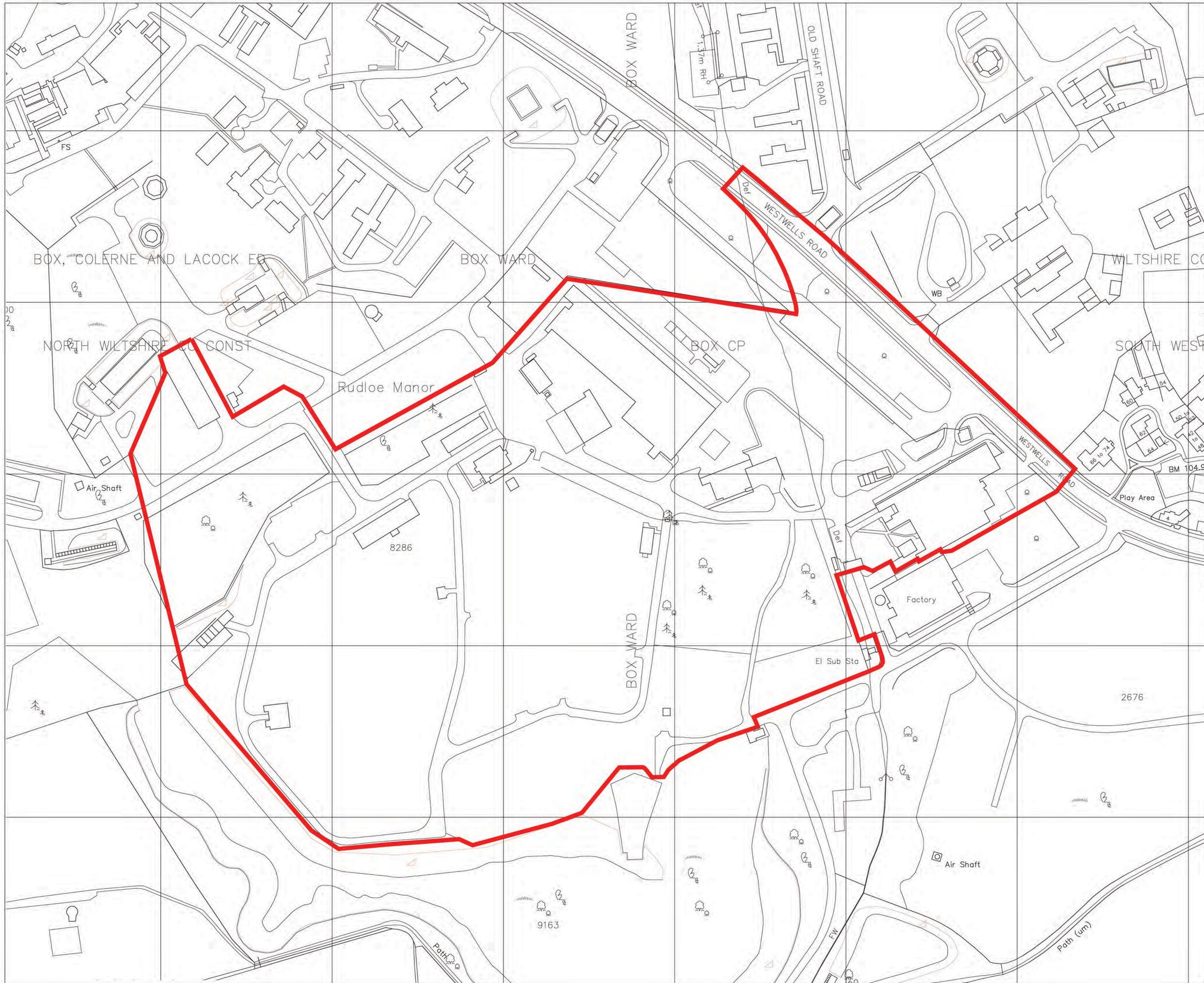
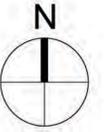
Description: **Site & Surrounding Area**

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Status: **Planning**

Scale: <b>NTS@A3</b>	Drawn: <b>JBM</b>	Date: <b>Nov 2007</b>
Job number: <b>25493</b>	Drawing number: <b>A1.2</b>	Revision: <b>P1</b>

Contractors are not to scale dimensions from drawing



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Client  
**Spring Park (Corsham) Limited**

Project  
**Spring Park** 

Description  
**Site Extent (Redline Boundary)**

Status  
**Planning**

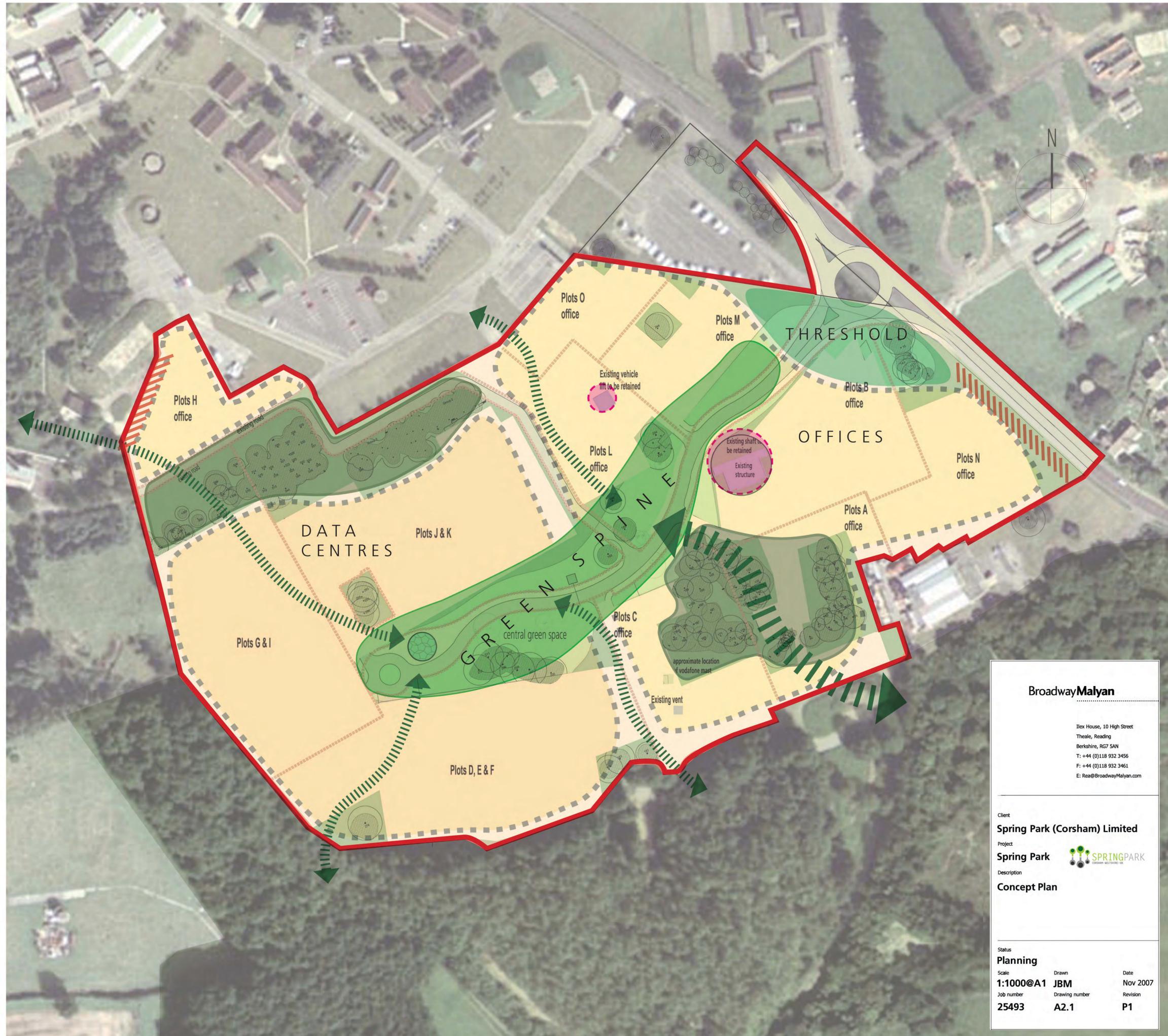
Scale	Drawn	Date
<b>1:1000@A1</b>	<b>JBM</b>	<b>Nov 2007</b>
Job number	Drawing number	Revision
<b>25493</b>	<b>A1.3</b>	<b>P1</b>

**KEY**

-  Site Boundary
-  Office Development
-  Data Centre
-  Formal Entrance creating a sense of arrival
-  Existing Tree Clusters to be Retained & Enhanced
-  Green Spine - Retaining Existing Trees Where Possible
-  Primary Green Links to Existing Woodland
-  Secondary Green Links to Existing Woodland
-  Landscape Buffer Planting
-  Existing Concrete Structures Enhanced as Landscape Features

**PROPOSED CHARACTER**

PARKLAND STYLE LANDSCAPE CHARACTER PROPOSED TO THE OFFICE DEVELOPMENT WHICH FLOWS INTO THE DATA CENTRE



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Client  
**Spring Park (Corsham) Limited**

Project  
**Spring Park** 

Description  
**Concept Plan**

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Status  
**Planning**

Scale	Drawn	Date
<b>1:1000@A1</b>	<b>JBM</b>	Nov 2007
Job number	Drawing number	Revision
<b>25493</b>	<b>A2.1</b>	<b>P1</b>



Plots H office

Plots O office

Plots M office

Plots B office

Plots N office

existing road

existing road

Plots L office

Existing shaft to be retained

Existing structure

Plots J & K

Plots A office

Plots G & I

central green space

Plots C office

approximate location of vodafone mast

Existing vent

Plots D, E & F

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Client  
**Spring Park (Corsham) Limited**

Project  
**Spring Park** 

Description  
**Illustrative Zoning Plan (Option 1)**

Status  
**Planning**

Scale	Drawn	Date
1:1000@A1	JBM	Nov 2007
Job number	Drawing number	Revision
25493	A2.2	P1



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Client  
**Spring Park (Corsham) Limited**  
Project  
**Spring Park**   
Description  
**Illustrative Zoning Plan (Option 2)**

Status  
**Planning**  
Scale  
**1:1000@A1**  
Job number  
**25493**  
Drawn  
**JBM**  
Drawing number  
**A2.3**  
Date  
**Nov 2007**  
Revision  
**P1**

**Have you carried out a cost–benefit assessment (CBA) of opportunities for cogeneration (combined heat and power) or district heating under Article 14 of the Energy Efficiency Directive?**

This has been reviewed and due to the technology used within the Data Centres, the heat generated by the equipment is actually already used as a fundamental part of the cooling system for the rooms to enable free cooling.

Spring Park Campus - Standby Generator Capacity

Campus	Facility	Generator Capacities			Installed Capacity			Final Capacity		
		Generator No	Rating (e) (kW)	Rating (th) (kW)	Generator No	Rating (e) (kW)	Rating (th) (kW)	Generator No	Rating (e) (kW)	Rating (th) (kW)
Spring Park	SQ17		1,600	3,956	5	7,760	17,815	8	12,560	29,683
	P1		1,000	2,717	10	10,000	27,170	12	12,000	32,604
	P2		1,464	3,656	12	17,568	43,872	18	24,888	62,152
	HV Gen		2,040	5,157	6	12,240	30,942	24	48,960	123,768
Spring Park	IED Site			33	47,568	119,799	62	98,408	248,207	
	Total Campus			33	47,568	119,799	62	98,408	248,207	

EU-ETS Qualification		
Generator Capacity > 3MW(th)	Facility Capacity > 20MW(th)	In EU-ETS?
YES	NO	NO
NO	YES	NO
YES	YES	YES
YES	YES	YES

Spring Park SQ17		IED - STANDBY GENERATOR SCHEDULE										POS	17/12/2018			
Standby Generators:		2 x SDMO X2000C installed in Machine Room 1 (2010)													AVK e-mail 14/03/2018 @ 09:17	
		3 x SDMO T1900 installed in Machine Room 2 (2015)														
		3 x SDMO X2000C to be installed in Machine Room 3 (Future)														
														Thermal Rating		
Location	Gen No.	Supplier	Serial No.	Year	Manufacturer	Model	Rating (e) (kWe)	Rating (th) (kWth)	NOx (mg/Nm <sup>3</sup> )	PM (mg/Nm <sup>3</sup> )	CO (mg/Nm <sup>3</sup> )	BAT	Comments	Generator X2000C	kW	
Machine Room 1	GS1	AVK		2010	SDMO	X2000C	1,600	3,956	1,305	26	21	TA Luft 2g	Based on stand by rating.	Engine Produced Mechanical Power	1,575	
	GS2	AVK		2010	SDMO	X2000C	1,600	3,956	1,305	26	21	TA Luft 2g	Based on stand by rating.			
Machine Room 2	GS3	AVK	T190015015455	2015	SDMO	T1900	1,520	3,301	3,800	110	560	Fuel Optimised	Based on stand by rating.	Heat Rejected to Exhaust	1,216	
	GS4	AVK	T190015014782	2015	SDMO	T1900	1,520	3,301	3,800	110	560	Fuel Optimised	Based on stand by rating.	Heat Rejected to Engine Coolant	670	
	GS5	AVK	T190015014783	2015	SDMO	T1900	1,520	3,301	3,800	110	560	Fuel Optimised	Based on stand by rating.	Heat Radiated to Intercooler Coolant	410	
Machine Room 3	GS6		Future			X2000C	1,600	3,956	1,305	26	21	TA Luft 2g	Based on stand by rating.	Heat Radiated to Ambient	75	
	GS7		Future			X2000C	1,600	3,956	1,305	26	21	TA Luft 2g	Based on stand by rating.	Heat Rejected to Spill Return	10	
	GS8		Future			X2000C	1,600	3,956	1,305	26	21	TA Luft 2g	Based on stand by rating.	<b>Total Thermal Rejection</b>	<b>2,381</b>	
Installed	5	Total Installed Capacity					7,760	17,815					TA Luft Emission Limits:			
Future	3	Future Capacity to Be Installed					4,800	11,868					NOx: 1700mg/Nm3	<b>Total Thermal Power</b>	<b>3,956</b>	
Total	8	Total Future Capacity					12,560	29,683					CO: 300mg/Nm3	<b>Generator T1900</b>	<b>kW</b>	
													Unburnt Hydrocarbons: 150mg/Nm3			
														<b>Engine Produced Mechanical Power</b>	<b>1,360</b>	
														Heat Rejected to Exhaust	977	
														Heat Rejected to Engine Coolant	852	
														Heat Radiated to Intercooler Coolant	N/A	
														Heat Radiated to Ambient	102	
														Heat Rejected to Spill Return	10	
														<b>Total Thermal Rejection</b>	<b>1,941</b>	
														<b>Total Thermal Power</b>	<b>3,301</b>	

Spring Park P1		IED - STANDBY GENERATOR SCHEDULE										POS	17/12/2018			
Standby Generators:		SDMO X1250C													AVK e-mail 14/03/2018 @ 09:17	
														Thermal Rating		
Location	Gen No.	Supplier	Serial No.	Year	Manufacturer	Model	Rating (e) (kWe)	Rating (th) (kWth)	NOx (mg/Nm <sup>3</sup> )	PM (mg/Nm <sup>3</sup> )	CO (mg/Nm <sup>3</sup> )	BAT	Comments		kW	
EC1	PQ1.1	AVK	11018157	2012	SDMO	X1250C	1,000	2,717	1,227	21	297	TA Luft 2g	Based on stand by rating.	Engine Produced Mechanical Power	1,000	
	PQ1.2	AVK	11018156	2012	SDMO	X1250C	1,000	2,717	1,227	21	297	TA Luft 2g	Based on stand by rating.			
	PQ1.3	AVK	13001316	2012	SDMO	X1250C	1,000	2,717	1,227	21	297	TA Luft 2g	Based on stand by rating.	Heat Rejected to Exhaust	922	
	PQ1.4		Future		SDMO	X1250C	1,000	2,717	1,227	21	297	TA Luft 2g	Based on stand by rating.	Heat Rejected to Engine Coolant	440	
EC2	G2	AVK	14003849	2014	SDMO	X1250C	1,000	2,717	1,227	21	297	TA Luft 2g	Based on stand by rating.	Heat Radiated to Intercooler Coolant	300	
	G3	AVK	14003011	2014	SDMO	X1250C	1,000	2,717	1,227	21	297	TA Luft 2g	Based on stand by rating.	Heat Radiated to Ambient	50	
	G4	AVK	14003013	2014	SDMO	X1250C	1,000	2,717	1,227	21	297	TA Luft 2g	Based on stand by rating.	Heat Rejected to Spill Return	5	
	G5		Future		SDMO	X1250C	1,000	2,717	1,227	21	297	TA Luft 2g	Based on stand by rating.	Total Thermal Rejection	1,717	
EC3	G6	AVK	13011940	2013	SDMO	X1250C	1,000	2,717	1,227	21	297	TA Luft 2g	Based on stand by rating.			
	G7	AVK	13011941	2013	SDMO	X1250C	1,000	2,717	1,227	21	297	TA Luft 2g	Based on stand by rating.	Total Thermal Power	2,717	
	G8	AVK	14002472	2014	SDMO	X1250C	1,000	2,717	1,227	21	297	TA Luft 2g	Based on stand by rating.			
	G9	AVK	14002471	2014	SDMO	X1250C	1,000	2,717	1,227	21	297	TA Luft 2g	Based on stand by rating.			
													TA Luft Emission Limits:			
Installed	10	Total Installed Capacity					10,000	27,170						NOx: 1700mg/Nm3		
Future	2	Future Capacity to Be Installed					2,000	5,434						CO: 300mg/Nm3		
Total	12	Total Future Capacity					12,000	32,604						Formaldehyde: 60mg/Nm3		
														Unburnt Hydrocarbons: 150mg/Nm3		

Spring Park P2		IED - STANDBY GENERATOR SCHEDULE										POS	17/12/2018			
Standby Generators:		SDMO X1850C													AVK e-mail 15/03/2018 @ 09:20	
														Thermal Rating		
Location	Gen No.	Supplier	Serial No.	Year	Manufacturer	Model	Rating (e) (kWe)	Rating (th) (kWth)	NOx (mg/Nm <sup>3</sup> )	PM (mg/Nm <sup>3</sup> )	CO (mg/Nm <sup>3</sup> )	BAT	Comments		kW	
EC1	G1	AVK	1400898	2014	SDMO	X1850C	1,464	3,656	1,610	31	285	TA Luft 2g	Based on stand by rating.	Engine Produced Mechanical Power	1,420	
	G2	AVK	1400899	2014	SDMO	X1850C	1,464	3,656	1,610	31	285	TA Luft 2g	Based on stand by rating.			
	G3	Future			SDMO	X1850C	1,464	3,656	1,610	31	285	TA Luft 2g	Based on stand by rating.			
EC2	G4	AVK	14005119	2014	SDMO	X1850C	1,464	3,656	1,610	31	285	TA Luft 2g	Based on stand by rating.	Heat Rejected to Exhaust	1,201	
	G5	AVK	14005120	2014	SDMO	X1850C	1,464	3,656	1,610	31	285	TA Luft 2g	Based on stand by rating.	Heat Rejected to Engine Coolant	590	
	G6	Future			SDMO	X1850C	1,464	3,656	1,610	31	285	TA Luft 2g	Based on stand by rating.	Heat Radiated to Intercooler Coolant	360	
EC3	G7	AVK	14003217	2014	SDMO	X1850C	1,464	3,656	1,610	31	285	TA Luft 2g	Based on stand by rating.	Heat Radiated to Ambient	75	
	G8	AVK	14003216	2014	SDMO	X1850C	1,464	3,656	1,610	31	285	TA Luft 2g	Based on stand by rating.	Heat Rejected to Spill Return	10	
	G9	Future			SDMO	X1850C	1,464	3,656	1,610	31	285	TA Luft 2g	Based on stand by rating.	Total Thermal Rejection	2,236	
EC4	G10	AVK	15013481	2015	SDMO	X1850C	1,464	3,656	1,610	31	285	TA Luft 2g	Based on stand by rating.	Total Thermal Power	3,656	
	G11	AVK	15013482	2015	SDMO	X1850C	1,464	3,656	1,610	31	285	TA Luft 2g	Based on stand by rating.			
	G12	Future			SDMO	X1850C	1,464	3,656	1,610	31	285	TA Luft 2g	Based on stand by rating.			
EC5	G13	AVK	15012620	2015	SDMO	X1850C	1,464	3,656	1,610	31	285	TA Luft 2g	Based on stand by rating.			
	G14	AVK	15012621	2015	SDMO	X1850C	1,464	3,656	1,610	31	285	TA Luft 2g	Based on stand by rating.			
	G15	Future			SDMO	X1850C	1,464	3,656	1,610	31	285	TA Luft 2g	Based on stand by rating.			
EC6	G16	AVK	15009154	2015	SDMO	X1850C	1,464	3,656	1,610	31	285	TA Luft 2g	Based on stand by rating.			
	G17	AVK	15009155	2015	SDMO	X1850C	1,464	3,656	1,610	31	285	TA Luft 2g	Based on stand by rating.			
	G18	Future			SDMO	X1850C	1,464	3,656	1,610	31	285	TA Luft 2g	Based on stand by rating.			
													TA Luft Emission Limits:			
Installed	12	Total Installed Capacity					17,568	43,872						NOx: 1700mg/Nm3		
Future	6	Future Capacity to Be Installed					7,320	18,280						CO: 300mg/Nm3		
Total	18	Total Future Capacity					24,888	62,152						Formaldehyde: 60mg/Nm3		
														Unburnt Hydrocarbons: 150mg/Nm3		

Spring Park HV Generator Farm

IED - STANDBY GENERATOR SCHEDULE

POS 14/12/2018

AVK e-mail 14/03/2018 @ 09:17

Standby Generators: MTU DS2500

Location	Gen No.	Supplier	Serial No.	Year	Manufacturer	Model	Rating (e) (kWe)	Rating (th) (kWth)	NOx (mg/Nm <sup>3</sup> )	PM (mg/Nm <sup>3</sup> )	CO (mg/Nm <sup>3</sup> )	BAT	Comments	
HV Gen	G1		Future		MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.	
	G2		Future		MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.	
	G3		Future		MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.	
	G4		Future		MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.	
	G5		Future		MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.	
	G6		Future		MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.	
	G7		Future		MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.	
	G8		Future		MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.	
	G9		Future		MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.	
	G10		Future		MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.	
	G11		Future		MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.	
	G12		Future		MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.	
	G13		Future		MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.	
	G14		Future		MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.	
	G15		Future		MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.	
	G16		Future		MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.	
	G17		Future		MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.	
	G18		Future		MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.	
	G19	AVK			2018	MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.
	G20	AVK			2018	MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.
	G21	AVK			2018	MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.
	G22	AVK			2018	MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.
	G23	AVK			2018	MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.
	G24	AVK			2018	MTU	DS2500	2,040	5,157	3,500	16	177	Fuel Optimised	Based on stand by rating.

Thermal Rating	kW
Engine Produced Mechanical Power	2,040
Heat Rejected to Exhaust	1,811
Heat Rejected to Engine Coolant	800
Heat Radiated to Intercooler Coolant	410
Heat Radiated to Ambient	90
Heat Rejected to Spill Return	6
<b>Total Thermal Rejection</b>	<b>3,117</b>
<b>Total Thermal Power</b>	<b>5,157</b>

Installed	6	Total Installed Capacity	12,240	30,942
Future	18	Future Capacity to Be Installed	36,720	92,826
Total	24	Total Future Capacity	48,960	123,768

TA Luft Emission Limits:  
 NOx: 1700mg/Nm3  
 CO: 300mg/Nm3  
 Formaldehyde: 60mg/Nm3  
 Unburnt Hydrocarbons: 150mg/Nm3



#### DESCRIPTIVE

- Electronic governor
- Mechanically welded chassis with antivibration suspension
- Air cooler for wiring temperature of 38/40°C with electric fan
- Exhaust compensators with flanges
- 24 V charge alternator and starter
- Delivered with oil
- Manual for use and installation

#### POWER DEFINITION

**PRP** : Prime Power is available for an unlimited number of annual operating hours in variable load applications, in accordance with ISO 8528-1.

**ESP** : The standby power rating is applicable for supplying emergency power in variable load applications in accordance with ISO 8528-1.

Overload is not allowed

#### TERMS OF USE

According to the standard, the nominal power assigned by the genset is given for 25°C Air Inlet Temperature, of a barometric pressure of 100 kPA (100 m A.S.L), and 30 % relative humidity. For particular conditions in your installation, refer to the derating table.

#### ASSOCIATED UNCERTAINTY

For the generating sets used indoor, where the acoustic pressure levels depends on the installation conditions, it is not possible to specify the ambient noise level in the exploitation and maintenance instructions . You will also find in our exploitation and maintenance instructions a warning concerning the air noise dangers and the need to implement appropriated preventive measures.

## X2000C

Engine type	12V4000G63E
Alternator type	LSA 51.2 S55
Performance class	G3

#### GENERAL CHARACTERISTICS

Frequency (Hz)	50
Voltage (V)	400/230
Max power ESP (kVA)	2000
Max power ESP (kWe)	1600
Max power PRP (kVA)	1818.2
Max power PRP (kWe)	1454.5
Intensity (A)	2887
Optional control panel	M80
Optional Control Panel	TELYS
Optional control panel	KERYS

#### DIMENSIONS AND NOISE LEVELS

##### DIMENSIONS COMPACT VERSION

Length (mm)	4050
Width (mm)	1885
Height (mm)	2158
Dry weight (kg)	11405

#### GENERAL CHARACTERISTICS

Voltage	ESP		PRP		Standby Amps
	kWe	kVA	kWe	kVA	
415/240	1600	2000	1455	1818	2782
400/230	1600	2000	1455	1818	2887
380/220	1600	2000	1455	1818	3039



# X2000C

## ENGINE SPECIFICATIONS

### GENERAL ENGINE DATAS

Engine model	MTU 12V4000G63E , 4- temps, Turbo , Air/Water DC 12 X
Cylinder arrangement	V
Displacement (C.I.)	57.2
Bore (mm) x Stroke (mm)	170 x 210
Compression ratio	16.5
Speed (RPM)	1500
Pistons speed (m/s)	10.5
Maximum stand-by power at rated RPM (kW)	1733
Frequency regulation (%)	+/- 0.5%
BMEP (bar)	22.03
Governor type	Electronic

### COOLING SYSTEM

Radiator & Engine capacity (L)	642
Max water temperature (°C)	104
Outlet water temperature (°C)	100
Fan power (kW)	N/A
Fan air flow w/o restriction (m3/s)	N/A
Available restriction on air flow (mm EC)	N/A
Type of coolant	Glycol-Ethylene
Thermostat (°C)	79/92

### EMISSIONS

Emission PM (mg/Nm3) 5% O2	26
Emission CO (mg/Nm3) 5% O2	21
Emission NOx (mg/Nm3) 5% O2	1305
Emission HC (mg/Nm3) 5% O2	145

### EXHAUST

Exhaust gas temperature (°C)	510
Exhaust gas flow (L/s)	5600
Max. exhaust back pressure (mm EC)	500

### FUEL

Consumption @ 110% load (L/h)	423
Consumption @ 100% load (L/h)	408
Consumption @ 75% load (L/h)	298
Consumption @ 50% load (L/h)	199
Maximum fuel pump flow (L/h)	1500

### OIL

Oil capacity (L)	260
Min. oil pressure (bar)	3.5
Max. oil pressure (bar)	7
Oil consumption 100% load (L/h)	1.22
Carter oil capacity (L)	200

### HEAT BALANCE

Heat rejection to exhaust (kW)	1216
Radiated heat to ambient (kW)	75
Haet rejection to coolant (kW)	670/410

### AIR INTAKE

Max. intake restriction (mm EC)	150
Intake air flow (L/s)	2200



## X2000C

### ALTERNATOR SPECIFICATIONS

#### GENERAL DATAS

Alternator brand	LEROY SOMER
Alternator type	LSA 51.2 S55
Number of phase	3
Power factor (Cos Phi)	0.8
Altitude (m)	0 à 1000
Overspeed (rpm)	2250
Number of pole	4
Excitation system	AREP
Insulation class / T° class, continuous 40°C	H / H / 125°K
AVR	R449
Harmonic factor, no load TGH/THC (%)	<3.5
Wave form : NEMA=TIF-(TGH/THC)	<50
Wave form : CEI=FHT-(TGH/THC)	<2
Number of bearing	1
Coupling	Direct
Voltage regulation at established rating (%)	+/- 0.5%
Recovery time (Delta U = 20% transient) (ms)	N/A

#### OTHER DATAS

Continuous Nominal Rating 40°C (kVA)	1860
Standby Rating 27°C (kVA)	2046
Efficiencies 4/4 load (%)	95.6
Air flow (m3/s)	2.5
Short circuit ratio (Kcc)	0.33
Direct axis synchro reactance unsaturated (Xd) (%)	374
Quadra axis synchro reactance unsaturated (Xq) (%)	224
Open circuit time constant (T"do) (ms)	2660
Direct axis transient reactance saturated (X"d) (%)	28.4
Short circuit transient time constant (T"d) (ms)	237
Direct axis subtransient reactance saturated (X""d) (%)	14.8
Subtransient time constant (T""d) (ms)	22
Quadra axis subtransient reactance saturated (X""q) (%)	18.5
Zero sequence reactance unsaturated (Xo) (%)	3.5
Negative sequence reactance saturated (X2) (%)	16.6
Armature time constant (Ta) (ms)	39
No load excitation current (io) (A)	1.3
Full load excitation current (ic) (A)	5.6
Full load excitation voltage (uc) (V)	64
Recovery time (Delta U = 20% transient) (ms)	N/A
Engine start (Delta U = 20% perm. or 50% trans.) (kVA)	3720
Transient dip (4/4 load) - PF : 0,8 AR (%)	12.4
No load losses (W)	15300
Heat rejection (W)	68000

#### DIMENSIONS AND NOISE LEVELS

## M80, transfer of information



The M80 is a dual-function control unit. It can be used as a basic terminal block for connecting a control box and as an instrument panel with a direct read facility, with displays giving a global view of your generating set's basic parameters.

Offers the following functions:

Engine parameters: tachometer, working hours counter, coolant temperature indicator, oil pressure indicator, emergency stop button, customer connection terminal block, CE



#### DESCRIPTIVE

- Electronic governor
- Mechanically welded chassis with antivibration suspension
- Radiator for core temperature of 48/50°C max with mechanical fan
- Protective grille for fan and rotating parts (CE option)
- Exhaust compensators with flanges
- 24 V charge alternator and starter
- Delivered with oil and coolant -30°C
- Manual for use and installation

#### POWER DEFINITION

PRP : Prime Power is available for an unlimited number of annual operating hours in variable load applications, in accordance with ISO 8528-1. ESP : The standby power rating is applicable for supplying emergency power in variable load applications in accordance with ISO 8528-1. Overload is not allowed.

\*DCC : Data Center Continuous Power ratings apply to Data Center installations where a reliable utility power is available and comply with Uptime institute Tier III and IV requirements. At constant or varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Average load factor : ≤ 100%.

#### TERMS OF USE

According to the standard, the nominal power assigned by the genset is given for 25°C Air Inlet Temperature, of a barometric pressure of 100 kPA (100 m A.S.L), and 30 % relative humidity. For particular conditions in your installation, refer to the derating table.

#### ASSOCIATED UNCERTAINTY

For the generating sets used indoor, where the acoustic pressure levels depends on the installation conditions, it is not possible to specify the ambient noise level in the exploitation and maintenance instructions . You will also find in our exploitation and maintenance instructions a warning concerning the air noise dangers and the need to implement appropriated preventive measures.

## T1900

Engine ref.	S16R-PTA
Alternator ref.	LSA 51.2 S55
Performance class	G3

#### GENERAL CHARACTERISTICS

Frequency (Hz)	50
Voltage (V)	400/230
Standard Control Panel	Basic terminal block
Optional control panel	M80
Optional Control Panel	TELYS
Optional control panel	APM802

#### POWER

Voltage	ESP		PRP		DCC (*)		Standby Amps
	kW <sub>e</sub>	kVA	kW <sub>e</sub>	kVA	kW <sub>e</sub>	kVA	
415/240	1520	1900	1382	1727	1382	1727	2643
400/230	1520	1900	1382	1727	1382	1727	2742
380/220	1520	1900	1382	1727	1382	1727	2887

#### DIMENSIONS COMPACT VERSION

Length (mm)	5497
Width (mm)	2286
Height (mm)	2479
Dry weight (kg)	12891
Tank capacity (L)	0

#### DIMENSIONS SOUNDPROOFED VERSION

Commercial reference of the enclosure	
Length (mm)	0
Width (mm)	0
Height (mm)	0
Dry weight (kg)	0
Tank capacity (L)	0
Acoustic pressure level @1m in dB(A)	0
Sound power level guaranteed (L <sub>wa</sub> )	0
Acoustic pressure level @7m in dB(A)	0



# T1900

## ENGINE CHARACTERISTICS

### GENERAL ENGINE DATA

Engine brand	MITSUBISHI
Engine ref.	S16R-PTA
Air inlet system	Turbo
Cylinders configuration	V
Number of cylinders	16
Displacement (L)	65.37
Charge Air coolant	Air/Water DC
Bore (mm) x Stroke (mm)	170 x 180
Compression ratio	14 : 1
Speed (RPM)	1500
Pistons speed (m/s)	9
Maximum stand-by power at rated RPM (kW)	1620
Frequency regulation, steady state (%) +/- 0.5%	
BMEP (bar)	18.11
Governor type	Electronic

### COOLING SYSTEM

Radiator & Engine capacity (L)	420
Max water temperature (°C)	98
Outlet water temperature (°C)	95
Fan power (kW)	43
Fan air flow w/o restriction (m3/s)	33.50
Available restriction on air flow (mm H2O)	20
Type of coolant	Glycol-Ethylene
Thermostat modulating range HT (°C)	82-94

### EMISSIONS

Emission PM (mg/Nm3) 5% O2	110
Emission CO (mg/Nm3) 5% O2	560
Emission HC+NOx (g/Nm3) 5% O2	3.8
Emission HC (mg/Nm3) 5% O2	100

### EXHAUST

Exhaust gas temperature @ ESP 50Hz (°C)	539
Exhaust gas flow @ ESP 50 Hz (L/s)	5150
Max. exhaust back pressure (mm H2O)	600

### FUEL

Consumption @ 110% load (L/h)	388
Consumption @ 100% load (L/h)	353
Consumption @ 75% load (L/h)	266
Consumption @ 50% load (L/h)	188
Maximum fuel pump flow (L/h)	588

### OIL

Oil capacity (L)	230
Min. oil pressure (bar)	2.50
Max. oil pressure (bar)	5.80
Oil consumption 100% load (L/h)	1.32
Oil sump capacity (L)	140

### HEAT BALANCE

Heat rejection to exhaust (kW)	977
Radiated heat to ambient (kW)	102
Heat rejection to coolant (kW)	852

### AIR INTAKE

Max. intake restriction (mm H2O)	400
Intake air flow (L/s)	1950



# T1900

## ALTERNATOR CHARACTERISTICS

### GENERAL DATA

Alternator ref.	LSA 51.2 S55
Number of Phase	Three phase
Power factor (Cos Phi)	0.80
Altitude (m)	0 to 1000
Overspeed (rpm)	2250
Number of pole	4
Capacity for maintaining short circuit at 3 In for 10 s	Yes
Insulation class	H
T° class (H/125°), continuous 40°C	H / 125°K
T° class, standby 27°C	H / 163°K
AVR Regulation	Yes
Total Harmonic Distortion in no-load DHT (%)	<3,5
Total Harmonic Distortion, on load DHT (%)	<3,5
Wave form : NEMA=TIF	<50
Wave form : CEI=FHT	<2
Number of bearing	1
Coupling	Direct
Voltage regulation at established rating (+/- %)	0.50
Recovery time (Delta U = 20% transient) (ms)	700
Indication of protection	IP 23
Technology	Without collar or brush

### OTHER DATA

Continuous Nominal Rating 40°C (kVA)	1860
Standby Rating 27°C (kVA)	2045
Efficiencies 100% of load (%)	95.60
Air flow (m3/s)	2.50
Short circuit ratio (Kcc)	0.33
Direct axis synchro reactance unsaturated (Xd) (%)	367
Quadra axis synchro reactance unsaturated (Xq) (%)	220
Open circuit time constant (T'do) (ms)	2950
Direct axis transient reactance saturated (X'd) (%)	28.40
Short circuit transient time constant (T'd) (ms)	268
Direct axis subtransient reactance saturated (X''d) (%)	14.80
Subtransient time constant (T''d) (ms)	22
Quadra axis subtransient reactance saturated (X''q) (%)	18.40
Subtransient time constant (T''q) (ms)	19
Zero sequence reactance unsaturated (Xo) (%)	2.60
Negative sequence reactance saturated (X2) (%)	16.70
Armature time constant (Ta) (ms)	39
No load excitation current (io) (A)	1.30
Full load excitation current (ic) (A)	5.50
Full load excitation voltage (uc) (V)	58
Engine start (Delta U = 20% perm. or 50% trans.) (kVA)	3720
Transient dip (4/4 load) - PF : 0,8 AR (%)	13.10
No load losses (W)	15300
Heat rejection (W)	68000
Unbalanced load acceptance ratio (%)	8

## DIMENSIONS

### CONTAINER ISO 40

Commercial reference of the enclosure	ISO40 Si
Length (mm)	12192
Width (mm)	2438
Height (mm)	2896
Dry weight (kg)	21810
Tank capacity (L)	500
Acoustic pressure level @1m in dB(A)	95
Sound power level guaranteed (Lwa)	118
Acoustic pressure level @7m in dB(A)	87

### Basic terminal block



The control unit can be used as a basic terminal block for connecting a control box.

Offers the following functions:

emergency stop button, customer connection terminal block, CE.

### M80, transfer of information



The M80 is a dual-function control unit. It can be used as a basic terminal block for connecting a control box and as an instrument panel with a direct read facility, with displays giving a global view of your generating set's basic parameters.

Offers the following functions:

Engine parameters: tachometer, working hours counter, coolant temperature indicator, oil pressure indicator, emergency stop button, customer connection terminal block, CE.

## TELYS, ergonomic and user-friendly



The highly versatile TELYS control unit is complex yet accessible, thanks to the particular attention paid to optimising its ergonomics and ease of use. With its large display screen, buttons and scroll wheel, it places the accent on simplicity and communication.

The TELYS offers the following functions:

Electrical measurements: voltmeter, frequency meter, ammeter.

Engine parameters: working hours counter, oil pressure, coolant temperature, fuel level, engine speed, battery voltage.

Alarms and faults: oil pressure, coolant temperature, failure to start, overspeed, alternator min./max., battery voltage min./max., emergency stop, fuel level.

Ergonomics: wheel for navigating around the various menus.

Communication: remote control and operation software, USB connections, PC connection.

For more information on the product and its options, please refer to the sales documentation.

## APM802 dedicated to power plant management



The new APM802 command/control system is specifically designed for operating and monitoring power plants for markets including hospitals, data centres, banks, the oil and gas sector, industries, IPP, rental and mining. This unit is available as standard on all generating sets from 275 Kva designed for coupling. It is optional on the rest of our range.

The Human Machine Interface, designed in collaboration with a company specialising in interface design, facilitates operations with a large 100% touch screen. The pre-configured system for power plant applications features a brand new customisation function which complies with the international standard IEC 61131-3. New communication functions (PLC and regulation), improve the high level of equipment availability in the installation.

Advantages:

- Dedicated to power plant management.
- Specially researched ergonomics.
- High level of equipment availability.
- Modularity and long service life guaranteed.
- Making it easy to extend the installation

For more information, please refer to the sales documentation.



#### DESCRIPTIVE

- Electronic governor
- Mechanically welded chassis with antivibration suspension
- Radiator with mechanic fans (please see the performance table for the temperatures)
- Exhaust compensators with flanges
- 24 V charge alternator and starter
- Delivered with oil and coolant -30°C
- Manual for use and installation

#### POWER DEFINITION

**PRP** : Prime Power is available for an unlimited number of annual operating hours in variable load applications, in accordance with ISO 8528-1.

**ESP** : The standby power rating is applicable for supplying emergency power in variable load applications in accordance with ISO 8528-1.  
Overload is not allowed

#### TERMS OF USE

According to the standard, the nominal power assigned by the genset is given for 25°C Air Inlet Temperature, of a barometric pressure of 100 kPA (100 m A.S.L), and 30 % relative humidity. For particular conditions in your installation, refer to the derating table.

#### ASSOCIATED UNCERTAINTY

For the generating sets used indoor, where the acoustic pressure levels depends on the installation conditions, it is not possible to specify the ambient noise level in the exploitation and maintenance instructions . You will also find in our exploitation and maintenance instructions a warning concerning the air noise dangers and the need to implement appropriated preventive measures.

## X1250C

Engine type	18V2000G65E
Alternator type	LSA 50.2 M6
Performance class	G3

#### GENERAL CHARACTERISTICS

Frequency (Hz)	50
Voltage (V)	400/230
Max power ESP (kVA)	1250
Max power ESP (kWe)	1000
Max power PRP (kVA)	1136.4
Max power PRP (kWe)	909.1
Intensity (A)	1804
Optional control panel	M80
Optional Control Panel	TELYS
Optional control panel	KERYS

#### DIMENSIONS AND NOISE LEVELS

##### DIMENSIONS COMPACT VERSION

Length (mm)	4450
Width (mm)	2128
Height (mm)	2260
Dry weight (kg)	7383

#### GENERAL CHARACTERISTICS

Voltage	ESP		PRP		Standby Amps
	kWe	kVA	kWe	kVA	
415/240	1000	1250	909	1136	1739
400/230	1000	1250	909	1136	1804
380/220	1000	1250	909	1136	1899

## X1250C

### ENGINE SPECIFICATIONS

#### GENERAL ENGINE DATAS

Engine model	MTU 18V2000G65E , 4-temps, Turbo , Air/Air DC 18 X
Cylinder arrangement	V
Displacement (C.I.)	35.84
Bore (mm) x Stroke (mm)	130 x 150
Compression ratio	16
Speed (RPM)	1500
Pistons speed (m/s)	7.5
Maximum stand-by power at rated RPM (kW)	1100
Frequency regulation (%)	+/- 0.5%
BMEP (bar)	22.32
Governor type	Electronic

#### COOLING SYSTEM

Radiator & Engine capacity (L)	225
Max water temperature (°C)	102
Outlet water temperature (°C)	95
Fan power (kW)	49
Fan air flow w/o restriction (m3/s)	21.83
Available restriction on air flow (mm EC)	20
Type of coolant	Glycol-Ethylene
Thermostat (°C)	75-88

#### EMISSIONS (5% O2)

Emission PM (mg/Nm <sup>3</sup> )	21
Emission CO (mg/Nm <sup>3</sup> )	297
Emission NOx (mg/Nm <sup>3</sup> )	1227
Emission HC (mg/Nm <sup>3</sup> )	25

#### EXHAUST

Exhaust gas temperature (°C)	525
Exhaust gas flow (L/s)	4200
Max. exhaust back pressure (mm EC)	500

#### FUEL

Consumption @ 110% load (L/h)	283
Consumption @ 100% load (L/h)	260
Consumption @ 75% load (L/h)	192
Consumption @ 50% load (L/h)	130
Maximum fuel pump flow (L/h)	600

#### OIL

Oil capacity (L)	130
Min. oil pressure (bar)	4.7
Max. oil pressure (bar)	7.5
Oil consumption 100% load (L/h)	2.6
Carter oil capacity (L)	110

#### HEAT BALANCE

Heat rejection to exhaust (kW)	922
Radiated heat to ambient (kW)	50
Heat rejection to coolant (kW)	440

#### AIR INTAKE

Max. intake restriction (mm EC)	150
Intake air flow (L/s)	1800



## X1250C

### ALTERNATOR SPECIFICATIONS

#### GENERAL DATAS

Alternator brand	LEROY SOMER
Alternator type	LSA 50.2 M6
Number of phase	3
Power factor (Cos Phi)	0.8
Altitude (m)	0 à 1000
Overspeed (rpm)	2250
Number of pole	4
Excitation system	AREP
Insulation class / T° class, continuous 40°C	H / H / 125°K
AVR	R450
Harmonic factor, no load TGH/THC (%)	<3.5
Wave form : NEMA=TIF-(TGH/THC)	<50
Wave form : CEI=FHT-(TGH/THC)	<2
Number of bearing	1
Coupling	Direct
Voltage regulation at established rating (%)	+/- 0.5%
Recovery time (Delta U = 20% transient) (ms)	500 ms

#### OTHER DATAS

Continuous Nominal Rating 40°C (kVA)	1250
Standby Rating 27°C (kVA)	1375
Efficiencies 4/4 load (%)	95.1
Air flow (m3/s)	1.8
Short circuit ratio (Kcc)	0.31
Direct axis synchro reactance unsaturated (Xd) (%)	392
Quadra axis synchro reactance unsaturated (Xq) (%)	235
Open circuit time constant (T"do) (ms)	3634
Direct axis transient reactance saturated (X"d) (%)	19.4
Short circuit transient time constant (T"d) (ms)	180
Direct axis subtransient reactance saturated (X""d) (%)	16.5
Subtransient time constant (T""d) (ms)	18
Quadra axis subtransient reactance saturated (X""q) (%)	17.3
Zero sequence reactance unsaturated (Xo) (%)	3.6
Negative sequence reactance saturated (X2) (%)	16.9
Armature time constant (Ta) (ms)	27
No load excitation current (io) (A)	0.9
Full load excitation current (ic) (A)	4.1
Full load excitation voltage (uc) (V)	44
Recovery time (Delta U = 20% transient) (ms)	500 ms
Engine start (Delta U = 20% perm. or 50% trans.) (kVA)	2895
Transient dip (4/4 load) - PF : 0,8 AR (%)	13.5
No load losses (W)	13960
Heat rejection (W)	51240

#### ISO20 CONTAINER

Canopy	ISO20 Si
Length (mm).	6058
Width (mm).	2438
Height (mm).	2896
Dry weight (kg).	12365
Tank capacity (L).	500
Acoustic pressure level @1m in dB(A) ( )	91 (0.7)
Sound power level guaranteed (Lwa)	112

#### CIR20 SSI CONTAINER

Canopy	CIR20 SSi
Length (mm).	6058
Width (mm).	2438
Height (mm).	2896
Dry weight (kg).	13890
Tank capacity (L).	500
Acoustic pressure level @1m in dB(A) ( )	83 (0.7)
Sound power level guaranteed (Lwa)	104

M80, transfer of information



The M80 is a dual-function control unit. It can be used as a basic terminal block for connecting a control box and as an instrument panel with a direct read facility, with displays giving a global view of your generating set's basic parameters.

Offers the following functions:

**Engine parameters:** tachometer, working hours counter, coolant temperature indicator, oil pressure indicator, emergency stop button, customer connection terminal block, CE

TELYS, ergonomic and user-friendly



The highly versatile TELYS control unit is complex yet accessible, thanks to the particular attention paid to optimising its ergonomics and ease of use. With its large display screen, buttons and scroll wheel, it places the accent on simplicity and communication.

The TELYS offers the following functions:

**Electrical measurements:** voltmeter, frequency meter, ammeter.

**Engine parameters:** working hours counter, oil pressure, coolant temperature, fuel level, engine speed, battery voltage.

**Alarms and faults:** oil pressure, coolant temperature, failure to start, overspeed, alternator min./max., battery voltage min./max., emergency stop, fuel level.

**Ergonomics:** wheel for navigating around the various menus.

**Communication:** remote control and operation software, USB connections, PC connection.

For more information on the product and its options, please refer to the sales documentation.



The KERYS control unit has been designed to fulfil the specific requirements of professionals in terms of operating and monitoring generating sets. It therefore offers a wide range of functions.

This control unit is fitted as standard to all generating sets designed to be used for coupling and is offered as an option across the rest of our range.

The KERYS can be built into the central console, fitted directly on the generating set, or in a separate cabinet, to fulfil all the requirements for low and high output power plants.

>The KERYS offers the following functions:

**Electrical measurements:** voltmeter, frequency meter, ammeter.

**Engine parameters:** working hours counter, oil pressure, coolant temperature, fuel level, engine speed, battery voltage.

**Alarms and faults:** oil pressure, coolant temperature, failure to start, overspeed, alternator min./max., battery voltage min./max., emergency stop.

**Additional functions:** coupling, website, diagnostic aid, assistance and maintenance, graphs and archiving, load impact management, 8 available installation configurations, certification in line with international standards.

For more information, please refer to the sales documentation.

Additional specifications :Website, Troubleshooting, Assistance and Maintenance, Plotting and logging, Load impact, 8 configurations available, Compliance with international standards...



### DESCRIPTIVE

- Electronic governor
- Mechanically welded chassis with antivibration suspension
- Air cooler for wiring temperature of 38/40°C with electric fan
- Exhaust compensators with flanges
- 24 V charge alternator and starter
- Delivered with oil
- Manual for use and installation

### POWER DEFINITION

PRP : Prime Power is available for an unlimited number of annual operating hours in variable load applications, in accordance with ISO 8528-1. ESP : The standby power rating is applicable for supplying emergency power in variable load applications in accordance with ISO 8528-1. Overload is not allowed.

\*DCC : Data Center Continuous Power ratings apply to Data Center installations where a reliable utility power is available and comply with Uptime institute Tier III and IV requirements. At constant or varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Average load factor : ≤ 100%.

### TERMS OF USE

According to the standard, the nominal power assigned by the genset is given for 25°C Air Inlet Temperature, of a barometric pressure of 100 kPA (100 m A.S.L), and 30 % relative humidity. For particular conditions in your installation, refer to the derating table.

### ASSOCIATED UNCERTAINTY

For the generating sets used indoor, where the acoustic pressure levels depends on the installation conditions, it is not possible to specify the ambient noise level in the exploitation and maintenance instructions . You will also find in our exploitation and maintenance instructions a warning concerning the air noise dangers and the need to implement appropriated preventive measures.

## X1850C

Engine ref.	12V4000G23E
Alternator ref.	LSA 51.2 S55
Performance class	G3

### GENERAL CHARACTERISTICS

Frequency (Hz)	50
Voltage (V)	400/230
Standard Control Panel	Basic terminal block
Optional control panel	M80
Optional Control Panel	TELYS
Optional control panel	APM802

### POWER

Voltage	ESP		PRP		DCC (*)		Standby Amps
	kW <sub>e</sub>	kVA	kW <sub>e</sub>	kVA	kW <sub>e</sub>	kVA	
415/240	1464	1830	1331	1664	1331	1664	2546
400/230	1464	1830	1331	1664	1331	1664	2641
380/220	1464	1830	1331	1664	1331	1664	2780

### DIMENSIONS COMPACT VERSION

Length (mm)	4050
Width (mm)	1885
Height (mm)	2158
Dry weight (kg)	11405
Tank capacity (L)	0

### DIMENSIONS SOUNDPROOFED VERSION

Commercial reference of the enclosure	
Length (mm)	0
Width (mm)	0
Height (mm)	0
Dry weight (kg)	0
Tank capacity (L)	0
Acoustic pressure level @1m in dB(A)	0
Sound power level guaranteed (Lwa)	0
Acoustic pressure level @7m in dB(A)	0

**AVK**THE POWER  
People**X1850C****ENGINE CHARACTERISTICS****GENERAL ENGINE DATA**

Engine brand	MTU
Engine ref.	12V4000G23E
Air inlet system	Turbo
Cylinders configuration	V
Number of cylinders	12
Displacement (L)	57.20
Charge Air coolant	Air/Water DC
Bore (mm) x Stroke (mm)	170.00 x 210.00
Compression ratio	16.5
Speed (RPM)	1500
Pistons speed (m/s)	10.50
Maximum stand-by power at rated RPM (kW)	1562.0
Frequency regulation, steady state (%) +/- 0.5%	
BMEP (bar)	19.86
Governor type	Electronic

**COOLING SYSTEM**

Radiator & Engine capacity (L)	594.00
Max water temperature (°C)	104
Outlet water temperature (°C)	100
Fan power (kW)	
Fan air flow w/o restriction (m3/s)	
Available restriction on air flow (mm H2O)	
Type of coolant	Glycol-Ethylene
Thermostat modulating range HT (°C)	79/92

**EMISSIONS**

Emission PM (mg/Nm3) 5% O2	31
Emission CO (mg/Nm3) 5% O2	285
Emission NOx (mg/Nm3) 5% O2	1610
Emission HC (mg/Nm3) 5% O2	37

**EXHAUST**

Exhaust gas temperature @ ESP @ 50 Hz (°C)	495
Exhaust gas flow @ ESP @ 50 Hz (L/s)	5600.00
Max. exhaust back pressure (mm H2O)	500

**FUEL**

Consumption @ 110% load (L/h)	403.00
Consumption @ 100% load (L/h)	365.00
Consumption @ 75% load (L/h)	266.00
Consumption @ 50% load (L/h)	181.00
Maximum fuel pump flow (L/h)	1500.00

**OIL**

Oil capacity (L)	260.00
Min. oil pressure (bar)	3.50
Max. oil pressure (bar)	7.00
Oil consumption 100% load (L/h)	1.100
Oil sump capacity (L)	200.0

**HEAT BALANCE**

Heat rejection to exhaust (kW)	1201
Radiated heat to ambient (kW)	75.00
Heat rejection to coolant (kW)	590/360

**AIR INTAKE**

Max. intake restriction (mm H2O)	150
Intake air flow (L/s)	2100.00

**AVK**THE POWER  
People**X1850C****ALTERNATOR CHARACTERISTICS****GENERAL DATA**

Alternator ref.	LSA 51.2 S55
Number of Phase	Three phase
Power factor (Cos Phi)	0.8
Altitude (m)	0 to 1000
Overspeed (rpm)	2250
Number of pole	4
Capacity for maintaining short circuit at 3 In for 10 s	Yes
Insulation class	H
T° class, continuous 40°C	H / 125°K
T° class, standby 27°C	H / 163°K
AVR Regulation	Yes
Total Harmonic Distortion in no-load DHT (%)	<3.5
Total Harmonic Distortion, on load DHT (%)	<3.5
Wave form : NEMA=TIF	<50
Wave form : CEI=FHT	<2
Number of bearing	1
Coupling	Direct
Voltage regulation at established rating (+/- %)	
Recovery time (Delta U = 20% transient) (ms)	700
Indication of protection	IP 23
Technology	Without collar or brush

**OTHER DATA**

Continuous Nominal Rating 40°C (kVA)	1860
Standby Rating 27°C (kVA)	2046.00
Efficiencies 100% of load (%)	95.6
Air flow (m3/s)	2.500
Short circuit ratio (Kcc)	0.330
Direct axis synchro reactance unsaturated (Xd) (%)	374
Quadra axis synchro reactance unsaturated (Xq) (%)	224
Open circuit time constant (T'do) (ms)	2660
Direct axis transient reactance saturated (X'd) (%)	28.4
Short circuit transient time constant (T'd) (ms)	237
Direct axis subtransient reactance saturated (X''d) (%)	14.8
Subtransient time constant (T''d) (ms)	22
Quadra axis subtransient reactance saturated (X''q) (%)	18.50
Subtransient time constant (T''q) (ms)	19.0
Zero sequence reactance unsaturated (Xo) (%)	3.50
Negative sequence reactance saturated (X2) (%)	16.60
Armature time constant (Ta) (ms)	39
No load excitation current (io) (A)	1.30
Full load excitation current (ic) (A)	5.60
Full load excitation voltage (uc) (V)	64.0
Engine start (Delta U = 20% perm. or 50% trans.) (kVA)	3720.00
Transient dip (4/4 load) - PF : 0,8 AR (%)	12.40
No load losses (W)	15300.0
	0
Heat rejection (W)	68000.0
	0
Unbalanced load acceptance ratio (%)	8

**DIMENSIONS****CONTAINER CPU40 Si**

Commercial reference of the enclosure	CPU40Si
Length (mm)	12192
Width (mm)	2438
Height (mm)	2896
Dry weight (kg)	24600
Tank capacity (L)	500
Acoustic pressure level @1m in dB(A)	86
Sound power level guaranteed (Lwa)	109
Acoustic pressure level @7m in dB(A)	78

**CONTAINER CPU40 Ssi**

Commercial reference of the enclosure	CPU40SSi
Length (mm)	12192
Width (mm)	2438
Height (mm)	2896
Dry weight (kg)	25620
Tank capacity (L)	500
Acoustic pressure level @1m in dB(A)	79
Sound power level guaranteed (Lwa)	102
Acoustic pressure level @7m in dB(A)	71

**X1850C**  
**CONTROL PANEL**

**Basic terminal block**



The control unit can be used as a basic terminal block for connecting a control box.

Offers the following functions:

emergency stop button, customer connection terminal block, CE.

**M80, transfer of information**



The M80 is a dual-function control unit. It can be used as a basic terminal block for connecting a control box and as an instrument panel with a direct read facility, with displays giving a global view of your generating set's basic parameters.

Offers the following functions:

Engine parameters: tachometer, working hours counter, coolant temperature indicator, oil pressure indicator, emergency stop button, customer connection terminal block, CE.



# X1850C CONTROL PANEL

TELYS, ergonomic and user-friendly

APM802 dedicated to power plant management



The highly versatile TELYS control unit is complex yet accessible, thanks to the particular attention paid to optimising its ergonomics and ease of use. With its large display screen, buttons and scroll wheel, it places the accent on simplicity and communication.

The TELYS offers the following functions:

Electrical measurements: voltmeter, frequency meter, ammeter.

Engine parameters: working hours counter, oil pressure, coolant temperature, fuel level, engine speed, battery voltage.

Alarms and faults: oil pressure, coolant temperature, failure to start, overspeed, alternator min./max., battery voltage min./max., emergency stop, fuel level.

Ergonomics: wheel for navigating around the various menus.

Communication: remote control and operation software, USB connections, PC connection.

For more information on the product and its options, please refer to the sales documentation.

The new APM802 command/control system is specifically designed for operating and monitoring power plants for markets including hospitals, data centres, banks, the oil and gas sector, industries, IPP, rental and mining. This unit is available as standard on all generating sets from 275 Kva designed for coupling. It is optional on the rest of our range.

The Human Machine Interface, designed in collaboration with a company specialising in interface design, facilitates operations with a large 100% touch screen. The pre-configured system for power plant applications features a brand new customisation function which complies with the international standard IEC 61131-3. New communication functions (PLC and regulation), improve the high level of equipment availability in the installation.

- Advantages:
- Dedicated to power plant management.
  - Specially researched ergonomics.
  - High level of equipment availability.
  - Modularity and long service life guaranteed.
  - Making it easy to extend the installation

For more information, please refer to the sales documentation.

# DIESEL GENERATOR SET

## MTU 16V4000 DS2500

380V – 11 kV/50 Hz/Standby Power/Fuel Consumption Optimized  
MTU 16V4000G63/Water Charge Air Cooling



Optional equipment and finishing shown. Standard may vary.

### PRODUCT HIGHLIGHTS

#### // Benefits

- Low fuel consumption
- Optimized system integration ability
- High reliability
- High availability of power
- Long maintenance intervals

#### // MTU Onsite Energy is a single-source supplier

#### // Support

- Global product support offered

#### // Standards

- Engine-generator set is designed and manufactured in facilities certified to standards ISO 2008:9001 and ISO 2004:14001
- Generator set complies to ISO 8528
- Generator meets NEMA MG1, BS5000, ISO, DIN EN and IEC standards
- NFPA 110

#### // Power Rating

- System ratings: 2200 kVA - 2600 kVA
- Accepts rated load in one step per NFPA 110
- Generator set complies to G3 according to ISO 8528-5
- Generator set exceeds load steps according to ISO 8528-5

#### // Performance Assurance Certification (PAC)

- Engine-generator set tested to ISO 8528-5 for transient response
- 85% load factor
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

#### // Complete range of accessories available

- Control panel
- Circuit breaker/power distribution
- Fuel system
- Fuel connections with shut-off valve mounted to base frame
- Starting/charging system
- Exhaust system
- Mechanical and electrical driven radiators
- Medium voltage alternators

#### // Emissions

- Fuel consumption optimized

#### // Certifications

- CE certification option

APPLICATION DATA<sup>①</sup>

## // Engine

Manufacturer	MTU
Model	16V4000G63
Type	4-cycle
Arrangement	16V
Displacement: l	76.3
Bore: mm	170
Stroke: mm	210
Compression ratio	16.4
Rated speed: rpm	1500
Engine governor	ADEC (ECU 7)
Max power: kWm	2185
Air cleaner	Dry

## // Fuel System

Maximum fuel lift: m	5
Total fuel flow: l/min	20

// Fuel Consumption<sup>②</sup>

	l/hr	g/kwh
At 100% of power rating:	513.3	195
At 75% of power rating:	381.1	193
At 50% of power rating:	260.6	198

## // Liquid Capacity (Lubrication)

Total oil system capacity: l	300
Engine jacket water capacity: l	175
Intercooler coolant capacity: l	50

## // Combustion Air Requirements

Combustion air volume: m <sup>3</sup> /s	2.6
Max. air intake restriction: mbar	50

## // Cooling/Radiator System

Coolant flow rate (HT circuit): m <sup>3</sup> /h	68.5
Coolant flow rate (LT circuit): m <sup>3</sup> /h	30
Heat rejection to coolant: kW	800
Heat radiated to charge air cooling: kW	410
Heat radiated to ambient: kW	90
Fan power for mech. radiator (40°C): kWm	44

## // Exhaust System

Exhaust gas temp. (after turbocharger): °C	490
Exhaust gas volume: m <sup>3</sup> /s	6.6
Maximum allowable back pressure: mbar	85
Minimum allowable back pressure: mbar	30

① All data refers only to the engine and is based on ISO standard conditions (25°C and 100m above sea level).

② Values referenced are in accordance with ISO 3046-1. Conversion calculated with fuel density of 0.83 g/ml.  
All fuel consumption values refer to rated engine power.

## STANDARD AND OPTIONAL FEATURES

### // System Ratings (kW/kVA)

Generator model	Voltage	Fuel consumption optimized 40°C/400m								
		without radiator			with mechanical radiator			with electr. driven radiator		
		kWel	kVA*	AMPS	kWel	kVA*	AMPS	kWel	kVA*	AMPS
Marathon 744RSL7092 (Low voltage marathon standard)	380 V	1880	2350	3570	1880	2350	3570	1840	2300	3494
	400 V	1920	2400	3464	1920	2400	3464	1880	2350	3392
	415 V	1800	2250	3130	1800	2250	3130	1760	2200	3061
Marathon 1020FDL7093 (Low voltage marathon oversized)	380 V	1880	2350	3570	1880	2350	3570	1840	2300	3494
	400 V	1920	2400	3464	1920	2400	3464	1880	2350	3392
	415 V	1800	2250	3130	1800	2250	3130	1760	2200	3061
Marathon 1020FDL7093 (Low voltage marathon engine output optimized)	380 V	2080	2600	3950	2040	2550	3874	2040	2550	3974
	400 V	2072	2590	3738	2000	2500	3608	2000	2500	3608
	415 V	2040	2550	3548	2000	2500	3478	2000	2500	3478
Leroy Somer LSA 51.2 VL95 (Low voltage Leroy Somer)	380 V	2080	2600	3950	2040	2550	3874	2040	2550	3874
	400 V	2080	2600	3753	2040	2550	3681	2040	2550	3681
	415 V	2080	2600	3617	2040	2550	3548	2040	2550	3548
Marathon 1020FDH7099 (Medium volt. marathon)	11 kV	2040	2550	134	2000	2500	131	2000	2500	131
Leroy Somer LSA 53.1 UL85 (Medium volt. Leroy Somer)	11 kV	2080	2600	136	2040	2550	134	2040	2550	134

\*  $\cos \phi = 0,8$

### // Engine

- 4-Cycle
- Standard single stage air filter
- Oil drain extension & shut-off valve
- Closed crankcase ventilation
- Governor-electronic isochronous
- Common rail fuel injection
- Fuel consumption optimized engine

### // Generator

- NEMA MG1, BS5000, ISO, DIN EN and IEC standards
- Self-ventilated
- Superior voltage waveform
- Solid state, volts-per-Hertz regulator
- No load to full load regulation
- $\pm 0,25\%$  voltage regulation no load to full load
- Brushless alternator with brushless pilot exciter
- 4 pole, rotating field
- Sustained short circuit current of up to 250% of the rated current for up to 10 seconds (marathon generator)
- Sustained short circuit current of up to 300% of the rated current for up to 10 seconds (Leroy Somer generator)
- Marathon low voltage generator
- Leroy Somer generator
- Oversized generator
- Medium voltage generator

■ Represents standard features

□ Represents optional features

## STANDARD AND OPTIONAL FEATURES, CONTINUATION

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### // Cooling System

- Jacket water pump
- Thermostat(s)
- Water charge air cooling
- Mechanical radiator
- Electrical driven front-end cooler
- Jacket water heater

### // Control Panel

- Pre-wired control cabinet for easy application of customized controller (V1+)
- Island operation (V2)
- Automatic mains failure operation with ATS (V3a)
- Automatic mains failure operation incl. control of generator and mains breaker (V3b)
- Island parallel operation of multiple gensets (V4)
- Automatic mains failure operation with short (< 10s) mains parallel overlap synchronization (V5)
- Mains parallel operation of a single genset (V6)
- Mains parallel operation of multiple gensets (V7)
- Basler controller
- Deif controller
- Complete system metering
- Digital metering
- Engine parameters
- Generator Protection Functions
- Engine protection
- SAE J1939 engine ECU communications
- Parametrization software
- Multilingual capability
- Multiple programmable contact inputs
- Multiple contact outputs
- Event recording
- IP 54 front panel rating with integrated gasket
- Different expansion modules
- Remote annunciator
- Daytank control
- Generator winding temperature monitoring
- Generator bearing temperature monitoring
- Differential protection with multi-function protection relay
- Modbus RTU-TCP gateway

### // Circuit Breaker/Power Distribution

- 3-pole circuit breaker
- 4-pole circuit breaker
- Manual-actuated circuit breaker
- Electrical-actuated circuit breaker
- Stand-alone solution in separate switch box

### // Fuel System

- Flexible fuel connectors mounted to base frame
- Fuel filter with water separator
- Switchable fuel filter with water separator
- Separate fuel cooler
- Fuel cooler integrated into cooling equipment

## STANDARD AND OPTIONAL FEATURES, CONTINUATION

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### // Starting/Charging System

- 24V starter
- Starter batteries
- Battery rack & cables
- Battery charger

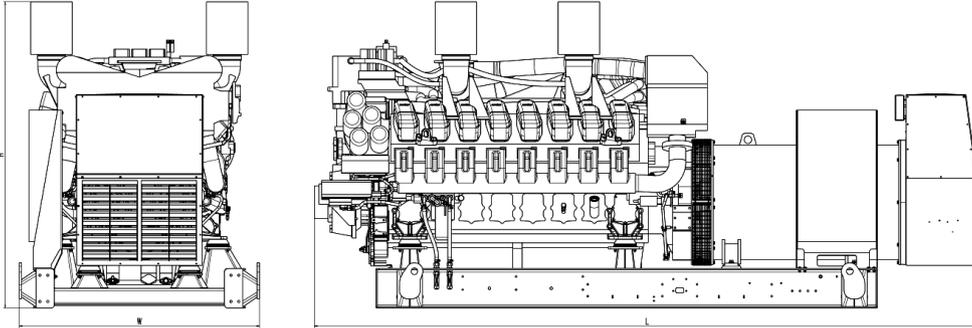
### // Mounting System

- Welded base frame
- Resilient engine and generator mounting
- Modular base frame design

### // Exhaust System

- Exhaust bellows with connection flange
- Exhaust silencer with 10 dB(A) sound attenuation
- Exhaust silencer with 30 dB(A) sound attenuation
- Exhaust silencer with 40 dB(A) sound attenuation
- Y-connection-pipe

## WEIGHTS AND DIMENSIONS



Drawing above for illustration purposes only, based on a standard open power 400 Volt engine-generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

### System

Open Power Unit (OPU)

### Dimensions (L x W x H)

5090 x 1836 x 2330 mm

### Weight (dry/less tank)

12893 kg

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific engine-generator set.

## SOUND DATA

// Consult your local MTU Onsite Energy distributor for sound data.

## EMISSIONS DATA

// Consult your local MTU Onsite Energy distributor for emissions data.

## RATING DEFINITIONS AND CONDITIONS

// Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO-3046-1, BS 5514 and AS 2789. Average Load Factor:  $\leq 85\%$ . Operating hours/year: max. 500.

// Deration factor:

Altitude: Consult your local MTU Onsite Energy Power Generation distributor for altitude derations.

Temperature: Consult your local MTU Onsite Energy Power Generation distributor for temperature derations.

Rated power is available up to 40°C and 400m above sea level.

Materials and specifications subject to change without notice.

**MTU Onsite Energy**

A Rolls-Royce Power Systems Brand

[www.mtuonsiteenergy.com](http://www.mtuonsiteenergy.com)