3 Proposed Development

3.1 Introduction

3.1.1 This chapter provides the definitive description of the Proposed Development for the purposes of the EIA. The chapter identifies the construction and operational design features of the Proposed Development that might affect the environment or contribute to the overall environmental effects of the scheme. The environmental effects of demolition and decommissioning have not been considered.

3.2 Development Description

3.2.1 The development applied for covered by this ES is:

"Redevelopment of site to deliver extension to existing Union Park data centre campus consisting of (a) free standing data centre building (b) energy, power, and water infrastructure (c) site access and internal roads (d) site security arrangements (e) hard and soft, green landscaping and (f) other ancillary and auxiliary forms of development

3.2.2 The masterplan for the Proposed Development is shown on Figure 3.1. The plan sets out an proposed layout for the development of the Site within the redline boundary. The total site area is 1.26ha.

3.2.3 The EIA has assessed the development and use of:

a) Data Centre Building - The proposed fourth block will connect directly onto the western edge of Data Centre Block 3. The intention is for the data centre to have a maximum height of 35m, mirroring that of Data Centre Block 3. The intention for the façade is to draw on the approach for Data Centre Block 2, using cladding panels connected to each other at right angles to create a point that sticks out. Three sets of these will be located vertically above one another with the angle of each set differing to that of the ones above and below it;

b) Ancillary Block – This is conjoined and immediately west of the Data Centre Building. It provides the required support and office space. It is to be glazed with glazing panels separated with dark vertical fins on the southern elevation to reduce solar glare. It is envisaged that roof space will be used for PV panels and brown / green roofing;

c) Energy Centre - An energy centre is proposed to be physically connected to the western edge of the ancillary block. The energy centre will have a maximum height of 28m. The intention is to draw upon the design approach of the three already permitted energy centres, using vertical fins with perforations and orientated in a way to allow views through the façade in some areas (with the use of back lighting adding interest). Darker cladding is to be used then for the Data Centre Building, extending the 'light-dark' pattern across all of the data centre buildings and contrasting with the lighter colour ;

d) Security Measures - Clearly ensuring a high level of security is key for the successful operation of a data centre (and designation of data centres at Critical National Infrastructure only increases these requirements) and the intention is that the permitted fence lines will effectively be extended around the proposed development. No visitor

reception centre is required to serve this block whilst the permitted western vehicular lock entrance will be used;

e) Car Parking and Access - The proposal is for the permitted circulation road, which runs around the western edge of Data Centre Block 3, to be extended further westwards to that it continues around the proposed fourth data centre and energy centre before turning back eastwards and re-connecting to the main access and egress into the wider site at North Hyde Gardens Road Bridge.

f) Landscaping – Conjoining Data Centre Block 4 with Data Centre Block 3 and pushing development as close to the railway line as possible leaves two primary areas of Data Centre Block 4 landscaping. Due to the security requirements of Ark and their future occupier, these areas of land are to be located within the secure fence line.

3.2.4 Plans submitted with the application (as listed on the drawing schedule enclosed at Appendix 3.2) show the detailed site layout which has been iteratively refined with consultation from the Council. They reflect the nature of the application and provide a defined layout for the proposed dwellings, access and green space.

3.3 Data Centre Buildings

3.3.1 A data centre is a physical facility that stores and processes data generated from the internet and the cloud. It is essentially an intensive climate controlled space for the continuous operation of computer servers and is supported by complex mechanical and electrical infrastructure to support its hardware and software. This includes power subsystems, uninterruptible power supplies (UPS), ventilation and cooling systems, network racks, server rooms and ancillary office and technical space for staff and security. Ancillary buildings, standby or back-up generators (which will only be used if the electrical grid fails) and substations are also required.

3.3.2 Data centres enable the delivery of shared applications and data, which is optimised for reliability, security and energy efficiency. However, data centres are not just stores, they are places where the latest technology is deployed to accelerate data processing and data management. They are critical facilities that bring data transmission, storage and management, together with the supporting networks, into general or conventional definitions of infrastructure.

3.3.3 Further, detailed information about the role and importance of data centre development is provided in the Planning Statement which accompanies this application.

3.4 The Proposals

3.4.1 The proposed Site Layout Plan is shown on the plan enclosed at Appendix 3.1.

3.4.2 The data centre element of UP4 is proposed to connect to the Ancillary Building (AB4) of the adjacent consented UP3 project. This allows flexibility of use if the two data centres are taken on by the same occupier but can also be used if UP3 and UP4 are occupied by independent tenants. The data centre is the largest element of the proposal and locating it adjacent to AB4 maximises the distance from the residential Hayes Village development whilst the triangular nature of the site also precludes locating the data hall to the west.

3.4.3 The ancillary building (AB5) for UP4 is proposed to run north south and adjoin the west elevation of the data centre block. This follows the pattern of the Union Park campus, using set-back ancillary buildings to break up the elevation of the neighbouring data centres. AB5 is the building with the most active façade in the proposal, using it to add interest and separate the more introverted data centre and energy centre has good compositional advantages.

3.4.4 The energy centre (EC4) is proposed to be located immediately to the west of, and conjoining with, AB5. This minimises the overall footprint and keeps the building as far from the residential Hayes Village development as possible. This arrangement also minimises the extent of façade and limits cable run distances.

3.4.5 Arranging the buildings in this order means that they step down in height moving west towards the residential development.

3.4.6 A link road is designed to run from the southeast corner of the site, connecting to the primary entrance of the Union Park Campus at the north side of North Hyde Gardens Bridge, and run clockwise around the proposed buildings, before turning east and connecting with the access route to the rear of the adjoining UP3 development. Running the access round around the outside of the buildings maximises the distance between the buildings and the site boundaries. This has advantages for construction, plant replacement and in protecting trees beyond the site boundary.

Data Centre Building

3.4.7 A data centre is a highly controlled environment designed for the continuous operation of computer servers.

3.4.8 The overall height of UP4 is 32.25m. This is the same height as for UP1, UP2, and UP3 and is compliant with Aviation threshold.

3.4.9 The gantries of UP1 and UP3 express the structure of the gantry supporting frame with large scale perforated panels recessed within this framing. In contrast UP2 has been designed with tapering vertical fins that sit in front of the gantry framing. UP4 belongs to this family of buildings in form and arrangement so has been designed in a similar design language. To establish an ‘A,B,A,B’ pattern UP4 follows the expression of UP2, using vertical fins as screening rather than expressing the frame.

3.4.10 The fins on UP2 are vertical and taper, being wider at the top and narrower at the bottom. As UP4 will be viewed form a variety of angles the fins were designed to be three dimensional, consisting of two flat vertical aluminium panels meeting to form a triangle.

3.4.11 PV panels and brown roofing are proposed at roof level.

Energy Centre

3.4.12 The Energy Centre provides back up power and consists of 14 generator sets as well as control rooms to host switchgear and other electrical equipment were required. There are certain requirements around adjacencies, stacking, plant replacement, and CFD modelling that defines the relationship between all of these elements and, of all elements of the site, this is arguable the element where form and design must follow function.

3.4.13 The façade is conceived as a series of triangular fins with a similar design to UP4. In contrast to UP4, these fins will be in dark grey powder coated aluminium (RAL 7016) whilst a waved approach is incorporated into the façade to add variety and allow visibility through the façade and into the building from various views.

3.4.14 To further soften EC4, in addition to the functional lighting required, it is proposed to include feature lighting to this building. This is discussed further below in the lighting section.

Ancillary Block

3.4.15 The ancillary building ('AB5'), which sits between UP4 and EC4, contains the office space for the development, as such it has the most transparent façade. This office accommodation overlooks the canal, providing views out for the occupants and a more human-scale, active façade for those looking at the building from across the canal.

3.4.16 The external fins provide practical solar shading and draw on the design of AB1 which book ends the Union Park development at the east end. The colour of AB5 is dark grey powder coated aluminium to match EC4 and provide a contrast to UP4.

Access and Highways

3.4.17 The access into the site is to be located immediately off the bend in North Hyde Gardens, which is to have controlled access gate and pedestrian access. The access point is proposed to be designed as private secure entrance and exit and based on observed vehicular speeds along North Hyde Gardens, appropriate visibility splays of 2.4m x 43m are achieved.

Ecological Mitigation & Landscaping

3.4.18 The Landscape Masterplan integrates planting within the large-scale urban development to enhance species diversity and ecological biodiversity. It has been designed in coordination with the Townscape and Visual Impact Assessment.

3.4.19 Detailed landscaping plans have been prepared by Murdock Wickham, and have been submitted as part of this application. The plans detail the comprehensive landscaping measures that are incorporated into the proposals. The key features of the proposed landscaping scheme are as follows:

- The existing woodland on the western side of the site has been preserved with appropriate management and additional scrub planting. To the east of the woodland, a turning area for heavy vehicles has been incorporated using species-rich reinforced grass. This space is framed by a gravel recreational path, scattered tree planting, and timber benches, creating a space that is not publicly accessible but is usable for staff.

- A well-being garden has been created for staff to the south of the site. The garden features picnic tables, vibrant planting, and ecological pond. Planting is strategically positioned to provide a natural screen from the nearby buildings and car park to the north, with trees and hedges lining the northern and eastern boundaries. Seating areas and pathways are oriented to provide views over the adjacent Grand Union Canal. This is not to be publicly accessible.

- Green and brown roofs with sedum planting are proposed, providing a landscape treatment to the roofscape, to be designed in conjunction with services and facilities, enhancing the biodiversity of the roofs.

- A stylised, south-facing 'Parairie' garden designed with an ecological focus provides seasonal interest and vibrant colour, featuring a variety of pollinator-friendly plants to boost biodiversity. It includes integrated seating areas to provide a tranquil space.

3.4.20 The Urban Greening Factor (UGF) calculations follows the Mayor of London, London Plan Guidance for Urban Greening Factor 2023. The landscape design has maximised the areas for landscaping and ecological enhancements achieving a UGF of 0.39.

3.4.21 To accommodate the proposed development, as shown on the proposed layout plan submitted as part pf this application, seven individual trees (nos.1-7) and one group of trees (G1) are to be removed because they are situated within the footprints of proposed structures or surfaces.

Sustainability and Energy Use

3.4.22 The proposals have been developed with sustainable design principles at its core, through adopting a considered holistic and integrated design approach. Indeed, Ark considers itself as a leader in delivering and operating sustainable developments within its industry, and this is particularly true of the proposals for Union Park. From the inception of the project Ark and its design team have strived for the highest environmental performance possible for the proposed data centre use.

3.4.23 The planning application is accompanied by an Energy and Overheating Statement prepared by HDR. Through analysis of the proposed development's design following the energy hierarchy of 'Be Lean', 'Be Clean', and 'Be Green' measures contained herein, the proposed exceed the policy SI 2 Minimising greenhouse gas emissions target of 15% reduction at the Be Lean stage and delivering a minimum on-site carbon dioxide emission reduction of over 35% beyond the baseline Part L Vol2 2021 building.

3.4.24 In summary:

- Part L Vol2 2021: Predicted 75% regulated CO2 savings sitewide
- Part L Vol2 : Compliance is currently achieved against Part L 2021 Vol.2, BER/TER CO2 emissions, BPER/TPER Primary Energy, and Sections 3, 4 (save for 7 spaces) and 5 (save for EC CRAC unit).
- CIBSE TM52/TM49: PASS achieved for all occupied spaces and communal areas
- TM54: EUI – 17,283.11 kWh/m^2

Surface Water Drainage Strategy and Flood Risk

3.4.25 The Environment Agency's indicative flood maps show that the site is located within Flood Zone 1, which is deemed to have less than a 1 in 1000 (0.1%) chance of river or tidal flooding in any one year.

3.4.26 The Flood Risk and Drainage Strategy, prepared by HDR, which accompanies the planning application notes that flood risk from surface water, groundwater and artificial sources have been reviewed and are low risk.

3.4.27 It is proposed to discharge surface water from the development via two separate connections to the surface water drainage system serving the rest of the campus. The surface water run-off from the entire campus is discharged into the River Crane, utilising the existing 675mm diameter outfall.

Foul Water Drainage

3.4.28 Foul water is proposed to be a separate network to the surface water, with foul water discharging into the existing drainage network serving the rest of the campus. There is an existing 2134mm diameter foul sewer main line, known as the Crane Valley Sewer, which runs through the site from north to south which benefits from a build over agreement.

3.5 Construction and implementation

3.5.1 This section describes the anticipated programme of demolition and construction works and the key activities that will be undertaken prior to completion and occupation of the Proposed Development.

Construction Duration

3.5.2 The approximate duration of the construction phase is outlined below:

- Construction to commence in 2026
- Construction to complete in 2028

3.5.3 As explained in Chapter 2 and above, a programme of demolition is already underway having been consented separate to this proposal.

Construction Management and Logistics Plan (CMLP)

3.5.4 Details of measures to protect the environment during the construction of the Proposed Development have been set out in the accompanying Construction Management and Logistics Plan (CMLP). Measures will address noise from demolition, noise during construction, communication strategy and neighbour liaison, working hours, delivery, waste removal and management, dust control, noise, and vibrations.

3.5.5 Once contractors have been appointed they will produce detailed management plans to demonstrate how they will comply with the requirements of the London Borough of Hillingdon (LBH) Draft Code of Construction Practice v.37.1 (CoCP) and how they will address the measures contained within the CMLP.

Plant and Equipment

3.5.6 An indication of the typical types of plant and equipment likely to be used during the Site clearance and construction works are provided in Table 3.1.

Table 3.1 **Indicative Plant and Equipment**

Plant/Equipment	Demolition	Groundwork	Superstructure
Dozer	✕	✓	✕
Backhoe with breaker	✓	✓	✕
Tracked excavator	✓	✓	✓
Dumptruck	✓	✓	✓
Hydraulic vibratory compactor	✕	✓	✕
Generator	✓	✓	✓
Grinder	✓	✓	✓
Concrete mixer	✕	✓	✓
Tower crane	✕	✕	✓
Piling rig	✕	✓	✕

Methods of Working

3.5.7 It is anticipated that contractor's compound will be located as secure areas within the Site and will be relocated, where necessary, as each construction phase nears completion onto the subsequent phase. All materials and plant storage will occur on the Site and no off-site compounds are necessary.

3.5.8 The working hours on site are expected to be controlled through a suitably worded planning condition.

Construction Traffic

3.5.9 Construction traffic movements consider the following sources of traffic:

- Workforce movements to and from the Site;
- Deliveries made to the Site;
- Removal/ import of material from the Site; and
- Trips made by associated trades.

3.5.10 The contractor will maintain, as far as reasonably practicable, existing public access routes and rights-of-way during construction. The intention will be to service construction by loading and unloading vehicles inside the site boundary utilising the established delivery times for this scheme, Union Park:

7.00 to 18.00 (Monday to Friday)

3.5.11 From summer 2015 the SLS (TfL & London Councils Safe Lorry Scheme) required almost all HGVs, irrespective of current exemptions, over 3.5 tonnes that drive in Greater London to be fitted or retrofitted with:

- Side guards (also known as “lateral protection devices”) irrespective of vehicle type; and
- Both Class V and VI mirrors, irrespective of vehicle age or registration date.

3.5.12 The contractor will ensure that all sub- contractors and suppliers delivery vehicles comply with the scheme and any non- complying vehicles are turned away from site.

Access Routes

3.5.13 The Contractor will use designated construction traffic routes for deliveries to the site and removal of waste etc. in accordance with the logistics drawing.

3.5.14 Access routes to and from the site to be used by heavy goods vehicles (HGVs) will be agreed with Sweet Projects prior to initiation of the construction programme, to minimise disruption to the road and pedestrian network. It is anticipated that the strategic road network will be used as far as possible for this purpose, with the majority of construction traffic assumed to be approaching the site from the west of London, unless from other areas of the country.

3.5.15 Given the existing traffic systems and traffic volumes within this area of London, the main routes for construction traffic on the strategic road network are as follows:

3.5.16 Deliveries to the site will be directed to the Hyde Garden Road entrance and will be managed for their suitability and offloading arrangements. Small vehicles will be used wherever possible and Hiab offloading employed for speed of turnaround and practicality.

3.5.17 Larger operations such as precast concrete deliveries will require articulated lorries to deliver and mobile cranes to offload. It is intended that for this operation a single delivery would be made within the morning delivery period and the vehicle would remain on site until 19.00. The mobile crane would remain on site for the days required to offload.

Vehicles will be required to adhere to a strict delivery schedule whereby single vehicles will be called forward to deliver at any one time. When contracts are awarded and suppliers known the Contractor will propose vehicle holding areas away from site to ensure that vehicles are only called forward when the delivery bay is available and they do not queue in the site vicinity or on the SRN routes.

Construction Vehicle Forecast

3.5.18 The number of larger size lorry movements, hours of operation and any lorry holding areas will be agreed in advance and the LBH through completion of a detailed Construction Traffic Management Plan in accordance with LBH's guidance. The Contractor will maintain an up-to-date log of all drivers that will include a written undertaking from them to adhere to LBH's approved routes for construction traffic.

3.5.19 There will be no overnight parking of lorries within the vicinity of the construction site.

3.5.20 Estimated numbers of construction related vehicle journeys for the demolition and construction period have been calculated based on volumes of demolition material/excavated waste material, together with imported concrete, piling, and cladding. An assessment has also been made for the fit-out period.

Table 3.2 **Summary of typical and peak traffic for key programme stages**

Programme Stage	Typical Daily Movements	Peak Daily Movements
Site Establishment	2-3 Vehicles delivering hoarding materials, removing paving etc. 12m rigid vehicles.	4-5 vehicles (guide only)
Piling and Substructure	4-6 Vehicles. Concrete deliveries, muck away tippers, re-bar and general deliveries.	10-12 vehicles during piling. Low loader for piling rig delivery and removal (guide only)
Superstructure	2-3 Vehicles. 1 full artic daily during precast erection. Large multi axle mobile crane daily	6+ Concrete wagons for roof or core pours (guide only)
Envelope	2-3 Vehicles. Glazing components by full artic. Small mobile crane to offload	5-6 vehicles various construction components, (guide only)
Fit Out of Ancillary Buildings	4-5 vehicles. Box vans delivering components and finishing materials	8-10 vehicles possible at peak – delivering components for fit out. (guide only)

Hoardings, Site Layout and Facilities

3.5.21 The site will be completely secure to deter public access. The proposed hoarding line and gates, all of which will be in accordance with the LBH license (if required), are shown on the enclosed plans. It is intended to provide protection from noise and dust at all times.

3.5.22 The final location of site offices, toilets and welfare facilities will be identified on the site as shown on the logistics plans.

Health and Safety

3.5.23 All work will be undertaken to relevant Health and Safety legislation. The construction of the Proposed Development will be supervised in accordance with the CDM Regulations 2015. Risk assessment will be undertaken for each work package prior to activities taking place.

3.5.24 The Contractor will ensure that the site is secure by 24 hour security and prevent unauthorised entry to or exit from the site. Site gates will be closed and locked when there is no one on site. Access and egress will be via manned security gates.

3.5.25 The Contractor is to provide out of hours emergency phone numbers in case there is any issue that needs their immediate attention.

3.6 Waste

3.6.1 Sweet Projects working methods minimise waste. Any waste arising from the site must be properly categorised and dealt with in accordance with appropriate legislation. Opportunities for re-using or recycling construction or demolition waste should be explored and implemented.

3.6.2 The Contractor will carry out the works in such a way that as far as is reasonably practicable the amount of spoil and waste (including groundwater, production water and run-off) to be disposed of is minimised, and that any waste arising from the site is properly categorised and dealt with in accordance with the appropriate legislation and guidance, but only if necessary.

3.6.3 A formal and detailed Site Waste Management Plan will be produced by the successful Contractor. The disposal of all waste or other materials removed from the site will be in accordance with the requirements of the Environment Agency, Control of Pollution Act (COPA), 1974, Environment Act 1995, Special Waste Regulations 1996, Duty of Care Regulations 1991 and the Waste Management Regulations 2006.

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

3.6.5 This approach complies with the waste hierarchy whereby the intention is first to minimise, then to treat at source or compact and, finally, to dispose of off-site as necessary. All relevant Contractors will be required to investigate opportunities to minimise and reduce waste generation, such as:

- Agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme.
- Implementation of a 'just-in-time' material delivery system to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste.
- Attention to material quantity requirements to avoid over-ordering and generation of waste materials.
- Re-use of materials wherever feasible e.g. re-use of crushed concrete from ground slab; re-use of excavated material for landscaping on other projects; re-use of steel and timber framing members from the existing building when demolished.
- The Government has set broad targets of the use of reclaimed aggregate, and in keeping with best practice the Contractor will be required to maximise the proportion of materials recycled.

- Segregation of waste at source where practical.
- Re-use and recycling of materials off-site where re-use on-site is not practical (e.g. through use of an off-site waste segregation facility and re-sale for direct re- use or re-processing). The expectations in this regard are outlined in the table below.

Table 3.3 **Re-use and recycling of materials off-site**

Material	Target	Probable Location
Architectural salvage	100% re-used	Several architectural salvage companies in London.
Structural steel for re- use	100% re-used	Any complete sections salvaged during the demolition works will be retained by the Contractors for re use in temporary works.
Metals	100% recycled	Every effort will be made to recycle these materials on site with any surplus being taken to waste transfer station.
Hardcore (crushed concrete etc.)	100% recycled	Taken off-site to be crushed and reused.
Excavated material/ clay etc.	100% recycled	Clay – 100% processed for re-use (subject to analysis).
Timber	Up to 80% re-used The amount re-used will depend on the material	We will attempt to salvage any re-useable timber for hoardings, battening, shuttering etc. for possible use on site with the balance being retained by the Contractors.
Glass (non- tempered, non-laminated and non-bomb proofing film etc.)	100% recycled	Processing facility in Greenwich.
Mixed waste	The amount recycled will depend on the material	An absolute minimum will remain for transport to landfill.
Asbestos (if found)	100% landfill	Taken to a licensed site.

3.6.6 Overall, the waste management for the site is likely to comprise of the following:

- Earthworks/Civils. The building will be cleared using hand tools and loaded into lorries or skips for processing off site.
- Excavation. Arisings will be loaded directly into a waiting eight-wheeled tippers or skips for processing off-site.

- Re-Use of Arisings. Where practical, ground slab arisings will be crushed off site and returned to create a piling platform for the sub-structure works.