Science and Technology Facilities Council

Daresbury Laboratory Development Plan

March 2023

Contents

1 Introduction

Overview of Development Plan

1.1 This is the Development Plan for Daresbury Laboratory, owned and run by the Science and Technology Facilities Council (STFC), part of UK Research and Innovation (UKRI).

1.2 Daresbury Laboratory is one of the UK's national laboratory facilities. It plays host to world-leading scientific research across a number of fields, and provides a major location to respond to emerging scientific research needs, working with universities, government and industry.

1.3 Daresbury is a premier location for research but suffers from ageing estate, a lack of space, the need for infrastructure and resilience upgrades, and the need to adapt to a Net Zero future, and securing and enhancing biodiversity on the site. The Development Plan aims to chart a course so that the estate can support the scientific vision and needs of the various departments, businesses and institutes that are based at the site.

1.4 The Development Plan document sets out:

- the baseline situation as of summer/ autumn 2022
- assumptions and projections for future development
- a spatial plan for the co-ordinated development of the laboratory over time
- key infrastructure requirements

1.5 A set of working documents relating to the delivery of changes at Daresbury have been produced to support development aspirations from this work.

The Site & Context

1.6 Daresbury Laboratory is situated approximately halfway between Runcorn and Warrington, near the A56 and A558, and bordered to the west by the Bridgewater Canal. The lab forms the nucleus of Sci-Tech Daresbury, a joint venture between STFC, Halton Borough Council and Langtree (a private developer). Sci-Tech Daresbury is developing commercially-available space for research and high-tech companies, often with links to the research performed at the lab.

1.7 Sci-Tech Daresbury and Daresbury Laboratory are key parts of the high-tech research economy in the north-west of England, and an important part of Halton Borough Council's development plans for high-skill jobs growth.

1.8 The Laboratory was founded in 1967 and several of the main buildings date from then. The Tower was constructed in the late 1970s to host an accelerator experiment, but has been out of use since the late 1980s. Today it specialises in accelerator technology and applications research, scientific computing, nuclear physics and technology development for international scientific experiments such as those at CERN or the European Spallation Source (ESS). Around 500 people work at the lab, with a further 1000 jobs in the surrounding Sci-Tech Daresbury park.

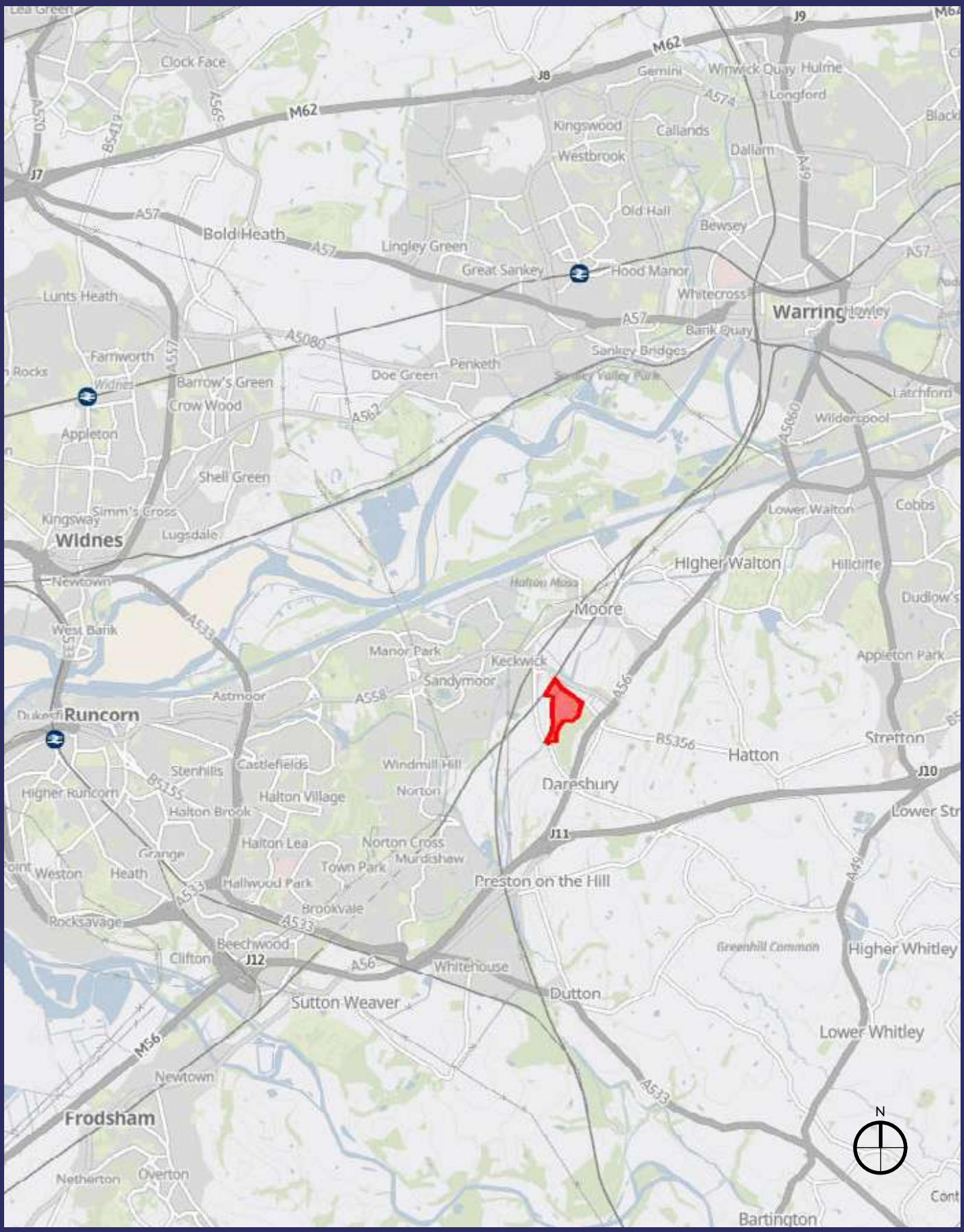


Figure 1
Site location and context

Vision

1.9 Harwell and Sci-Tech Daresbury research and innovation campuses lie at the heart of STFC's strategy to drive innovation led growth in innovative businesses and support the creation of jobs in high-tech sectors. The campuses are home to a variety of research-intensive organisations, from disruptive start-ups to blue-chip companies, co-located with internationally leading research and innovation infrastructure - a platform from which to support the needs of growing enterprises, stimulating innovation and productivity growth in sectors such as digital, health and life sciences, energy, space and security.

1.10 Our vision is for the STFC campuses to be nationally and internationally significant assets in the delivery of the Government's ambition for an economy driven by innovation-led growth.

1.11 As UKRI's most significant asset in the North West, Sci-Tech Daresbury's will:

- accelerate Sci-Tech Daresbury's growth, fuelling regional prosperity;
- be an internationally recognised leader in the application of advanced digital technologies to industrial challenges;
- be the main UK centre for advanced accelerator technologies; and
- stimulate innovation, commercialisation and collaboration through clusters rooted in sectors and technologies which play to the strengths of Sci-Tech Daresbury

UKRI and STFC's Strategy

1.12 STFC's mission is to deliver world-leading national and international research and innovation capabilities and, through those, discover the secrets of the Universe. Our major research and innovation campuses including at Daresbury Laboratory and our research facilities across the UK support fundamental research in astronomy, physics and space science.

1.13 Our goal is to deliver economic, societal, scientific and international benefits to the UK and its people – and more broadly to the world. Our strength comes from our distinct but interrelated functions.

1.14 Our scientific facilities provide access to world-leading, large-scale facilities across a range of physical and life sciences, enabling research, innovation and skills training in these areas.

1.15 On our national campuses, including Daresbury Laboratory, we work with partners to build National Science and Innovation Campuses based around our National Laboratories to promote academic and industrial collaboration and translation of our research to market through direct interaction with industry.

1.16 We support university-based research, innovation and skills development in astronomy, particle physics, nuclear physics, and space science.

1.17 Our large-scale scientific facilities in the UK and Europe are used by more than 3,500 users each year, carrying out more than 2,000 experiments and generating around 900 publications. Our facilities provide a range of research techniques using neutrons, muons, lasers and X-rays, and high performance computing and complex analysis of large data sets.

1.18 They are used by scientists across a huge variety of science disciplines ranging from the physical and heritage sciences to medicine, biosciences, the environment, energy, and more. These facilities provide a massive productivity boost for UK science, as well as unique capabilities for UK industry.

1.19 We help to inspire and involve a future pipeline of skilled and enthusiastic young people by using the excitement of our sciences to encourage wider take-up of STEM subjects in school and future life (science, technology, engineering and mathematics).

1.20 UKRI's strategy, and by extension STFC's strategy sets out long-term, high-level priorities for how we will deliver our vision for an outstanding research and innovation system in the UK that provides everyone with the opportunity to contribute and to benefit, enriching lives locally, nationally and globally. It is underpinned by four principles for change:

- diversity;
- connectivity;
- resilience; and
- engagement

1.21 These principles are fundamental to how we work as an organisation and will help to create the conditions for the UK's research and innovation system to flourish.

1.22 In addition, the strategy outlines six objectives for how UKRI will deliver on its ambitions. Working with government and partners across the sector, to foster world-class people and careers, places, ideas, innovation and impacts, supported by STFC as a world-class organisation.

'A World-Class Place'

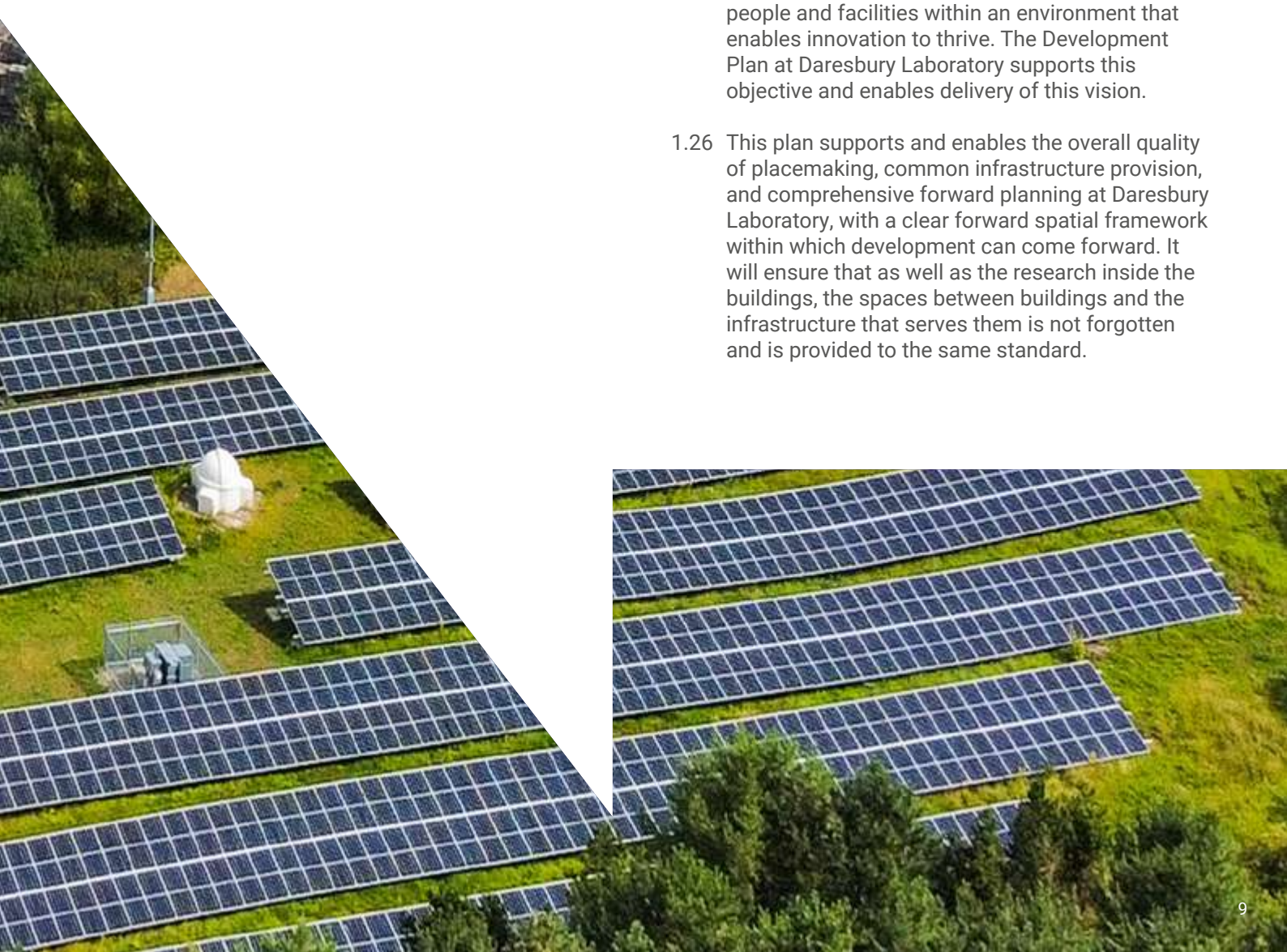
1.23 STFC's vision and ambition, as part of UK Research and Innovation is to take a key role in UKRI's key role in delivering the government's ambitions for the UK as a global leader in research and innovation, and priorities set out in the:

- plan for growth;
- research and development (R&D) roadmap;
- innovation strategy;
- the R&D people and culture strategy;
- integrated review; and
- levelling up white paper

1.24 Innovation is the lifeblood of the UK's future economic growth. It boosts productivity, helps businesses grow and scale and drives the creation of a wide range of high-quality jobs. The future development of Daresbury Laboratory will be a key driver of that economic growth.

1.25 The "World Class Places" objective of UKRI's strategy recognises the vital importance of place within the research ecosystem, bringing together people and facilities within an environment that enables innovation to thrive. The Development Plan at Daresbury Laboratory supports this objective and enables delivery of this vision.

1.26 This plan supports and enables the overall quality of placemaking, common infrastructure provision, and comprehensive forward planning at Daresbury Laboratory, with a clear forward spatial framework within which development can come forward. It will ensure that as well as the research inside the buildings, the spaces between buildings and the infrastructure that serves them is not forgotten and is provided to the same standard.



Development Plan Objectives

1.27 The Development Plan demonstrates the future possibilities for the laboratory, and how it can most effectively manage and develop its estate to ensure world-class science can continue to be undertaken at the site.

1.28 Within this overall aim, the Development Plan will show how Daresbury can change in the future within three key themes:

Science

- ensure Daresbury retains its status as a world-class research facility
- enable expansion of the research done through providing and ensuring space for major new modern facilities
- address the issues that are limiting the site's potential, including legacy costs of the state, inefficiency of building and land use, and lack of space
- provide future-proofed, flexible and modern accommodation for scientific research and business incubation

People

- create an open, collaborative site that is connected to Sci-Tech Daresbury and enables innovative links between public sector research and industry
- make the lab more welcoming with an improved arrival experience
- create a people-focused campus
- create streets and places, that encourage interaction and communication
- ensure buildings and spaces support mental wellbeing and support a social hub for the campus and its workforce
- encourage active life-styles throughout the day, such as walks, recreation and exercise on site

Environment

- prepare the lab for a Net Zero future
- make more efficient use of the existing estate, exploring options to reduce embodied carbon impact of development
- enhance biodiversity across the campus
- minimise environmental and visual impacts

Climate Change

1.29 STFC wish to ensure that Daresbury Laboratory can move to being Net Zero by 2040. The Development Plan will contribute towards this goal by setting out high-level design standards for new buildings that reflect this ambition, by incorporating energy efficiency measures and creating opportunities for sustainable energy generation.

1.30 The Development Plan also provides the basis for new power provision infrastructure on the site to support the new scientific facilities proposed. It is anticipated that such power provision will support a transition to low-carbon energy. The certainty provided by the Development Plan will aid in planning for this transformative new infrastructure.

Methodology

1.31 The Plan was developed over four stages:

1. Baseline – gathering a comprehensive understanding of the site, ambitions, issues, opportunities and detailed technical information.

2. Options Generation – creation of a long-list of building refurbishment, retrofit and rebuilding options for evaluation and high-level feasibility testing

3. Scenario Generation – understanding demand for space under different growth scenarios and sequencing building projects

4. Finalisation – presentation of the Development Plan as an overall composite plan, Design Guide for future design teams working on the site, and an Implementation Plan including sequencing and high-level costs.

1.32 At each stage of the project an on-site workshop was held to review materials and discuss next steps.

Stakeholders & Governance

1.33 The Development Plan has been a collaborative effort between STFC's Estates team and the consultant team of David Lock Associates and Fathom Architects. Options and technical detail have been developed at a series of in-person workshops held at Daresbury Laboratory, and interim calls via Microsoft Teams.

1.34 Scientific department heads were consulted as part of the baseline exercise, to understand their space requirements, forward projections, project pipeline and site amenity vision. Those consulted were:

- Paul Vernon, Executive Director of STFC Business and Innovation
- Stuart Buxton, Regional Head of Estates
- Ian Lazarus, Technology and Nuclear Physics
- John Ginever, Digital Infrastructure
- Kate Royse, Hartree Centre
- Tom Griffin, Scientific Computing
- Jim Clarke, Accelerator Science and Technology Centre (ASTeC)

1.35 Additionally, Head of STFC Security, David Hackett was consulted for technical information regarding the security provision at the site.

1.36 The emerging Development Plan has been reviewed and discussed with the STFC Masterplanning Group on a monthly basis, an informal group of directors who meet to decide on any emerging issues or options within the Development Plan. Members of the Masterplanning Group were:

- Dr Alan Partridge, Executive Director National Labs - Large Scale Facilities
- Dr Neil Geddes, Executive Director National Labs
- Mark Affonso, Finance Director
- Paul Vernon – Executive Director of STFC Business and Innovation
- Liz Kitchener – Head of Estates
- Paul Cross – Head of Capital Development
- Stuart Buxton – Regional Head of Estates

1.37 The emerging Development Plan has been considered and discussed by the Daresbury Strategy Group, and an interim briefing has been made during the process to STFC's Property Board.

Use of the Development Plan

1.38 The Development Plan will be used in a number of ways:

- to inform infrastructure investment decisions, with the knowledge that long-term investments will not compromise future development
- to assist in creating robust business cases, by ensuring all necessary items for funding are clear and well-documented
- to help design teams create proposals for buildings and public realm that contribute to the wider site, creating a place greater than the sum of its parts and reducing piecemeal, disjointed development
- to assist feasibility teams in selecting an appropriate site

Project Conception

1.39 The estates team understand that a science business case must be written by the department to obtain a budget and that the building itself may represent a fraction of the total cost. However, the facility is likely to have a considerable impact on STFC over its lifetime and so the estates input is important.

1.40 Once the project has the support of the relevant director, departments should contact the Head of Capital Development so that they can talk through the estates implications of the idea. This means understanding the implications of the idea on the site, finding suitable plots and locations, identifying any likely impacts on infrastructure and related facilities (transport, catering etc.).

1.41 The aim is to ensure that the project is able to fully account for its impact, and there are no unwelcome additional costs later on. It may be that an early estates cost estimate can be provided too if appropriate.

1.42 If the demand for a facility arises from these conversations, that a paper is written by estates (with the science department) to Property Board, asking for its inclusion on the STFC project pipeline. The project can then only proceed if it has gained STFC approval to be included on this pipeline. Templates will be written for both the report and the pipeline.

1.43 By doing this, there will be a full list of all projects being developed by STFC allowing the full impact, and full opportunities, to be understood and planned for at a strategic level.

Developing a Strategic Brief

1.44 Assuming that the project is supported by STFC's Property Board, and that the department is able to secure funding, then the design process for the facility will start with a feasibility study, which will be undertaken by a consultant team, the size and complexity of which will be determined by the project needs.

1.45 The Head of Major Projects will allocate an estates project manager, and they will write a strategic brief in partnership with the department, who will employ the professional team.

Documents

1.46 The Daresbury Laboratory Development Plan comprises the following main documents, all of which support each other:

- Development Plan (this document), including the Design Guide
- Composite Development Plan / Regulatory Plan
- Plot Passport Guide
- Implementation Guide
- appendices, including technical studies and costing estimates supporting and documenting the content of the main documents

Composite Development Plan

1.47 An overarching map/plan of the whole site, that contains all design parameters in a single place.

Design Guide

1.48 Contained within this overall Development Plan document, this is a comprehensive guide that explains all layers of information in the Composite Plan, with the implications for different areas of the site.

1.49 It provides additional design guidance for future teams putting together proposals, designs and business cases as to what is expected in different places at Daresbury. It sets out the detail behind typologies of open space, street and other public realm, as well as providing a holistic overview of the long-term placemaking ambition, and how each individual development within Daresbury will contribute towards this.

Plot Passports

1.50 Each identified development plot has a brief technical data sheet behind it, specifying:

- dimensions
- future maximum heights and development potential, including indicative massing
- essential enabling works and decanting requirements
- key site construction considerations
- safeguards within the Development Plan for essential infrastructure and facilities

Document Usage

1.51 Typically, the Design Guide should be consulted first, giving an overarching view of the site and its future development. It can assist in selecting an appropriate plot and understanding sequencing scenarios.

1.52 Once a plot or potential plots are selected, the Plot Passports can be consulted as more detailed technical supporting evidence to help design teams establish the key parameters early in the process without needing to redo site analysis or develop strategies as to how a new building can fit into the wider campus.

1.53 A business or feasibility case can take the considerations in the Plot Passports to costing stage, and have a discussion with the Estates team, to determine early on the level of works required as part of a proposal, so they can be costed robustly. This may include (but is not limited to):

- utility diversions and consolidation
- landscape and public realm treatments immediately adjacent to the building
- a contribution towards a wider public realm transformation fund, delivered centrally by Estates
- Biodiversity Net Gain contributions or habitat creation, as required by legislation
- costs for moving existing uses on a plot, and constructing replacement buildings, which may include all of the above costs for that site
- car parking construction if significant numbers of parking spaces are displaced, and contributions towards a sustainable travel implementation fund

1.54 As designs are progressed, the Design Guide should be consulted frequently to understand design principles and responses that are appropriate within and around the chosen plot.

Funding the Public Realm

1.55 The Development Plan identifies a number of potential changes to the space between buildings within Daresbury Laboratory, collectively known as the public realm.

1.56 In the past this aspect of the site has been neglected or considered as an afterthought, with no coherent plan or vision for its design, function and appearance. Now that the Development Plan is in place, there is much greater certainty about the future direction of the site and public realm requirements.

1.57 The Development Plan sets out the overall principles and function of streets, open spaces and other spaces in between buildings. As part of the implementation of the Development Plan, STFC may commission a detailed public realm and landscape plan.

1.58 Within the public realm, there are several areas where different funding approaches may be needed:

- landscape and public realm treatments immediately adjacent to the building: it is likely that these would be funded as part of the business case for the building
- street transformations: due to the need for street changes to be undertaken more comprehensively (at least between junctions) to avoid duplication of works and partial change along a street, these changes are likely to be delivered independently of building projects and funded through a central funding pot.
- major open spaces and public realm that serve more of the site: these changes are likely to be delivered by a central funding pot, as their benefits will be felt by many and costs may not be able to be funded directly from scientific funding cases.

1.59 Centralised funding for major projects could be obtained in a number of ways:

- external/UKRI funding for campus change and transformation
- as part of a major and transformational funding opportunity such as a large-scale scientific facility being funded at Daresbury Laboratory

1.60 Additional work will be undertaken to determine the appropriate funding approach for such projects.

2 Daresbury Laboratory Today

2.1 This chapter sets out a baseline understanding of the site's physical attributes, technical and scientific status, key issues and opportunities, and the wider planning context that might affect development. It forms a picture of the site during the period the Development Plan was being created, Summer/Autumn 2022.

Site Analysis

2.2 This section sets out the current physical situation of the laboratory across a range of themes. A composite plan is shown below.

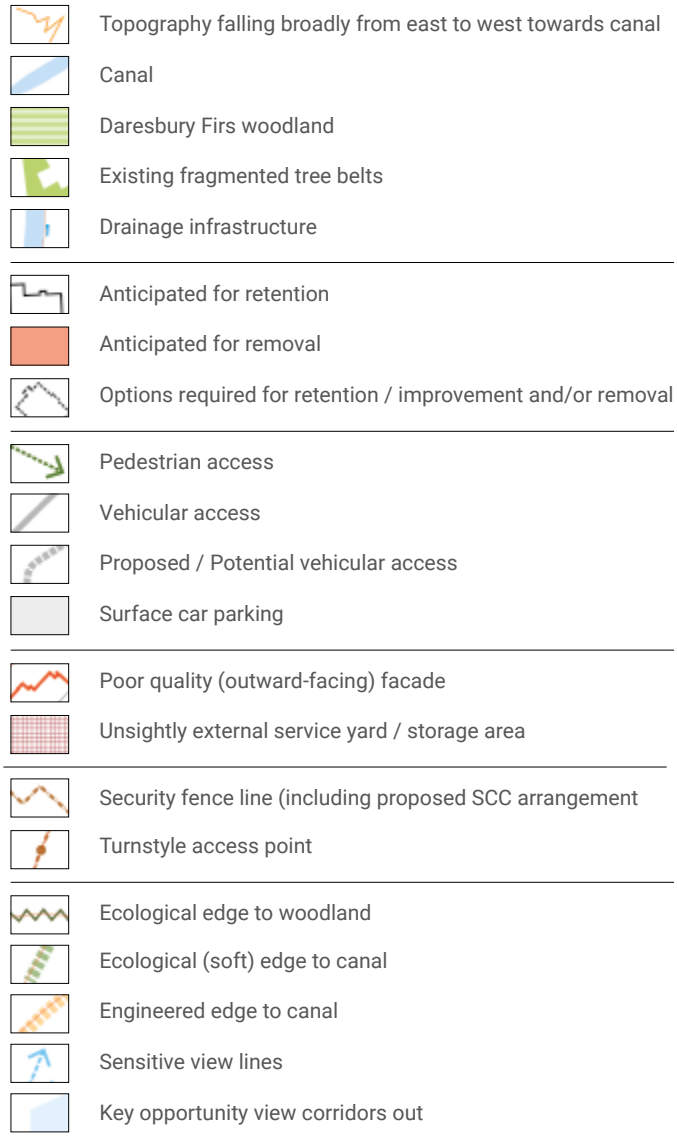


Figure 2
Composite site analysis plan

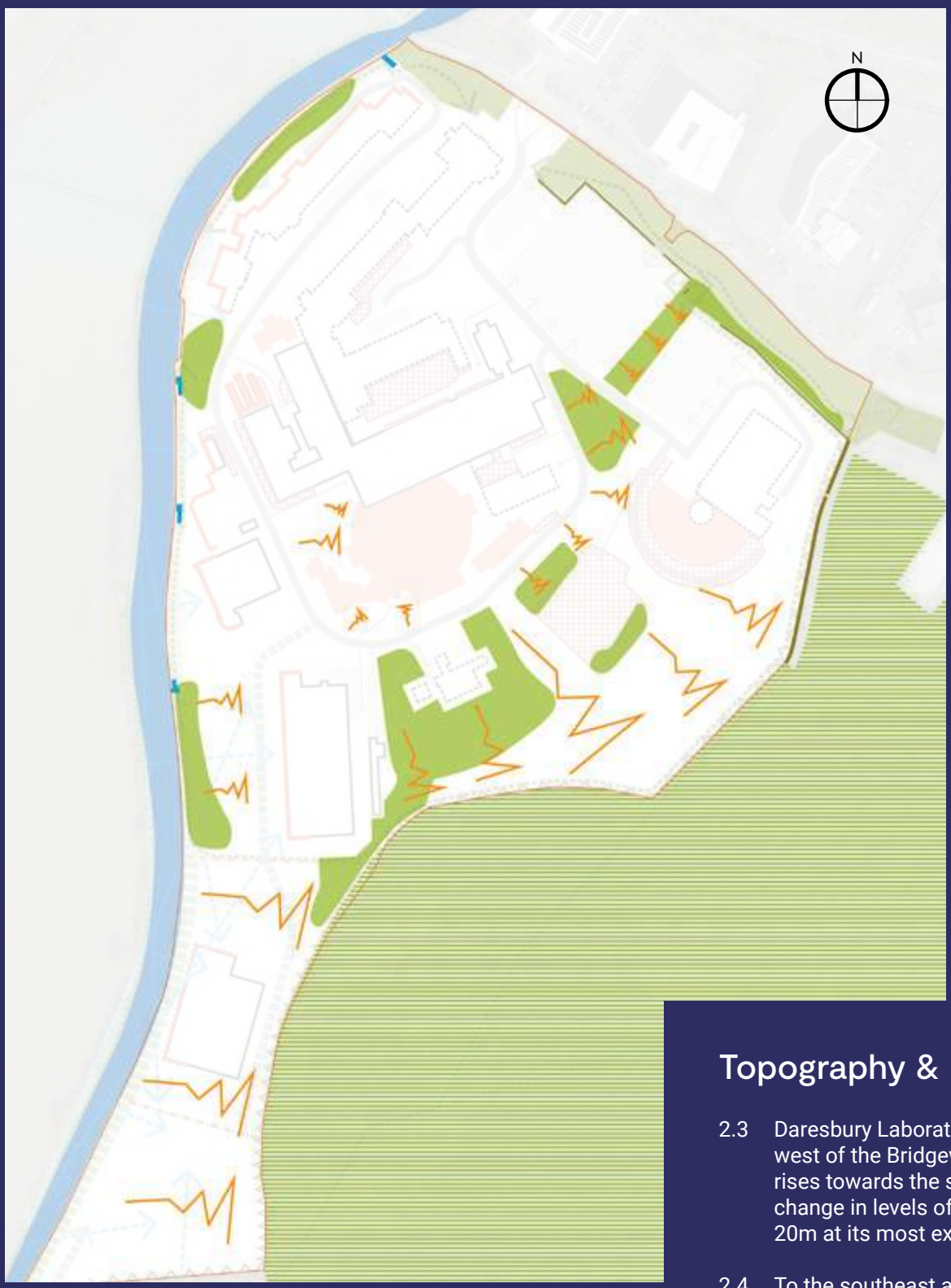


Figure 3
Existing topography and natural features

- Topography falling broadly from east to west towards canal
- Canal
- Daresbury Firs woodland
- Existing fragmented tree belts
- Drainage infrastructure

Topography & Landscape

2.3 Daresbury Laboratory sits to the west of the Bridgewater Canal. It rises towards the southeast, with a change in levels of approximately 20m at its most extreme.

2.4 To the southeast are The Firs, an area of woodland and a local nature reserve. Within the site there are some fragmented tree belts.

2.5 Surface water on the site is channelled by a series of drains that flow into the canal. This requires an annual fee paid to the canal owners, Peel. The most recent development on the site, the Scientific Computing Centre (SCC) manages all surface water within the site using underground attenuation crates.

Figure 4
Views of the site and existing edges

- Ecological edge to woodland
- Ecological (soft) edge to canal
- Engineered edge to canal
- Sensitive view lines
- Key opportunity view corridors out

Views & Sensitive Edges

2.6 When viewed from outside, the site is only visible from the west, southwest and northwest, and these are likely to be the most sensitive. Views from the north and northeast are from within Sci-Tech Daresbury and the built-up environment. Views from the east are blocked by The Firs and topography, although the Tower is visible from all directions and is considered by Halton Borough Council as a local landmark.

2.7 The eastern edge of the site is natural but bordered by a protective fence for security and to prevent casual access from the woodland (by both humans and animals). The canal edge varies from more natural in the south to more engineered in the north.

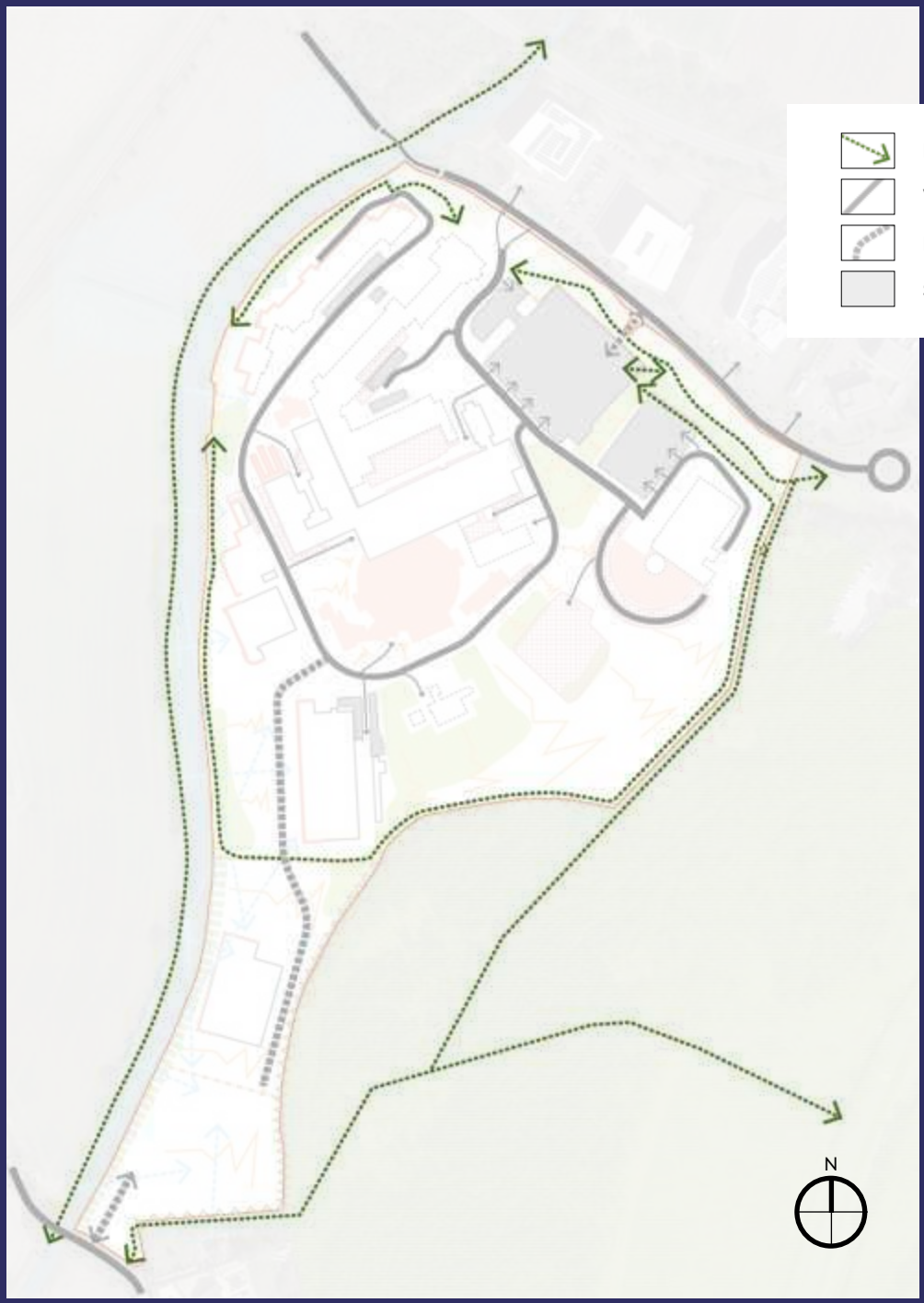


Figure 5
Existing site access, movement and parking

Access, Movement & Parking

2.8 At present there is only a single vehicular access for all staff, visitors and deliveries, with the site being essentially a large cul-de-sac. This can cause blockage issues when a large delivery is occurring within the site. There is an additional access point further east from Keckwick Lane into a surface car park, but this is currently gated and unused.

2.9 All car parking is surface parking, and is concentrated along Keckwick Lane, with only some operational parking near to buildings. Visitors are dropped at the plaza area in front of reception, which functions as a turning circle.

2.10 There are a number of walking routes in and around the site, in particular on both sides of the canal, the linear park along Keckwick Lane, and access to the The Firs from south and north.

2.11 The lab is engaged in creating a new Travel Plan and currently offers some encouragement for staff to arrive via bike or bus, but due to its relatively isolated location and local public transport and active travel provision, a high proportion (>75%) of staff drive to work.

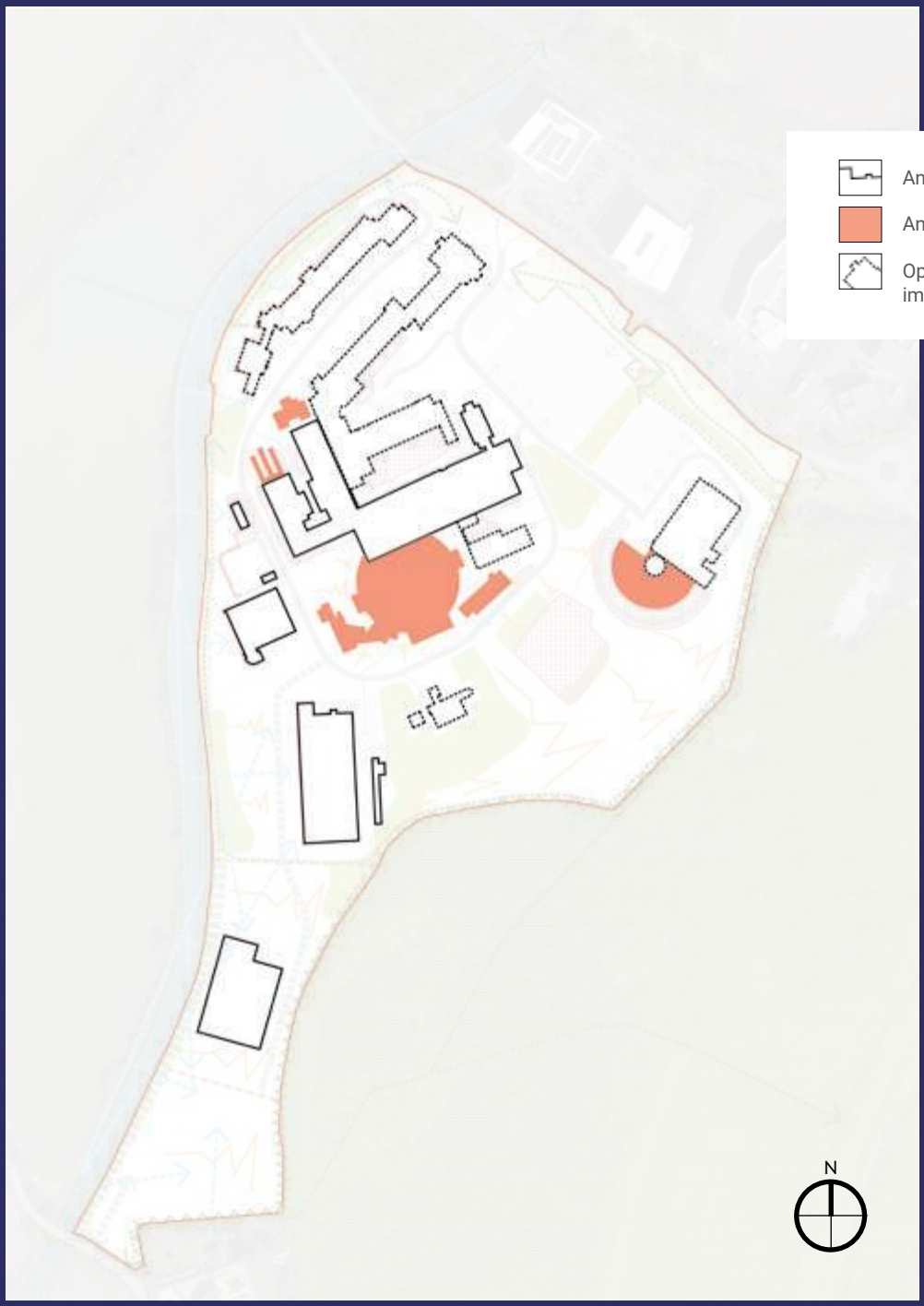


Figure 6
Anticipated building retention and removal

Built Form

2.12 The site has a mix of buildings, many nearing end of life or with significant maintenance issues. Most have been adapted and repurposed from their original uses and are often not completely suitable for modern scientific research purposes.

2.13 Building floor spaces roughly divide into three typologies – offices, lab space and experimental halls.

2.14 Most buildings are considered grade C condition, requiring significant work to bring them up to an acceptably usable standard for modern research. The Inner Hall suffers from water ingress issues and repeated adaptation over the years. The Tower is a highly bespoke building for a particular experiment and has struggled to find an alternative use since the end of the experiment in the late 1980s.

2.15 A full discussion of the assumptions behind potential removal and retention of buildings is set out in the following chapter “Assumptions and Projections”.

Figure 7
Existing assessed building condition (2019)

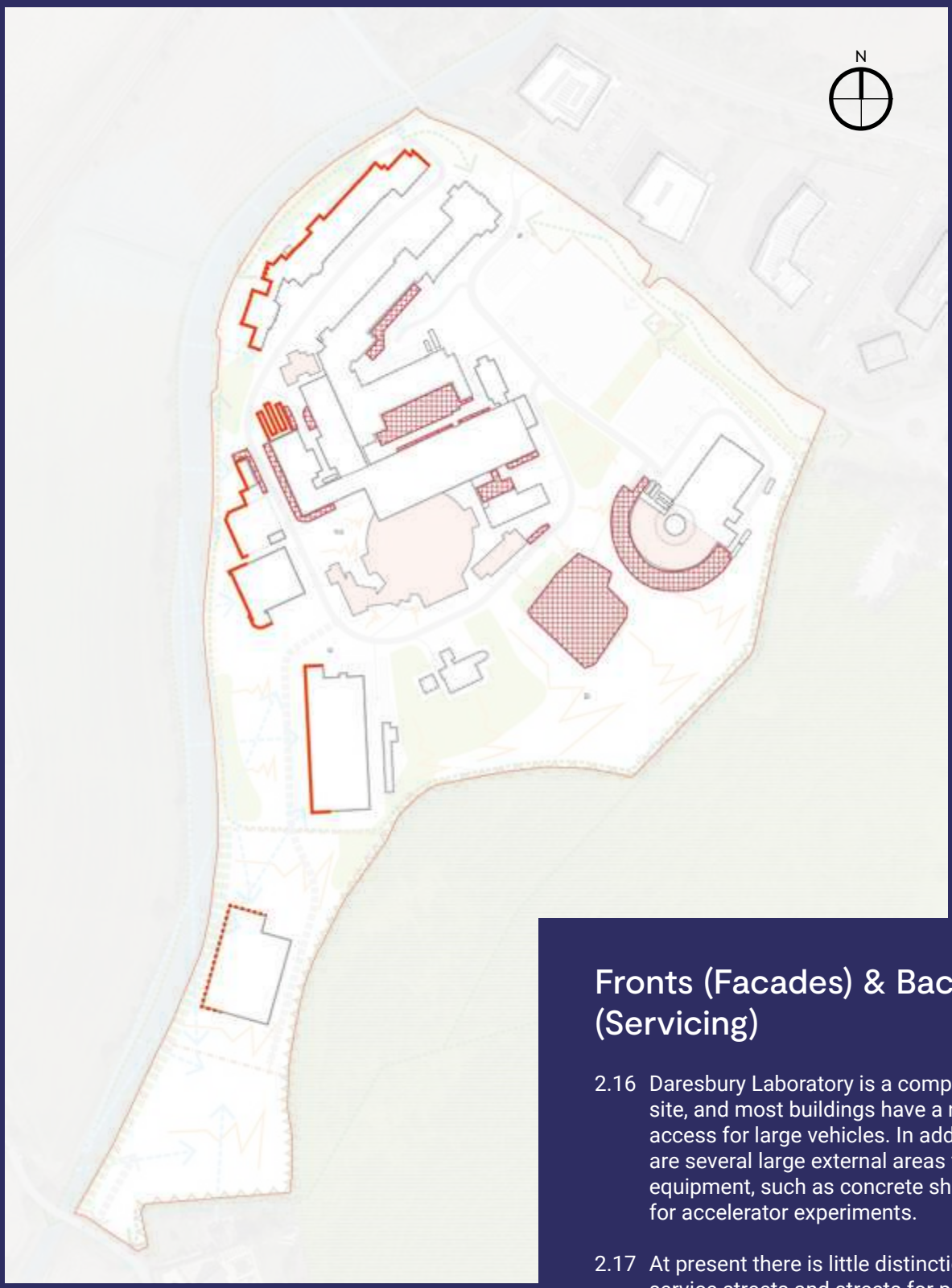


Figure 8
Existing facades and service yards

Poor quality (outward-facing) facade

Unsightly external service yard / storage area

Fronts (Facades) & Backs (Servicing)

2.16 Daresbury Laboratory is a complex operational site, and most buildings have a need for servicing access for large vehicles. In addition, there are several large external areas for storage of equipment, such as concrete shielding blocks for accelerator experiments.

2.17 At present there is little distinction between service streets and streets for people to move around the site, and buildings are not oriented consistently, so that servicing entrances are kept away from front doors.

2.18 The site borders the canal and looks over open countryside (although this land is allocated for development in the HBC Local Development Plan). This façade is mixed, with a substation, blank wall of CTH and the canal side façade of A block. It has a poor relationship with the canal and the aesthetics do not reflect STFC's desired first impression quality.

Figure 9
Existing site security line

Security fence line
(including proposed SCC arrangement)

Turnstyle access point

Security

2.19 The site does not have a complete security fence line, with the area around reception being open, as well as the canal edge. Turnstile access points are present along Keckwick Lane and facing towards Low Wood House.

2.20 The new Super Computing Centre will provide an extension to the secure fence at the southern end of the site, and due to the nature of the work is likely to need this provision into the future.

2.21 Future needs for security provision will be dictated by the business needs and requirements of the site. There is an ambition to increase permeability between the lab and the rest of Sci-Tech Daresbury.

Baseline Position

2.22 In addition to the physical situation of the site, the Development Plan has considered a number of current scientific and estate issues that need to be satisfied for effective future growth at the laboratory.

Electrical Infrastructure

2.23 At present there is sufficient incoming electrical supply capacity for the site, with around 2.5MW used on average, 7MW allocated capacity (secured through an annual payment) and 20MW physical switching capacity. However the provision of a new supercomputing centre requiring an additional 5.6MW will change this situation, and there is the potential for a further 5.6MW expansion in the future. As such incoming supply provision will need to be upgraded.

2.24 The on-site distribution of electrical power lacks enough switching capacity to add significant new load to the internal High Voltage (HV) network. There is no back up power, and there is no site-wide N+1 configuration for dual supplies to transformers in case of failure of supply wiring. In addition, some equipment is reaching end-of-life or is well beyond end-of-life and is being kept alive through increasingly rare spare parts. This has been documented in the Part A Primary Electrical Infrastructure Study (v1.4).

2.25 Key recommendations of the report, taken forward in the Development Plan, are:

- STFC should seek to increase the allocated supply in line with the requirements of existing projects and vitally any new ones the Development Plan will be used to deliver.
- on-site distribution currently limits the site as new construction will not be able to be powered. Options for rectification are:
    - obsolescence, resolving issues with investment on a case by case basis. This will not resolve resilience (N+1 or back up supply) or internal distribution and switching.
    - risk based/resilience approach, as above but swapping old infrastructure and adding in N+1 supplies. However without an increase in switching capacity at the main incoming supply point, this is not feasible as there are no switches to plug in to.
    - comprehensive distribution upgrade – construct downstream HV ring main with substations, replacing old for new and including N+1 supplies. Inclusion of change over units for rental back up generators can be provisioned. At present there is no location for these sub stations to go on the site.

2.26 The Development Plan takes forward the final option, a comprehensive distribution upgrade, as it can be co-ordinated with new access infrastructure (to house the ring main), new building construction (to house new N+1 substations), and enables new development to occur. Spatial provision is included within the plan, and the investment programme should be taken forward as an essential piece of enabling infrastructure.

Other Key Infrastructure

2.27 As well as electrical supply, the site has a number of other emerging infrastructure issues, which if left unresolved are likely to result in a degradation of capability:

- **surface water:** the existing site and highways drain into the Bridgewater Canal through a series of underground drains, with agreement of and payment towards Peel, the owners. The new development at the Super Computing Centre is managing surface water through on-site attenuation crates and infiltration. Future development should aim to reduce the use of the canal for runoff.
- **logistics and goods in:** the existing logistics building is located in the centre of the site and is suffering from failure of the floor. It is unsuitable for modern needs, with a small yard, and due to its location requires all deliveries to enter the site through the single entrance. A new goods in location, located at the edge of the site, would simplify circulation and provide a purpose-built facility suitable for modern needs.
- **security:** at present the site has a fence with 3 sides, and an extension planned for the Super Computing Centre. With the ambition for a more open site, options for changing security provision in terms of the fence and operational points of access should be explored.

2.28 Of these, the most pressing infrastructure issue is the provision of electrical power.

Project Pipeline

2.29 The project pipeline at Daresbury covers projects that are either funded or have a clear route to funding. The baseline position has been set as:

- **Supercomputing Centre (SCC) –** under development to the south of the site
- **Supercomputing Centre Phase 2 –** a potential expansion of the SCC to provide additional compute power. This would take place on land to the south of the SCC. Development of the project may be accelerated due to electrical infrastructure constraints at RAL
- **Ion Therapy Research Facility (ITRF) –** approx. 2,300m2 (GIA) of experimental hall space, at 14m tall, with a similar internal configuration to the Electron Hall
- **CESA Centre of Excellence for Sustainable Accelerators –** approx. 4,300m2 (GIA) of experimental hall space, double or triple height
- **Psi Quantum –** similar in size to M or H block
- **Arts & Humanities Research Centre –** co-funded with Arts & Humanities Research Council to deliver research in conservation science and similar humanities-related subjects

Scientific Needs and Ambitions

2.30 Following engagement with the scientific department heads (outlined in the previous chapter), a number of common themes and requests have emerged that the Development Plan should address and respond to:

- the need for flexible experimental hall space. Daresbury has a number of departments who need large experimental space for short and medium-term experiments, particularly those based around accelerator science and detector technology development. Departments do not require dedicated space, but flexible halls with controlled environments and good crane access, such as the recently-refurbished Electron Hall, are considered ideal. Key characteristics identified are:
  - deep plan for flexibility (35-40m)
  - temperature controlled
  - crane access throughout
  - 15-18m internal height
- flexible smaller lab space is also at a premium, and at a minimum new buildings should offer the ability to change space between office and lab space (e.g. to support laser experiments, electronics labs or other smaller experiments)
- office accommodation is considered poor and needs updating. A mix of spaces may be required, with some cellular offices retained, particularly for computing researchers who need space to concentrate, through to smaller office ‘pods’ (e.g. 8-12 people), all the way up to open-plan offices set out to modern standards
- office amenity spaces, such as meeting rooms, informal breakout spaces and kitchens are also in need of improvement
- finally, site-wide amenity and wellbeing provision was identified as important to retain and improve, as a common space for all to come together

Planning Context

2.31 Halton Borough Council (HBC) is the local planning authority, and also a partner in the Sci-Tech Daresbury joint venture. The site is a key part of the borough's strategy to promote high-skilled employment growth for local residents.

2.32 HBC's Local Plan was adopted on 2 March 2022. It is a unitary authority, responsible for highways and transport as well as planning responsibilities.

2.33 The overall Sci-Tech Daresbury site is allocated as a Strategic Employment Location (SEL1). Surrounding the laboratory, locations E4, E5, E6, E10 and E11 are allocated for employment growth connected to science and innovation. These are set out in policy ED1.

2.34 Policy ED3 "Complementary Services and Facilities within Employment Areas" encourages complementary facilities to be included within employment areas that support the employment land use and benefit employee needs. These may include "catering facilities, small scale convenience retail (up to 280 sqm net), Restaurants and Cafés, and Childcare Facilities".

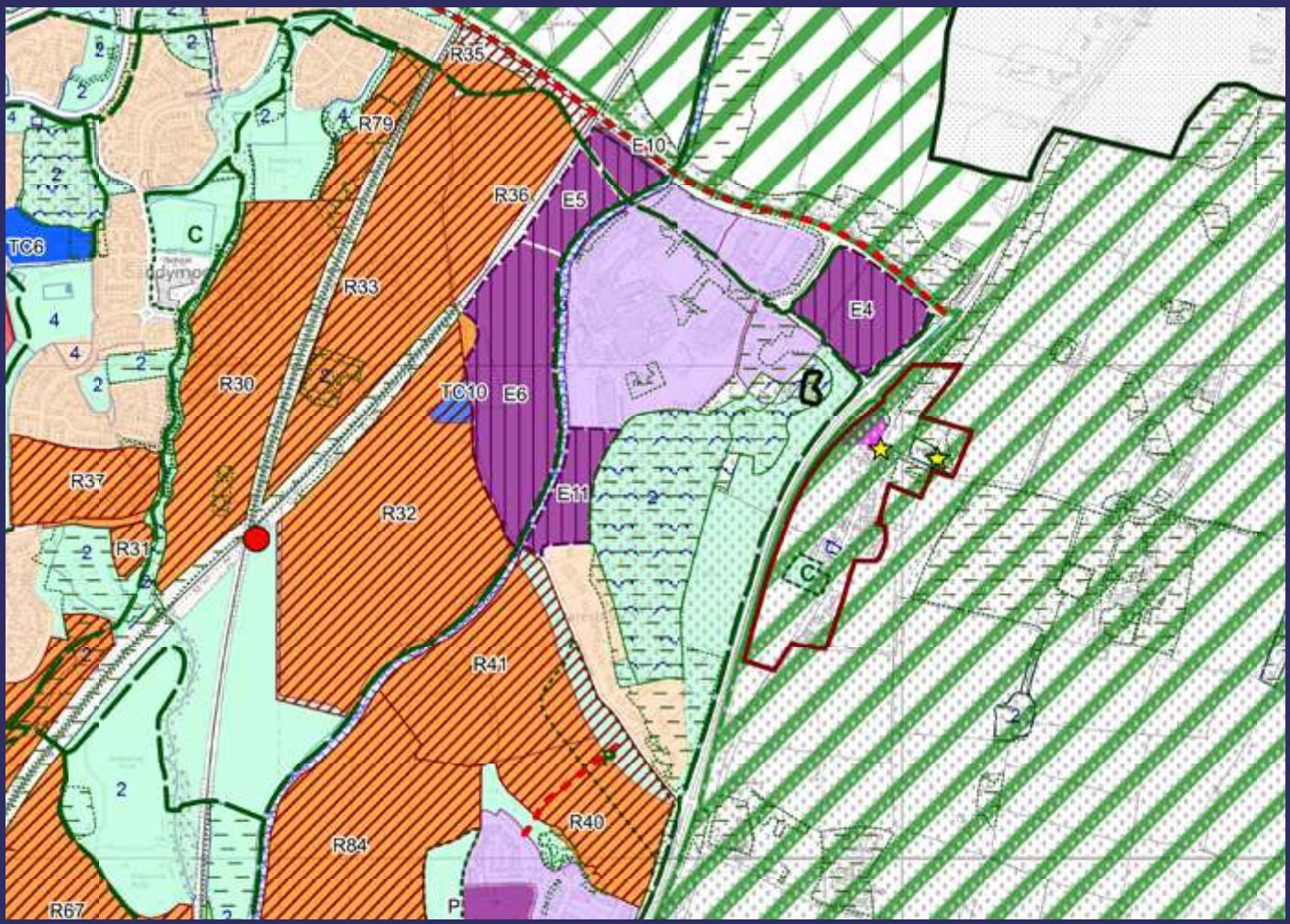


Figure 10
Extract from HBC Local Plan policies map

Engagement and Planning Issues

2.35 As part of the Development Plan process, an engagement session was held with Development Control officers from HBC's planning team, and a member of HBC's Economic Development team to understand key planning issues, and how recent applications at Sci-Tech Daresbury have been handled.

2.36 Key issues identified that will be considered as part of the Development Plan:

- **traffic generation and impact on surrounding roads:** the A558 and junctions along it have been noted as potentially becoming overloaded in the event of significant expansion at the combined site. Further work will need to be undertaken to assess the overall impact and mitigation measures required. Surrounding residential development will also place additional burdens on the road network
- **landscape and visual impact:** The Firs is a recognised local natural landmark and any construction that changed views to it from the valley below could be considered detrimental to the landscape and visual character of the area. Proposals should attempt to minimise encroachment on this view
- **heritage assets on site, specifically the Tower and potentially the Tower building below:** The Tower is a local landmark, but is currently unlisted
- **biodiversity net gain and ecology:** there are significant opportunities for enhancing ecological connections along the canal and with wider networks, including bat movement corridors and connections to The Firs
- **heights:** building heights are treated on a case-by-case basis and are not usually an issue, however the recent Ultra Violet development in allocation E4 required some modifications due to its visibility. It is not anticipated that heights within the laboratory site would cause an issue

2.37 To date, applications for new development at Sci-Tech Daresbury have been treated on a case-by-case basis without reference to a governing framework. STFC and the joint venture are in discussions about a joint framework plan to provide future certainty and simplify future planning applications, as well as co-ordinate growth between the sites to ensure one does not constrain the other.

2.38 Significant development at both sites has the potential to accidentally trigger an Environmental Impact Assessment (EIA) based on cumulative impact. A proactive approach to developing a comprehensive framework plan could pre-empt this and give HBC a clear understanding of future development potential, ecology and placemaking opportunities.

3 Assumptions & Projections

Assumptions

3.1 Daresbury Laboratory is a dynamic and mixed environment that needs flexibility to respond to changing research demands in the future. This section sets out agreed high-level assumptions to ensure the Development Plan can be developed to a level of detail so that it can inform future decisions.

3.2 Should these assumptions change, the implications for the Development Plan should be revisited.

Building Assumptions

3.3 There are three categories of building assumptions: likely removal, likely retention and repair, and a need for developed options.

3.4 Overall assumptions are:

- BREEAM outstanding as a minimum building standard, in line with UKRI and STFC net zero aspiration strategy
- prepare the site for Net Zero carbon by 2040
- The Development Plan excludes the Hartree Centre, which is leased from the Sci-Tech Daresbury JV, but consideration is made for whether this should continue long-term to bring the centre back within the main laboratory site

3.5 Buildings likely to be removed:

- **C Block –** STFC decision on demolition after the removal of computing functions has been approved
- **M Block –** demolish due to poor condition and lack of suitability for current uses
- **H Block –** demolish due to poor condition (temporary cabins) and lack of suitability for current uses
- **Logistics/Goods In –** demolish due to poor condition and lack of suitability for current uses. Location in site is poor for goods in access.

3.6 Buildings likely to be retained:

- **D Block, Plant Room 1, Boiler House and Water Treatment –** retain and repair due to nature of equipment housed
- **CTH**
- **ETC**
- **Electron Hall** – recent refurbishment and high suitability of space to current uses
- **Tower (tower structure only exc. office building and experimental halls) –** condition confirmed by survey to be sound, however repair and maintenance needs to be considered

3.7 Buildings where further options will be explored to maximise site potential:

- **A Block**
- **B Block, Reception**
- **Horizon Centre, Amenity Block –** space is of low quality and unsuitable for wider objectives, and potential to rationalise amenity provision as well as improve site-wide circulation
- **ITAC F/G Block –** potential to rationalise this part of the site
- **ITAC BIO –** potential to rationalise this part of the site with C Block removal, and improve quality of space provided to incubated/early-stage businesses
- **Inner Hall –** poor suitability for current uses, high maintenance upkeep and poor general building condition, potential to rationalise this part of the site
- **SuperSTEM –** potential to rationalise this part of the site and use land more efficiently, and locate a vibration-sensitive use in a more suitable part of the site
- **Plant Room 2 –** potential to rationalise this part of the site and use land more efficiently. Currently used to supply Electron Hall and C Block, so provision would need to be reconfigured if removed
- **Tower (building) –** existing structure will need repair of exterior panels and is underused internally. It is of useful office/lab dimensions and could be expanded or replaced
- **Tower (experimental halls) –** halls are underused at present and are not structural to tower structure, but removal may not liberate land that can be used efficiently

Access & Movement

3.8 Assumptions for access and movement requirements for the Development Plan are:

- overall ambition to improve the arrival experience for visitors, moving towards 'concierge' style approach
- maximum level of parking needed in the future to be based on current modal share patterns and anticipated jobs growth scenarios
- need for replacement Goods In building and location where access can be disentangled from visitor and staff access
- an additional emergency vehicle access is required, and internal circulation improved with redundancy or a loop to prevent deliveries blocking access further into the site
- current bridge over canal will be superseded by a new vehicle bridge to grow Sci-Tech Daresbury to the western side of the canal
- better management of visitor cars, contractors and logistics needed

Utilities and Infrastructure

3.9 Assumptions for utilities, infrastructure and related requirements for the Development Plan are:

- reconsider security line provision to ensure the site is more permeable from Keckwick Lane and Sci-Tech Daresbury
- prepare the site to be Net Zero carbon by 2040
- provide space for a HV ring main and provision of substations within buildings to improve resilience and enable development
- facilitate move away from canal-based surface water management towards SuDS
- need for better space to store shielding concrete blocks should current compound be removed
- need for an estates workshop and estates building for up to 100 staff
- need for covered telehandler storage space within yards

Growth

3.10 Assumptions for growth requirements for the Development Plan are:

- overall ambition to grow to 1000 people in DL, with likely short-term growth to 500+ people
- ambition to host more early-stage incubation of companies before spinning out to wider JV, with key clusters of Health, Digital, Materials/Engineering and a Space Cluster development underway
- Daresbury has potential to be a 'UKRI' facility, hosting joint funding council projects

Amenity

3.11 Assumptions for amenity requirements for the Development Plan are:

- general level of amenity provision is considered acceptable but may need to be modernised
- consideration of provision at RAL as sister site within STFC needs to be made
- potential need for bookable spaces for classes, conferences, leisure provision
- consideration of whether a combined facility could be included in plans
- provision needs to be made for a Skills Factory apprentice meeting space
- provision could be made for a multi-faith room and new mums/nursing room
- although at RAL there is provision of a nursery facility and a hotel for visiting researchers, this supports a much larger site and is not considered viable as a standalone offering at Daresbury. However, should further development occur across the combined STFC and JV sites, the combined catchment may support such facilities, and joint approaches should continue to be considered

Space Demand Projections

3.12 The demand for space on the site is a key assumption in the creation of the Development Plan. At present the estate is considered full, as nearly all available space has an occupant and any additional capacity requirements require decanting and other solutions.

3.13 As set out in the previous section, the scientific pipeline requires a number of new buildings, and growth of jobs (and thus desk space) will place further pressure on space.

3.14 Much of the office accommodation within the laboratory estate is based around cellular offices, either single occupancy or shared by 2-3 people. Office buildings typically date from the 1960s or 1970s and are somewhat outdated internally. Meeting and gathering spaces within office buildings have been identified by department heads as being of poor quality or lacking, and amenity facilities such as kitchen spaces are also poor.

3.15 Growth in jobs will require more desk space, and more space for experiments undertaken by researchers.

3.16 To inform the spatial requirements of the Development Plan, an assessment is needed to determine:

- potential capacity through efficiency savings in the existing estate by bringing office accommodation to modern standards;
- required growth in space for confirmed pipeline projects and near-term needs; and
- long-term space forecasts for different building typologies under different growth scenarios

Office Usage and Potential Efficiency Savings

3.17 As noted above, office space provision on site is mixed and does not match modern standard. To determine if there are any efficiency savings possible, a study was undertaken to compare current office space usage at Daresbury with modern standards on office space provision. Two standards were compared:

- British Council of Offices (2019): industry standard guidance on general office space design, including provision of amenity areas, shared areas and informal breakout spaces. This standard is most applicable to most office areas at Daresbury
- University College London standards (2018 v2): benchmark standards for research environments, particularly laboratory-linked office spaces. This is a useful comparator for some areas of the site

3.18 The study sets out the following basic standards for office re-configuration at Daresbury:

- BCO: 1 desk space per 8m2 NIA, including desk, incidental meeting spaces and basic amenity provision, ranging from 85-100% occupation
- UCL: 1 desk space per 6m2 NIA, but excluding additional meeting spaces and other needs, ranging from 85-100% occupation

3.19 When applying this to blocks A, B and the Tower building, the following efficiencies were found:

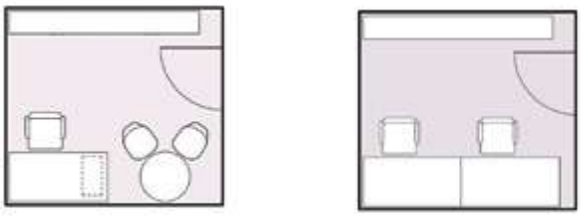
Desk Spaces	Existing	BCO	UCL
A Block	158	198 — 233	191 — 225
B Block	153	131 — 155	162 — 190
Tower Building	63	88 — 103	123 — 105

Table 1
Desk space comparisons existing vs. modern office standards

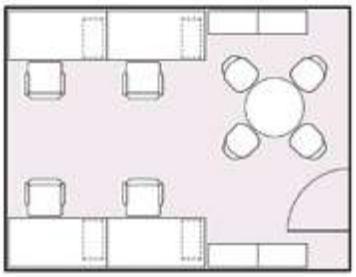
3.20 A number of potential office configurations are set out in the UCL guidance which could be applied successfully at Daresbury Laboratory. These range from cellular offices (where appropriate) through to full open plan configurations.

3.21 The full study on blocks A, B and the Tower building has been included as an appendix to the Development Plan.

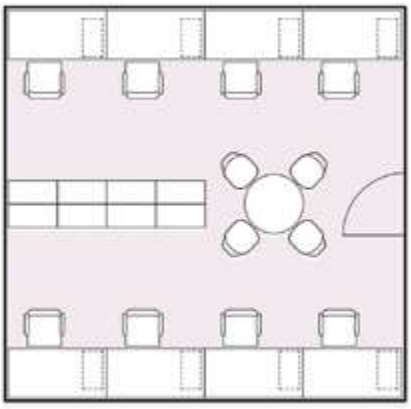
Single or double Occupancy Cellular Office
9–11m²
1–2 people



Shared Cellular Office
4.5–6m²
4 person



Shared Cellular Office
4.5–6m²
8 person



Open Plan Office
4.5–6m²
8 person

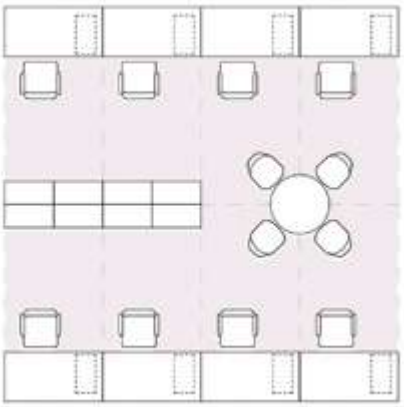


Figure 11
Potential office configuration options

Space Demand Methodology

3.22 To assess at a high level the future space demands at the site, the following methodology has been undertaken:

1. A baseline measurement of current space provision on the site, divided into three typologies: Office, Lab and Hall.

2. A study on modern office and desk space provision standards, as set out by the British Council of Offices, and by University College London, as comparisons. The findings of this have been set out above.

3. Space requirements from the agreed scientific pipeline have been gathered as a base level of provision.

4. A simple model was set up, with the following as parameters to modify the calculations:
   a. number of jobs on site
   b. the percentage of existing office space on site that will be remodelled to modern BCO standards (8m2 NIA = 1 desk space)
   c. the percentage of jobs on the site who need access to experimental space (labs or experimental hall) in addition to office desk space. This is to differentiate between experimental departments such as ASTeC or Technology, and scientific computing departments which require desk space only (apart from bespoke facilities such as the SCC).

5. Growth in space requirements are calculated pro-rata, proportional to jobs growth, with the following modifications:
   a. existing office spaces converted to modern office standards release space for more desks within the existing estate
   b. lab and experimental hall space only grows pro-rata in line with the proportion of jobs on site who need such space
   c. a minimum level of space requirements was set by the known scientific pipeline

6. As reasonable test cases, scenarios were set for:
   a. 600 jobs (minimum growth)
   b. 800 jobs (medium growth)
   c. 1000 jobs (maximum growth)

3.23 The following assumptions were made:

- the site estate is currently full
- there are currently 500 jobs on site
- around 70% of jobs on site are connected to lab or experimental hall space, based on split of departments

3.24 Modelling parameters were set as the following (Table 2).

3.25 This approach allows a high-level site-wide estimate of space requirements at Daresbury into the future. It is not a detailed study of what will be needed, but helps to construct spatial scenarios and space assessments for future growth possibilities.

Parameters	**Today**	**Minimum**	**Medium**	**Maximum**
Jobs on site	500	600	800	1000
% move of existing offices to modern standards (1 per 8m²)		20%	40%	60%
% of jobs who need lab / hall space*	70%	70%	70%	70%

* Set at a constant level to set a reasonable 'high' scenario. Should Daresbury grow as a scientific computing centre it is reasonable to assume this would fall over time.

Table 2
Space demand modelling parameters

Results

3.26 Existing provision and future space demand on the site is set out in Table 3 below:

NIA Floorspace (m², approx.)	Office	Lab	Hall	Total
Existing	6,300	4,600	10,300	21,200
Minimum	6,600	5,500	16,900	29,000
Medium	7,800	7,400	16,900	32,100
Maximum	8,900	9,200	20,500	38,600

Table 3
Existing space provision on site

3.27 Note that the office space demands assume a certain amount of conversion of existing offices to modern standards, as set out in the modelling assumptions table (Table 2). As an example, Figure 12 below shows how this is calculated for the 'minimum' scenario to produce an overall uplift of 300m² space demand.

3.28 These forecasts have been taken forward as a baseline requirement of the Development Plan, and compared against potential space provision schedules in later chapters.

3.29 A full calculations spreadsheet has been developed to aid future planning.

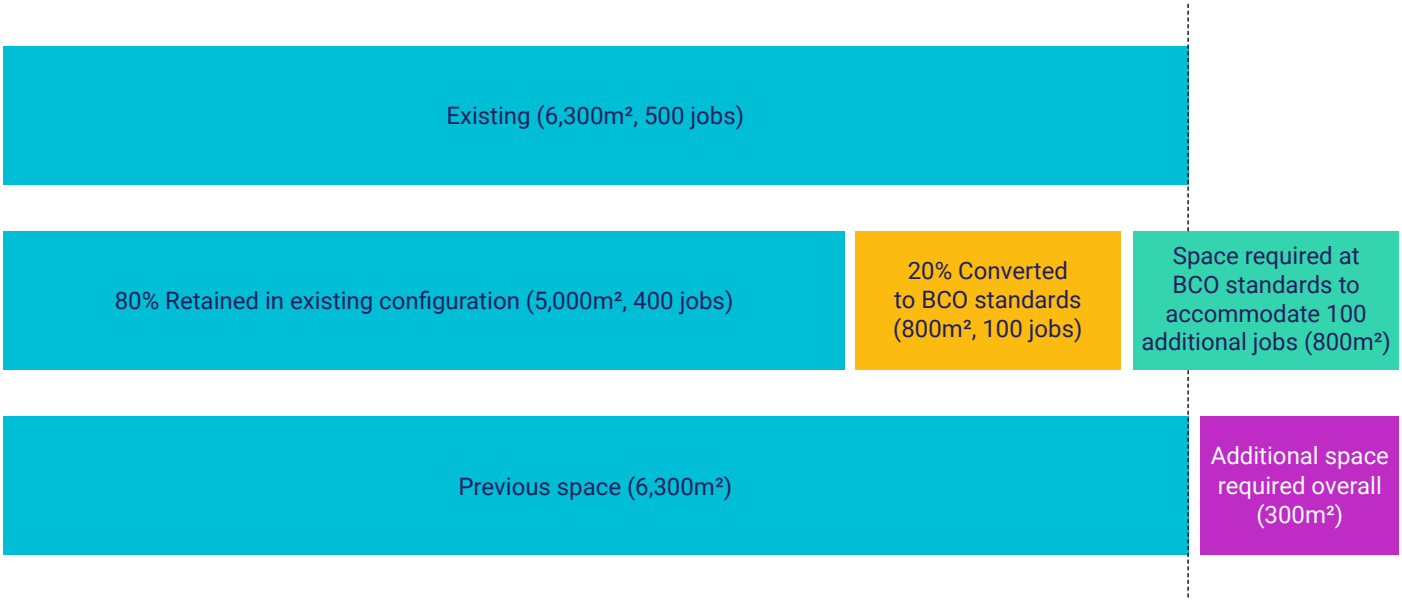


Figure 12
Space demand estimation approach, with conversion of offices to modern standards

4 Development Plan

Vision

4.1 The Development Plan sets out how Daresbury Laboratory could double the number of people working on site, enabling new cutting-edge science and transforming the existing estate to be suitable for the flexible, changing demands of 21st century research.

4.2 The Development Plan illustrates a maximum development scenario. This is to ensure that potential future development needs are safeguarded and interim development does not compromise future possibilities. It does not require the site to be developed to the full maximum scenario, and but retains the option should the requirement for that growth be there.

4.3 How the medium and minimum development scenarios (developed in the previous chapter to understand space demand) could look are illustrated as phasing plans within the accompanying Implementation Plan document.

Figure 13
Indicative massing model of Daresbury Laboratory under 'maximum' development scenario

Key Moves

4.4 To deliver the Development Plan's overall objectives, several essential moves have been identified, which when undertaken together can unlock space and potential at the laboratory.

Removal of the Inner Hall

4.5 The existing hall is in poor condition, leaks and has been repeatedly adapted over the years to the point where the adaptations are preventing further work on the building. It is poorly shaped for the science that is undertaken at the site.

4.6 Removal of the Hall would release a significant amount of land for a new experimental hall similar to the Electron Hall. It would simplify and improve access and yard arrangements for these buildings, and would provide a long-term space for changing experimental needs at Daresbury.

4.7 The Inner Hall is currently hosting a facility building detector components for external research facilities that will run until 2027.

Removal of the existing Visitor Centre / Amenity Block

4.8 The existing Visitor Centre and Amenity Block that links B and C/D block is poorly configured. Although in relatively good condition, it still requires repairs. The small space for gym provision does not provide for the aspirations for quality amenity provision at the site, and is not sufficient for current staff numbers.

4.9 The location of the building also blocks access routes and prevents a circular loop within the site for vehicles.

4.10 Removal would enable a circular access loop within the site, providing alternative routes for deliveries and emergency services in the case that the loop is blocked in the other direction by a large vehicle making a delivery or pickup. This loop will host an HV ring main, and enable the comprehensive upgrade of electrical distribution infrastructure on site. Removal would also enable the creation of a high quality public space at the heart of the campus, and a better link to Keckwick Lane. Finally, it would allow the successful reconfiguration of B and C block to unlock further development capacity.

Car Park Decking and Consolidations

4.11 At present surface car parking takes up a considerable amount of land along Keckwick Lane. This land could be more efficiently used for expanding the laboratory estate, enabling further scientific research.

4.12 Consolidation of the existing surface car parking into a single decked multi-storey building would unlock significant land which already has access infrastructure and is relatively level.

4.13 Two options are available to consolidate car parking – either within the site on the existing lower car park, or off-site in a shared facility with the Sci-Tech Daresbury joint venture across the Bridgewater Canal. This would require construction of a new bridge and the resolution of land ownership issues, but could unlock additional development space within the site which could have mutual benefits for STFC and the JV. Further information on the car parking options is detailed later in this section.

4.14 Consolidation of car parking enables a considerable number of projects by opening up the higher car park to development of a large flexible labs/office building. This would enables relocation of other buildings for improvements and redevelopment by providing 'swing space' for the estate.

4.15 Additionally it releases a site for a more efficient and suitable Goods In/Logistics building, detailed right.

Relocation of Goods In / Logistics

4.16 The current Goods In building is in poor condition with a considerable building repair liability and urgent need for floor repairs. It is poorly configured internally and lacks exterior yard space for incoming and outgoing deliveries. It is located in the centre of the site, requiring all deliveries to enter through the single vehicle entrance, creating additional traffic within the site and congestion at the entrance point at times.

4.17 Relocating the Goods In building to the edge of the site, near an existing but unused access point, would disentangle deliveries from staff and visitor access, and would enable a purpose-built building that can more efficiently handle deliveries and internal logistics.

4.18 Moving the function would also release land near the Inner Hall for a large, purpose-built experimental hall.

4.19 There is also the potential to combine a Goods In building with an office building potentially to provide Estates with a single location, freeing space elsewhere for research use. Further work is needed to determine whether an estates workshop could be housed in this location.

Creation of a primary ‘people’ space

4.20 Daresbury is a highly collaborative research environment, with hundreds of people on site, and is the heart of the wider Sci-Tech Daresbury development. A single space that functions as the social focus of the site is needed to further foster this and bring people together throughout the day. Such a space should have both outdoor and covered areas, should maximise solar aspect for sun throughout the day, should include planting and link to the canalside, and should consolidate as many amenity uses and jobs density around it as possible to ensure day-long vitality and activity. It will support STFC’s cluster strategy for Sci-Tech Daresbury and be an important component in physically bringing people and activity together.

A Consolidated Amenities building incorporating a wider range of functions

4.21 A new ‘heart’ space would benefit from being adjacent to a single building that houses most amenity functions within the site. For site staff, these functions include:

- café
- restaurant
- lounge
- gym
- bookable spaces and rooms
- lecture theatre
- multi-faith room
- nursing room
- visiting researcher space / user facility
- Skills Factory apprentice space

4.22 Additionally, facilities for visitors include:

- visitor centre (education and potentially for the general public)
- conference facilities

4.23 Visitor facilities could be located in the same place to benefit from the overall activity and ‘buzz’, or could be located elsewhere such as near the Tower to create a different type of space within the site.

Overall Plan

4.24 The composite development plan in Figure 14 sets out key regulatory parameters, movement types and land use on the site. It should be read in conjunction with the Design Guide (Chapter 5) for more information about the designations and land use on the site.

4.25 Several areas are identified on the plan for options studies. These are:

- A and B Blocks
- Tower Area

4.26 In addition, there are sections below exploring options for delivery of:

- a Combined Amenity Building
- a Multi-Storey Car Park

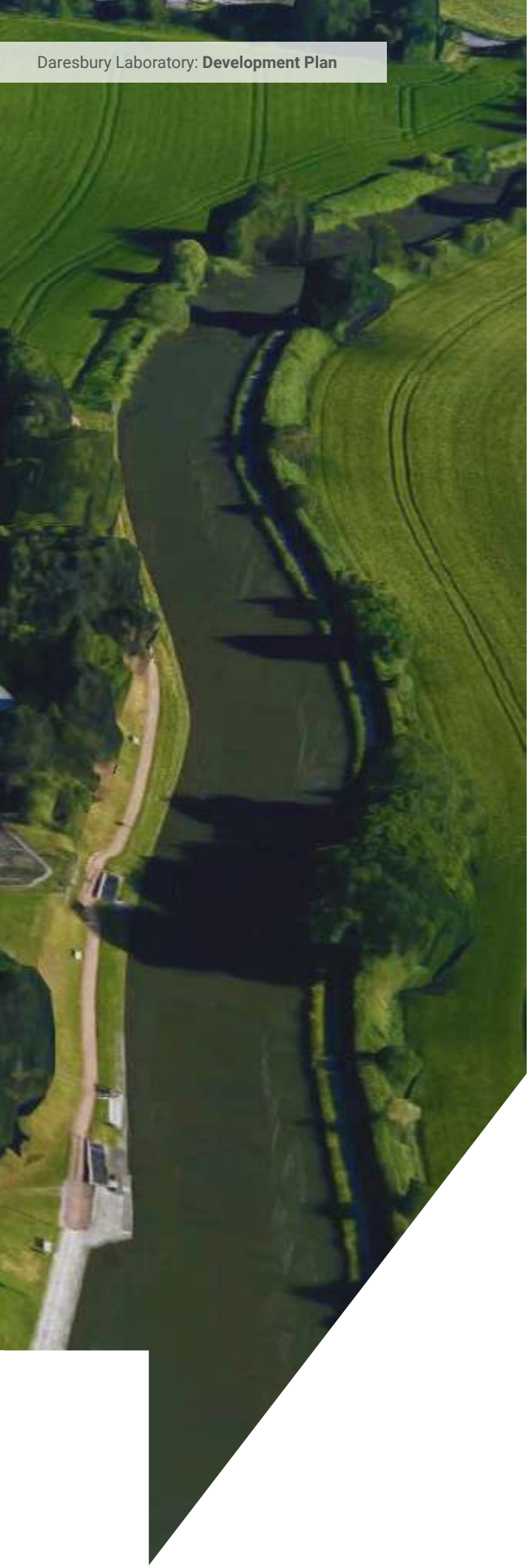
A & B Block Options

4.27 A and B block are the core office accommodation on site, and also host the key amenity functions of café, restaurant, lecture theatre, lounge, amenities block and reception.

4.28 Both buildings have the potential in structural terms to be adapted and extended to provide additional and higher quality internal accommodation. This would have the benefit of retaining significant embodied carbon in the frame and foundations of the building.

4.29 Each of A and B block have had four retrofit and extension options prepared for them and costed. A replacement and new build layout option has also been prepared for comparison.

4.30 A full assessment of the projects across a range of criteria is detailed in chapter 6. A full appendix of design considerations has been included as an appendix to the Development Plan.



Boundaries

- Development plan boundary

Movement

- Public/external vehicle access
- Bus stop
- Pedestrian connections
- Daresbury Avenue
- Multi-modal street
- Service network

Vehicle parking

- Decked car park

Service and logistics

- Goods-in facility

Security

- Security fence
- Main vehicle access point
- Service vehicle access point
- Pedestrian-only access point

Development and built form

- Existing building
- Committed or likely pipeline building
- Development plot
- High aesthetic quality frontage
- Primary development plot building frontage
- Amenity building

Landscape framework

- Biodiversity enhancement opportunities

Public realm

- Primary ‘plaza’
- Secondary ‘plaza’
- Gateway ‘plaza’
- Open space: natural ‘staying’
- Open space: natural ‘transit’
- Service yard

Utilities

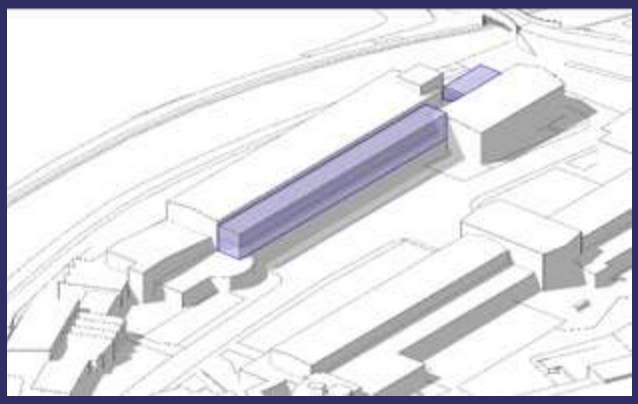
- Indicative HV ring main
- 33kV incoming supply
- Indicative local substation locations
- Potential SuDS provision

Figure 14
Composite Development Plan

A Block – Retrofit Options

4.31 A summary of A Block retrofit and extension options is shown below.

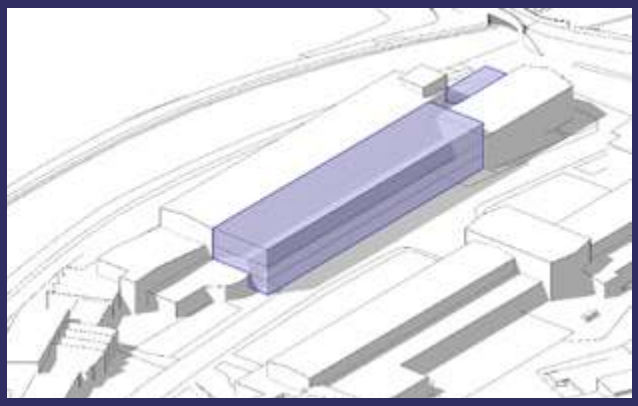
Option 1
Massing:



Extend at first and second floor to align with ground floor below.

Additional NIA (m²): 727

Option 2
Massing:



Extend at first and second floor to align with ground café block.

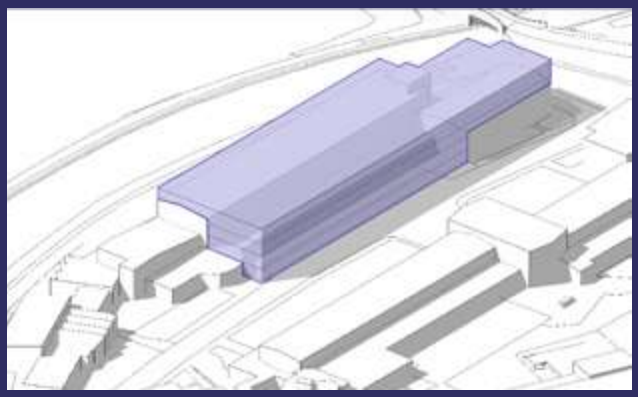
Additional NIA (m²): 2082

Option 3
Massing:

Extend at first and second floor to align with ground café block. Either one or two additional new floors.

Additional NIA (m²): 3413

Option 4
Massing:



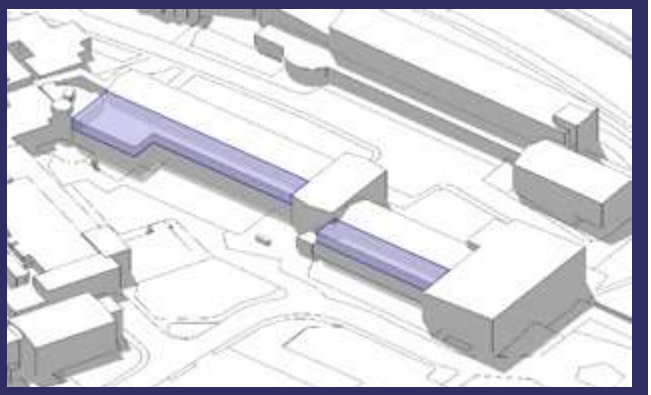
Extend at first and second floor to align with ground café block. Either one or two additional new floors.

Additional NIA (m²): 5701

B Block – Retrofit Options

4.32 A summary of B Block retrofit and extension options is shown below. All options include the demolition of the Amenity Block / Visitor Centre that connects B block to C and D block.

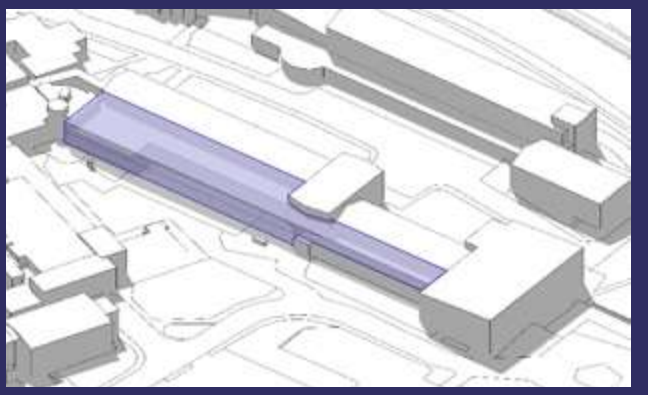
Option 1
Massing:



Extend at first floor to align with ground floor blocks to both wings 01 & 02. Open up central area to create a connection through the building.

Additional NIA (m²): 664

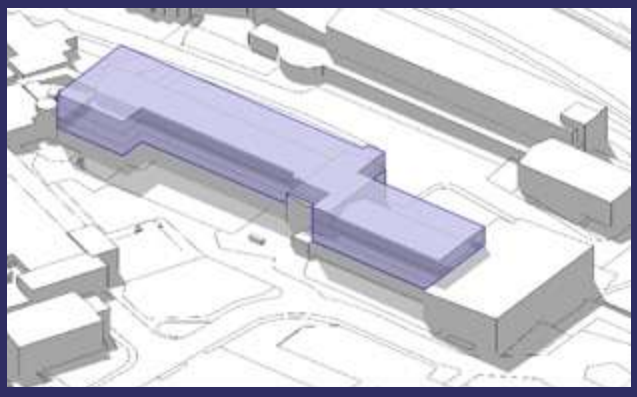
Option 2
Massing:



Extend at first floor to align with ground floor blocks to wing 01. Extend at ground and first floor level to align with wing 02. Open up central area to create a connection through the building.

Additional NIA (m²): 1371

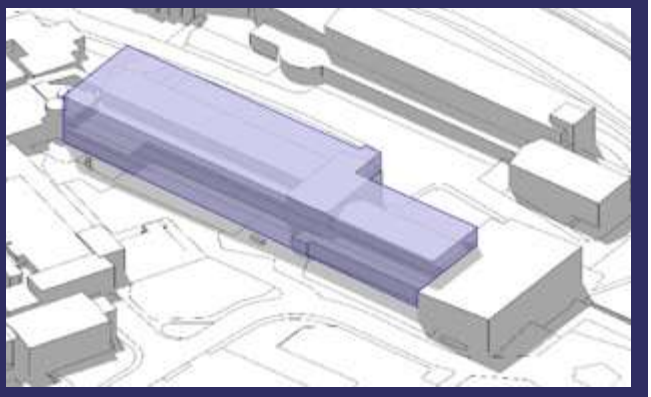
Option 3
Massing:



Extend at first floor to align with ground floor blocks to wing 01. Open up central area to create a connection through the building. Potential new floors above. Option to increase floor to ceiling height at first floor to accommodate labs at this level with office accommodation above.

Additional NIA (m²): 3936

Option 4
Massing:



Extend at first floor to align with ground floor blocks to wing 01. Extend at ground and first floor level to align with wing 02. Open up central area to create a connection through the building. Potential new floors above. Option to increase floor to ceiling height at first floor to accommodate labs at this level with office accommodation above.

Additional NIA (m²): 5371

New Build Comparison

4.33 A potential layout of plots for new flexible office and lab buildings on the site of A and B blocks is set out below. A1, A2 and A3 are independent of B1, B2 and B3, and could be delivered with one block being retained and extended, and the other demolished and replaced.

4.34 Should a new build approach be selected, B block would be the natural first target for replacement. It hosts fewer amenity functions that would need to be relocated, has a marginally higher repair bill (as assessed by the D+K condition report), and its replacement would open additional routes from A block to the rest of the site. Part of B block will already be demolished to enable the internal loop and ring main facility.

4.35 The layout of plots is flexible. Two potential layouts are shown below – one with 2 × larger 36m depth offices (similar to the Hartree Centre configuration), and one with 2 × smaller 36m depth buildings and an 18m depth building (similar to Ultra Violet).

Amenity Building Options

4.36 Closely related and intertwined with the options for A and B Block, a centralised amenity building has been identified as an important project. This is to both replace space lost by the removal of the existing visitor centre and amenities block, and also to complement a new central space.

4.37 As all of the amenity provision at present is contained within A and B block, two options are considered, depending on the approach taken with A and B block:

- retrofit extension of A block
- new build building to complement plots A1, A2, A3

4.38 If it is chosen that Block A will be extended rather than replaced with new build construction, it would be natural to continue this approach to the amenities building and complete this as a single project. Should Block A be replaced, it would support the choice of a new build amenities building, making the most efficient use of the site and maximising the opportunity for new integrated architecture and public realm as a landmark heart of the overall campus.

4.39 Such a facility would be intended to accommodate:

- café
- restaurant
- lounge
- gym
- bookable spaces and rooms
- lecture theatre
- multi-faith room
- nursing room
- visiting researcher space / user facility
- Skills Factory apprentice space

4.40 Additionally, facilities for visitors include:

- visitor centre (education and potentially for the general public)
- conference facilities

4.41 A high-level space estimation for the facility has found that existing space usage: 1700m² NIA / 2100m² GEA. Assuming that the Lecture theatre and Visitor Centre remains the same size as existing, and growth of 1.5x for other facilities, an overall GEA of 3,200m² is required. This has guided the design proposals.

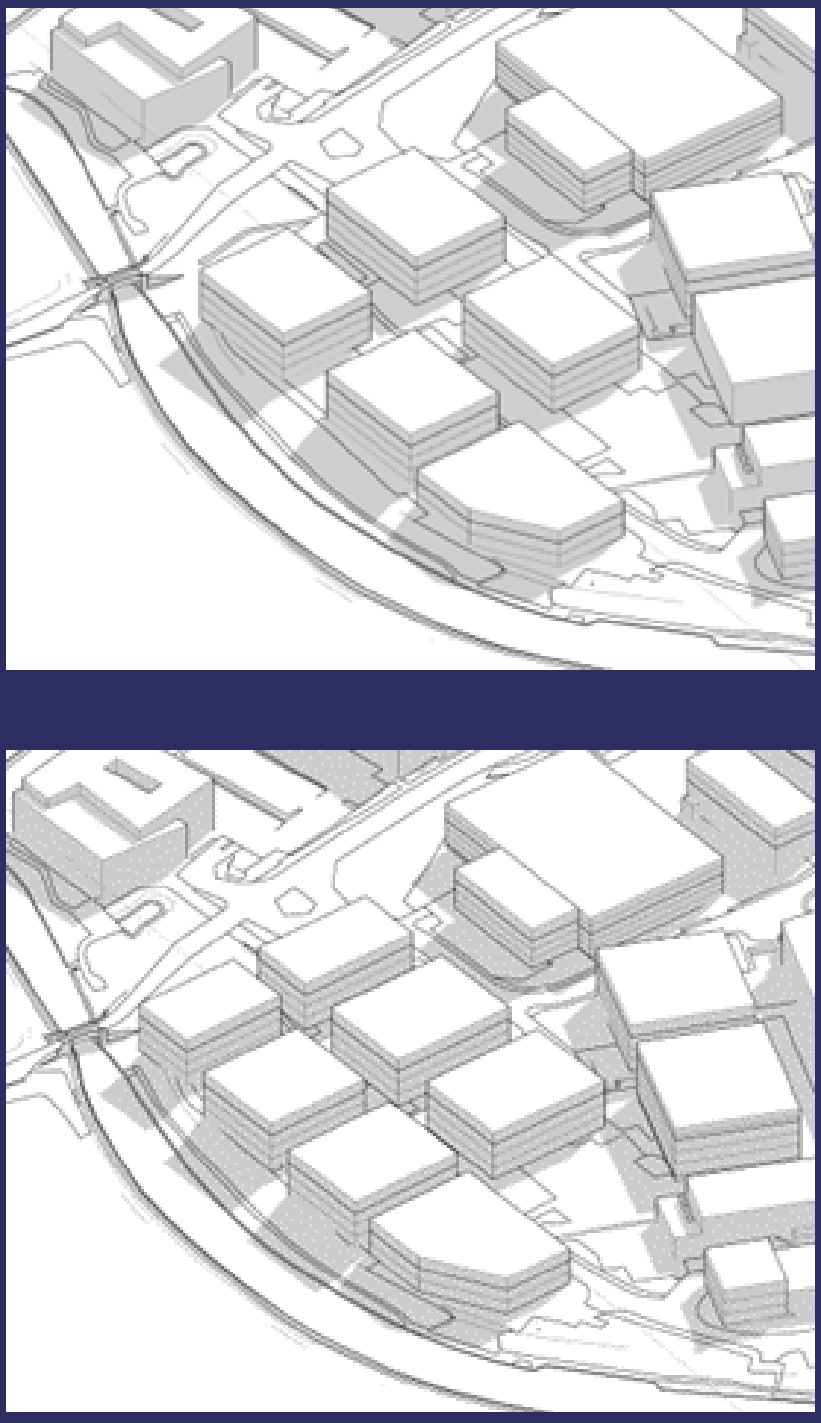


Figure 15
A and B Block indicative plot and massing options

Retrofit Extension

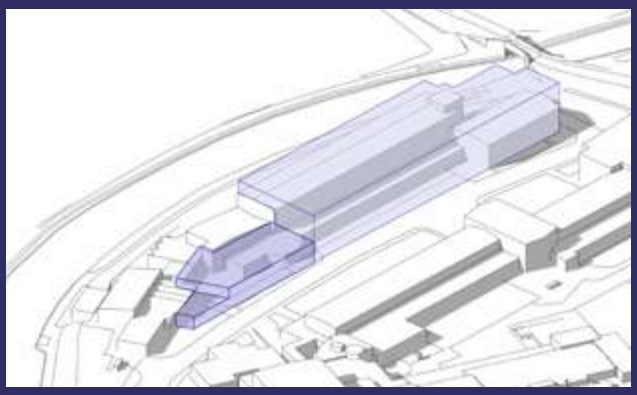
4.42 Five options have been prepared for consideration, varying in scale. Each extends A block and could be undertaken with the retention/extension of A block (as set out above).

Option 1
Massing (shown with A block Option 4):

Extend at ground and first floor to align with adjacent proposal. Small footprint and lowest impact yet lowest additional GIA.

Additional NIA (m²): 792

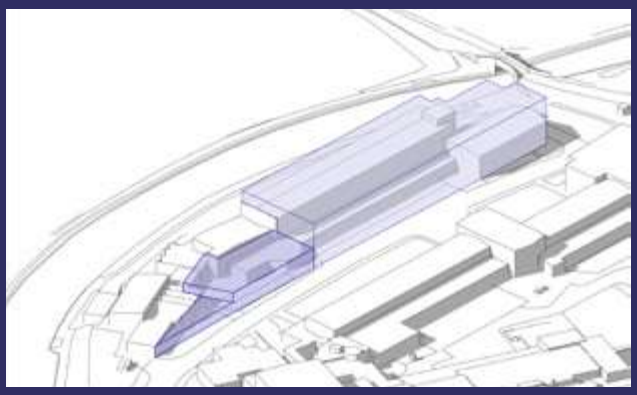
Option 2
Massing:



Extend at ground and first floor to align with adjacent proposal. Additional area aligning with GF Kitchen. Gained area over Option 1 but creates a deeper plan. Creates opportunity for interior facing gym.

Additional NIA (m²): 878

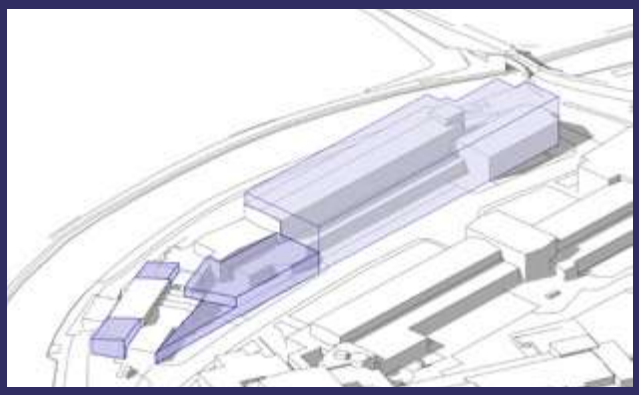
Option 3
Massing:



Extend at ground and first floor to align with adjacent proposal. Ground floor extension spanning existing building width. Creates deeper plan as with Option 2 but with additional opportunity to rehouse WC provision internally for higher quality spaces along the facade.

Additional NIA (m²): 934

Option 4
Massing:



Extend at ground and first floor to align with adjacent proposal. Ground floor extension spanning existing building width. Rear extensions adjacent to existing dining areas. Option to demolish and rebuild existing Dining Area.

Additional NIA (m²): 1089

Option 5
Massing:

Extend at first and second floor to align with adjacent proposal. Second floor would best serve less frequented amenity spaces.

Additional NIA (m²): 1248

New Building

4.43 Should A block be replaced with a new build construction, a new Amenity building could be constructed on the approximate current site of the Lecture theatre, restaurant and lounge. It would be intended to frame the new central public space within the laboratory, and would be integrated with a comprehensive landscape and public realm scheme.

4.44 This location would be an opportunity for a distinctive landmark building to help define the modern and innovative character of the lab. The facility should face onto the central space to the south, maximising sunlight into the building. It should connect the interior to the canal-side green space, and provide a high architectural quality façade towards the canal.

4.45 As an example precedent of what could be possible, a new user facility at the Institut Laue-Langevin in Grenoble, France is shown below.

Figure 16
Indicative location and massing of potential new build amenities building

Figure 17
New user facility at Institut Laue-Langevin, Grenoble (Levitt Bernstein)

Tower Options

4.46 The Tower building consists of three structurally independent parts – the Tower itself, the lower experimental halls, and the office building.

4.47 The Development Plan has considered each of these components separately. The following options have been considered:

- Tower
  - retention and reuse
  - retention and basic repair
  - demolition
- Tower Office Building
  - retrofit extension
  - new build replacement
- Lower Experimental Halls
  - retention and reuse
  - demolition

Tower

4.48 The Tower has been out of use for many years and requires capital spending to bring it up to modern safety standards if it is to be reused. The access to the hall at the top is limited and this prevents its regular use due to fire evacuation regulations.

4.49 A structural survey of the Tower has confirmed it is in excellent structural condition, and apart from internal refurbishment needs (including replacement windows). It is a local landmark although not listed.

4.50 The Development Plan has considered whether the removal of the Tower itself would unlock significant land needed for development of the site. The assessment estimates approximately 6,000m2 of GEA (around 4500m2 NIA) would be possible on the site, if also coupled with removal of the experimental halls.

4.51 However, the Development Plan also identifies that plots elsewhere on the site, including those with fewer constraints, would be able to deliver a potential oversupply of space when compared with anticipated demand, and as such removal of the Tower and Halls is not critically necessary to deliver growth at Daresbury. Adopting a sequential approach to the selection of plots, with ease of delivery as a priority, would suggest that ***retention of the Tower would be the first option.***

4.52 If possible, the Tower should not remain an empty 'folly'. Potential uses include:

- re-use for experiments, e.g. micro-gravity experiments that are currently being explored
- use as part of a visitor centre 'experience', with limited numbers afforded access as part of a tour and with explanatory materials
- more creative re-use, with access issues addressed with the provision of an additional access inside the tower or externally, to create a visitor attraction explaining the heritage of the site and the innovative heritage of the area

Tower Office Building

4.53 The attached office building offers considerable potential for extension and retrofit. An occupancy study undertaken for the Development Plan finds that the building is under-occupied and poorly configured internally. Its dimensions and internal structure indicate it could be successfully refurbished and extended vertically to provide additional, more suitable accommodation.

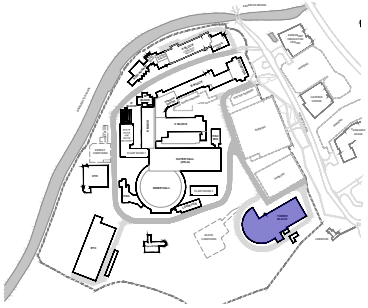
4.54 A vertical retrofit extension option has been prepared, as well as a comparison demolition and new build replacement option.

4.55 The vertical extension option is set out below. This would enable the Tower itself to remain in-situ if desired.

Tower block retained, additional floors

Proposal

- Demolish existing second floor lightweight extension and rebuild two floors of accommodation on top of the existing block



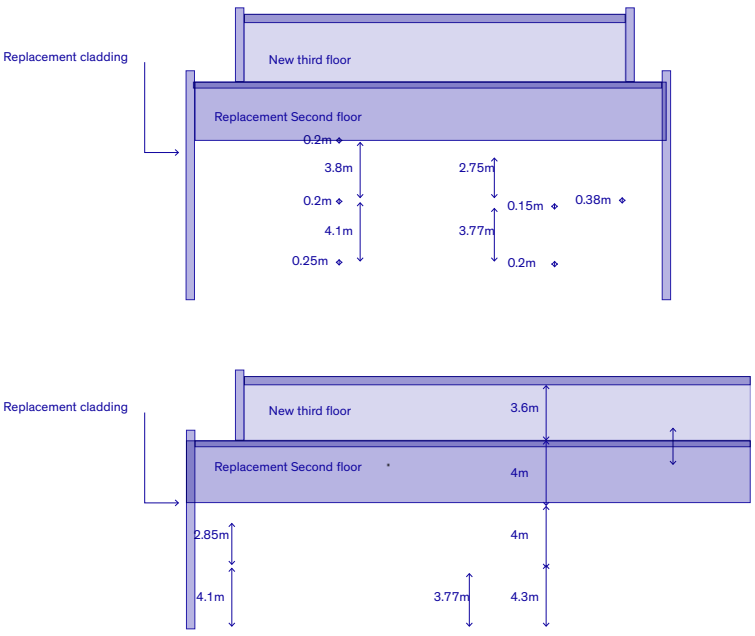


Figure 18
Tower retained with additional floors on the office block

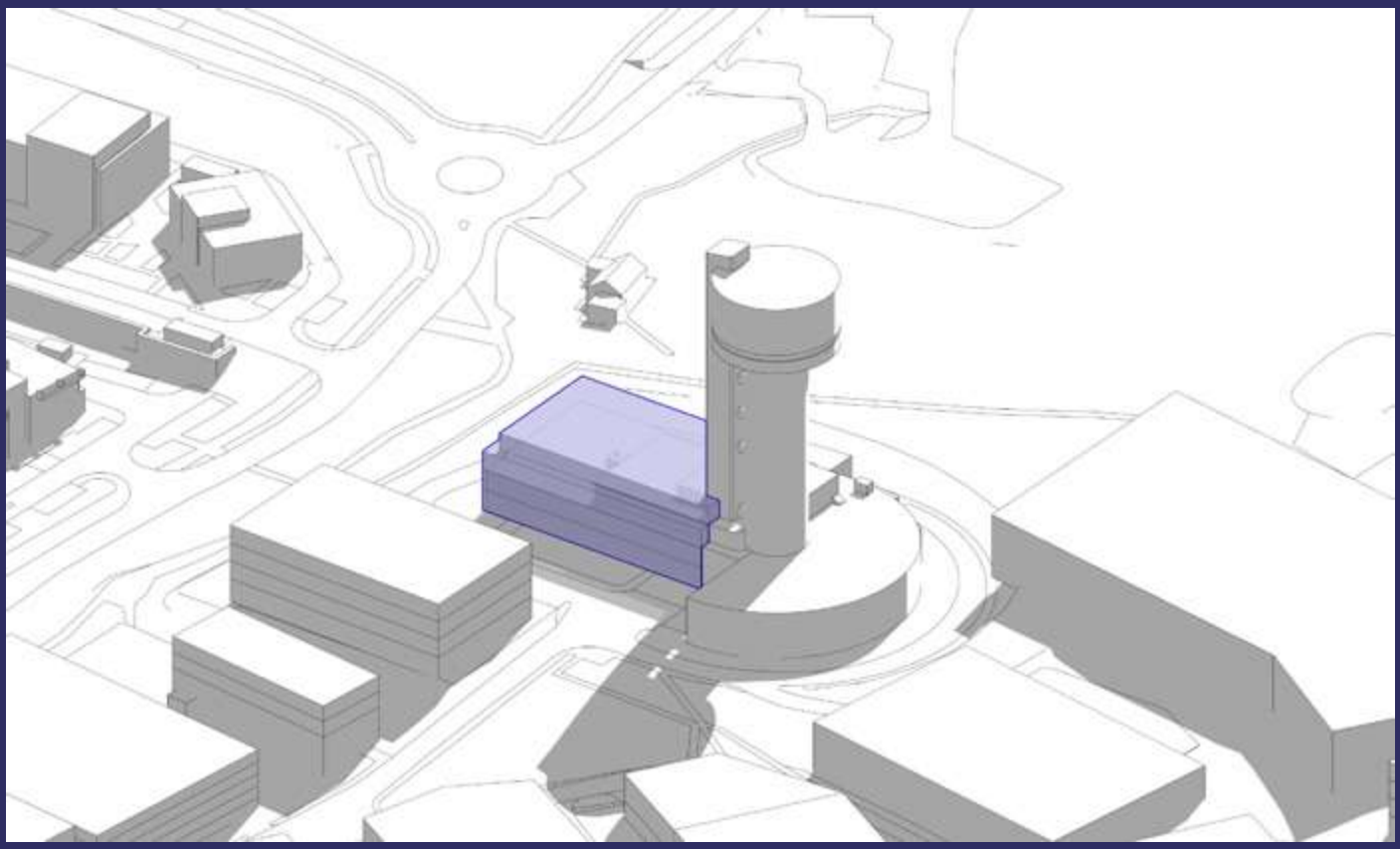


Figure 19
Tower building extension option section and massing

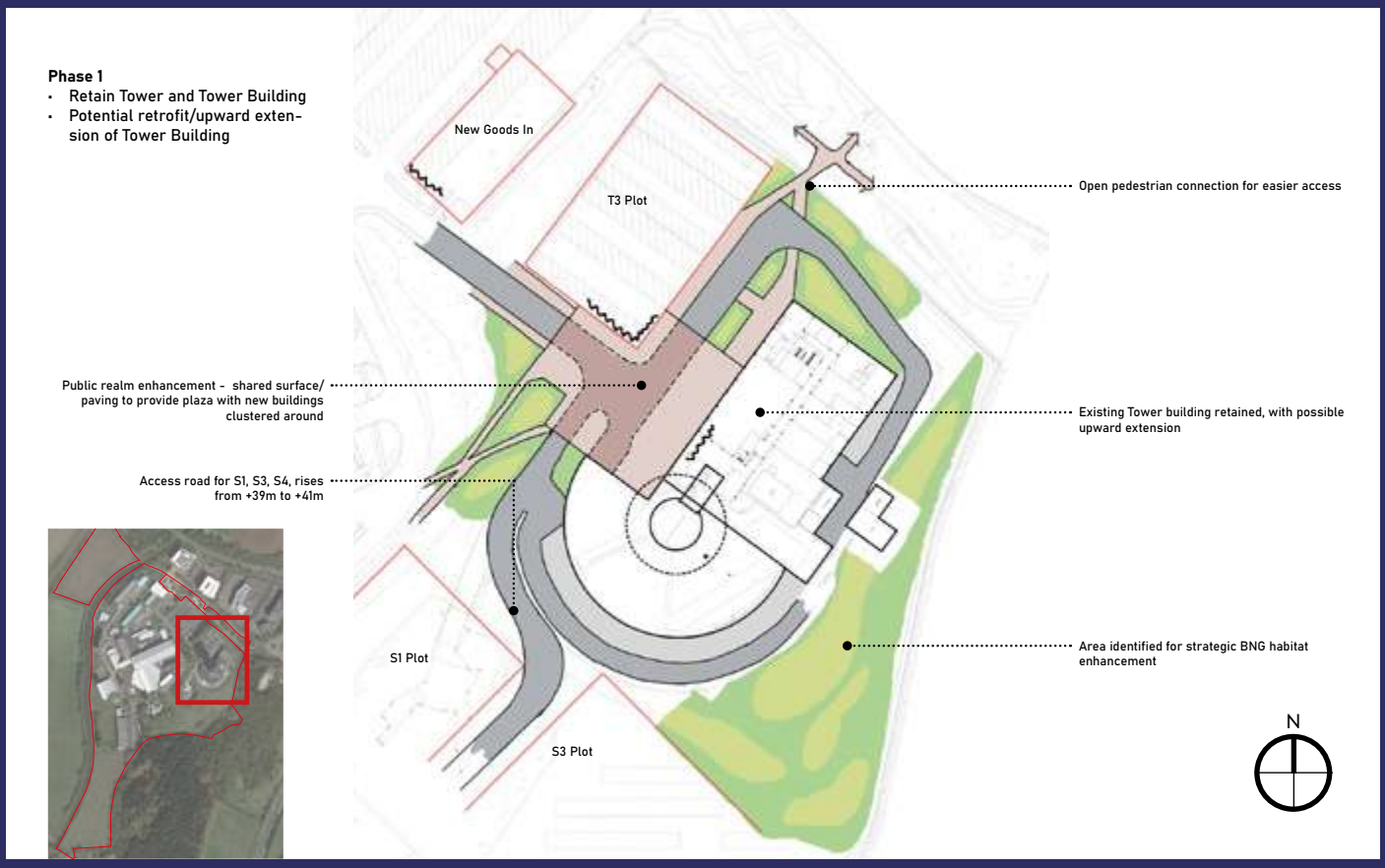


Figure 20
Tower building extension option plan

4.56 Should the office building be removed but the Tower retained (and potentially the experimental halls below), a plot (T1) would be released for development. This is the new build option, as shown below.

4.57 Both options would deliver a similar amount of space:

- new build (T1): 6,000 — 8,000m² GEA (approx. 4,500 — 6000m² NIA)
- retrofit extension: approx. 5,500m² NIA

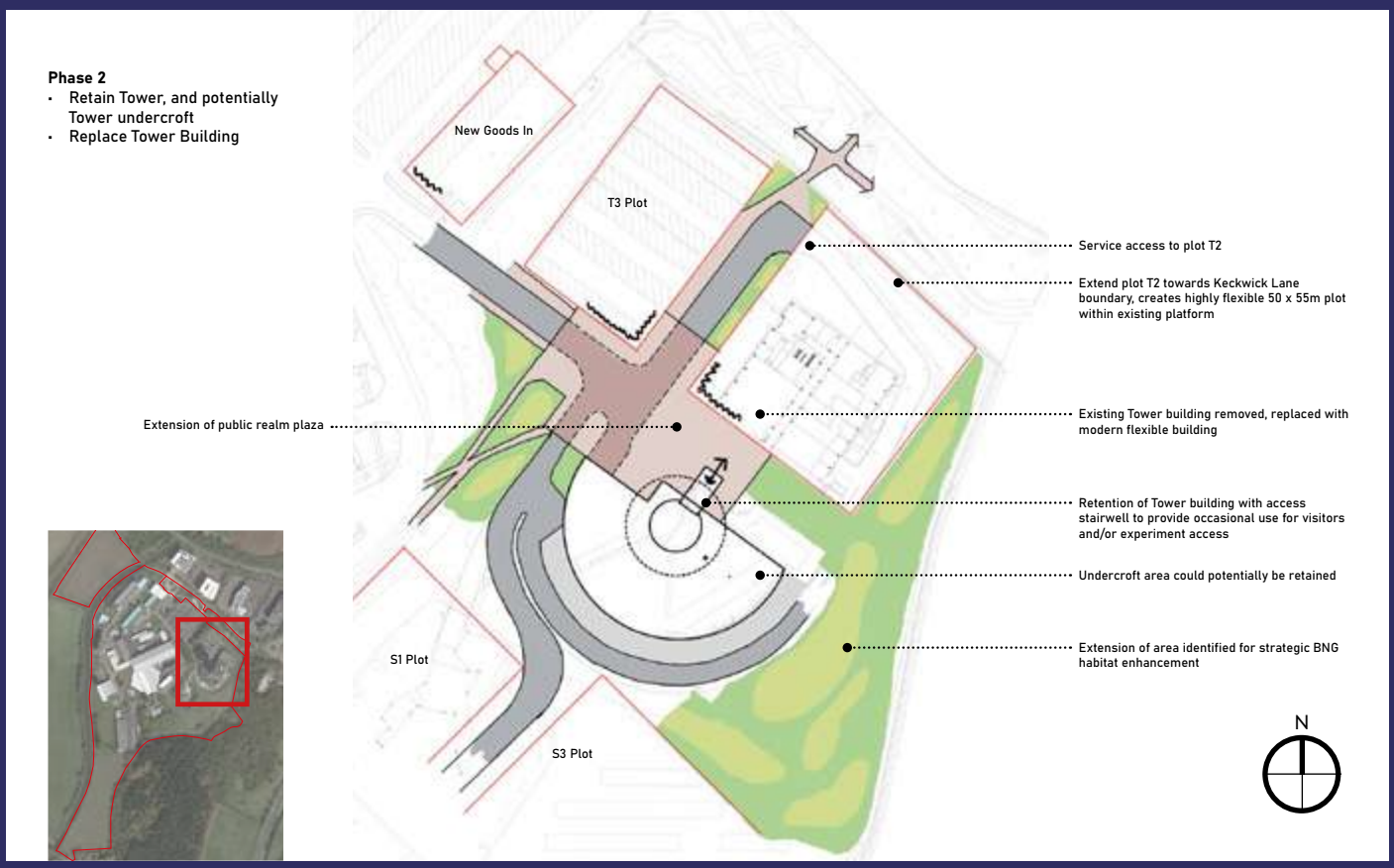


Figure 21
Tower building replacement option plan

Experimental Halls

4.58 The semi-circular experimental halls at the base of the Tower are structurally independent of the tower, and are currently used for a proton therapy experiment and storage. Their shape means they are difficult to use for many applications. However they are accessible.

4.59 The Development Plan has considered the benefits of demolition of the experimental hall, both in the scenarios where the Tower is demolished and where it is retained.

4.60 Should the Tower be retained, there is little benefit to be had by demolishing the experimental halls on their own. The land released would not be enough to successfully site a building adjacent to the Tower, and expanding the plot to the south-west would compromise the efficiency of land use on the slopes.

4.61 Should the Tower be demolished and the halls demolished, a plot (T2) would be released, which could deliver up to 6000m² of potential space, as discussed above in the Tower options section.

4.62 Given the recommendation to retain the Tower, this option is not feasible at present and is not included in the Development Plan.

4.63 Should the experimental halls be retained, a number of options for retention and reuse present themselves:

- continued use as a flexible experimental hall, potentially with some refurbishment
- internal reconfiguration into smaller labs
- refurbishment and reconfiguration for use as a conference centre or as a visitor centre, concentrating those uses near the Tower as the most visible landmark of the site

Figure 22
Tower and experimental hall replacement plot option plan

Car Park Options

4.64 Two potential locations are being considered:

- on-site, located on part of the existing lower surface car park; or
- off-site, in a shared facility with the Sci-Tech Daresbury joint venture across the Bridgewater Canal to the north of Keckwick Lane. This would require construction of a new bridge and the resolution of land ownership issues

On Site

4.65 For certainty of implementation, the Development Plan safeguards the location for a new MSCP within the STFC boundary on the site of the existing lower car park. However, should discussions with the Sci-Tech Daresbury JV prove fruitful, the alternative location would enable additional development within the laboratory site and should not be discounted at this stage.

4.66 A potential 650 car parking spaces is possible on the core site, outlined in solid yellow below. Key dimensions are:

- 48m depth, allowing 3x double rows of car parking spaces
- 5 decks of parking, at 2.7m height, to match the height of buildings across Keckwick Lane taking into account the change in ground level (see Figure 24 overleaf)

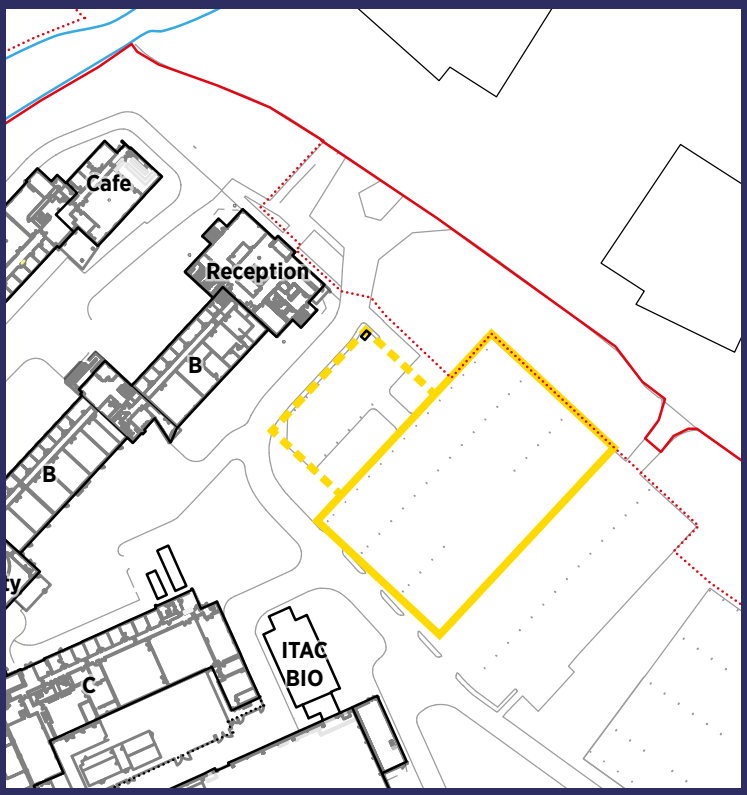


Figure 23
Potential site for decked car park

Figure 24
Potential decked car park height

4.67 In addition, should the car park be extended above the existing visitors car park (as shown in Figure 23 with a dotted yellow line), an additional 150 spaces could be accommodated, bringing the total to 800. This would retain the ground floor for a Reception building with an active street frontage.

4.68 It is anticipated that visitor parking would be integrated within the decked car park, at ground level, with an internal security pass point to allow staff and those with authorisation to proceed to upper levels.

4.69 A high quality façade or screening would need to be provided facing Keckwick Lane to ensure the place quality of the street is retained.

Off-Site

4.70 Land located to the north of the laboratory, across the Bridgewater Canal, to the north Keckwick Lane and south of the A558, is currently mooted as a potential location for a combined MSCP for the entire Sci-Tech Daresbury site, including the laboratory.

4.71 Should this occur, this would release the land within the laboratory currently mooted for decked car parking to deliver additional development capacity. A plot of 48 × 65m would be released, with a potential development capacity of 7,000m² (assuming 3 storeys of 4m height each) covering the majority of the plot. However, it is likely that the plot would accommodate two smaller buildings, with an overall capacity of 3,800m² (36m depth) and 1900m² (18m depth), overall 5,700m².

4.72 Should visitor parking need to be retained within the lab, capacity is likely to be reduced to accommodate it within this part of the site.

5 Design Guide

The composite Development Plan sets out all the design parameters and spatial information governing future development at Daresbury Laboratory. All new buildings, infrastructure and public realm proposals are expected to reference it and respond to it.

The composite plan is made up of a series of layers of information, each setting the design rules for a different aspect of the site (e.g. street types, open space types, plot frontages). This Design Guide explains each layer in turn, along with additional supporting information, to ensure new proposals can fit in with the wider Development Plan and contribute towards a cohesive, successful future site.

This illustrative visualisation is a vision for how Daresbury Laboratory's future could be delivered in line with the Design Guide. It brings together public realm, movement, built form and new amenities to create a high quality heart of the campus, reflecting UKRI's ambitions for world-class places at the centre of the UK's research strategy.

Access & Movement

Street Types

5.1 Street types at Daresbury are arranged as a hierarchy, based on their importance for pedestrian movement and placemaking. Pedestrian movement is prioritised at the top of the hierarchy, and vehicle and service movements are more prominent lower down.

5.2 General vehicle movement (private cars) are restricted from moving into the site, and are in general 'captured' by the car parks adjoining Keckwick Lane. In the future this will remain the case and internal vehicle movements will reduce even further with the consolidation of car parking into a single location. As such streets can be designed for minimal vehicle traffic, only needed by internal operational vehicles.

5.3 At the top of the hierarchy, Daresbury Avenue connects the main entrance plaza to the central space which hosts the amenity building. Multi-modal streets are important movement corridors shared by most modes on site. At the bottom of the hierarchy are service roads, providing essential access to facilities but not considered core placemaking or pedestrian movement opportunities.

5.4 The street types are templates, with key design principles and essential parts of the street section defined, along with the types of users who need to be accommodated. Design responses, particularly on the existing site, may vary depending on immediate context.

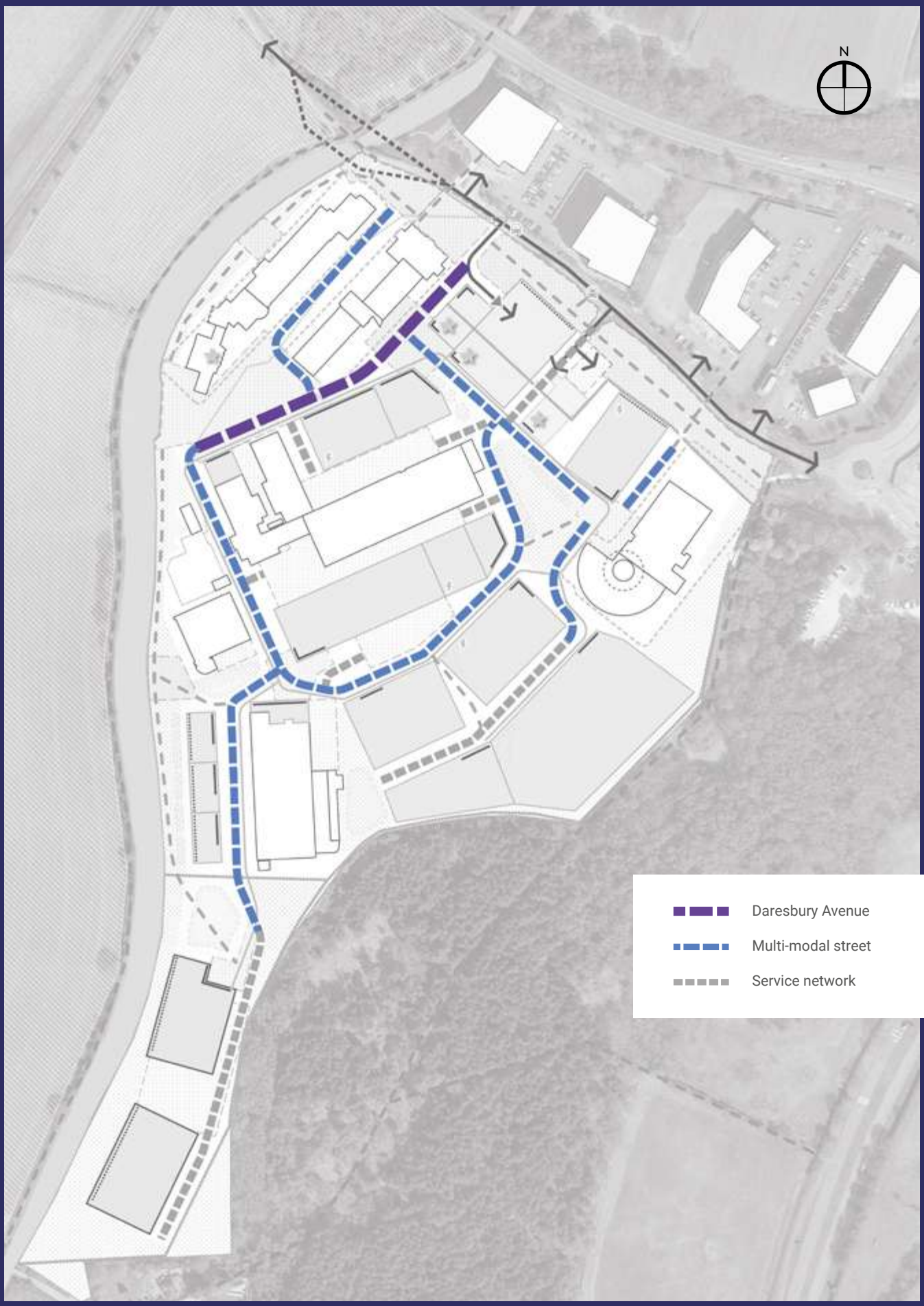


Figure 25
Street types

Street Type: Daresbury Avenue

Vision

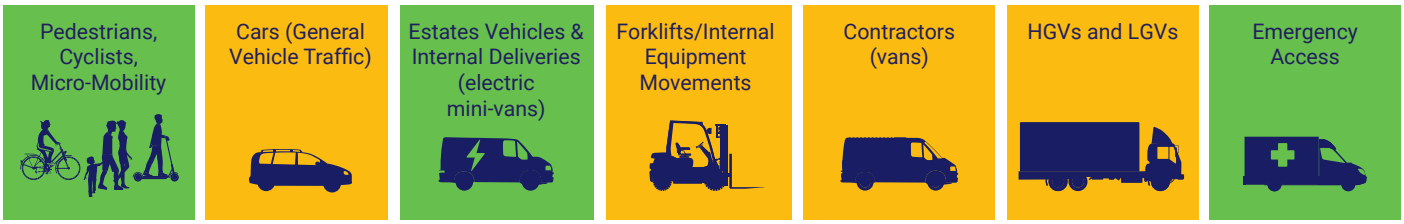
This is an important structuring street of Daresbury Laboratory, connecting the main entrance through to the 'heart' public space and the canal side. It will be a defining impression of the site for visitors and staff alike, and offers an opportunity for a high standard of placemaking.

Primarily Daresbury Avenue will be a formally laid out street, with occasional vehicle movements, and surface materials that make clear this is a pedestrian priority space. Buildings will face their front doors and high quality facades onto it. The design of the street will encourage visitors and staff to walk along it to arrive at the main public space at the heart of the site.

Design Parameters

- provision of wide, continuous footways along the Avenue
- carriageways surfaced with materials that integrate them with the pedestrian priority public realm, with kerbing to mark where occasional vehicle movements go
- regular secure and overlooked cycle parking near building entrances
- integration of green infrastructure within street layout section as a placemaking area, to provide seating, meeting spaces, and relaxation and collaboration opportunities, as well as biodiversity net gain areas and new habitat opportunities
- use of the green infrastructure area to provide initial surface water management, slowing flow of water into wider drainage infrastructure or strategic SuDS
- continuous shared surfaces or raised tables at intersections to allow for free movement of pedestrians and cycles / micro-mobility
- a level of lighting to ensure 24-hour pedestrian safety but mindful of reducing light pollution
- lower-height lighting and lighting integrated within street furniture for footways and pedestrian-priority areas, with taller lighting columns only to provide lighting coverage for carriageways

Modes



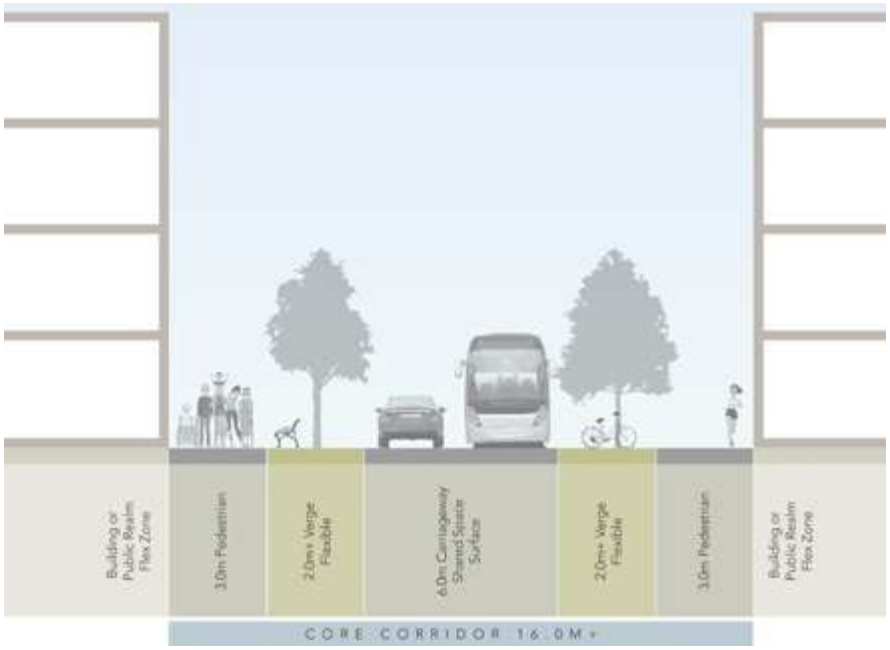


Figure 26
Daresbury Avenue Section

Street Type: Multi-Modal

Vision

These are general-purpose streets that can accommodate most transport modes within Daresbury Laboratory. As well as providing vehicle and service access, these streets provide a high-quality environment for pedestrians and incorporate green infrastructure opportunities for biodiversity, surface water management and improvements to quality of place.

Design Parameters

- straight carriageways and footways, with carriageway deviations only where traffic calming is necessary when crossing main pedestrian routes
- where variation in widths is needed, verges and Green Infrastructure should be varied
- verges on new multi-modal streets planted with native street trees, with a more formal arrangement closer to the north-west of the site (Daresbury Avenue and the 'heart' space), and a more naturalistic planting pattern further to the south and closer to the woodland edge
- a shared footway/cycleway provided on both sides of the street
- where possible, verges should contain wildflower planting with mown edges
- cycle parking, seating, wayfinding features and other flexible uses of space should be incorporated within the green infrastructure areas, leaving the footway free and continuous
- accessible ducting of sufficient size to incorporate a wide range of utilities, including data, power, gas, water and other services. Ducting should be incorporated under the footway and away from green infrastructure
- a level of lighting to ensure 24-hour pedestrian safety

Modes

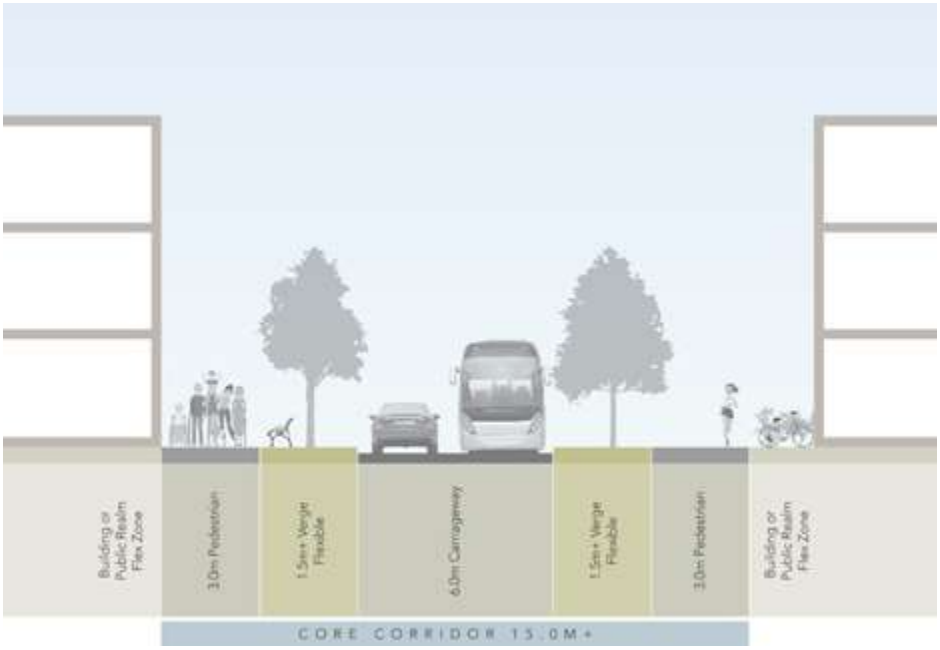


Figure 27
Multi-Modal Street Section

Street Type: Service

Vision

Functional streets, mostly short sections of street away from multi-modal streets connecting to service yards. They provide essential servicing and vehicle movement to larger facilities.

Design Parameters

- where street widths allow, incorporation of green infrastructure within roadside verges
- straight carriageways and footways, with carriageway deviations only where traffic calming is necessary when crossing main pedestrian routes
- where variation in widths is needed, verges and GI should be varied
- accessible ducting of sufficient size to incorporate a wide range of utilities, including data, power, gas, water and other services. Ducting should be incorporated under the footway for new construction (or rebuilt streets) and away from green infrastructure
- a level of lighting to provide essential safety for vehicle movements, but otherwise minimised to reduce light spillage

Modes

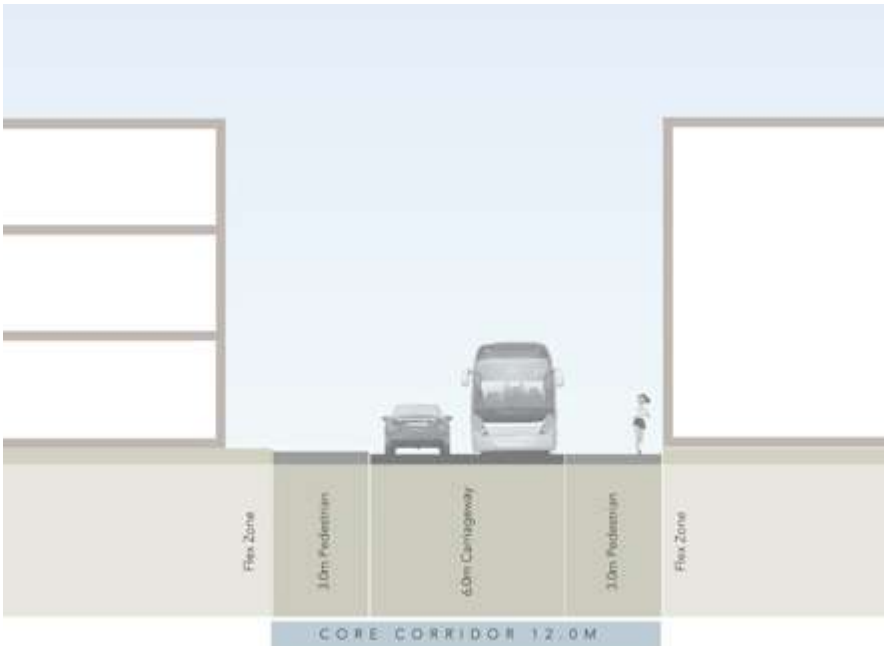


Figure 28
Service Street Section


V2
V1

Arrival & Vehicle Parking

5.5 Significant land at Daresbury is used to provide surface car parking. The Development Plan sets out a location for potential decked car parking to accommodate up to 800 spaces if needed. A discussion on an alternative option, locating parking off-site, is contained in the previous chapter.

5.6 General vehicle movement (private cars) are restricted from moving into the site, and are in general 'captured' by the car parks adjoining Keckwick Lane. In the future this will remain the case and internal vehicle movements will reduce even further with the consolidation of car parking into a single location.

5.7 New decked parking should be light, clean and secure. Use of natural materials or screening on exterior walls reduces visual impact, and any façade facing Keckwick Lane should be of high aesthetic quality. Provision for EV charging should be included in all new and upgraded car parks.

5.8 New developments should not provide general staff parking within the plot. On-plot parking should be provided for essential operational requirements and disabled/accessible parking. Service parking should be integrated within a service yard, away from main pedestrian routes and streets within the site.

5.9 At present most staff and visitors access Daresbury Laboratory by private car. Without efforts to achieve sustainable modal shift, proposed expansion of the site's employment is likely to exacerbate these issues.

5.10 STFC's wider transport and sustainability strategies are looking at enabling sustainable modal shift for those arriving at the site. Within the site, active modes of mobility will be the norm and encouraged through the improvement of streets, and provision of cycling, walking and micro-mobility infrastructure.

5.11 Cycle and micro-mobility parking will be integrated conveniently throughout the RAL site as part of streets, buildings and open spaces. Secure storage for bicycles should be provided within new buildings, as well as showers and changing areas. Cycle charging points for e-bikes should be provided, along with a small space for bicycle maintenance.

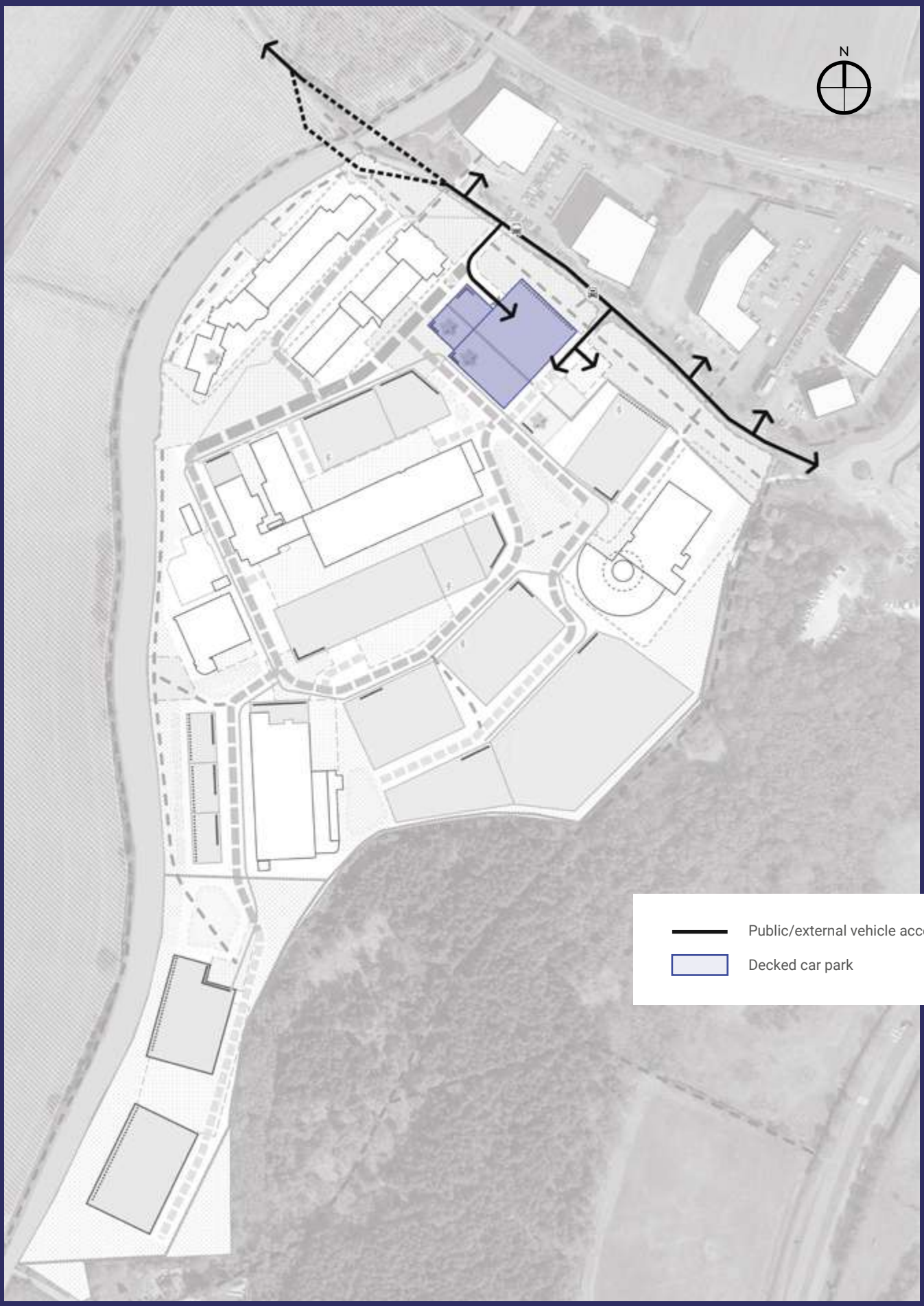


Figure 29
Composite Development Plan

Campus Environment

Public Realm

5.12 The public realm strategy and set of open space types at Daresbury are arranged as a hierarchy, based on their importance for the overall laboratory. At the top is the single primary space, intended to be used regularly by all. Further down are secondary plaza spaces, used by those departments and buildings in the immediate vicinity.

5.13 Two 'gateway' spaces are set out, where there is likely to be a high degree of transit within the space by different modes. These spaces will be designed to ensure transit is accommodated primarily, whilst retaining a high quality of space and materials.

5.14 In addition, natural spaces for wider recreational use have been identified, divided into 'transit' spaces, which people primarily move through, and 'staying' spaces, which people would likely use for sitting, relaxing, meeting or contemplation. These provide a different environment for users, and integrate with the wider biodiversity and landscape network.

5.15 The relationship between Daresbury Laboratory and the external spaces of the linear park along Keckwick Lane, and the entrance plaza at the laboratory reception must be carefully considered. The linear park is a high quality space that creates a distinctive street, with planting, seating and amenity spaces carefully integrated. This should be complemented with attractive frontages or screening from new development adjacent, and public realm that connects to it should consider extending or 'flowing' the linear park's design elements further into the site to provide continuity.

5.16 Overall design principles for all space are:

- safe, accessible and legible (easy to understand)
- overlooked and with passive surveillance, ideally with main entrances facing onto them
- maximising opportunities for new habitats and biodiversity and the public realm which contribute to the overall site aspirations in line with the design guide
- robust, resilient, sustainable and fit for purpose
- designed with a clear purpose or activities in mind
- buildings that front onto key primary, secondary or gateway spaces should aim to create a cohesive palette of materials that complement the character of the space

5.17 As part of the implementation of the Development Plan, STFC may commission a detailed design for public realm.

5.18 Each open space type detailed in this guide sets out a series of design principles for different open space types. Unless agreed otherwise with Estates, detailed designs must observe these principles.

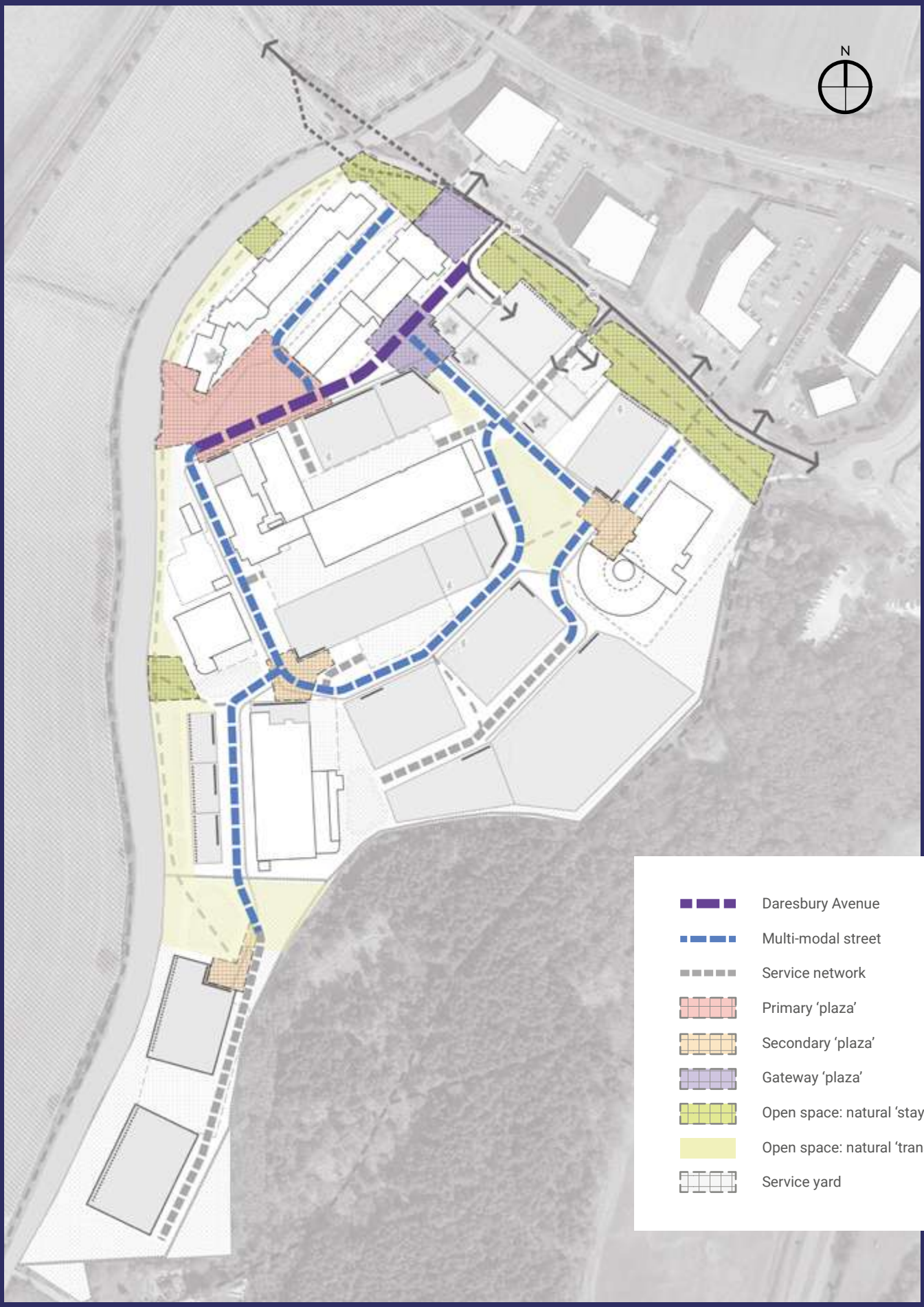


Figure 30
Illustrative Public Realm Plan

Open Space Type: Primary / Heart

Vision

A central open space that can bring everyone on the site together, with a high quality of landscaping and public realm, designed for people first and excluding vehicles. It will connect to a space on the canal, and a combined Amenities building will complete the space, with a frontage that connects to and animates the open space outside.

The space will host public art, incorporate space for events and gatherings, and provide a daily area for lunches, recreation and meetings. It is intended to be active and animated throughout the day, with the 'buzz' of a major research facility evident for visitors.

Design Principles

- **Planting**
  - formal trees and planting within hard landscaping
  - formal shrub beds and amenity planting
- **Street Furniture**
  - seating within formal treed areas or enclosed by formal planting beds
  - lighting columns
  - waste and recycling bins
  - power and data points
  - bicycle parking and charging points
  - public art
- **Built Form**
  - buildings front onto space – no backs or servicing
  - clustering of building entrances onto space
  - permeable frontage into/out of combined amenities building that connects transparently to outdoor space
- **Materials**
  - stone (natural or reconditioned)
  - bound gravel
  - setts/block paving
  - PPC metal
  - timber for street furniture and planting features
- **Access**
  - mostly fully pedestrianised space
  - walking and cycling into spaces
  - operational vehicle traffic restricted to shared surface carriageways marked around southern/ eastern edge
- **Typical Activities and Programming**
  - event space for campus occasions
  - exhibition space
  - meetings and external hosting
  - lunches and breaks
  - formal and informal socialising
  - relaxation and quiet contemplation

Open Space Type: Secondary / Cluster

Vision

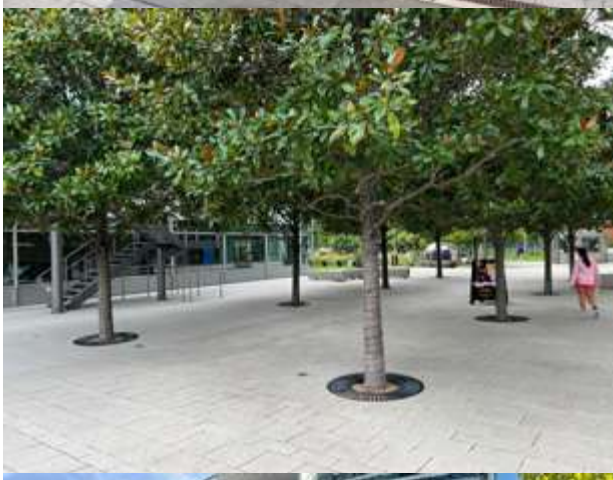
Located where clusters of buildings exist or are anticipated, and connected by multi-modal routes to Daresbury Avenue or the primary heart space. This aids legibility and navigation around the site.

These spaces also help promote collaboration between departments and buildings with the landscape at each point designed to encourage this by providing spaces to linger/congregate. The use of public art should be promoted to help establish these spaces as key areas around the site.

Two key spaces are identified: one outside the Tower building, and a second outside ETC. Both of these spaces will have additional development fronting onto them in the future, with new front doors facing onto them. They are both at a slight distance from the primary heart space and offer an additional placemaking opportunity at a location where large numbers of people will work.

Design Principles

- **Planting**
  - formal trees and planting within hard landscaping
  - formal shrub beds and amenity planting
- **Street Furniture**
  - seating for meetings, relaxation and lunchtime/ breaktime recreational use
  - meeting pods and picnic tables
  - bicycle & micro-mobility parking
  - power and data points
  - waste and recycling bins
  - public art
- **Built Form**
  - buildings generally front onto space
  - clustering of building entrances onto space
- **Materials**
  - stone (natural or reconditioned)
  - bound gravel
  - timber for street furniture and planting features
  - PPC metal
  - tarmac where necessary
- **Access**
  - primarily pedestrian focused with shared space carriageways, clearly denoted through material choices, to provide essential access and servicing
- **Typical Activities and Programming**
  - meetings
  - lunches and breaks
  - formal and informal socialising
  - relaxation and quiet contemplation



Open Space Type: Gateway

Vision

These are important nodes within the internal movement network, primarily intended for people and vehicles to move through. As such they should be designed to be distinctive, memorable and attractive, but with enough space for efficient movement and to prevent conflicts between modes.

Design Principles

- **Planting**
  - formal trees and planting within hard landscaping
  - some formal shrub beds to delineate space
  - incorporation of SuDS features with suitable planting for wetter habitats
- **Street Furniture**
  - seating around edge of planting beds
  - lighting columns
  - waste and recycling bins
  - bicycle parking and charging points
- **Built Form**
  - buildings generally front onto space
  - clustering of building entrances onto space
- **Materials**
  - stone (natural or reconditioned)
  - bound gravel
  - timber for street furniture and planting features
  - PPC metal
  - tarmac where necessary
- **Access**
  - primarily pedestrian focused with shared space carriageways, clearly denoted through material choices, to provide essential access and servicing
  - enough space given to each mode to avoid conflicts and allow movement
- **Typical Activities and Programming**
  - primarily designed as a transit space
  - meeting external visitors
  - access to outdoor space and sitting

Open Space Type: Natural ‘Transit’

Vision

Spaces that are primarily natural in character, but primarily designed for people to move through with occasional seating.

Design Principles

- **Planting**
  - variety of natural habitats
- **Street Furniture**
  - seating
  - outdoor gym equipment
- **Built Form**
  - mix of fronts and backs
  - backs of buildings typically screened by structural planting
- **Materials**
  - gravel path
  - bark mulch
  - timber
  - PPC metal
- **Access**
  - pedestrian use
- **Typical Activities and Programming**
  - recreational access – e.g. lunchtime walks or runs
  - some sitting space for lunches and breaks




Open Space Type: Natural 'Staying'

Vision

Spaces within Daresbury that can provide natural surroundings for users, as a change of scene from an otherwise more built up /urban environment. These spaces will be designed to prioritise 'staying' uses, with seating and gathering spaces that would enable people to use them for meetings, recreation and contemplation.

Design Principles

- **Planting**
  - variety of natural habitats, more formally planted/landscaped
  - some formal trees and planting areas as open space connects to formal elements (e.g. Heart open space, Daresbury Avenue etc.)
  - larger areas of lawn for relaxation
- **Street Furniture**
  - seating, either within formal treed areas, enclosed by formal planting beds or integrated into landscape (e.g. steps to canal)
  - meeting pods and picnic tables
  - lighting columns
  - waste and recycling bins
  - power and data points
  - public art
- **Built Form**
  - buildings to have high quality or active frontages
  - canalside space should have permeable façade into Amenities Building
  - no service accesses or building rears
- **Materials**
  - stone (natural or reconditioned)
  - bound gravel
  - timber for street furniture and planting features
  - PPC metal
  - tarmac where necessary
- **Access**
  - fully pedestrianised spaces
  - walking and cycling into spaces
  - general vehicle traffic removed
- **Typical Activities and Programming**
  - meetings
  - lunches and breaks
  - formal and informal socialising
  - relaxation and quiet contemplation

Green Infrastructure & Biodiversity

5.19 Taken together with the Firs to the south-west, a green ring of open spaces and networks will ring the site and cut through, offering a variety of human and ecological environments.

5.20 The canal side is an important opportunity for enhancement as a space and as an ecological corridor. Limitations on construction near to the canal (5m) must be considered, and co-ordination with Peel (the canal owners) must be undertaken.

5.21 The plan sets out opportunities for biodiversity enhancement within the site, providing additional habitats for wildlife, and ensuring future development can comply with legislative requirements to secure net gain of biodiversity. Two approaches are identified through the Development Plan:

- **Large-Scale Habitat Creation:** currently un-used areas of the campus where small interventions and management could enhance native habitats and biodiversity potential. As well as those identified by STFC's ecology consultants as part of their baseline survey, the Development Plan identifies areas across the site where this could occur without conflicting with future development requirements
- **Localised Habitat Creation:** the Design Guide sets out opportunities within streets, open spaces and key locations for habitat creation as part of the public realm of the campus. These vary from planting and tree opportunities through to management for wildflowers in street verges

5.22 New plot developments should contribute towards strategic habitat creation, and should undertake all possible localised habitat creation measures within their plot and in the adjacent public realm.

5.23 When undertaking habitat creation, expert advice should be sought on the most appropriate habitats to fit in with the wider campus network. General principles are:

- a patchwork of different habitats across the site, working together to be replicated in a way that they would be see in the natural world, can be more valuable than repeating the same habitat creation strategies everywhere
- a mix of native species should be used for planting, with more ornamental species acceptable in formal areas towards the centre of the site
- climate change resilience of species should be considered
- networks of connected habitats are more valuable than isolated habitats
- accessibility of habitats, and lighting levels, should vary across the site, to provide refuge for nature away from people, as well as providing spaces where users can come into contact with nature

Figure 31
Green Infrastructure and Biodiversity

Health & Recreation

5.24 Healthy lifestyles are an important part of STFC's strategy for improving the quality of Daresbury Laboratory for staff and visitors. Opportunities for formal and informal sport and recreation are recognised.

5.25 Recreational routes are identified as part of the landscape framework to provide a variety of environments for staff and visitors to use. There is an opportunity to identify a recreational running loop, taking in the footpaths through The Firs.

5.26 The 10 principles of Sport England's 'Active Design' set out how the built environment can support active and healthy lifestyles, and should be referenced and reflected in any new development.

Figure 32
Health and Recreation Plan

Development

Plots

5.27 A number of potential development plots are identified across the site, which could support specific new-build building projects. Each of these plots has an associated Project Data Sheet or Plot Passport associated with it. These 'passports' set out key design considerations, existing site preparation requirements and other information, as well as estimated costs.

5.28 Should car parking come forward outside of the site, an additional plot would be made available on the safeguarded site.

5.29 Additionally, areas around A and B Blocks, and the Tower, have a number of potential options available for either retrofit extensions or replacement with new buildings, and are subject to detailed study in the previous chapter.

5.30 Plots are denoted as:

- **A (A1, A2, A3, AM) –** on or near current A block
- **B (B1, B2, B3) –** on or near current B block
- **C (C1, C2) –** on or near current C block
- **H1 –** site of H block
- **I (I1, I2, I3) –** on or near the current Inner Hall
- **S (S1, S2, S3, S4) –** on the south-eastern Slopes
- **T (T1, T2, T3) –** on or near current Tower
- **W (W1, W2, W3) –** at the west of the site adjacent to ETC

5.31 This and later sections of the Design Guide sets out broad site-wide parameters that affect plots, to demonstrate how each plot fits together as part of a coherent whole.

5.32 In addition, committed or likely pipeline buildings for the Super Computing Centre are highlighted and safeguarded on the plan. Potential locations for the ITRF and CSAR pipeline projects, based on known information, are also noted on plots.

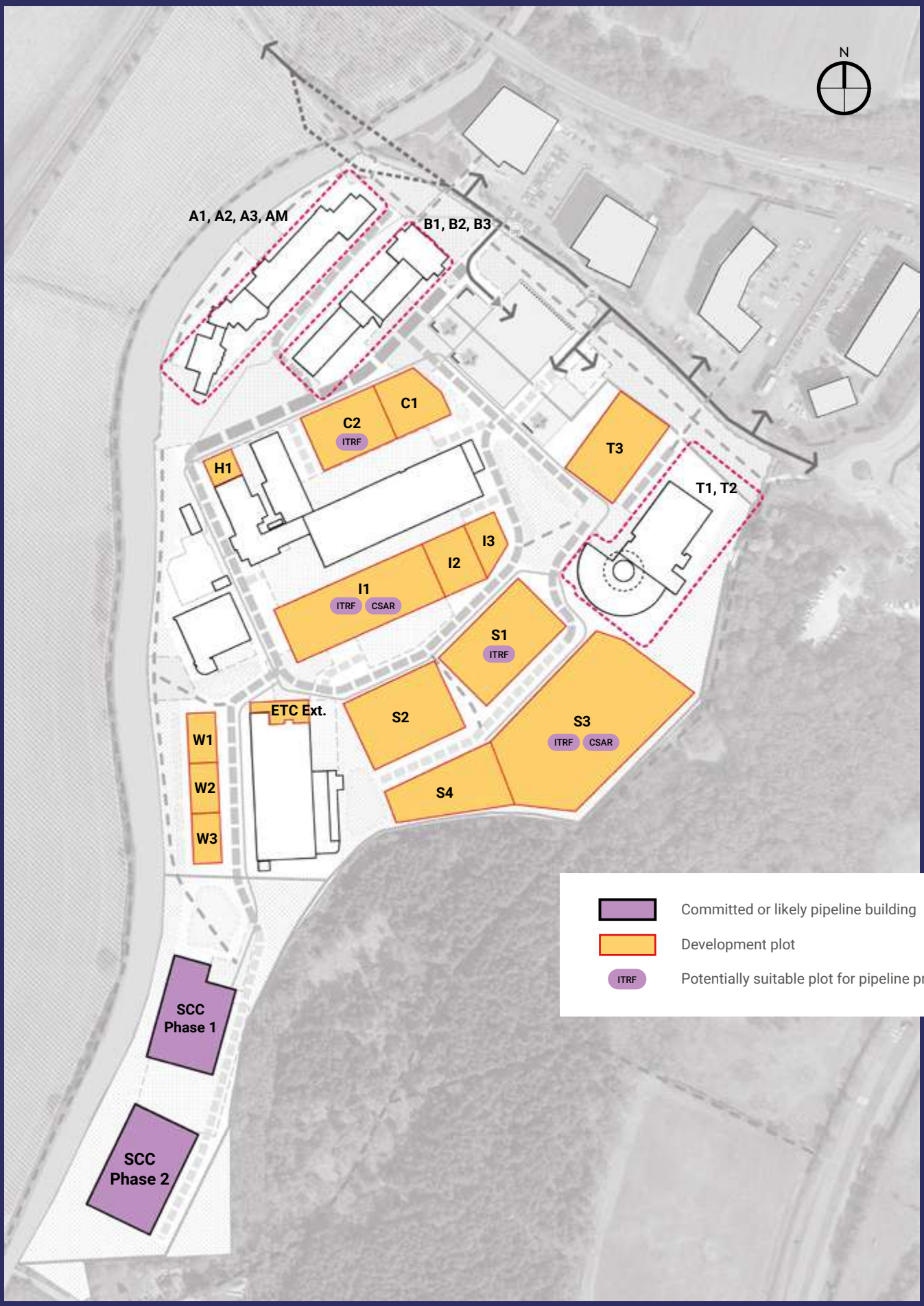


Figure 33
Development Plots Plan

Frontages and Service Yards

5.33 The current site lacks coherence in its approach to front doors and service accesses to buildings, leaving streets with a mix of both, with inherent conflicts between service users and pedestrians, and a lack of overall placemaking coherence.

5.34 The design of key frontages specified on the plan should be considered with special care, due to their importance to the overall campus. Where absolutely necessary for operational or scientific reasons, key frontages may contain service doors or entrances, but their design must be considered especially carefully, and the frontage should also include a visible and active front door and active frontage. Use of landscape features, materials or architectural design can lessen the impact on key frontages of an essential service entrance.

5.35 Further detail on the design of different facades is contained in the following section on Architectural Design Principles.

5.36 Overall design principles are:

- fronts of buildings should face onto Daresbury Avenue, multi-modal streets
- service entrances should be located away from building fronts where possible, and should be located on service or multi-modal streets. No service entrances should be located on Daresbury Avenue

5.37 Locations for service yards are set out on the plan. Where possible these serve multiple buildings and are tucked away from the main areas of people-focused public realm. They are concentrated around the experimental halls in the centre of the site.

Figure 34
Frontages and Service Yards Plan

Building Heights

5.38 Indicative building heights are shown for each plot identified on the site. These primarily respond to existing heights both within the site and along Keckwick Lane, and reflect building dimensions that are anticipated to perform well for most of the activities on site. These are not strict limitations and should be tested on a case-by-case basis as projects come forward.

5.39 The heights indicated have been used to calculate floor space schedules. They have not been tested through an LVIA process, but do respond to the baseline LVIA assessment of views, landscape impact and sensitivities. They also reflect the streets they are adjacent to, and anticipated use.

5.40 Due to the nature of the work that takes place at Daresbury, the requirements for development are often atypical. For example, many specialist labs require interstitial floors to accommodate specialist equipment and necessary ventilation. Such requirements mean that some lab buildings are five to six metres per floor, rather than the three to four metres typical of most commercial buildings. Given these specialist demands which are specific to the laboratory, it is important that the site is able to accommodate sufficient height in development so as not to restrict the types of science it can accommodate. Therefore indicative heights are proposed rather than number of storeys to enable the mass to be split in multiple ways.

5.41 Buildings may be designed up to the maximum building heights identified on the Parameter Plan and the individual plot passports. The maximum building heights are above ordnance data and pertain to the maximum height of the building roof level. Occasional plant, flues or antennae may exceed the stated maximum building heights provided that they are located to reduce visual clutter and appropriate design, screening or visual mitigation (if necessary) is provided so that they do not form a continuous visual block.

5.42 The most sensitive part of the site for heights and building massing is the southeastern slopes, to the south of the Tower building and adjacent to the Firs. This area has the potential to host a large experimental hall of 14-16m height. An important principle to observe on this set of plots is the importance of preserving the long views of the Firs, and particularly the tree line. A study in Figure 36 below demonstrates the potential impact of a large hall in this area, reinforcing the need for mitigation treatments to the northwestern edge of any building, and the potential need to break up the massing of any such building. The study considers a worst case of a 16m building taking up the majority of plot S3.

Figure 36
Visibility of potential 16m experimental hall on plot S3 from the west

Figure 35
Building Heights Plan

Levels

5.43 The topography of the site requires thinking at an early stage about how the change in levels affects development footprints. This is particularly the case with development on the south-eastern slopes, where there is a 12m difference from the access loop adjacent to the Inner Hall and the highest point on the site.

5.44 The plan sets out indicative anticipated finished floor levels (FFLs) of buildings on plots. Where possible buildings retain existing levels, and are matched to adjacent service yards. These levels should be taken as an indicative guide, and further detailed testing will be required, but demonstrate feasibility of access to these plots from adjacent streets.

5.45 On the south-eastern slopes it is possible to combine plots S3 and S4, but not S1 and S2 due to the change in levels. Retaining structures will be needed to ensure buildings can be constructed on these slopes with some cut and fill to obtain a flat plot. A section study below sets out how new buildings could be accommodated on plots S3 and S4, close to the wooded site boundary.

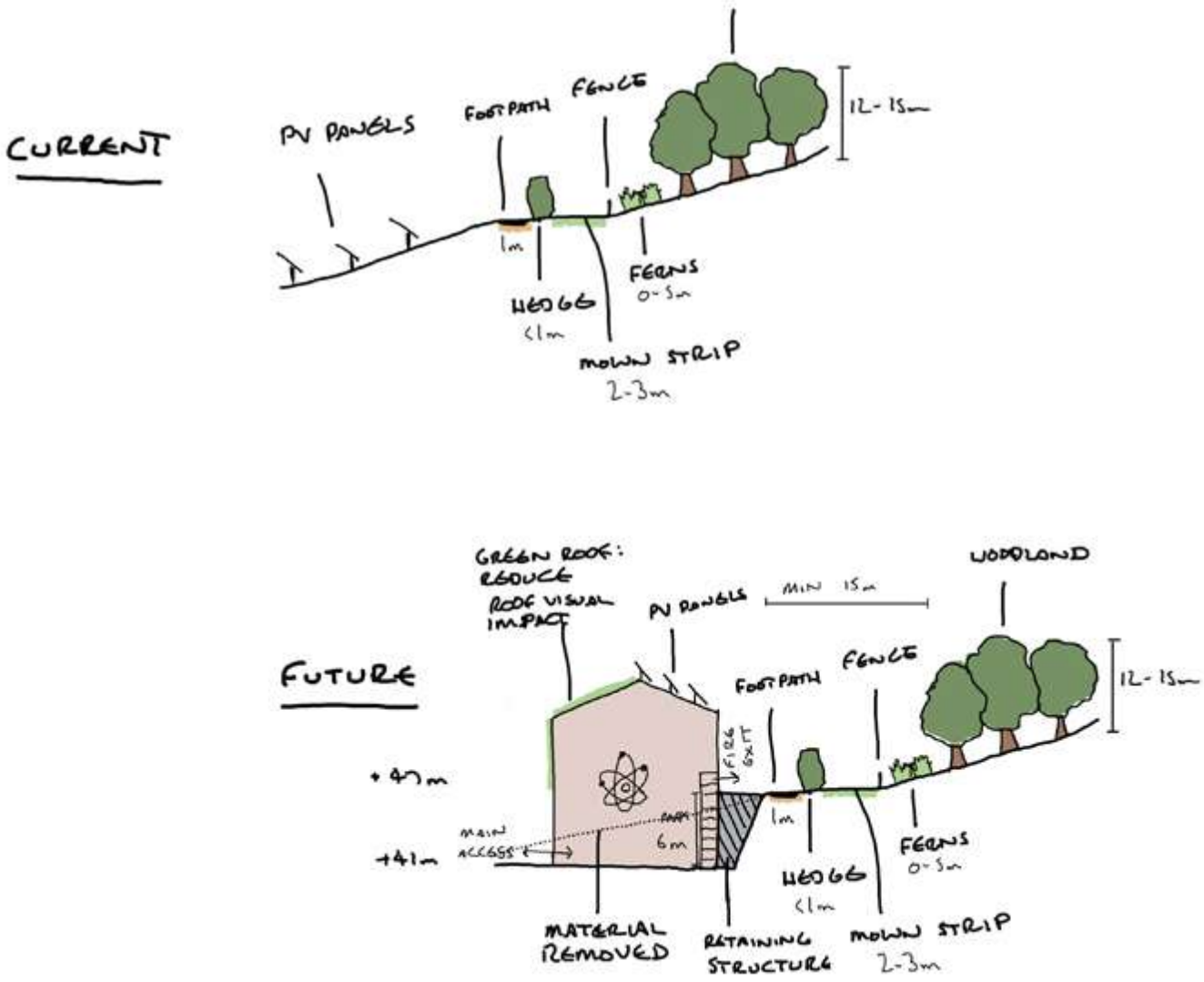
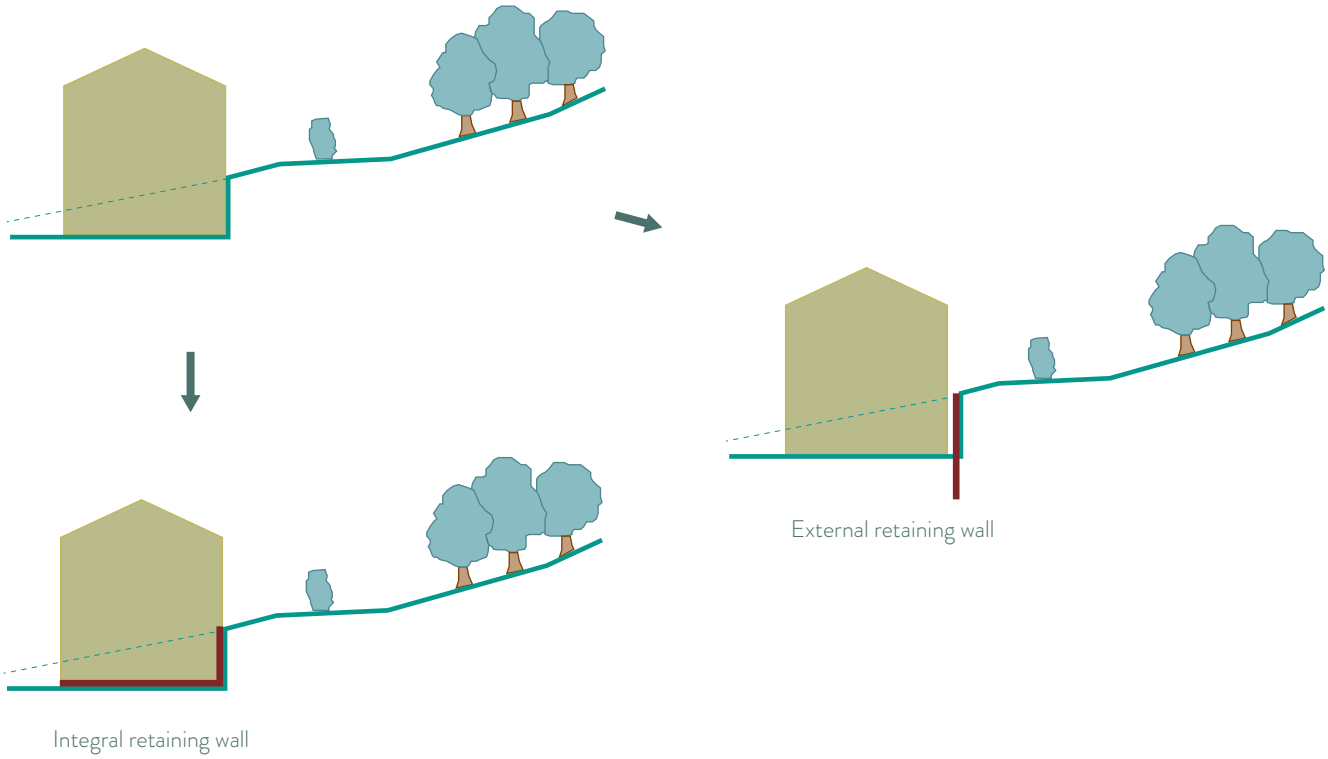


Figure 38
Woodland Edge Section Study

Figure 37
Site Levels Plan

5.69 Figure 39 below sets out potential construction options for retaining walls.



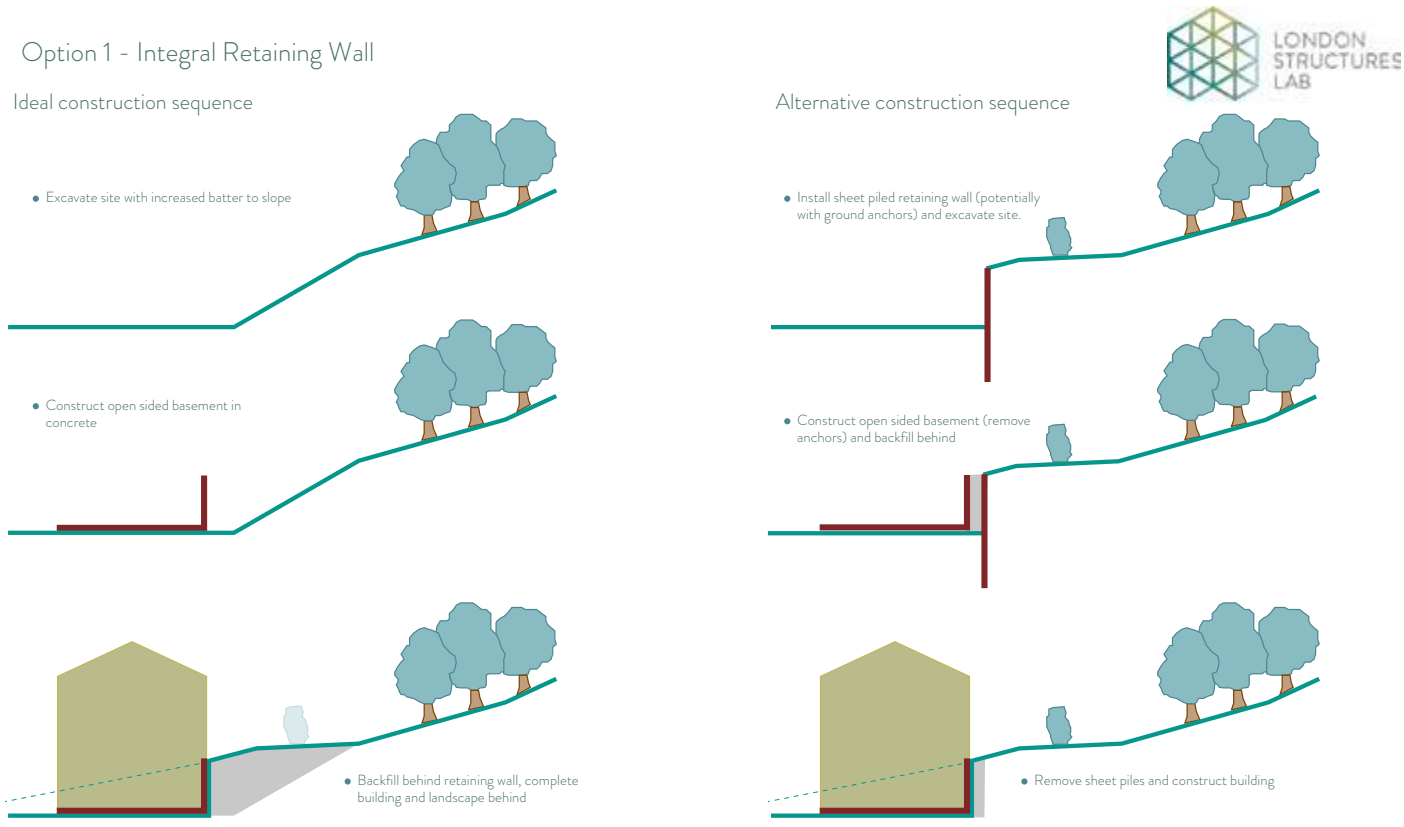
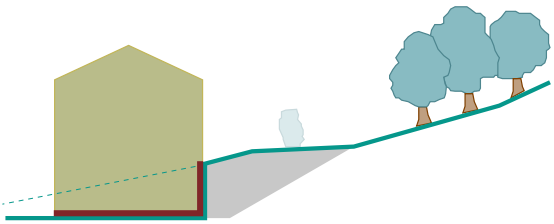


Figure 39
Retaining Wall Construction Options

Option 1 - Integral Retaining Wall

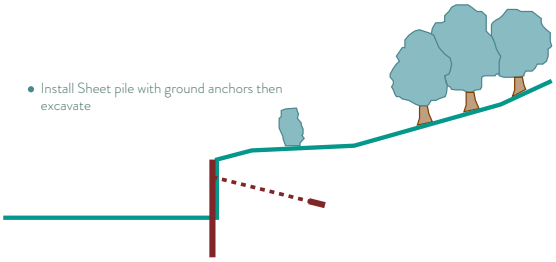


Pros
- Less material so better carbon
- Longer design life
- External drain and external membrane means all structure is inside water resiting line

Cons
- Larger excavation impact on landscaping

Option 2 - External Retaining Wall

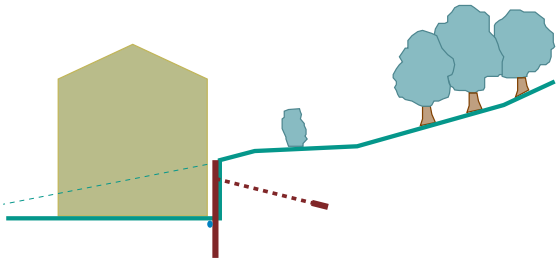
- Install Sheet pile with ground anchors then excavate



Pros
- Can be carried out in advance and without building being designed.
- Can reduce waterproofing requirements on the building
- Reduces total excavation
- Reduces disruption to landscaping

Cons
- Materially intensive
- Sheets and anchors have a design life
- Incurs maintenance issues for structure and drainage

We would not recommend this option due to maintenance, durability and access issues



- Install ground drain and build the building

Installation of sheet piles

Waling beam with ground anchors

Infrastructure

Utilities

5.46 Daresbury Laboratory has need of a wide array of utilities such as electrical power, data, water, gas and more specialist services. A key infrastructure requirement is renewal of the existing 11kV high voltage (HV) electrical power network, moving it to a ring main system with more redundancy and resilience.

5.47 The Development Plan sets out how such a ring main network could be accommodated within the existing site. As the site is redeveloped and existing utilities displaced, utilities should be concentrated into this corridor.

5.48 Finally, potential locations that could be suitable for new switching substations supplying electrical power off the main HV network have been identified. Technical feasibility work on these and other options will progress separately.

5.49 Overall design principles are:

- new utilities should be laid in accessible trenches, laid within pedestrian footways to allow ease of maintenance and access
- trenches should be oversized for future-proofing, with regular access points, especially at anticipated plot supply points and at anticipated street junctions

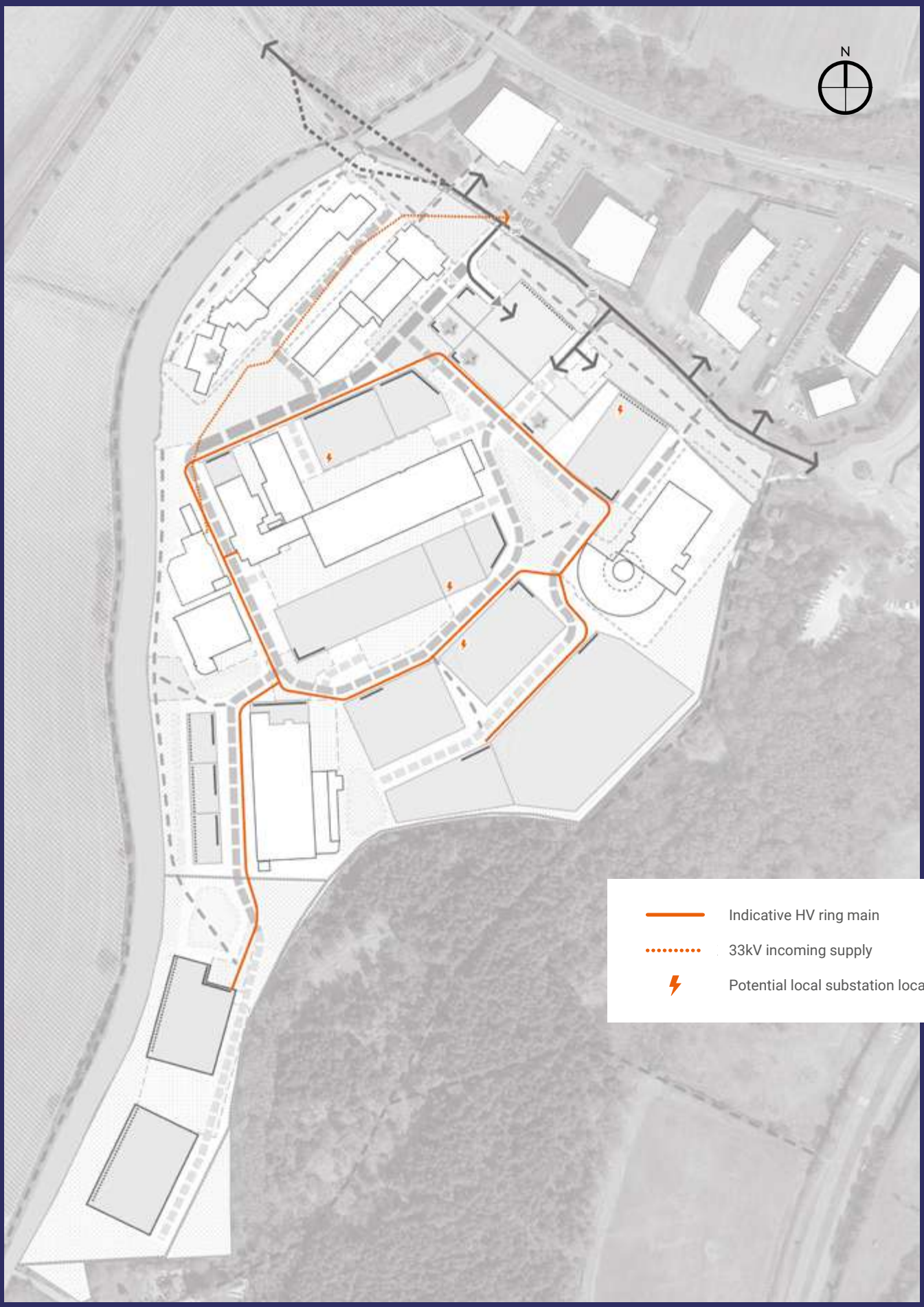


Figure 40
Utilities Plan

Security

5.50 Daresbury is a permeable site, but has a range of facilities managing different security risks. At present there is an incomplete security fence and limited controlled turnstile entrance points along it, as well as an open area around reception where anyone can enter.

5.51 The Development Plan does not propose significant changes to this fence, other than suggesting where it is likely to be extended to protect the Super Computing Centre.

5.52 The overall design approach to security is one of design zones. The site is permeable and open, but through the position of streets and uses, the design of space makes it clear that as you get further into the site, it is a less public environment. This peaks at the southern end where the Super Computing Centre will be a secured facility.

5.53 All new buildings should be designed so that they can be secured with building-level security. This entails minimising external entrances, ideally to a single front door and a single service bay, and providing internal space to allow for a reception and security gates. Equipment should be secured within buildings, and not located outside in cages or similar, to discourage casual theft.

5.54 The Development Plan proposes that most deliveries do not enter the 'secure' part of the site, and instead drop off at the Goods In yard, which functions as a security cordon. Some large vehicles that need to make direct deliveries can pass through at a security checkpoint, removing this function from the main vehicle entrance.

5.55 As the site is a government facility, it may be necessary to consider additional security precautions in the public realm. Guidance on locating Hostile Vehicle Mitigation (HVM) protective features sensitively into the public realm has been prepared by CPNI.

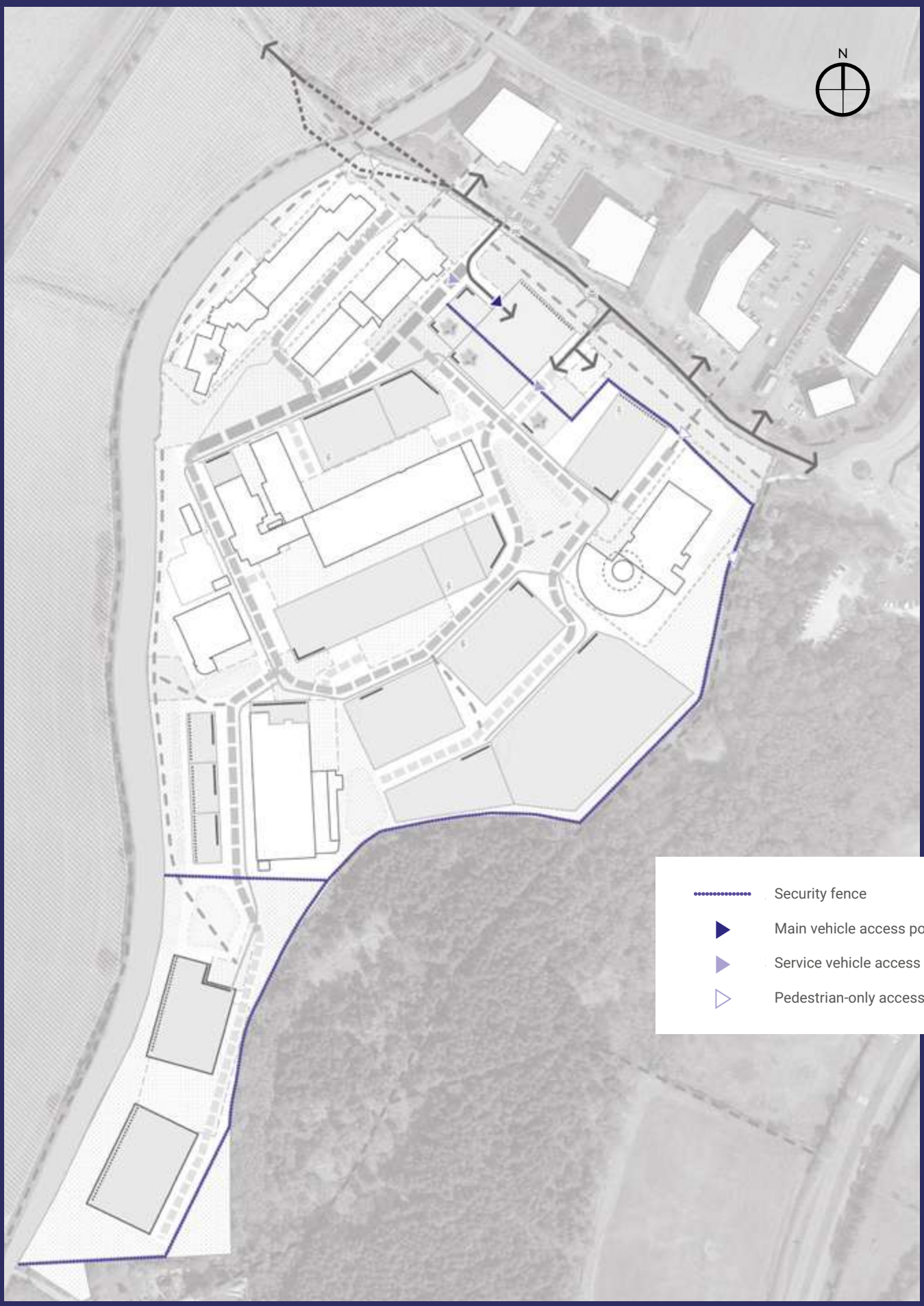


Figure 41
Security Plan

Goods In & Servicing

5.56 The current Goods In building is located in the centre of the site, and requires all vehicles to enter through the single access point. It is also in need of significant repair and is poorly suited to its current role due to its internal layout.

5.57 A new Goods In location, next to Keckwick Lane and with an existing access point already present, would disentangle goods deliveries from staff and visitor vehicles, and the entrance plaza. It would allow goods deliveries to enter and leave quickly, and would retain a direct access option onto the internal circulation loop for larger vehicles needing to access facilities directly.

5.58 Design principles for the new logistics and servicing location are:

- use of planting, landscaping and the use of a screen façade or similar to reduce visual impact onto Keckwick Lane
- frontage of the building onto the internal multi-modal street to allow pickup of some items by those walking from elsewhere in the site
- careful lighting design to limit light spill from the servicing yard

5.59 A concept study on how a new Goods In could be successfully laid out is shown in Figure 43 below.

Figure 43
Goods In concept layout study

Figure 42
Goods and Servicing Plan

Surface Water

5.60 There are two distinct areas for surface water drainage - the existing site network that drains into the Bridgewater Canal, and new plots on previously undeveloped land.

5.61 Development should follow Sustainable Drainage Systems (SuDS) principles and 'slow the flow' of water into the canal drainage network, through use of building, street and local open space attenuation methods and maximising permeable surfaces. With appropriate building design and landscape design, flow into the canal could be cut significantly compared to today's baseline.

5.62 New plots, such as S1-4 and W1-3 are not connected to this network, and new development should attenuate all surface water within the boundaries of the site, limiting flow rates to current greenfield rates. Areas for potential strategic surface water provision are highlighted but are illustrative and should be tested for technical suitability. In addition, areas within streets where water could be accommodated as part of the public realm (e.g. through swales with natural habitats), are indicated.

5.63 Overall design principles for all new developments are:

- 'slow the flow' of water into the strategic attenuation network
- maximisation of permeable surfaces on buildings and surrounding landscape and streets
- use of Green Space Factor principles to ensure all potential options are maximised
- use of the principles from 'The SuDS Manual' (CIRIA) for detailed and strategic design

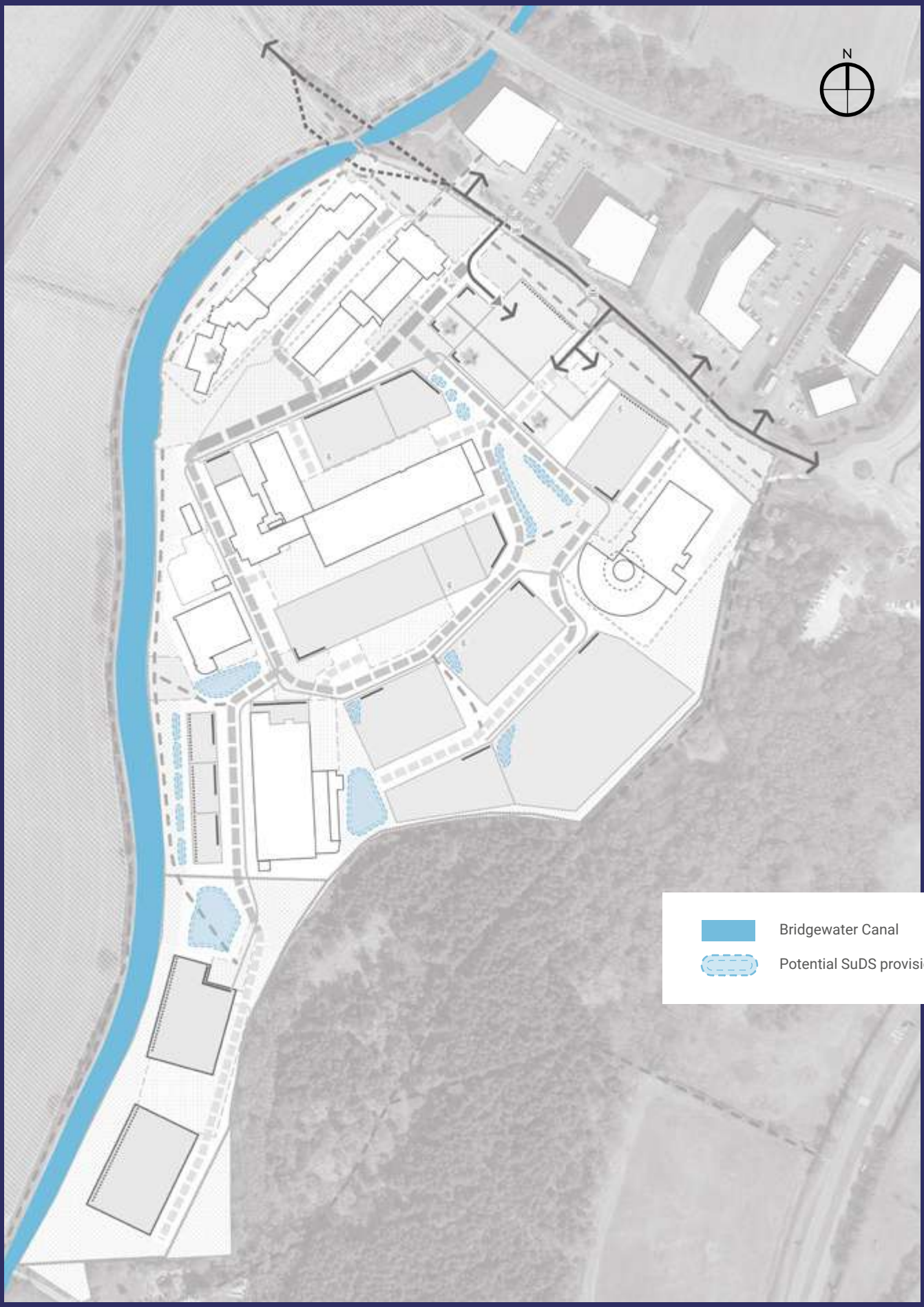


Figure 44
Surface Water Plan

Architectural Design

Building Arrangement

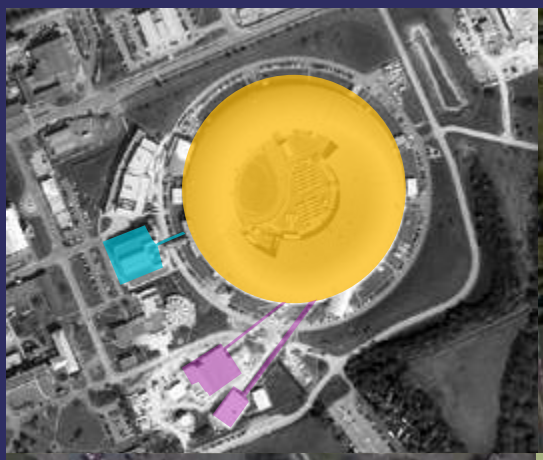
5.63 **Organisation principles**
The buildings on innovation hubs/science campuses tend to be organised in one of two ways. Either using a 'head and tail' approach, with each building containing its own front of house amenities and functional spaces; or using a 'farmhouse and shed' approach, where amenities are combined in a single building, surrounded by a cluster of functional buildings.

5.65 **Heads and tails**
This approach has a head that provides the building's front of house for the scheme. This is the smarter, showier element of the scheme that is used to create identity and heart, often providing the amenity and combined administration areas. The tail is then the functional parts of the building's program that connects to the head.

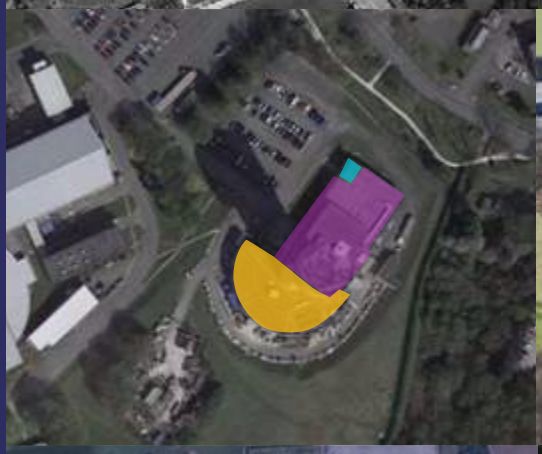
5.66 **Farmhouse and sheds**
This approach has the farm house at the centre providing the grandeur, comfort and forward-facing building, with sheds and outbuildings providing the functional accommodation.

5.67 **A mixture at Daresbury**
Both of these approaches exist on the Daresbury campus, and should be utilised further, allowing each plot to reflect its use.

5.68 The approach to each building plot needs to be flexible to ensure longevity and sustainability. Consideration in the design should be given to adaptability and re-use, to allow buildings to be easily extended and reconfigured.



Diamond Light Source, RAL



The Tower, Daresbury

Begbrooke Science Park, University of Oxford

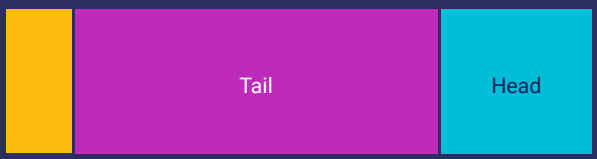


Figure 45
Head and Tail Building Arrangement

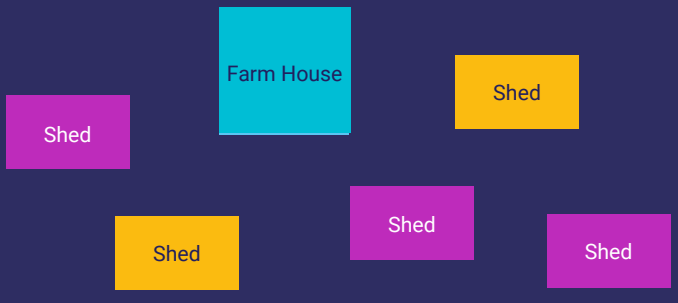


Figure 46
Farmhouse and Shed Campus Arrangement

Head / Farm house – Amenity, desk activities

Tails / sheds – Functional activities

Specific equipment

Existing Character

- the existing building characters vary across the site. This approach results in an individual identity for each building or department
- brick was used for the older buildings and has more of a domestic feel and scale.
- The Tower has pre-cast concrete cladding that reflects its era.
- the more functional buildings are simple metal clad “sheds”, reflecting their utilitarian nature.
- upgrades to existing buildings have been undertaken with re cladding in metal panels

Block B reception

The Tower

The Tower office building

Hartree Court

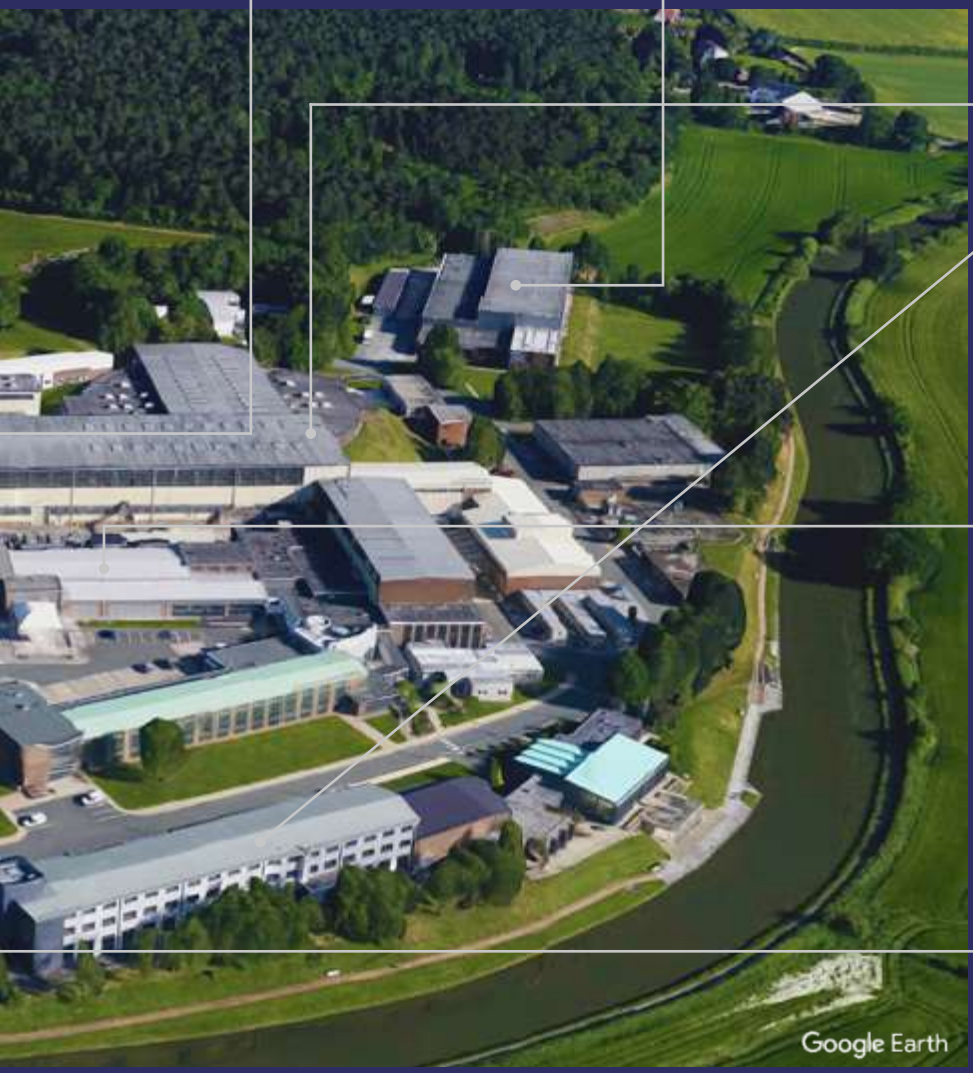
Figure 47
Existing Buildings

Electron Hall Inner Hall Inn

CTH

Block A - re-clad

The Outer Hall



Block D

ITAC Bio

Vision for Improvement

Introducing more character

5.69 Creating three different character groups helps add a structure and framework for each building's aesthetic to follow. This can be applied to either whole façades or parts of, and will enable a clearer understanding of the function of the spaces within. The character of each building can, in turn, help to improve the legibility around the site.

1. 'Fronts/Heads'

Glazed / 3D quality / colour / texture

New fronts of the building to incorporate:

- warmer tones,
- glazed elements to link internal and external environments
- 3D / textured facade elements (depth)

2. 'Rears/Tails'

Simple / metal / utilitarian /reflect use

New rears to buildings:

- simple cladding
- allow flexibility to grow

3. 'Amenity/Focus'

Glazed / focal point / interaction with public realm

New amenity building to consider:

- relationship to public realm
- glazed elements to link internal and external environments
- bold design to create a focal point for the campus

Building Character – Type 1

Character 1 – Building fronts

- active frontages can create a visual link to the activity within the buildings and offer opportunities to interact with the landscaping and surrounding context
- the fronts of each building should be easily identified, with a human scale to them
- glazing should be considered to connect the internal and external environments, improving legibility to the spaces beyond
- these should provide elements of active frontage, highlighting entrances and shared amenity spaces

The Tower Building, Daresbury

Sci-Tech Campus, Daresbury

Innovation Centre, Sci-Tech Campus, Daresbury

Precedents

The Kennedy Institute, University of Oxford

Old Road Campus, University of Oxford

Big Data Institute, University of Oxford

Quad 1, Harwell Campus

Bob Champion Building, UEA, Norwich

Clinical Biochemistry Lab and Logistics, Copenhagen

Figure 48
Existing character 1 buildings at Daresbury

Building Character – Type 2

Character 2 – Functional facades

- these facades incorporate both functional uses and service areas
- the design of these should respond to the use within and can be of a calm, utilitarian aesthetic
- they should be industrial and robust in design. From simple metal clad sheds to more articulated facades in front of labs and office spaces.
- these facades should respond directly to the internal use within
- consideration should be given to flexibility and how these spaces might adapt and change over time, incorporating cladding systems that can easily be reconfigured or reused where possible

Existing character 2 type buildings at Daresbury and RAL

Precedents

Montblanc, Hamburg

AMRC North West, University of Sheffield

Nanopore, Harwell

Building Character – Type 3

Character 3 – Focus Buildings

- these buildings should be the focus of the campus and highlight the communal amenity uses that happen within
- these buildings should have a human scale to the façade
- appearing more playful in character with distinct designs will help identify these within the campus and improve legibility around the site
- these buildings should have a clear connection to the surrounding landscape and feel welcoming and inviting for all

Existing Amenity buildings

Precedents

New user facility at the Institut Laue-Langevin in Grenoble

EMBL Imaging Centre, Heidelberg

Pacific Centre Campus Amenities San Diego


Character 1
Character 3
Character 2
+10m
Character 1 or 2
Depending on Use

Entrances

- main entrances to each building need to be clearly legible and easily identified within the streetscape through the use of recesses, canopies, lighting, materials and colour
- the main entrances should be located along a key active frontage, as described for each plot within the development plan
- where appropriate, a higher level of visibility should be allowed for in these areas with inclusion of further glazing. The use of lighting and signage should aid legibility

Existing entrances at Daresbury

Entrance precedents

Building Elements

Plant

- plant should be designed into the overall composition of buildings wherever practical. It should be integral to the design such that it is perceived as part of the intended form and shape of a proposed building
- if located at roof level, it should be set back from the building edge where possible
- where plant is located at ground level, it is to be shielded from view with screening, and located away from the main building frontages
- plant should be acoustically treated where required through either treatment of the individual plant or the plant screen

Roofscapes

- roofscapes act as a fifth elevation and appropriate consideration should be given to these. The use of green and brown roofs should be employed where feasible

Car parks

- car parking spaces for employees within the Campus will be consolidated predominately in multi-storey car parks outside the security line. Open-roof, multi-storey car parks should be discouraged where they would give rise to unacceptable light spill
- façades should provide screening to the parking areas and help integrate the building into the landscape. Consideration should be given to screening to reduce light spillage
- pedestrian entrances to the car parks should have a different character in order to highlight these in the streetscape

Lighting

- lighting design will be sensitive to the surrounding area and its users. It will seek to:
- enable users to move about the site safely, helping to alleviate the fear of crime, and to easily identify main entrances to each building;
- designs should minimise light spill and glare, to minimise impact on local sensitive areas (including residents, ecological receptors, and the surrounding natural landscape)

Sustainability

Sustainable development principles

- maximise the reuse and recycling of materials including materials existing on site;
- optimise the orientation of buildings to utilise solar gain and shading;
- optimise natural ventilation techniques to improve the well-being and comfort of internal environments and further reduce energy needs;
- include water harvesting and storage provision

Considerations

- prioritise a fabric-first design approach for the built form and its envelope, focusing on airtightness, high insulation, passive ventilation and the incorporation of renewable energy systems and technologies where possible;
- modern methods of construction (MMC) are prioritised for the built form and its envelope;
- specify highly efficient and ultra-low energy fixed building services or infrastructure to help reduce regulated emissions

Standards and Certifications

- all developments should meet BREEAM Outstanding standard (STFC Strategy)

Reducing embodied carbon

The development should:

- use sustainably sourced and accredited, low embodied carbon materials
- use naturally sourced materials
- reduce materials with high carbon footprints (materials whose production process have high carbon emissions)

6 Review Mechanism

6.1 The Development Plan will be a long-term document setting out parameters for the site and its expansion over an anticipated 15-year term. Due to the ever-changing requirements of science, and how funding decisions on new facilities are made, it will be necessary for the Development Plan to be regularly reviewed to ensure it is an up to date and relevant document.

6.2 Two levels of review mechanism are proposed:

1. An Annual Review of the assumptions, projects and overall plan to ensure that information held is accurate, up-to-date and remains useful as an operational tool. Projects completed would be reviewed against the plan to determine where changes may be necessary.

2. A more in-depth Strategic Review, held at 4-5 year intervals, of all materials in the Development Plan, to ensure that it reflects UKRI/STFC's strategic position, and the potential pipeline for major projects on the site. It would also review the use of the plan over an extended period to ensure that its structure remains relevant. This Strategic Review could also be shared with the local planning authority to assist them in their plan-making processes and keep them apprised of changes to the strategic outlook.

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