



Science and
Technology
Facilities Council

UK ATC Development Plan



December 2023

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1 Introduction

Overview of Development Plan

1.1 This document, and its accompanying Implementation Plan, set out a Development Plan for the UK Astronomy Technology Centre (UK ATC). It is based at the Royal Observatory Edinburgh, which is owned and run by the Science and Technology Facilities Council (STFC), part of UK Research and Innovation (UKRI).

1.2 UK ATC is one of the UK's leading specialist facilities for astronomy research and instrument construction. It plays host to world-leading scientific research, and provides a link to the University of Edinburgh through the co-location of their Institute for Astronomy within the site, and also hosts and incubates a number of startup businesses.

1.3 UK ATC is a key location for this research but also needs to maintain a complex and historic estate, overcome a potential lack of access for future larger astronomical instruments, and needs to adapt to a Net Zero future while securing and enhancing biodiversity on the site. The Development Plan aims to chart a course so that the estate can support the scientific pipeline and future strategy of the site.

1.4 This document consists of:

- The baseline situation as of Spring 2023.
- An assumed scientific pipeline for the future.
- A spatial plan for the co-ordinated development of UK ATC over time.
- Discussion of key projects.
- Sequencing and phasing considerations.



Figure 1: Royal Observatory Edinburgh aerial view in context

- 1.5** UK ATC is located on the southern fringe of the city of Edinburgh, on Blackford Hill. It is based within the Royal Observatory Edinburgh, a complex of buildings which are all owned and managed by STFC. To the south lie the Braid Hills and Hermitage of Braid, a protected landscape area, and to the north are expansive views across the city.
- 1.6** The site was founded in 1894 after the city's original observatory on Calton Hill became unusable due to the expansion of the city, causing light pollution which prevented observations. The site was the home of Scotland's Astronomer Royal, and it remains in its original astronomical research use today. This is a vital part of the site's heritage importance and significance.
- 1.7** Over the 20th and 21st centuries, expansion on the site has required additional development, which have all been within the original historic walls. The most recent new building was the Higgs Building, opened in 2017.
- 1.8** The Estate is approximately 8,650m² over 10 buildings, ranging from historic listed buildings, 1960s construction and the newest built in 2017. The original buildings are all listed by Historic Scotland, with the 1894 Building at Grade A (Nationally Significant).
- 1.9** The site is accessed from Observatory Road, a residential street which passes through a ceremonial gateway and rises up the hill to a hairpin bend, before turning to the summit and a car park outside of the main gates.
- 1.10** As a result of this location, heritage and access, the site has a number of interconnected landscape, visual impact, heritage management and conservation issues, intertwined with the need to provide access to a working estate handling large-scale experimental equipment.

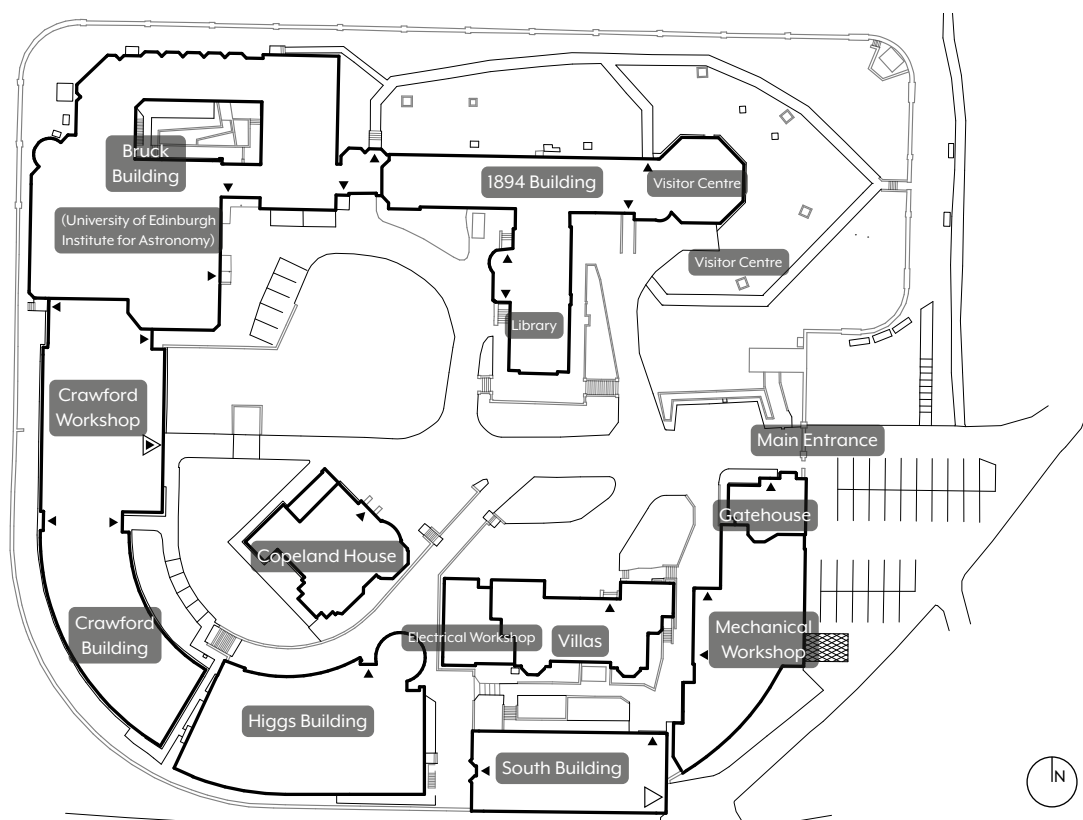


Figure 2: ROE Site Plan and users

UKRI and STFC's Strategy

1.11 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 UK ATC and our research facilities across the UK support fundamental research in astronomy, physics and space science.

1.12 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.

1.13 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.

1.14 On our national campuses 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.

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

1.16 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.

1.17 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.



1.18 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).

1.19 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.

1.20 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.

1.21 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.

1.22 Through STFC's investments we ensure that UK-funded researchers remain at the forefront of global pioneering discoveries. We continue to provide strategic leadership and identify the brightest ideas and highest-priority areas for investment in our frontier science and facilities, and will work across UKRI through a new interdisciplinary responsive mode. At UK ATC we will:

- Provide national leadership in the scientific return to the UK from the JWST through UK ATC's central role in the calibration and operation of MIRI and engagement with the STFC Webb Fellows.
- Complete and deliver to the Very Large Telescope the new Multi-Object Optical and Near Infrared Spectrograph instrument, currently being constructed at UK ATC.





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 UK ATC 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 UK ATC 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 UK ATC, 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.

The Science and Pipeline at UK ATC

- 1.27** UK ATC is a national centre of excellence for the development of scientific instrumentation and facilities for ground and space-based astronomy.
- 1.28** UK ATC is delivering the long term instrument design and manufacture programme (HARMONI, METIS, ANDES, MOSIAC) for the European Southern Observatory, Extremely Large Telescope (ESO ELT).
- 1.29** It is providing effective leadership and project management expertise for STFC international research Infrastructure collaborations such as the Square Kilometer Array (SKAO), investing £90 million over three years in the construction of the SKAO with our co-hosts in Australia and South Africa and other international partners.
- 1.30** At present, the major experiment on site within these programmes is the construction of MOONS experiment (Multi-Object Optical and Near-infrared Spectrograph) for the Very Large Telescope (VLT) in Chile is currently underway, and is anticipated to be complete in 2024.
- 1.31** As well as other instrument and subsystems research, the site hosts a number of startup businesses in BID (Business Incubation and Development) incubation space, which includes a range of cleanroom facilities.
- 1.32** Royal Observatory Edinburgh site also hosts the University of Edinburgh Institute of Astronomy (IFA). The staff and students at the IFA make up around 50% of the site's ~200 employees.
- 1.33** The site will likely host the construction of the HARMONI experiment (High Angular Resolution Monolithic Optical and Near-infrared Integral field spectrograph) for the Extremely Large Telescope (ELT, currently under construction) from 2025 onwards, as part of the wider SKAO and ELT programmes. This instrument will be larger than MOONS and will require construction in a clean environment.

Development Plan Objectives

1.34 The UK ATC Development Plan follows the overall pattern of other STFC Development Plans, with overarching objectives in three themes.

• Science

- Ensure UK ATC can retain its status as a world-class research facility.
- Enables the anticipated research pipeline to be undertaken.
- Addresses the issues that are limiting the site's potential, including conservation of the historic estate and site access.
- Future-proofed, flexible and modern accommodation for scientific research and business incubation.

• People

- Improve the quality and utility of outdoor spaces through improved landscape and public realm.
- Consider options for meeting space to bring people together for effective collaboration.
- Commitment to the management and improvement of the existing heritage estate.

• Environment

- Prepares the site for a Net Zero future.
- Enhance biodiversity across the campus.
- Minimise environmental and visual impacts.

Climate Change

1.35 UKRI's aspiration is to be Net Zero carbon emitter by 2040, and the UK Government has committed to being Net Zero by 2050. To support this, STFC wish to ensure that their estate can move to being Net Zero by 2040. The Development Plan will contribute towards this goal by setting out areas of opportunity, and also discuss feasible approaches when dealing with the historic estate.

Methodology

1.36 Due to the constrained nature of the site, and limited anticipated pipeline, this Development Plan has been undertaken using a more 'light-touch' approach than Development Plans at STFC's larger sites at RAL and Daresbury.

1.37 The key stages of work have been:

1. An initial workshop (October 2022) held internally between STFC's Estates team and UK ATC leadership to understand key issues and the strategic future needs of the site.
2. A baseline assessment (including planning policy) and site visit (March 2023) which established a deeper understanding of the site and a discussion of scientific needs for HARMONI. This site visit was collaborative between STFC's Estates team (both national management and on-site), research staff, the Development Plan team, landscape architects and heritage architects.
3. Supporting studies on the heritage impact of potential site changes, and a landscape and visual assessment of potential massing options.
4. A review of findings and concept plan, followed by feedback from STFC on additional projects or emphasis.
5. A final report on findings and the Development Plan (this document).

1.38 The UK ATC Development Plan has been a collaborative effort between STFC's Estates team and the consultant team at David Lock Associates, with support from landscape consultants LUC, heritage architects LDN Architects and planning context from Carter Jonas.

How to use the Development Plan

1.39 This document should be consulted to help guide future projects at UK ATC, in particular those with spatial implications. It sets out a list of key projects which should form the basis of plans for capital investments in future years at the site.

2 UK ATC today

Site Analysis

2.1 This chapter sets out a baseline understanding of the site's physical attributes, key issues and opportunities, growth forecasts, 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, Spring 2023.

Site Photos

Views



Figure 3: Existing views out

Exterior



Single point of access,
3.5m wide



Reconstructed southern wall



Service entrance to workshop

Figure 4: Exterior of site

Heritage



Historic collections



Library interior



Grade A listed
buildings



Cluttered settings

Figure 5: Heritage assets both inside and out

Buildings



Higgs & Crawford



New estates workshop



Villas and workshop



Bruck building



Bruck building



Crawford workshop



Workshop

Figure 6: Range of buildings on site

Landscape



Views out and internal enclosure



Mix of planting



Existing trees



North garden



Existing lawn

Figure 7: Landscape photos, internal and external

Spaces and Amenity



Central south-facing space



Bruck building courtyard



Centre of site



Central south-facing space
Figure 8: Outdoor spaces



Outside visitor centre



Outside seating near restaurant

Servicing



Estates vehicle parking



Estates vehicle



Bins



Complex levels and access

Figure 9: Servicing and access

Buildings and Heritage

2.2 The site is entirely contained within historic walls, which are listed at Grade B. Listed buildings include:

- The 1894 Observatory Building and Library - Grade A listed.
- The Gatehouse – Grade B listed.
- Copeland House – Grade B listed.
- The Villas – Grade C listed.

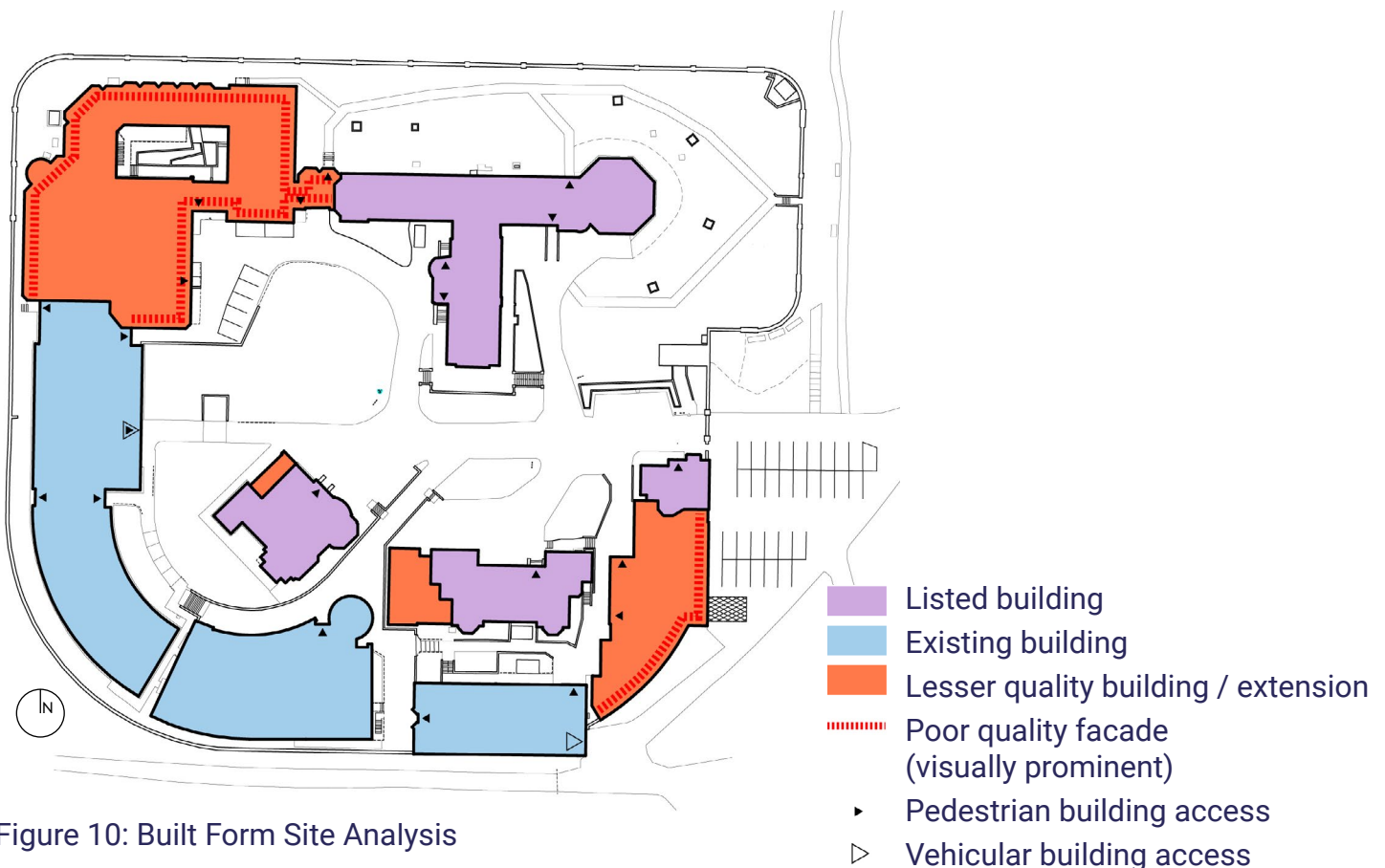
2.3 The 1894 building in particular suffers from significant condition issues, with recent high level reporting (2021) estimating costs of around £6m, however this scheme did not include cost associated the UKRI Net Zero commitment.

2.4 A Conservation Plan was prepared by LDN Architects in 2020 to support the continued occupancy and use of the heritage estate while ensuring its significance can be assured. It is important to note that the building remaining in its original use contributes greatly to its heritage significance. Conversely, a loss of the original use would cause harm to the heritage significance of the site overall.

2.5 Other buildings have condition issues, with the Mechanical Workshop being graded 'C' (Deficient) in a 2019 D+K condition survey. Elsewhere it is noted that the Bruck building may have some structural issues currently being addressed through temporary supports.

2.6 The architecture of the site is mixed, with the highest quality in the historic listed buildings and more recent buildings. The 1967 Bruck Building and Mechanical Workshop present facades and design that are of lesser quality. The Bruck Building in particular is highly visible from the city to the north, and is in the setting of the 1894 building.

2.7 The overall structure of the site is very contained and enclosed through the built form, contrasting with the open and expansive surroundings and creating an almost 'college-like' area inside the walls.

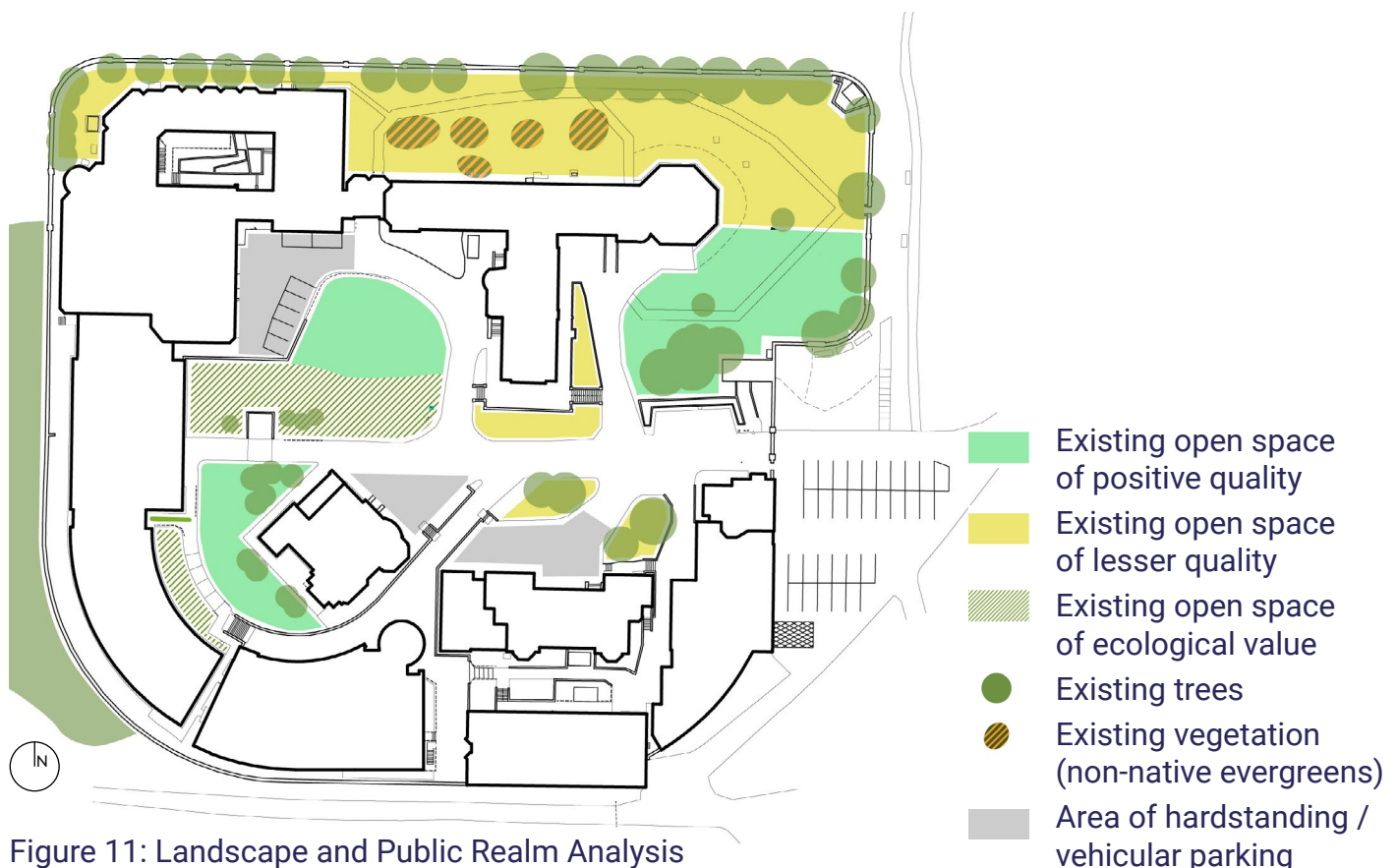


Landscape and Public Realm

- 2.8** Much of the site landscaping is grass, ornamental planting or hardstanding, with some trees. The northern gardens are infrequently used due to their aspect creating a cold and windy environment. There are few opportunities to sit or use outdoor spaces, except for near the canteen where seating pods have been installed. Much of the landscape provides low biodiversity value, and there is likely to be potential for enhancement, particularly along the northern edge.
- 2.9** Since the COVID-19 pandemic, staff car parking within the site has been limited to disabled-only, and vehicle access limited to operational needs. This is supported by Estates and management and expected to continue. A number of former car parking spaces and hardstanding still exist which previously were used for car parking.

Wider context

- 2.10** Outside of the walls, the site benefits from long views across the city and surrounding countryside, a significant advantage of its location. Conversely, it is also highly visible from all directions, and forms part of the setting of the Edinburgh UNESCO World Heritage site.



Access and Circulation

2.11 The single point of access to the site is through the main gates, to the immediate north of the gatehouse. There is a pedestrian gate, and a vehicle access with a width of 3.5m. Immediately inside the gate are a small number of disabled parking spaces and electric vehicle charging points. Cycle parking is located around the site, although much of the provision is of poor quality. Since the COVID pandemic, staff have not been able to park inside the site routinely. There are a number of unused car parking spaces around the site.

2.12 The access entrance gate poses a spatial constraint for large vehicle which complicates logistics for material deliveries and the despatch of telescopes such as HARMONI. At present oversized deliveries and despatches require a crane to lift them over. At the bottom of the hill, oversized deliveries must pass through the neighbouring park to get around the ceremonial arch.

2.13 The gate is not wide enough to handle MOONS when it leaves, and is not wide enough for many of the incoming deliveries anticipated for HARMONI and the final instrument. The access road to the Crawford Workshop is currently not wide enough for the MOONS departure and a small scheme is underway to widen it.

2.14 The site has complex levels, rising in the north and dropping in the south. This, and the tight arrangement of buildings, means that vehicle access is quite restricted.

2.15 Estates service vehicles are parked outside around the site, causing degradation of the vehicles in the Scottish weather.

2.16 Waste is disposed in large bins outside of the Villas in the centre of site.

2.17 There is no single location for goods in handling on the site. Each building handles their own goods in separately.

2.18 There is a locked service access to the South Building through the exterior walls in the southeast of the site.

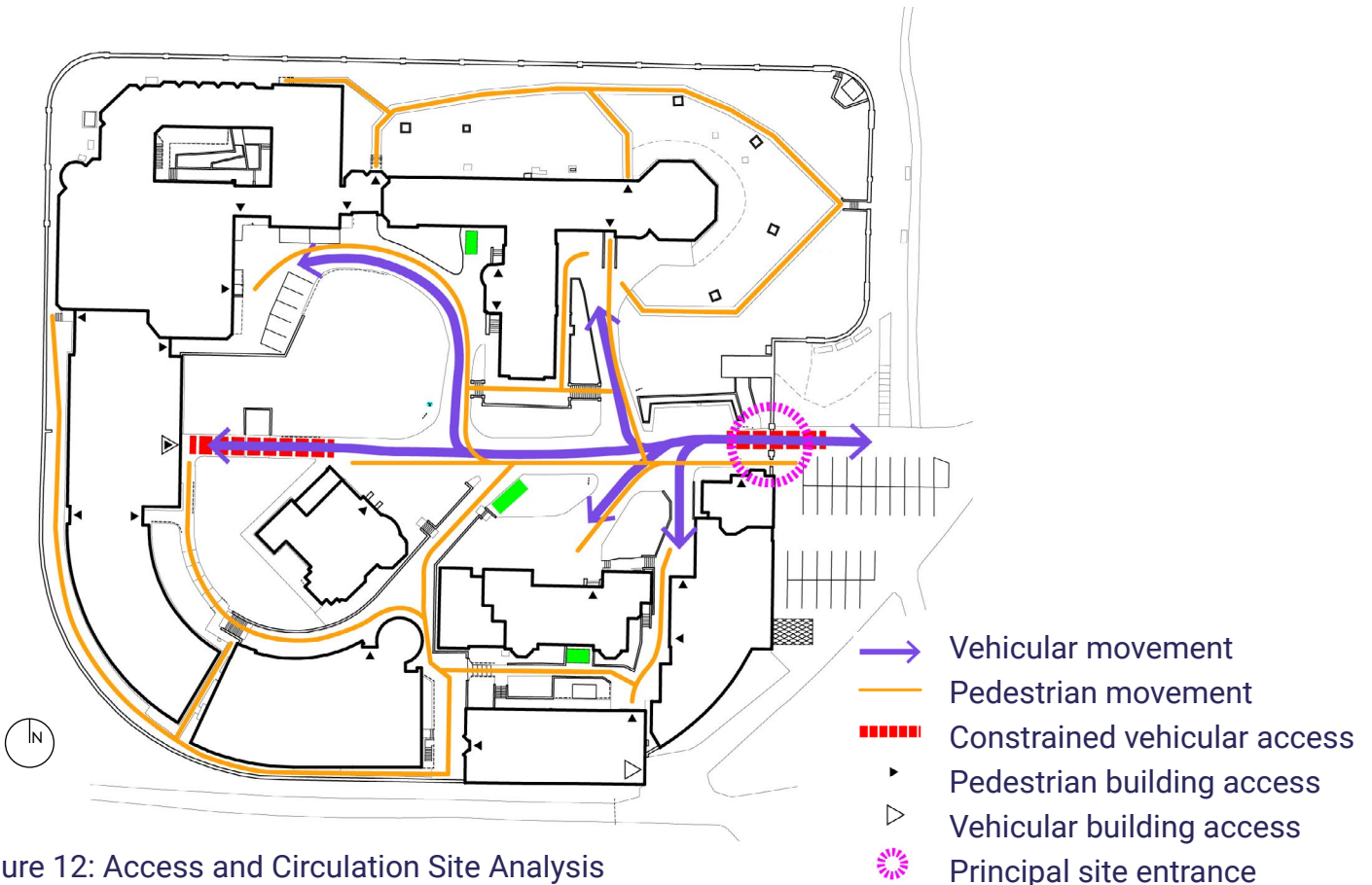


Figure 12: Access and Circulation Site Analysis

Space Demand and Growth

- 2.19** The site currently hosts around 200 people, with approximately 100 of these being STFC staff, and the rest staff and students of the University of Edinburgh.
- 2.20** Jobs growth at the site is not expected to be rapid – around 2 – 3% per annum is anticipated, settling at a maximum of 135 full-time-equivalent (FTE) posts. For 2023 this will be accommodated by adding occupants to existing offices. Beyond this a new solution may need to be found.
- 2.21** The University of Edinburgh has not at present indicated a major change in need for space or jobs growth, although it is noted that the nearby Kings Campus (focused on the Faculty of Science) has recently completed a large new amenities building.
- 2.22** Space demand for BID tenants is similarly not anticipated to grow rapidly, but some reconfiguration of existing space is needed, as demand for high-grade cleanrooms (e.g. ISO class 5) is not as high as expected when they were built.
- 2.23** There are two key demands for changes in space or additional floorspace:
1. The need to accommodate the larger HARMONI experiment, in a clean environment with appropriate delivery handling at the clean/dirty interface.
 2. A request for additional meeting or conference space within the site.
- 2.24** Satisfying these space demands will be investigated as part of the Development Plan, as well as concepts to understand where additional floorspace could be sought should the need arise in the medium-term.

Planning Policy Context

- 2.25** The site is subject to a number of key planning policy considerations:
- **Heritage**
 - There are Grade A, B and C listed buildings on the site.
 - The site is in the setting of a Scheduled Monument to the west.
 - The site forms the setting to a Conservation Area to the north and west.
 - **Environmental**
 - The site is in the Edinburgh Green Belt.
 - The site is part of a Local Nature Conservation Site.
 - The surroundings of the site are part of the Local Nature Reserve of Heritage of Braid.
 - **Landscape & Views**
 - The site is located in the Special Landscape Area of Braids, Liberton and Mortonhall.
 - The site is visible from the UNESCO World Heritage Site and in a number of Protected Views from points in the city.
 - The site is the starting point of a number of key views of the city.
- 2.26** Full details of relevant planning policy is attached as an appendix to this document.
- 2.27** A number of recent planning applications have been made on the site, and a full history is set out in the appendix.

Key Issues and Opportunities

2.28 From this baseline position, a number of key issues and opportunities for the site have been identified.

2.29 Issues:

- Managing the site's heritage, the statutory requirements and addressing condition issues, particularly the 1894 Building, as part of a commitment to conservation of the legacy estate and ensuring the site can remain in use into the future.
- Addressing the condition and suitability of other buildings, especially the Bruck Building and Mechanical Workshop, and considering that the Bruck Building is not occupied by STFC.
- Ensuring that HARMONI can be undertaken on the site, with external access secured through the gate, and internal access (clean handling into the workshop environment).
- Provision of meeting rooms and conference facilities could be improved to provide space for large events, typically around 40 people.

2.30 Opportunities:

- There is an opportunity to enhance the quality of outdoor spaces and landscaping at UK ATC, creating outdoor amenity and more defined spaces, making the most of recent car parking reconfiguration.
- Changes to the built form could improve the setting of listed buildings, for example by pulling back from listed buildings (no adjoining structures), removal of excess signage and other measures.
- Landscape changes should also reflect functional needs, such as access, storage for service vehicles, and biodiversity net gain/nature recovery on site.
- The relationship to the landscape outside the walls can also be improved, considering views and shelter.
- Through landscape and visual assessment work, the Development Plan could establish high-level massing parameters for potential future growth should it be needed.
- Ensure the long term strategic future of the site by improving access and handling at the Crawford Workshop.



3 Development Plan

Overall Concept Plan

3.1 The Development Plan is underpinned by an overall spatial concept plan, which sets out where uses, spaces and development could most effectively be distributed. The concept plan demonstrates potential for opportunity, i.e. while it shows that buildings could be demolished, expanded or replaced, this does not state that they should be, instead it is for optioneering purposes and to ensure spatial compatibility in the future.

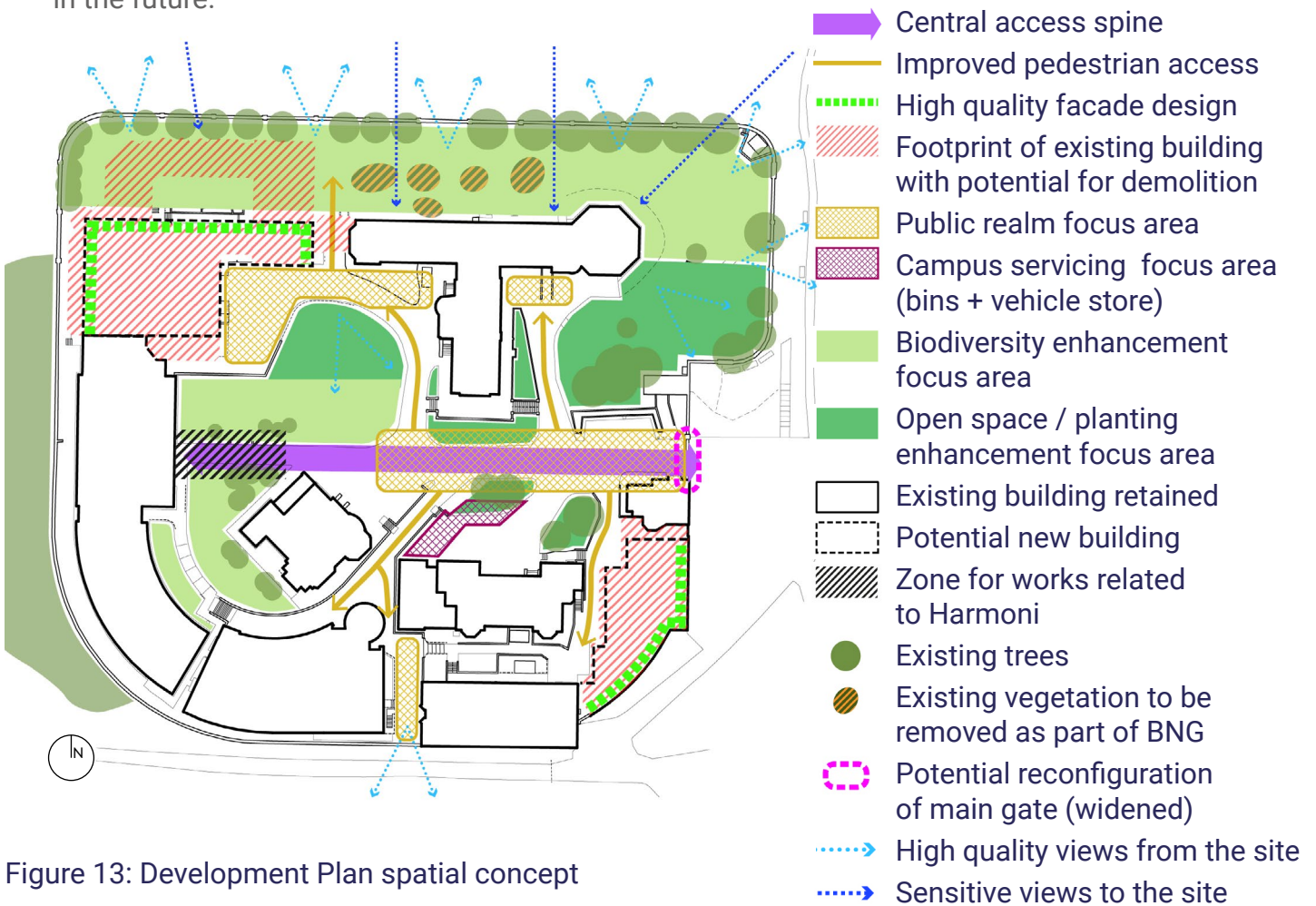


Figure 13: Development Plan spatial concept

3.2 The concept plan sets out:

- Access and movement arrangements.
- Public realm and landscape focus sites.
- Landscape parameters.
- Potential development locations.
- Key projects

3.3 As the site is small and constrained in terms of development potential, the Development Plan is mostly focused on a series of key projects, which fit together within the overall site concept plan. The rest of this chapter sets out these projects and actions in more detail, grouped under:

- Preserving the Heritage Estate.
- Creating Outdoor Spaces and Amenity.
- Accommodating the Pipeline.
- Further Development Potential.
- Meeting Spaces.
- Other Projects.

Preserving the Heritage Estate

3.4 UK ATC and the entire Royal Observatory Edinburgh site is a highly visible and nationally-significant heritage site, which has added importance because of its continued use for astronomy research. STFC recognises this importance and is committed to maintaining the legacy.

3.5 The 1894 Building has a number of condition issues which must be rectified so that STFC can satisfactorily discharge its statutory duties to maintain the Grade A listed building. Many of these issues also compromise the internal quality of spaces and function for staff and should be dealt with, and a programme balancing a complete building refurbishment with constraints around adaptation to fully modern accommodation (for example open plan offices are unlikely to be possible) should be prepared. A previous report in 2019 costed repairs at £6m.

3.6 In addition to repair and renewal, STFC's strategy is to move its estate to Net Zero operation by 2040. This will present a challenge to the most historic buildings on the site, so it should be established what measures are feasible to undertake. A site-wide series of studies can establish a baseline and the highest-priority actions for Estates to undertake to move the site towards Net Zero operation.

3.7 It is recognised that the relationship between UK ATC and the University of Edinburgh's IFA is highly valued and likely to continue in the long-term, and management of the estate with a duty of care to all tenants will support a strong future relationships. Estates will need to understand the full scale of liabilities and statutory responsibilities before engaging on a strategic resolution and programme of works.

3.8 Actions:

- Undertaken a more in-depth feasibility study of repair to the 1894 Building, including revised costs and options to move as close as possible to Net Zero operation.
- Deliver condition repair to the 1894 Building in line with the revised feasibility study and the 2020 Conservation Plan.
- Baseline analysis of energy load and carbon emissions.
- Commission a structural engineers report for the Bruck building, and update the existing lifecycle cost information with remedial costs.
- Thermographic analysis of existing structures to understand where improvements need to be made.
- Energy Performance Certificates (EPCs) for all buildings on the site.
- Engage with University of Edinburgh to discuss potential impact of 1894 building refurbishment on phasing and decanting, so these can be included in overall project costs.



Creating Outdoor Spaces and Amenity

3.9 The open space within the site is small and thus needs to work hard to deliver all of the benefits that it could offer. At present much of the space is undefined in function. The concept plan sets out a series of focus areas for the public realm within UK ATC, which when taken together consider:

- Usable amenity outdoor space for staff.
- A welcome and outdoor gathering space for schools at the visitor centre.
- Views out to the surrounding countryside.
- Biodiversity net gain and habitat creation.
- Clear pedestrian movement around the site.
- Essential access to key buildings.
- Waste management and servicing.

3.10 These potential areas, and their key functions, are set out in the plan below.

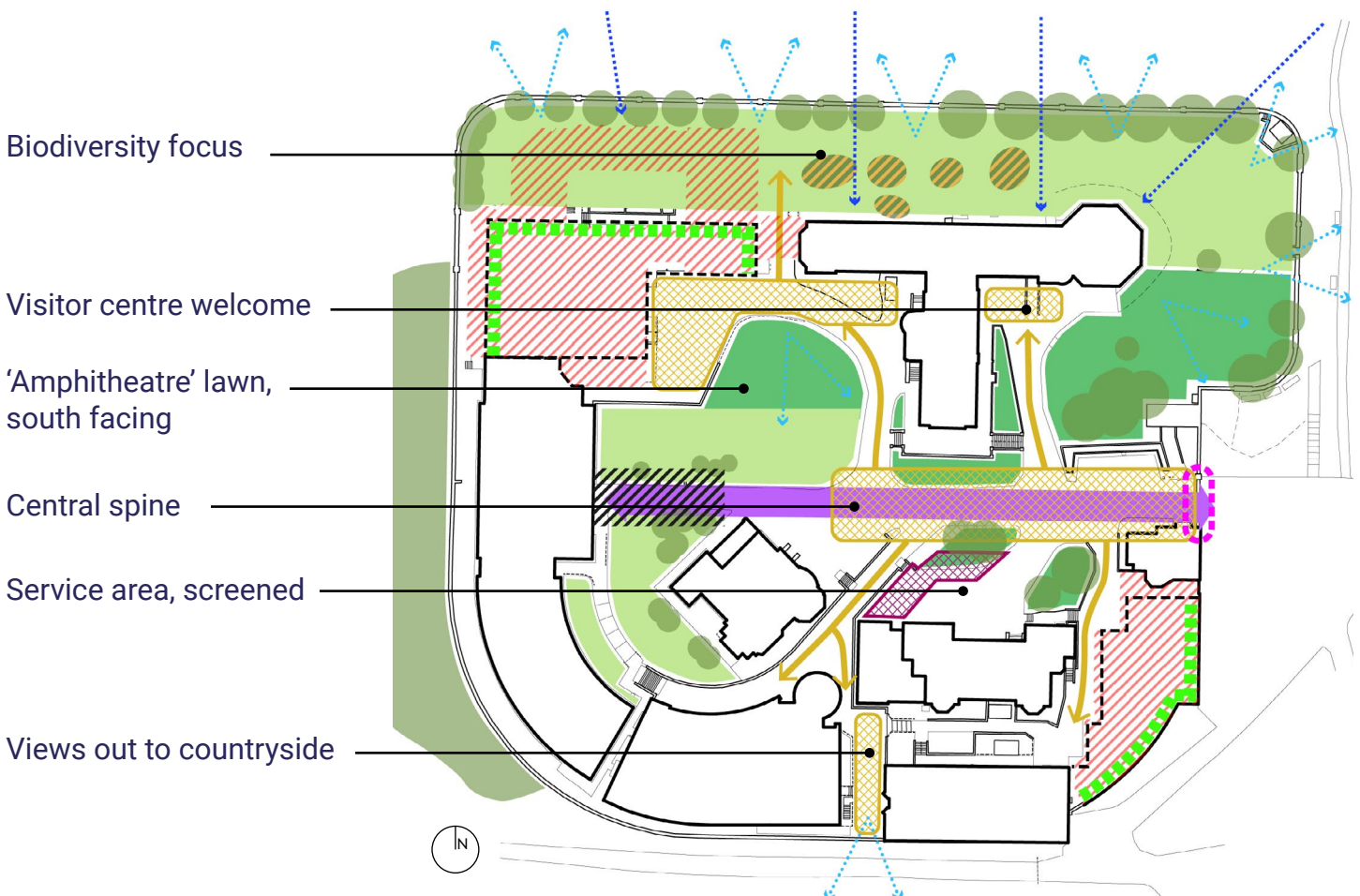


Figure 14: Defining outdoor spaces for amenity and nature recovery

3.11 Many of these areas could be realised through small-scale projects and interventions, such as provision of furniture or changes to planting schemes and management approaches. This approach needs to be underpinned by an overarching strategy to ensure benefit and placemaking is maximised.

3.12 This strategy of packaging areas of the public realm for conversion provides flexibility and adaptability. Some of the current public realm was previously used for on-site car parking. Since the COVID-19 pandemic, all staff car parking has been removed from the site and this remains the long-term ambition of STFC. However, should this policy need to be reversed in the future, public realm design should retain flexibility. This can be most effectively accomplished by prioritising those areas that do not currently have legacy parking spaces, such as:

- The ‘amphitheatre lawn’.
- Visitor centre welcome – green space for gathering.
- Northern gardens for nature recovery and biodiversity net gain.
- Restaurant terrace area with views out.

3.13 Areas such as the central spine and service area could be designed to retain parking spaces or be converted back to parking use in the future, should the need arise.

3.14 Actions:

- Identify priority landscape projects, concentrating on areas where small changes could have large impact, and considering where overall Development Plan changes such as access to Crawford Workshop and the main gate may cause future alterations.
- Review planting schemes within northern gardens to deliver biodiversity net gain.
- Review management approaches in northern gardens to deliver nature recovery plan.
- Undertake detailed design of potential estates vehicle store (see Other Projects later in this chapter).

Meeting Spaces

3.15 Through the early engagement process, a potential need for new meeting spaces for 40+ people within UK ATC was identified, as well as potentially a similar need for the IFA. This was identified to support continued collaboration and interaction on the site, as well as supporting academic conferences and events.

3.16 The Development Plan has undertaken a high-level assessment of potential locations for such meeting spaces, using the existing estate as well as potential new development within the walls, as detailed above.

3.17 Typical floorspace requirements for a 40 person ‘hollow square’ meeting-style room is up to 150m². This could accommodate a range of different seating styles, and when configured in lecture theatre format could accommodate up to 70 people.

3.18 For the purposes of comparison and high-level exploration of options, a 150 person lecture theatre/classroom-style room would require around 350m². Potential locations for such a facility are also tested.

3.19 Potential locations for a 40-person room include:

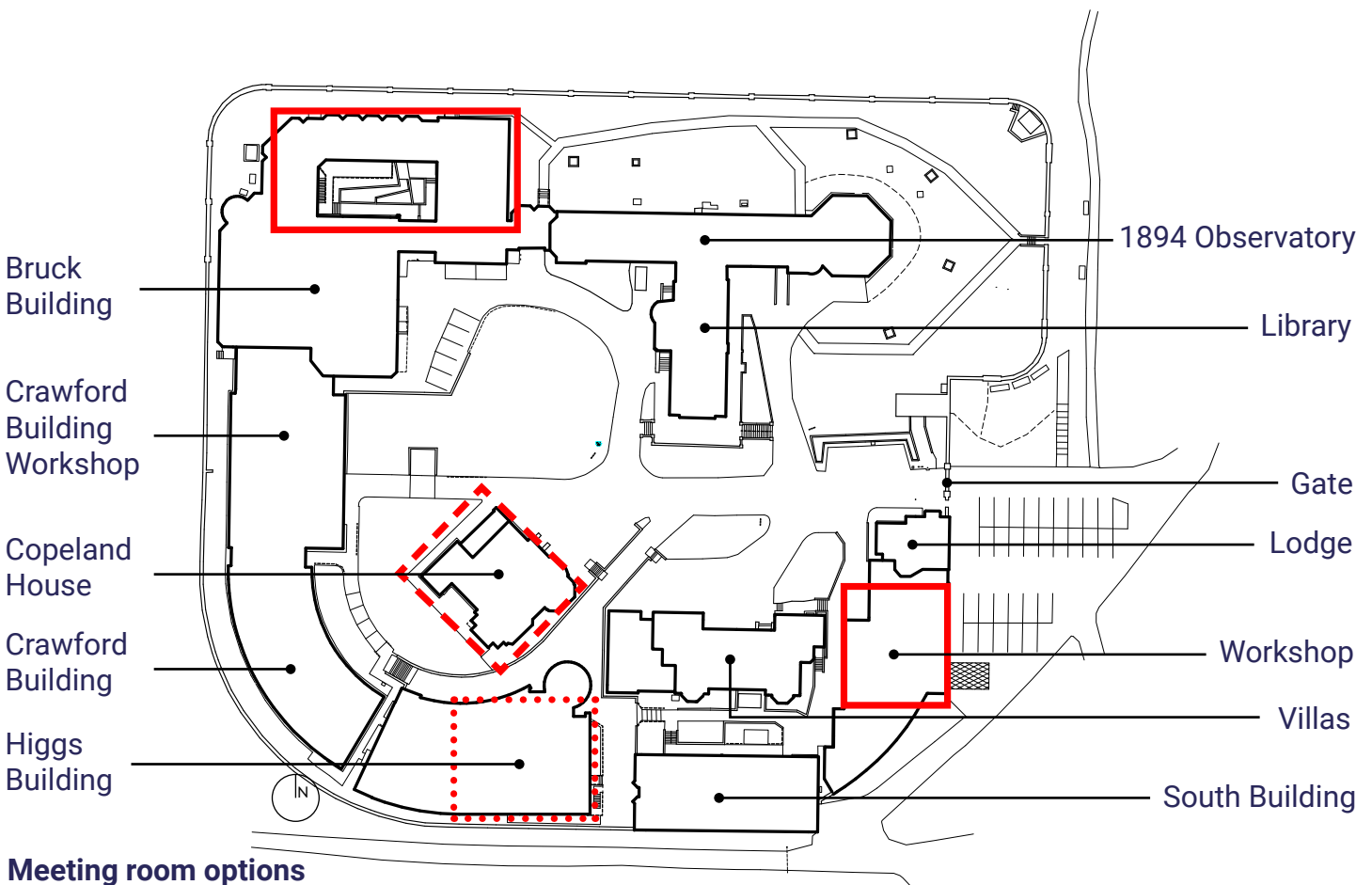
- Use of existing assets in the Higgs Building.
- Reconfiguration of Copeland House to be primarily for meeting rooms, as a central hub within the site.
- Above a rebuilt building on the site of current Mechanical Workshop.

3.20 Potential locations for a 150-person conference facility include:

- Use of existing assets in the Higgs Building.
- As part of an extended basement in a rebuilt Bruck building.

3.21 Actions:

- Space occupancy review to understand usage of existing meeting spaces within UK ATC, BID and IFA.
- Explore options to share use of spaces amongst organisations at ROE.
- Feasibility study on reconfiguration of Copeland House to be used for meeting rooms, with existing administration offices consolidated elsewhere.
- Include meeting room need as part of brief for future development on site.



Meeting room options

- New development required
- Reconfiguration of existing buildings
- Use of existing facilities subject to space usage study

Figure 15: Potential location of meeting room spaces

Servicing

3.22 An estates vehicle store has been proposed to protect the selection of vehicles that maintain the site from the weather. The Development Plan concept proposes an area to the north of the Villas as the best.

3.23 As identified in the analysis, at present the site does not have a single goods in area for the storage and handling of materials and equipment. Such a facility ideally requires:

- Ground floor vehicle access.
- Reversing/parking space outside for delivery vans.
- Level pedestrian and trolley access.
- Sufficient internal height for racking and storage.

3.24 At present the space requirements for such a facility are yet to be defined. The Development Plan sets out a number of potential options which could be explored in the future.

3.25 Small facilities could be located:

- In the extension located to the west of the Villas, currently used as a workshop. This would align with the overall central servicing location for the site proposed above.

- In a reconfigured Mechanical Workshop building.
- On the ground floor of the South Building, utilising the current exterior service access.

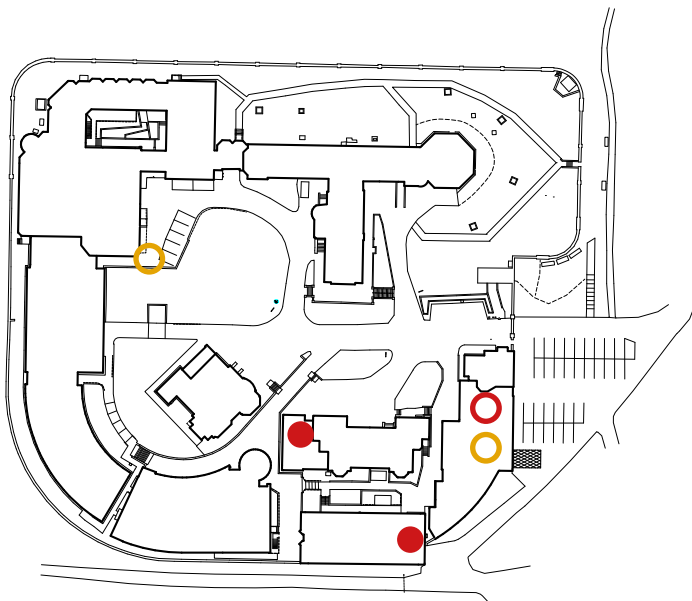
3.26 Larger facilities could be located:

- In a redeveloped Bruck building (e.g. the maximum development option with service access on the ground floor).
- In a reconfigured Mechanical Workshop building, perhaps with an exterior access through the walls.

Office space

3.27 Office space across the site should ideally be consolidated into buildings with the most flexibility and accessibility – the Higgs and Crawford buildings. As the Higgs is used by BID tenants, consolidating administration and office into this building should be the aim. This will need to be underpinned by a space usage study to understand how offices, labs and meeting rooms are used since the COVID pandemic changed working patterns.

3.28 Through this process, large underused offices in Copeland House and the Villas could be freed up to provide meeting spaces. The space usage study could also identify opportunities to reconfigure and expand lab space.



- Small - reconfigure existing space ○ Large - new development required
- Small - new development required

Figure 16: Potential location of goods in areas



Prioritisation and Sequencing of Projects

- 3.29** The priority projects at UK ATC are those that ensure the imminent HARMONI experiment can be undertaken. The sequence of the actions required are set out under the relevant sections above.
- 3.30** In parallel, and considering any public realm works necessary to ensure HARMONI can proceed, a study on simple landscape, outdoor furniture and planting changes to enhance outdoor amenity and provide nature recovery possibilities should be undertaken. This can be extended in the future with more comprehensive changes.
- 3.31** A space usage study should be completed to facilitate projects on office reconfiguration and an assessment of meeting room needs. STFC has these skills in-house and has experience at RAL and Daresbury Laboratory.
- 3.32** Detailed feasibility studies on addressing condition issues in the heritage estate (especially the 1894 building) should commence to inform investment plans.
- 3.33** Finally, preparations to move the site to Net Zero should begin with a baseline study on UK ATC, including thermographic analysis and EPCs for all buildings, to create a programme of future works and investment that can be supported through the UKRI Net Zero fund.

Development plan Annexe A

Future potential

- A.1** Although at present significant growth of UK ATC is not envisaged, and this is not a direct objective of the Development Plan, should the future strategic direction of STFC, UK ATC or the science on-site require additional space, further opportunities for increasing accommodation have been considered and presented here only to enable future consideration.
- A.2** Although there are a number of constraints on development (heritage, visual impact etc.) future options do exist for limited development should the need arise.
- A.3** Since the completion of the Higgs Building in 2017, the last remaining area for 'new' development has been taken. As such, any new development requirements would need to be an intensification of floorspace on an existing site.
- A.4** At present there is no demand for this development, and so this part of the Development Plan is purely to identify where any future, unanticipated demand could be accommodated through a series of massing concept studies.
- A.5** The two critical factors governing development are a) landscape and visual impact of height increases and b) heritage setting impact on listed buildings. To understand this in more detail, a landscape and visual assessment of massing was undertaken by LUC, a specialist consultant. Heritage impacts were not formally assessed due to the lack of detailed design, but following general principles of:
- Following existing or historic building lines.
 - Creating physical separation from listed buildings, especially where existing buildings are joined to listed buildings.
 - Considering massing impacts in relation to the skyline.
- A.6** Further work on assessing heritage impact will need to be undertaken should these areas be considered for development.
- A.7** Two potential locations where intensification of development could be undertaken have been identified – the Bruck Building and the Mechanical Workshop.



A.8 The Bruck building (A on the plan) has been chosen because:

- It is in relatively poor condition.
- It is inefficiently configured internally, based around an underused courtyard and with cellular offices.
- It is architecturally not of the same quality as the rest of the site, and occupies a visually prominent position.
- It is in the setting of the 1894 building, and change could improve the setting of this grade A listed building.

A.9 The Mechanical Workshop (C on the plan) has been chosen because:

- It is in relatively poor condition.
- It is inefficiently configured internally as a single floor with a very high roof height.
- It is joined to the Grade B listed Gate House building, and is visible from the main public entrance above the works, but does not match the architectural quality of the rest of the ROE site.

A.10 Due to the potential need to expand and reconfigure the Crawford Workshop to support instruments for the ELT in the future, the Development Plan also tests the expansion potential of the workshop (B on the plan).

A.11 This part of the Development Plan does not set out any key actions for Estates, but forms part of an understanding for the future potential of UK ATC should redevelopment projects be identified as needed.



Figure A1: Areas for development potential testing

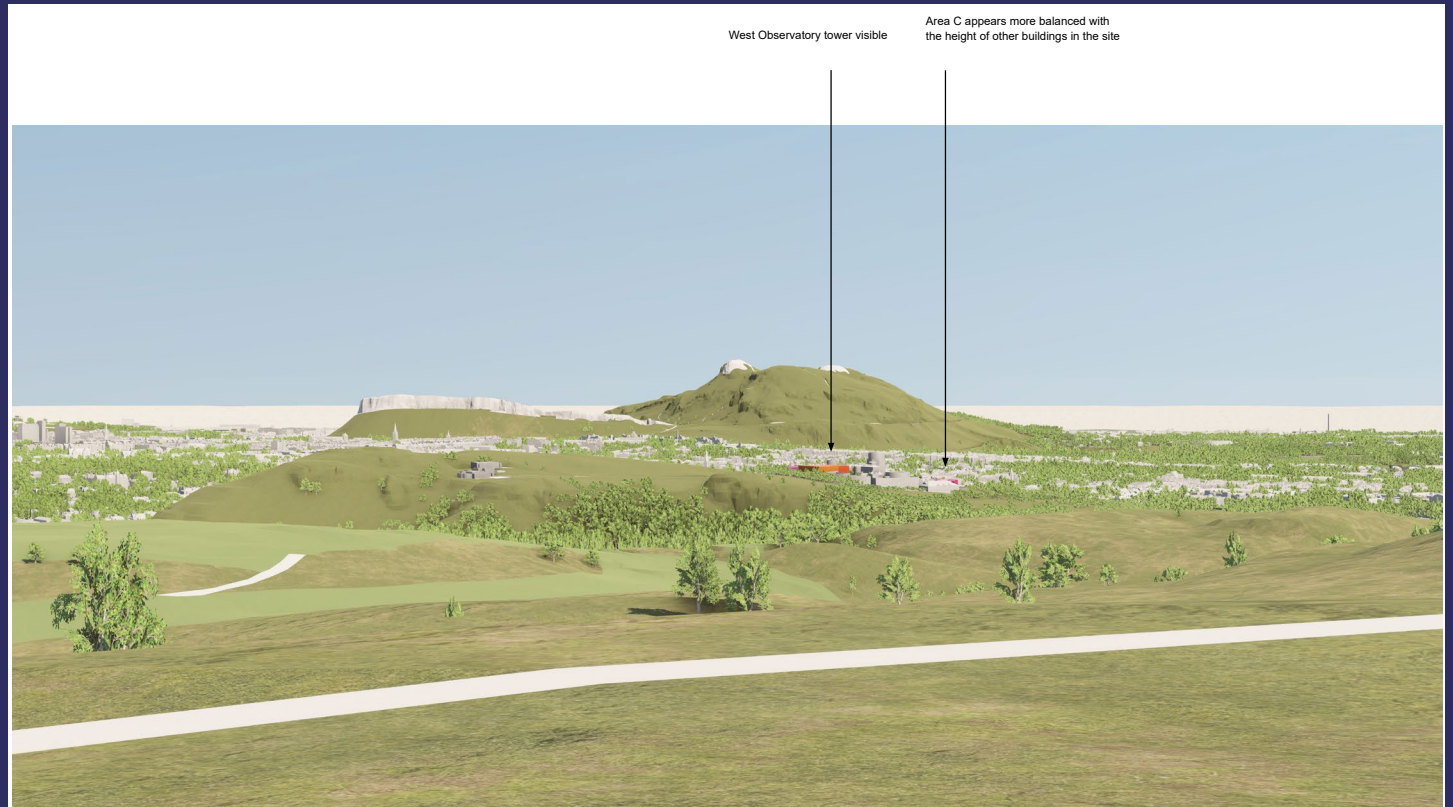
Landscape and visual assessment findings

- **A.12** A landscape and visual assessment was undertaken by LUC for STFC, which has informed this work. It took key views around the site, both near and far, and tested the impact of massing changes in the three identified areas. From this, potential height parameters which would be acceptable from a landscape and visual perspective are set out.

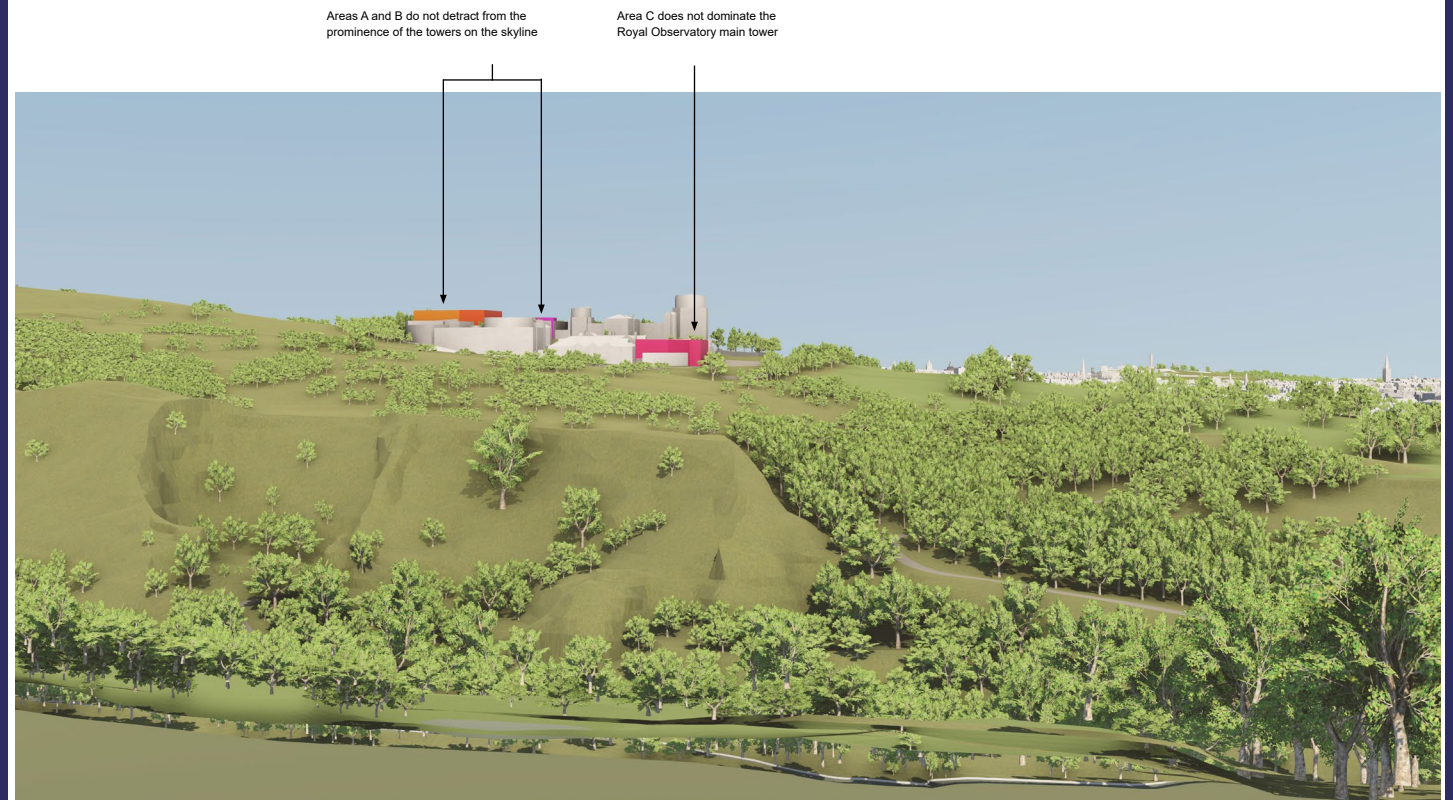
- Area A – Bruck Building: Currently 7.3m, with potential to go up to 9.6m.
- Area B – Crawford Workshop: Currently 9.4m, with potential to go up to 12.8m.
- Area C – Mechanical Workshop: Currently 8.5m (pitched roof height), with potential to go up to 9.6m usable height.

A.13 The diagrams below show the impact of such massing (extracted from LUC report).

Figure A2: Long view from southwest towards Arthur's Seat



Location: 324856, 669494 Bearing: 33.9° Field of View: 39.6° Area B: upwards extension Area B: upwards extension Area B: eastwards extension Area C: upwards extension Notes: VuCity model incomplete in distance



Location: 326027, 669855 Bearing: 347.5° Field of View: 39.6° Area B: upwards extension Area B: upwards extension Area B: eastwards extension Area C: upwards extension Notes: VuCity model incomplete at base

Figure A3: Medium view from Hermitage of Braid

BRUCK BUILDING

A.14 The Bruck Building was opened in 1967, and hosts the University of Edinburgh's Institute for Astronomy (IFA). It has a net internal area (NIA) of 1630m² over 1.5 floors (due to level changes). The existing building is configured around an internal courtyard which is not especially well-used or attractive.

A.15 The Bruck building is adjacent to the 1894 building, and joins at the entrance hall. Its building line projects in front of the 1894 building, almost reaching the exterior walls, and the architecture is radically different and not of particularly high quality. All of these factors together suggest that the Bruck building is causing harm to the visual and aesthetic setting of the Grade A building, and if it needed to be redeveloped, modern approaches to conservation of the built environment would require a very different approach.

A.16 Specifically, it is likely that a new building would not be able to physically join to the 1894 building, and that the building line would need to match or at least make reference to the 1894 building's northern building line.

A.17 As such, this design study sets out key design parameters for testing redevelopment potential on the site:

- A maximum height of 9.6m, with heights at the eastern end matched to the roof (not tower) of the 1894 building
- A northern building line matching that of the 1894 building as a 'safe' testing option. It may be possible to move forward of this line in the northwest corner of the site, but for the purposes of exploring potential this line has been assumed across the site.
- A physical gap to the 1894 building to provide betterment to its heritage setting.
- Integration with a potential outdoor amenity space on the bank to the southeast, and a reduction in car parking spaces and hardstanding.

A.18 Four options are set out, from minimum to maximum.

Table A1: Bruck Building redevelopment options

| Option | NIA Floorspace (m ²) | Notes |
|---------------------------------------|----------------------------------|---|
| Existing heights | 1200 | <ul style="list-style-type: none"> • ‘Safest’ option in terms of heritage and landscape impact. • Reduction in floorspace. |
| Existing heights Extended basement | 1700 – 1950 | <ul style="list-style-type: none"> • Makes use of existing foundations to the north but could require significant groundworks. • Skylight provision in gardens to maximise natural light to basement. |
| 9.6m height at western end | 2100 – 2650 | <ul style="list-style-type: none"> • Design of western terrace / increase in height to reference 1894 building tower (e.g. Higgs Building). |
| Maximum extents | 3500 - 4000 | <ul style="list-style-type: none"> • Takes over bank to the south. • Could require significant ground works. • Provides vehicle access to lower floors for flexible workshop provision. |

A.19 The four options are set out below.



Figure A4: Interior courtyard of Bruck Building

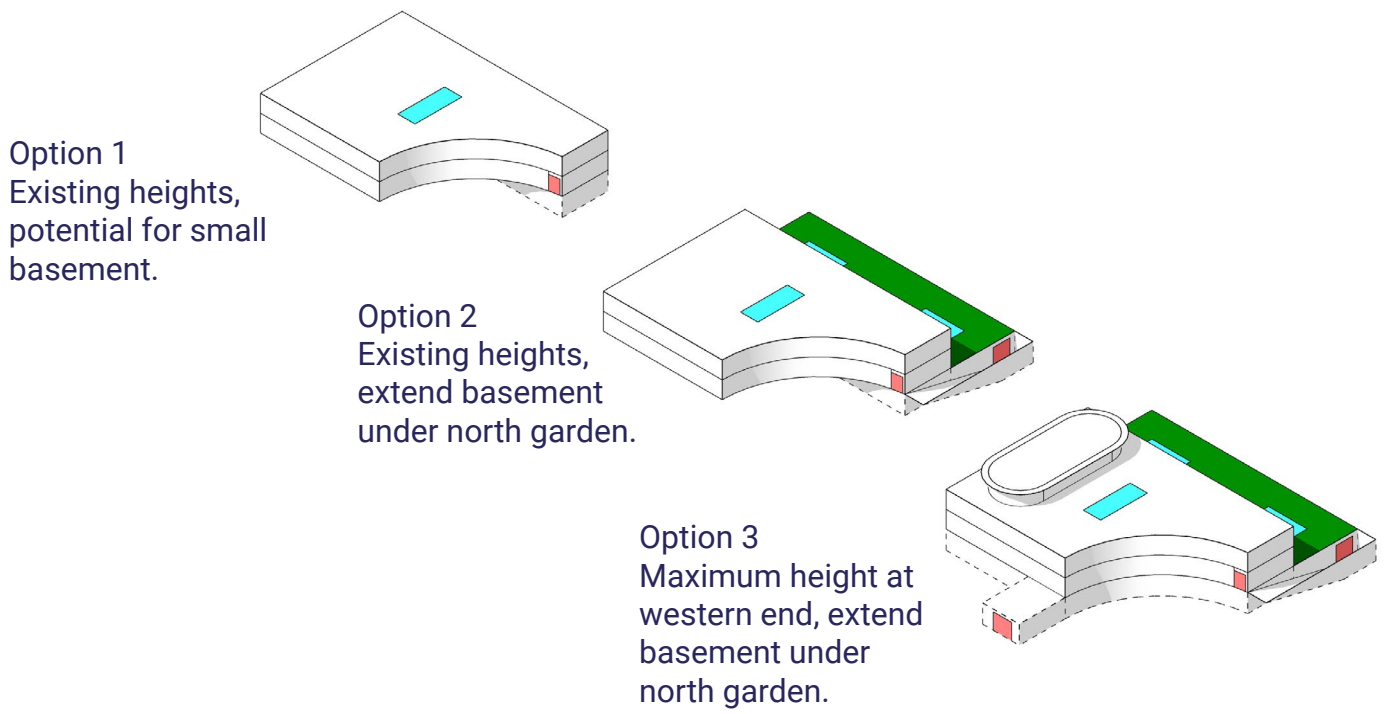


Figure A5: Bruck Building Massing Options 1-3

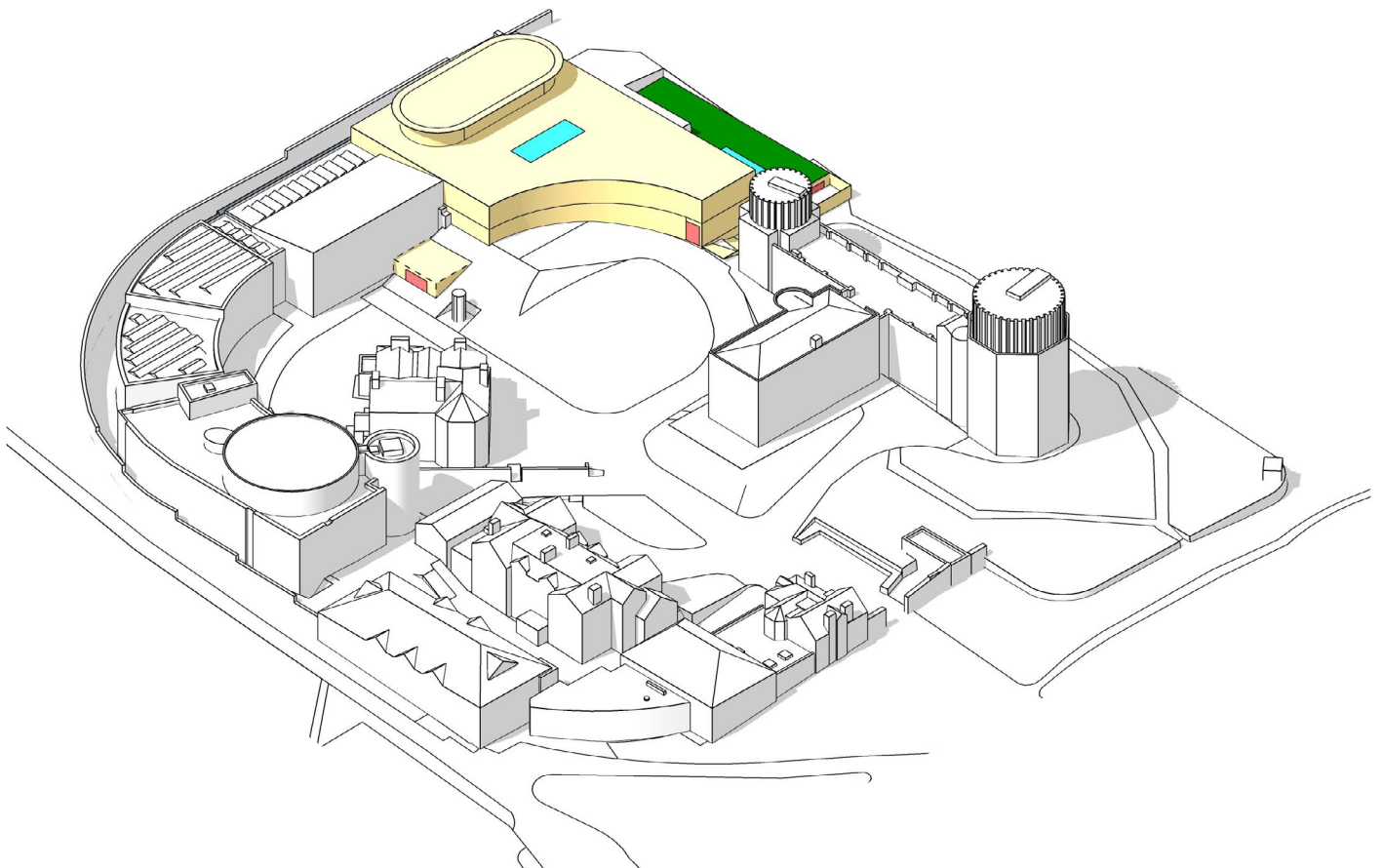


Figure A6: Bruck Building Massing Option 3 in situ

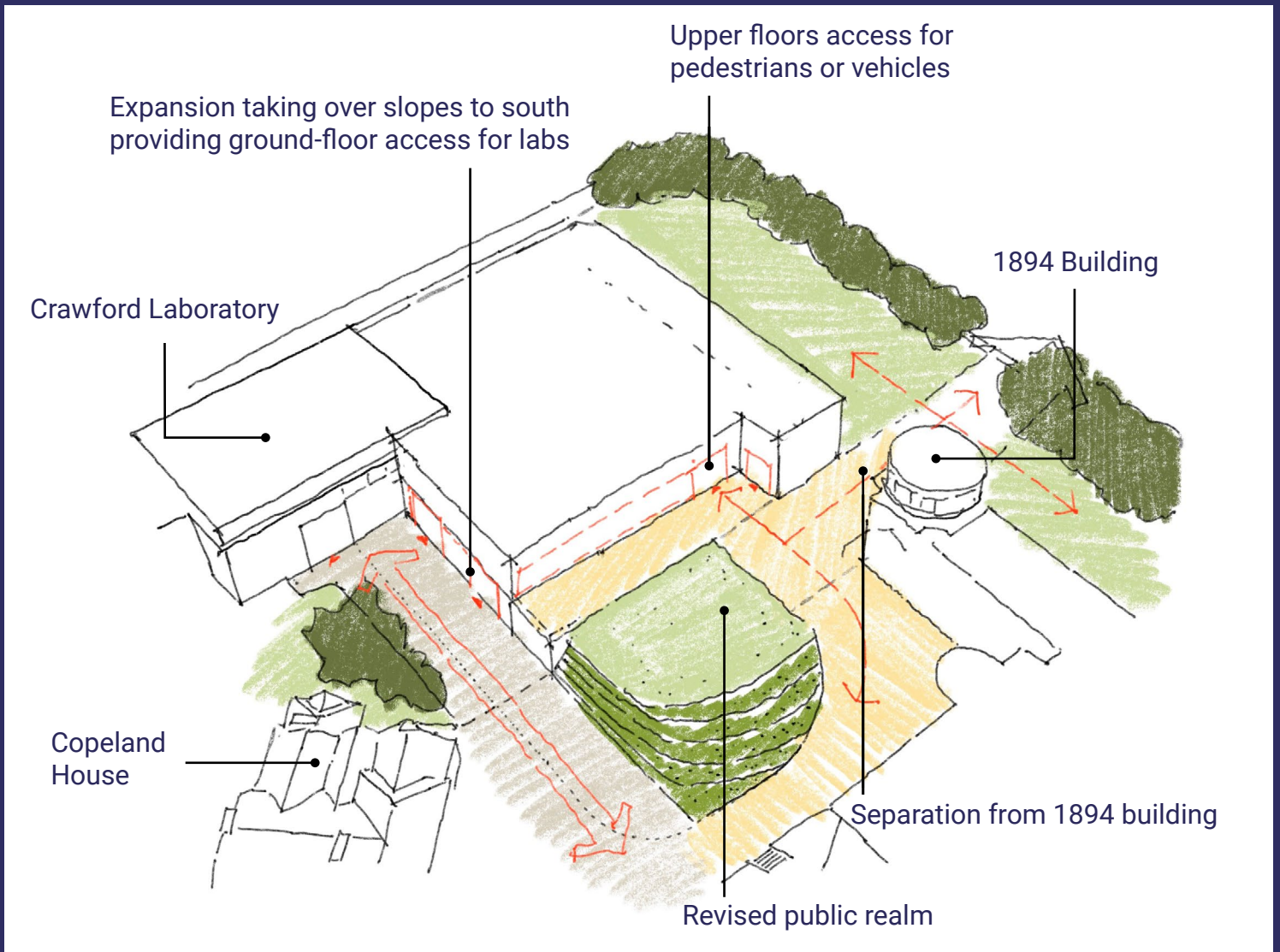
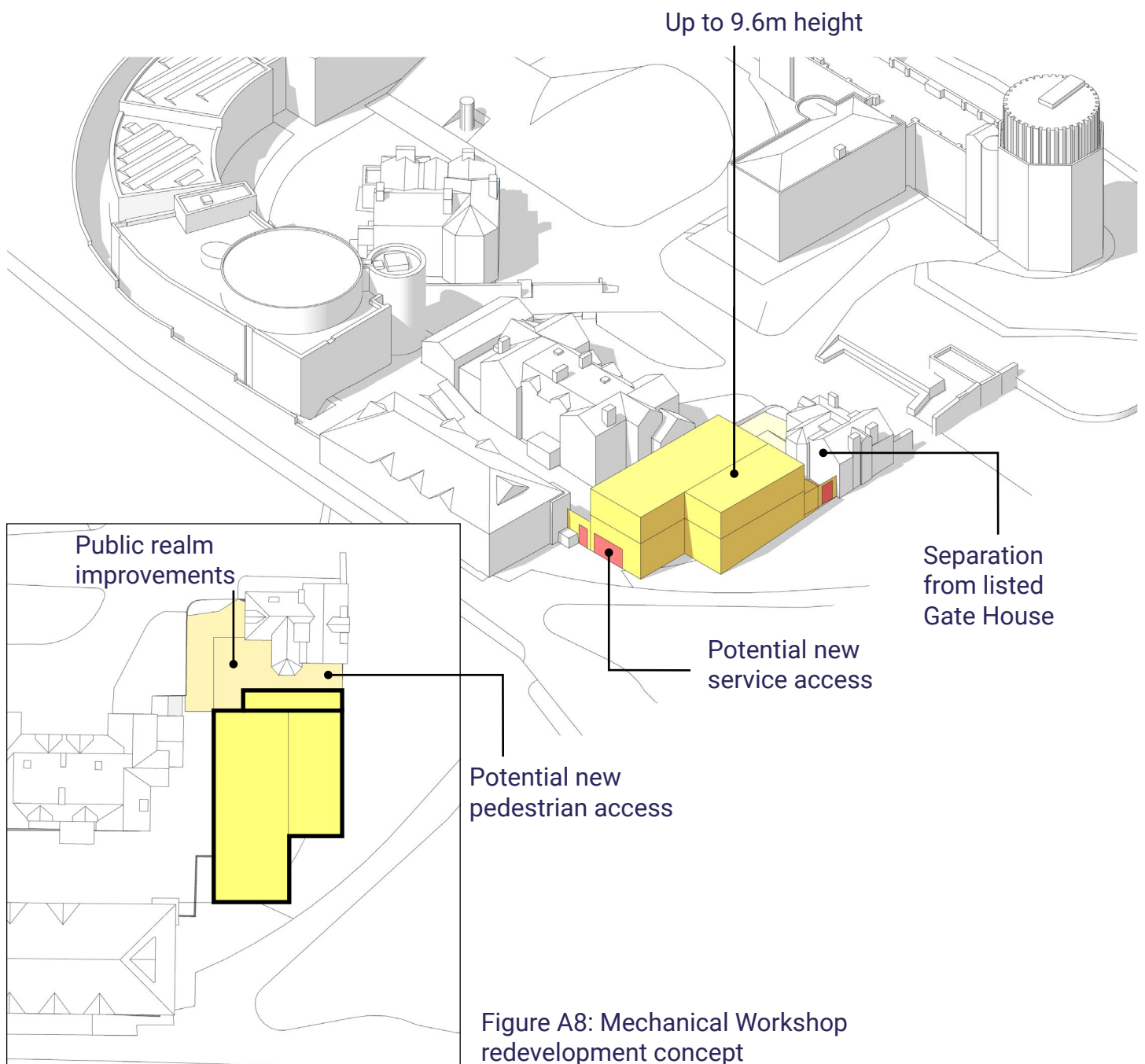


Figure A7: Option 4 maximum development concept sketch

Mechanical workshop

- A.20** The Mechanical Workshop is a single storey building joined to the Grade B listed Gate House and the listed exterior walls. It has a tall pitched roof, accommodating workshop equipment inside, with an NIA of approximately 400m². The building has been flagged as condition 'C' in the D+K condition report, although this is primarily internal services and fabric issues.
- A.21** The existing building is comparatively tall but does not use most of the roof height for the equipment on the ground floor. There is potential to increase heights and accommodate additional accommodation if needed.

- A.22** By creating a physical gap to the listed Gate House, the setting of this building could be improved through new, sensitively-considered development.
- A.23** A concept study of a combined workshop building with first-floor accommodation, potentially providing a meeting room or conference facility near the main entrance, with new public realm at the entrance, is set out below. This configuration could yield approximately 700m² of NIA floorspace, configured as workshop with a 5.5m floor to ceiling height, and first floor office/meeting room.



Improving access to the site

A.24 The HARMONI experiment is the primary assumed pipeline project that requires Estates attention. The size of the instrument means it is likely to require a number of deliveries that do not fit through the exterior gate, as well as final dispatch of the instrument.

A.25 MOONS experiment, currently being completed, requires a widening of the access road to the workshop. Landscape alterations have been designed and will be progressed during 2023.

A.26 The gate is 3.5m wide (with a usable width that is less due to gate hinges). In the past oversize deliveries have been handled by use of a crane. However, this will become less feasible and more inconvenient. The frequency of such deliveries may only increase long-term, due to the overall increase in size for instruments on the ELT, which will likely be the long-term future of the site's large instrument output.

A.27 Consideration has been given to off-site construction through obtaining a lease on a nearby industrial unit, and fitting out appropriately. Although this may be a convenient option on initial examination, there are a number of strategic issues:

- Around 50% of STFC staff at UK ATC will be engaged on the project. Given the nature of the work, it would make operational sense for them to be based near the experiment, rather than having two separate sites for design and build. This would reduce the number of STFC staff on site considerably, calling into question its long-term sustainability.
- Management procedures and policies would need to be updated, in terms of primary places of work, and potentially introducing additional costs such as travel between sites, on top of lease costs and capital fit-out.

- Moving instrument construction off-site would be a strategic statement that the site is unsuitable for its long-term use, where experiments will be of this scale for the ELT. Keeping the site in its original use is an important heritage concern, which is supported in planning policy when considering necessary and sensitive alterations to any listed buildings. If the site can be adapted sensitively, it makes sense to do so.

A.28 Potential options to tackle this access issue are set out in Table 1 opposite.

A.29 To understand what adaptations might be needed, a supporting study on widening the main gate has been undertaken by LDN Architects, who prepared the 2020 Conservation Plan for ROE.

A.30 Due to the gate refurbishment and potential to declutter the existing piers of signage and accrued services, there is the potential for betterment to the listed gates, walls and setting of the Gate House.

A.31 The preferred option for pursual is widening the gate to allow 5m wide deliveries which provides full operational benefits and is substantially the same as Option 2 in terms of heritage impact and visible change.

A.32 Actions:

- Confirm dimensions and programme of HARMONI deliveries and outputs.
- Undertake pre-application discussions with City of Edinburgh Council and Historic Environment Scotland to determine acceptability of Option 3 gate widening proposal.
- Commission a detailed architectural and landscape design for widened gate based on preferred option.
- Obtain planning permission and undertake works to widen gate prior to HARMONI commencement.

Table A2: Exterior Access Options

| Option | Pros | Cons |
|--|--|---|
| Widen gate | <ul style="list-style-type: none"> Keeps site in original use. Accommodates oversized logistical requirements. | <ul style="list-style-type: none"> Potential architectural heritage impact. Capital Cost. Minor impact on parking spaces. |
| Crane over gate for oversized components | <ul style="list-style-type: none"> Lowest capital cost. | <ul style="list-style-type: none"> Heritage risk from collision. Risk to components (science risk). Long-term unsuitability of site. Inconvenience. |
| Off-site construction | <ul style="list-style-type: none"> Long-term strategic option for larger experiments. Potentially frees ROE site to build component parts. | <ul style="list-style-type: none"> Management impact. Loss of staff on site. Additional running costs. Potential impacts on long-term strategic sustainability of site. |

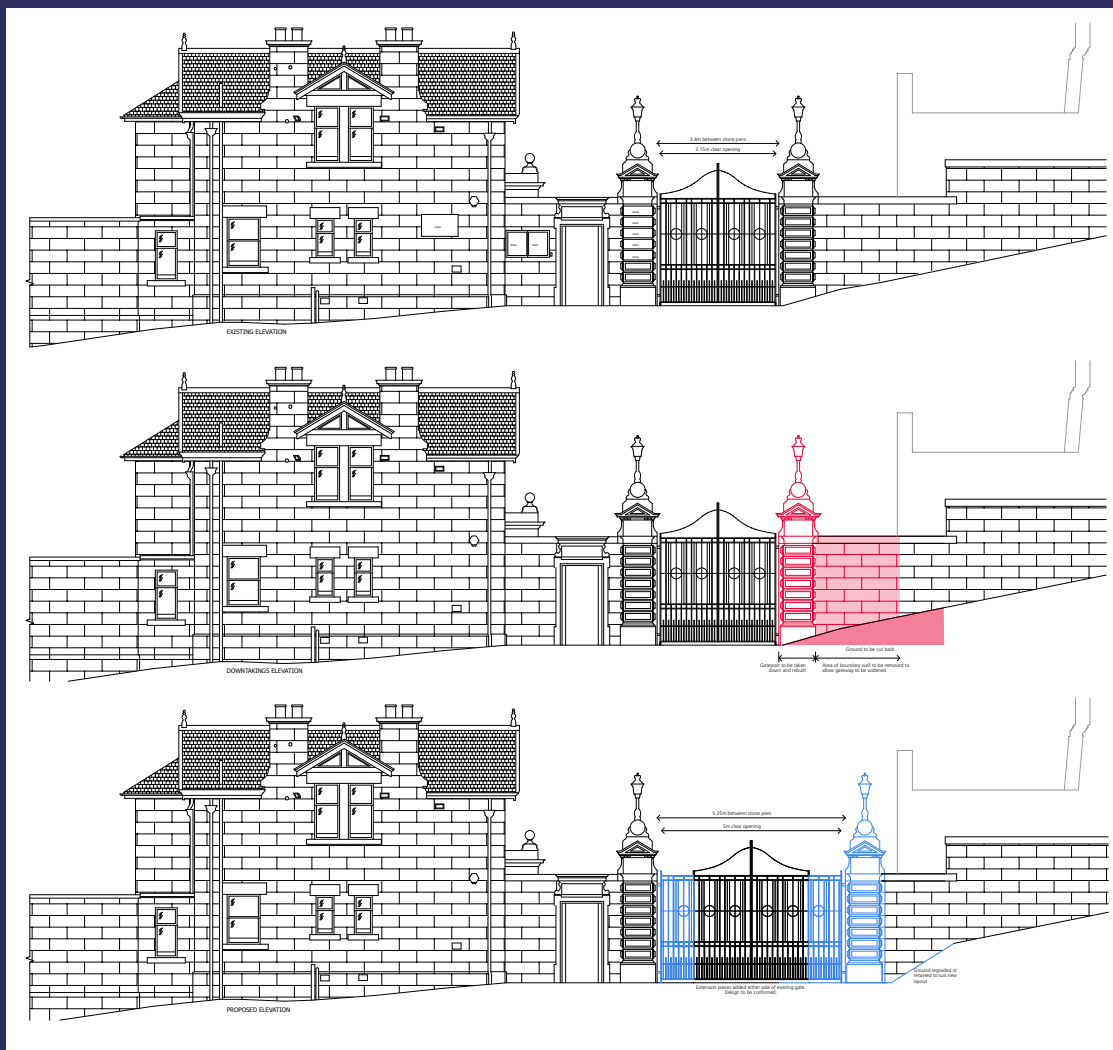


Figure A9: Gate widening to 5m (LDN Architects)



Produced by STFC Estates Services