All detailed plans and information in relation to the Arup Building courtesy of Nicholas Hare Architects
Introduction

The New Museums Site (NMS) is one of the University's central and most prominent sites, occupying an historic location in the city centre with a unique, globally important, heritage.

The earliest records show the site as the location of an Augustinian Friary and its gardens. Later, in the 18th century, the site was taken into the University's ownership, first as its Botanic Garden and then, in the second half of the 19th century, as a location for buildings specifically designed for the study of the Natural Sciences. In the first half of the 20th century, rapid ad hoc expansion continued as the need for space grew to accommodate the work of the Cavendish Laboratory in particular. An urban environment of poor quality, with a public realm consisting of a series of interconnected service spaces with an inappropriate scale and high density was the result. Post war attempts to improve the situation whilst providing still more usable space, through a comprehensive redevelopment plan, were not continued after the completion of the Arup Building in the early 1970's and left their own legacy in terms of further disjunctions of public space and scale.
1.1. THE PURPOSE OF THE DOCUMENT

Redevelopment of the site in the 21st century is now facilitated by the relocation of science and technology based departments to new accommodation at West Cambridge.

The purpose of this document is to ensure that redevelopment is carried out in a coherent, holistic and sensitive way that respects the individuality of the institutions and more valuable existing buildings on the site, while also representing, facilitating and encouraging the communication and collaboration that is an essential part of the University’s success. In this way the site can be improved as an urban place, as a setting for a wide variety of academic lives, and as a place through which the University can present its past, present and hopes for the future to its visitors.

To this end this document firstly sets out some key aims and priorities. Secondly, it establishes a number of strategies for how these aims might be addressed and, finally, it describes specifically how it is envisaged that some of these strategies might be implemented.

1.2. USE OF THE DOCUMENT

It is intended that the document should be the reference and starting point for all future development on the site. Some elements of the plan are considered essential to the success of the transformation of the site as a place in the city. These include the approach to heritage assets, the general location of new buildings and the size of these new buildings in relation to the external spaces. There should be a presumption that these elements are to be respected and implemented. Other elements are deliberately and necessarily left unresolved; they need further work by specific design teams entrusted with the progress of future development.

1.3. SPACE PLANNING

One of the greatest challenges facing the redevelopment of the NMS is to balance the need to improve the quality of the place with the need for useable academic space. The masterplan does not seek to fully resolve this tension. Nor can it do so as the need for useable space is continually developing and will continue to do so in the future. Instead, the Masterplan has been developed on the basis of a working hypothesis made up of elements of varying degrees of certainty and uncertainty as described below. A schedule illustrating how space might be allocated to the various entities on this basis is included as an Appendix.

A) A number of strategic relocations are planned as follows:
   - Dept. of Materials Science and Metallurgy and the Dept. of Chemical Engineering and Biotechnology will vacate all space allocated to them on the New Museums Site
   - The Cambridge Conservation Initiative will be established in the Arup Building
   - A new Student Services Centre will be established on the site providing student facing administrative services
   - The Dept. of Land Economy and the Dept. of Geography will be relocated to the site
   - The University Library will establish an information hub with some associated study space to maintain a city centre facility after the closure of the Central Science Library
   - The Cambridge Institute for Sustainability Leadership will be relocated to the site if possible

B) The following entities already on the site will remain:
   - Division of Biological Anthropology (part)
   - Division of Social Anthropology
   - Department of the History and Philosophy of Science including the Whipple Museum
   - Department of Sociology
   - Department of Psychology (part)
   - The Dept. of Zoology (which would be consolidated around the main Zoology Building in the south east corner of the site)
   - Offices of the Cambridge Philosophical Society

C) Space utilisation will improve around the University generally and in particular with regards to formal teaching space. Investment will be made in existing assets, such as the Lecture Theatres in ‘listed buildings’, to ensure that they contribute to the effective working of the Estate.

D) There will be an increased use of shared – possibly centrally managed – facilities to include:
   - A replacement Lecture Theatre (for the Cockcroft Lecture Theatre) and replacement computer teaching rooms, as the need is determined, in basement space beneath the central courtyard (Second Court)
   - Generic academic office accommodation that could be allocated to specific fixed term research projects as the need arises
   - Generic meeting spaces
   - Shared library services around the University Library hub

1.4. PREPARATION OF THE MASTERPLAN

The masterplan has emerged through a number of phases of work that have taken place over several years. This started with research, both into the history and nature of the site itself, as well as into what the University needs to support the development of its academic plans. Subsequently, a number of development options were proposed for the various parts of the site and after these had been discussed within the University community and with other key stakeholders, a holistic vision for the site emerged. It is important to emphasise that this did not arise as an independent or abstract idea to be superimposed on the site but that rather it grew out of a study of the site itself.

1.5. GOVERNANCE

The work has been overseen by a New Museums Site Development Board, reporting to the Planning and Resources Committee. The Board consists of the following members:
   - Senior Pro Vice Chancellor Planning and Resources (Chair)
   - Academic Secretary
   - Head of the School of Biological Studies
   - Head of the School of the Humanities and Social Sciences
   - University Librarian
   - Executive Director of the Cambridge Conservation Initiative
   - Director of Estate Management
   - The Head of the Planning and Resource Allocation Office

A list of professional consultants and consultees that have contributed to the masterplan is included as an appendix.

1 The relocation of the two Divisions of Anthropology and that part of the Dept. of Psychology which is on the New Museums Site to the Downing Site has been mooted but is dependent on other projects being brought forward to facilitate them. The possible relocation of Sociology to the Sidgwick Site has also been discussed in the past.
SECTION 2.0

Aims
2.0 AIMS

The aim of the masterplan is to restructure and regenerate the New Museum Site (NMS) through redevelopment of its buildings and spaces. The redevelopment will optimise the usability of the site for the University with accommodation that is flexible and sustainable, open space that will transform the way the site can be used, and with a quality throughout that is reflective of the site's heritage and its location at the heart of Cambridge. Overall the masterplan seeks to expand the site's appeal and its potential to contribute to the city's economy and culture.

2.1 THE MASTERPLAN AIMS

2.1.1 TO CAPTURE THE HISTORY AND TRADITION OF THE NEW MUSEUMS SITE

The NMS has an important role representing the University to local, national and international audiences, while for the city's wider population the site is a part of the city centre surrounded by civic, retail, cultural and College uses.

The NMS has an impressive historic academic heritage that includes ground-breaking research and discoveries. The masterplan seeks to promote the understanding of the site's heritage whilst transforming it into an attractive and sustainable environment for working and learning, while making it adaptable for future requirements.

Through implementation of the masterplan the site is to continue to contribute to the life of the city, as a focus for the University museums and collections, and through enhancement of public access and the creation of enjoyable spaces within the site, which collectively create a 'window' into the life of the University and the site's history.

2.1.2 TO IMPROVE ACCESSIBILITY

The masterplan proposes improved entrances to the site from surrounding city streets, inviting access and controlled public use of the site. This will enable the site's museums and collections to be more easily accessed, and its cultural heritage to be explored.

2.1.3 TO RETAIN HERITAGE AND QUALITY BUILDINGS THAT CONTRIBUTE TO THE SITE AND ITS SURROUNDINGS

An objective of the masterplan is to selectively conserve heritage buildings, located principally in the perimeter of the site, comprising a majority of Listed Buildings and Buildings of Local Interest. The core of the site has been substantially changed over time, and contains buildings of generally lower quality. The site core therefore provides the greatest opportunities for change and for new open spaces, which will in turn improve the setting of Listed Buildings on the site's perimeter.

The definition of heritage/cultural interest is subjective and therefore presents some risks that are addressed by the masterplan approach, having been explored through consultation with English Heritage (EH).

The site is located within the Cambridge Historic Core Conservation Area and there is presumption in favour of conservation of its Listed Buildings and Buildings of Local Interest, which is to be fully and finally tested through detailed proposals before implementation of each of the masterplan development phases can commence.

The buildings on the site are varied. A variety of approaches addressing removal, retention and alteration, fabric improvement and raising sustainability performance are applied through the masterplan to meet the site’s future uses, constrained by heritage considerations for some of the buildings. The masterplan proposes the rational reuse of existing buildings of merit that can meet the needs of future occupants, and proposes to undertake selective demolition and replacement of buildings to enable better public realm and improve retained Listed Buildings & Buildings of Local Interest and their setting.

2.1.4 TO PROVIDE A NEW SPATIAL STRUCTURE WITH LINKS TO THE CITY

The masterplan outlines a clear spatial structure for the site as a part of the historic city that supports University activity and provides a platform for academic life. The masterplan creates an attractive and legible environment that allows for all uses to come together with attractive open spaces that have a high amenity and sustainability value, as well as supporting the individual building uses.

New flexible open spaces are a major component of the masterplan proposals that allow for the movement of people and a setting for buildings. Fundamental changes take place in the site core, where scope has been identified.

2.1.5 TO EMBRACE SUSTAINABLE DEVELOPMENT

A set of twelve sustainability principles have been identified to be adopted at the New Museums Site. They have been employed to assist in the development of the masterplan and will be applied through the redevelopment design and construction phases. The principles also address the occupied buildings on the site.

Servicing, site utilities and infrastructure are rationalised through the masterplan. This will make it easier to accommodate future changes as well as improving the current situation. Future changes include alterations in site use, climate change and new energy sources. The proposed layout, remodelling and green infrastructure will support natural ventilation, shading, solar gain and daylighting, rainwater capture and recycling.

Access for appropriate levels of servicing, refuse collection and emergency vehicles are retained in the proposals. The provision of long term and short term cycle parking is increased, whilst the numbers of vehicle parking and delivery spaces are reduced to a minimum, to fulfil aims to implement a sustainable travel strategy.

A key aim of the masterplan is to deliver biodiversity enhancement.
by maximising areas of green infrastructure (such as living roofs) and providing features such as insect houses and nest boxes, which together will provide for wildlife such as invertebrates, birds and bats.

The use of wildlife cameras and such technology as a University specific biodiversity ‘app’ could enable a live feed of information from the buildings to site visitors, students and staff to raise awareness of the biodiversity of the site.

Sustainable Drainage Systems (SuDS) will be utilised to attenuate flows and reduce the surface water discharge to the public sewers surrounding the site in accordance with local policy and good practice.

2.1.6. TO RATIONALISE COMPLEX UTILITIES, SERVICES, MECHANICAL AND ELECTRICAL NETWORKS

The masterplan proposes a site-wide infrastructure strategy and rationalisation of existing services to improve energy efficiency, comfort, reliability and adaptability, and to reduce management and maintenance liabilities.

Many of the existing networks are inadequately recorded, and serve different parts of the site or the University more widely. The masterplan proposes a comprehensive change over the duration of the implementation of the masterplan, and partial or phased work will need careful planning.

2.1.7. TO BE DELIVERABLE

Development is to be phased in six ‘Development Areas’ consisting of logical parcels combining buildings, associated external spaces and incremental upgrade or replacement of site utilities and infrastructure, which are described in detail later in the report.

The development area boundaries have been conceived with consideration of existing building users, proposed users and the needs of the University, to reduce the impact on site occupiers.

The Development Areas can be implemented in a sequence that delivers efficiencies in construction and duration, and to reflect the University’s expenditure and delivery plans.

The approach to phasing Development Areas in terms of planning strategy and dealing with heritage assets is supported by Cambridge City Council (CCC) and EH, and is therefore important in minimising planning and delivery risk.
ENTRANCES AND ACCESSIBILITY - EXISTING

OPEN SPACES FOR PEOPLE - EXISTING

MOVEMENT AND WAYFINDING - EXISTING

ENTRANCES AND ACCESSIBILITY - PROPOSED

OPEN SPACES FOR PEOPLE - PROPOSED

MOVEMENT AND WAYFINDING - PROPOSED

Vehicle access
Secondary pedestrian/cycle access
Primary pedestrian/cycle access
Usable open space
Views into the site
Main routes through the site
Focal points
2.2. MASTERSTROKES

The masterplan proposals are underpinned by ‘masterstrokes’ which set the broad approach to the spatial structure of the site and define how the site will function and relate to its context.

These ‘masterstrokes’ are described below:

2.2.1. ENTRANCES AND ACCESSIBILITY

To maximise the functionality of the site and the role the site has in the city centre, the masterplan proposes to:

- Provide a sufficient number of entrances for convenient access into the site, including improvements to existing entrances and the creation of new ones to respond to ‘desire lines’ from all directions within the city
- Ensure that access points feature, where possible, views into the site core to create a relationship between the city and the site

2.2.2. SPACES

Generous open spaces will be created within the site, designed to be attractive and accessible. The existing open space is unplanned and unattractive with little opportunity for enjoyment, having been used to accommodate buildings and extensions, utilities and services, and car parking.

Through rationalisation of existing buildings, high quality, usable outdoor space is proposed in the masterplan to:

- Contribute to the city-wide network of open spaces
- Create a sequence of spaces that have varying qualities, providing structure to the site and improving its legibility
- Introduce a hierarchy of open spaces with clear entrance points and clearly developed thresholds between them
- Create spaces with functions that are influenced by the use of the site and its buildings, so that internal building space and external spaces relate well
- Provide open space at different levels with access to some building rooftops and opportunity to experience the city from an elevated perspective
- Create spaces that are pedestrian-focused
- Create spaces that are accessible for everyone and usable by all

2.2.3. MOVEMENT AND WAY-FINDING

Clear way-finding is required to aid legibility. Currently the site is difficult to navigate, and access and movement through the site is not assisted by good signage or clear sight-lines. The masterplan proposes:

- Provide a legible hierarchy of open spaces, containing identifiable routes through the site and allowing for easy navigation
- Create more obvious access routes to the site via the Arup Building podium and Zoology Museum
- Organise the buildings and spaces, using views of ‘landmark’ features to help intuitive orientation, differentiation and familiarisation

2.2.4. HEIGHT AND MASSING

The masterplan will optimise the building volumes appropriate for the site. This will involve rationalisation of the existing buildings, including removal and a reduction in size of some, and replacement of some buildings with larger ones. The masterplan proposes:

- To conserve the wider city-scape, and visually integrate the surrounding context
- Redevelopment to an appropriate scale for the size of the site
- To reflect the wide range of existing building heights and massing across the site and in the surrounding streets
- Create a built environment that mediates between the different heights and massing of buildings and open space, to allow for sufficient sunlight into the buildings and the open spaces
This Section describes the various strategies which have been developed in relation to specific issues and which inform the masterplan proposal. The themes are:

- Heritage Assets
- Spatial Structure
- New Buildings
- Site Access & Permeability
- Sustainability
- Healthy Environments
- Biodiversity
- Public Art
- Utilities & Primary Infrastructure
- Energy Centre & District Heating Network
- Water Resources
- Surface Water Drainage
- Foul Water Drainage
- Movement
- Servicing
ILLUSTRATIVE MASTERPLAN

Public Entrance to University Property

1. Parson’s Court
2. Bene’t Street Yard
3. Arts School accommodating part of the Student Services Centre (SSC)
4. New Examinations Hall Building accommodating part of the Student Services Centre
5. New entrance through the ground floor of the Old Cavendish East Wing
6. Existing entrance through the ground floor of the Old Cavendish Laboratory
7. Third Court - access for emergency vehicles only
8. New foyer to the Whipple Museum
9. The Whipple Museum
10. Existing entrance to the site through the ground floor of the Heycock Wing
11. Old Metallurgy Building refurbished
12. New building behind the retained facade of the 1907 Building with new pedestrian entrances on the ground floor
13. Existing arch between the 1907 and Zoology Buildings to be designated for motor vehicles only
14. Zoology Building
15. Foyer to the Museum of Zoology
16. Elevated Court to the Museum of Zoology
17. Public Stair to the Arup Podium from Corn Exchange Street
18. The Arup Building
19. Deliveries layby adjacent to Facilities Management base on the ground level of the Austin Building
20. First Court - restricted access for motor vehicles
21. Second Court with terracing up to Arup Building Podium - access for emergency vehicles only
22. Glazed street
23. Austin Building rebuilt around adapted existing structure
24. New building accommodating shared academic services
25. Mond Building
26. Cafe at podium level
27. Steps up to podium level
28. Babbage lecture theatre at podium level
INTRODUCING THE MASTERPLAN

The site masterplan is illustrated on the left, and the images to the right give an aerial view of some of the masterplan interventions.

The following pages describe the strategies that have influenced the masterplan, whilst section four of the report provides detail on the six ‘Development Areas’ of the site.
3.1. HERITAGE ASSETS

The whole of the site is within the Cambridge City Centre Conservation Area. The perimeter buildings of the site contribute hugely to the character and aesthetic qualities of the Conservation Area and all have national or local heritage designations. Within the site interior there are also buildings designated as ‘listed’ or of ‘local interest’, though the history of the site is such that even buildings of little or no architectural value are of some interest. Detailed information on the history of the site and the buildings on the site are included as an appendix.

The key buildings formally identified as having architectural and or historical significance on the site are:

- Arts School, Grade II listed. An Edwardian building that remains in an unmolested condition and includes in the basement re-set fragments of the Augustinian Friary that originally occupied the site
- Old Cavendish Laboratory (including the East Wing and Rayleigh Wing), Grade II listed. Late Victorian and Edwardian buildings in a neo-gothic style built in phases for the Dept. of Physics, which eventually vacated the site in the 1960’s. Little of the original interiors remain except for two lecture theatres which are in very original condition
- Mond Building, Grade II listed. An early ‘modernist’ building constructed in the 1930’s as an extension to the Cavendish Laboratory with reliefs by Eric Gill on the exterior
- Old Metallurgy Building & Heycock Wing, Building of Local Interest. Victorian buildings in a neo-baroque style that have been significantly altered internally. The backs have also been affected by the installation of servicing equipment
- Phoenix Building & Old Physical Chemistry Building, Grade II listed. These buildings incorporate the hall of the Perse School which now forms the main gallery of the Whipple Museum. The interiors and the backs of these buildings have been significantly altered
- 1907 Building, Building of Local Interest. An Edwardian extension to the Old Metallurgy Building in a free classical style. Though the façade remains, the building behind was rebuilt in the 1950’s as part of the Shell Building extension
- Shell Building, Building of Local Interest. Utilitarian in appearance the building nevertheless contains some interesting details
- Zoology Building, Grade 2 listed. Designed by E.H. Prior. Much of the building behind the main façade was rebuilt in the 1950’s though the interiors at the corner of Downing Street and Corn Exchange Street remain

3.1.1. STRATEGIC APPROACH TO HERITAGE ASSETS

The strategic approach to these heritage assets is as follows:

- Conserve the perimeter of the site as an essential part of the Conservation Area. Make some radical but sensitive interventions to create new openings in order to improve permeability and access
- Enhance the listed buildings by improving their setting and by removing unsightly additions and services where possible
- Carry out alterations to other buildings of merit in order to make them more useful
- Undertake key demolitions of buildings of lesser value in order to achieve the masterplan improvements

In addition, the following buildings have been noted to have some value:

- Balfour Building. The south and west facades are the last surviving fragments of the original Salvin designed buildings, which were the first purpose built for the sciences on the NMS. Nothing else remains
- Arup Building. A significant building by Sir Philip Dowson of Arup Associates. An application to have the building listed in 2012 was refused
- The Examinations Hall. The building shows the remains of an interesting ventilation system and has an ornate single storey classical stone façade

3.1.2. PROPOSED ENHANCEMENTS

Besides the general improvements and improved accessibility, the following heritage assets will be specifically enhanced through improved settings as described in further detail in Section 3.2:

- Old Cavendish Laboratory. Improvements to its setting through the creation of Third Court and the upgrading of Bene’t Street Yard
- Mond Building. Enhanced setting through the creation of Third Court and the views provided from Bene’t Street and Bene’t Street Yard
- Arts School. Enhanced setting through the improvements to Bene’t Street Yard
- Old Metallurgy Building. Improvements to the building itself through the removal of external services and the repair of affected details
- Arup Building. Better integration with the rest of the site

To achieve these enhancements the masterplan proposes a number of alterations and demolitions, mostly in the central area of the site, in order to restructure the site and fundamentally change the relationship between open space and built form.

3.1.3. ALTERATIONS

- A new entrance into the site is created by forming an opening in the fabric of the ground floor of the Old Cavendish Laboratory East Wing
- The built space between the Phoenix Building and the Old Physical Chemistry Building is to be remodelled to create a new foyer for the Whipple Museum. This will be accessible from both the interior and exterior of the site, thereby forming a new entrance to it, and will achieve the segregation of the Museum entrance from the entrance to the academic department
Facades to be retained

Demolition of ground floor only to facilitate proposed archway through Old Cavendish East Wing

BUILDINGS TO BE DEMOLISHED

- Ground floor of Old Cavendish East Wing to create opening into site from the North
- Examinations Hall Building
- Mond Annex
- Northern end of Austin Building
- Rolls Royce Laboratory
- Cockcroft Building
- Bridge from Phoenix Building to Balfour Building
- Back of Phoenix Building
- Balfour Building - Southern and Western elevations retained
- Shell Building
- Goldsmiths Laboratory
- 1907 Building - Eastern and Southern elevations retained

LEGEND

- Buildings to be demolished
- Demolition of ground floor only to facilitate proposed archway through Old Cavendish East Wing
- Facades to be retained
3.1.4. DEMOLITIONS

- The Balfour Building. The south and west facades that remain from the original Salvin building will be retained and repaired as far as possible but the building behind, which is of no architectural or historic interest, will be demolished to make way for a new building.
- The Cockcroft Building. This building is of little or no architectural/historical significance and is of poor quality within. It has a profoundly difficult relationship to the adjacent Arup Building and to the external spaces around it.
- The Examinations Hall Building. A relatively utilitarian building, with considerable alterations, that sits awkwardly with buildings within and outside the site and lacks significant townscape presence.
- The Mond Building Annex. This building blocks the view into the site through the Cavendish Laboratory arch and the contrast between its industrial glazing and the Grade 1 Listed Building of Corpus Christi College is very unsatisfactory. Its demolition will allow the creation of one of the key new external courtyards on the site and a key view into the site.
- The Goldsmiths’ Laboratory. A single storey building in close proximity to other buildings with no real setting or townscape presence. Its removal is key to the creation of the main public court and the main entrance to the site.
- The Rolls Royce Building. Single storey building of no architectural or historic interest. It was originally a cycle shelter.
- The 1907 Building. This will be demolished, retaining the Pembroke Street façade and the return façade supporting the Pembroke Street arch. The façade is the only remaining part of the original structure which was replaced in the 1950’s when the rear wing, known as the Shell Building, was constructed. The demolition of these later parts of little architectural value will enable a more efficient and sustainable new building, with new public entrances to the site at the ground floor, to be constructed in this key location at the main entrance to the site, whilst conserving the street elevation and characteristics of Pembroke Street and Downing Street.

3.1.5. CONSULTATION

Cambridge City Council and English Heritage have been consulted at key stages of the masterplan development to agree a strategy for retention, conservation, enhancement, and demolition of buildings to minimise planning risk. Both the City Council and English Heritage have indicated broad support for the proposals, although detailed proposals will require future consultation as they are brought forward.

3.1.6. ARCHAEOLOGY

The location of the site on the edge of the medieval city suggests that much significant archaeology should exist below ground and the presence of the King’s Ditch, which runs across the south east corner of the site, is of particular interest.

Though large areas of the site have been disturbed during previous building campaigns it is likely that further investigations will be required in areas where basement excavations take place.
3.2. SPATIAL STRUCTURE

In order to meet the aim of creating a clear spatial structure for the site, the masterplan proposes a hierarchy of external spaces. This consists of three main external courts linked by secondary spaces, which act as thresholds and transitions between the courts, and a series of more private ‘lanes’ that form a network of linkages at a smaller scale for the University community.

Each space will require careful individual design but the approach to materials, detailing, lighting and selection of furniture must be consistent to ensure that there is a quality and aesthetic coherence across the site appropriate for the scale and use of the spaces.

3.2.1. COURTS

The three courts are intended to perform different roles and they differ in their size, context (use of adjacent buildings), spatial layout, degree of access, ability to be closed-off, content and character.

- First Court. The most public space on the site, the First Court acts as a forecourt or entrance hall to the rest of the site when entered via the new main entrance from Pembroke Street. It leads to the most clearly public facing institutions on the site such as the Museum of Zoology, the Whipple Museum, the new shared teaching facilities building (including the University Library Hub), and the Arup Building podium on which is located the public café, the Babbage Lecture Theatre and the entrance to the Cambridge Conservation Initiative. It will provide parking for the limited number of vehicles allowed on the site.

- Second Court. This Court is at the heart of the site and core University functions with the multi-purpose exams halls, Student Services Centre and shared academic facilities facing onto it. It acts as a ‘living room’ for the occupants of the site with access to the podium via south and west facing terraces allowing members of the University to sit out and enjoy fine weather. The terraces also provide continuity between the raised podium and the ground plane.

- Third Court. The smallest and most intimate of the proposed courtyards, responding to the medieval scale of Free School Lane (with its Grade 1 Listed structures on the other side of the street), Bene’t Street and the city centre to the north.

3.2.2. LINK SPACES

Linking spaces are proposed to act as transitions between the three principle courts and with the public realm outside the site.

The three courts and the linking spaces between them will provide the primary route through the site linking it to the rest of the city.

Gates located at the thresholds between spaces will allow access to be controlled as specific occasions require.

3.2.3. LANES

A number of narrower routes between and within buildings are located throughout the site, principally on the west, and echo the structure and scale of the medieval city. They are principally for use by University staff and students, providing a more private and intimate way of moving around and through the site.

3.2.4. VIEWS

Views into and between spaces are extremely important in providing legibility of the spatial structure. Refer to Section 3.4.3.

3.2.5. LEVELS

Existing site levels vary slightly, and a general proposed level has been adopted across all spaces, so that threshold and ground floor levels of existing and proposed buildings are accommodated, with limited changes required only in a few locations.

The raised podium of the Arup Building is integrated into the public realm as a whole by increased functionality and improved access via new terracing and steps.
3.3. NEW BUILDINGS

The masterplan proposes the construction of new buildings in the following locations:

- On the site of the Examinations Hall Building (circa 4,500sqm GIA)
- In place of the Balfour and Cockcroft Buildings (circa 3,000sqm GIA, including 950sqm GIA within a new basement)
- Behind the façade of the 1907 Building (circa 2,000sqm GIA)

In addition, it is proposed that the Austin Building (circa 2,400sqm GIA) is stripped-back to its primary structure and rebuilt with a new external envelope. As such, it will have the appearance and performance of a new building while achieving savings in materials use and embodied carbon compared to full demolition and rebuild.

3.3.1. DESIGN OF NEW BUILDINGS

The masterplan does not seek to prescribe how new buildings are to be designed. Rather it focuses on the creation of structured external spaces and a number of overarching principles that are considered to be the key elements in the making of a successful urban space and its integration into the wider city.

There are however a number of principles that underpin the approach to the design of new buildings as follows:

- The massing of the buildings proposed in the central area (Development Area 6), which has been carefully modelled and considered with regard to its effect on the rest of the site, is paramount and the external volume of this built form should not be increased
- Entrances to buildings are to be designed in relation to the external spaces
- Roofs are to be designed to ensure they work towards the site-wide biodiversity and sustainable drainage strategies and to be amenities for the enjoyment of users of the buildings of which they are a part and of neighbouring buildings. Views of the city and beyond are to be celebrated
- Roofs should contribute to the scale and character of the Cambridge skyline and avoid the monolithic
- Architecture should be contemporary without recourse to historicism or pastiche

Refer also to following sections on Sustainability, Infrastructure, Energy Efficiency, Biodiversity and Drainage.

3.3.2. BASEMENTS

The masterplan includes the provision of a number of new basements. These are included to show how further useable space can be provided and integrated into the site without increasing the size and massing of the central built volumes above ground.
VIEWS & VISTAS

Built line, permeable to views on ground floor
View lines
Termination points of views
3.4. \textbf{SITE ACCESS \& PERMEABILITY}

The masterplan proposes an increase in the number of entrances into the site, with new entrances from the north, south and west for pedestrians, in order to make it physically more accessible and look visually less exclusive with a greater sense of transparency.

The creation of a goods delivery and collection point with a layby on Corn Exchange Street, and the very significant reduction of parking spaces on site resulting from implementation of the University’s travel plan, will reduce the number of motor vehicles accessing the site. The creation of new pedestrian entrances from Pembroke Street will allow the existing archway to be dedicated for vehicle use only.

\subsection*{3.4.1. EXISTING ENTRANCES}

Existing entrances from Free School Lane and through the Pembroke Street arch already benefit from high quality architecture, which helps to mark the entrances within the surrounding street scene. The re-organisation in the site core will create high quality vistas from these entrances towards the West Tower of the Arup Building aiding legibility and way finding.

Secondary entrances through the Heycock Wing and Parson’s Court will benefit from improvements to the external spaces, the removal of inappropriately sited services, and built form that relates to adjacent external spaces at ground floor in a more sensitive way.

\subsection*{3.4.2. NEW ENTRANCES}

The principle entrance into the site from Pembroke Street will be transformed by opening up the ground floor of the 1907 Building for pedestrian access and visual transparency.

A new opening through the ground floor of the Old Cavendish East Wing will create a new entrance into the site from Bene’t Street without the need to enter the Arts School. This new opening will create a vista to the Mond Building, which will help to anchor the site within its context.

On Free School Lane, a new entrance foyer is proposed for the Whipple Museum, which will create a recognisable entrance for the Museum on the street and allow access to First Court during its hours of opening.

\subsection*{3.4.3. VIEWS AND VISTAS}

The legibility of the site, its sense of permeability and its integration into the city fabric will be strongly dependent on views into and out of the site interior.

Key views from the thresholds into the site are:

- From the new entrances at ground level of the new 1907 Building into the public area of First Court, which acts as an orientation space and provides access to the main public amenities such as the Museum of Zoology, the Whipple Museum, the cafe and possibly a display of rare books in the University Library Hub in the shared academic facilities building which fronts onto First Court. This building will have a mainly glazed ground floor, providing further views into the Second Court beyond, and will announce the presence of the main lecture theatre within

- Through the existing archway on the ground floor of the Old Cavendish Laboratory on Free School Lane across Third Court, between the modified end of the Austin Building and the new building in the North Range towards the West Tower of the Arup Building

- From Bene’t Street through the new opening in the ground floor of the East Wing of the Old Cavendish Laboratory into Third Court and the entrance rotunda of the Mond Building

- Through the new entrance foyer of the Whipple Museum, which should be as transparent as possible, into First Court
# THE PRINCIPLES DRIVING THE SUSTAINABILITY FRAMEWORK

<table>
<thead>
<tr>
<th>Principle</th>
<th>Aim</th>
<th>Target Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ENERGY AND CLIMATE CHANGE</strong></td>
<td>Reduce the carbon footprint for the site by incorporating energy efficient design and reducing energy demands through infrastructure choices and informed behaviour; design to accommodate future climate change conditions.</td>
<td>Reduce on site CO₂ emissions by 20% compared to 2012 levels. Reduce CO₂ from construction through guidance and monitoring. Remove sources of greenhouse gases on site. Design to cope for future climate change conditions.</td>
</tr>
<tr>
<td><strong>WATER</strong></td>
<td>Take steps to minimise flood risk at the site. Reduce water demand for welfare, research, and building services through water efficient design, use of rainwater and greywater, and informed occupant behaviour.</td>
<td>Manage surface water and flood risk using SUDs techniques. Reduce on site water use for each phase by 20% compared to 2012 levels. Minimise construction water use through guidance and monitoring. Use embodied operational energy balance to inform masterplanning decisions. Adopt a whole life approach to component and material selection and efficient design. Adopt construction approached to minimise materials use.</td>
</tr>
<tr>
<td><strong>MATERIALS</strong></td>
<td>Minimise the demand for new materials through the reuse of existing buildings, structures, and components, and designing for an appropriate life, for robustness and for low maintenance. Ensure that all materials are sustainably and responsibly sourced.</td>
<td>Recycle/renovate existing buildings to reduce demolition and new construction waste. Design out waste and target 3.2 t/100m² waste generation or less during construction. Include infrastructure to reduce operational waste and increase recycling.</td>
</tr>
<tr>
<td><strong>WASTE</strong></td>
<td>Ensure the design and construction processes minimise waste arisings, and provide waste infrastructure to allow high levels of recycling during construction and operation. Design for recyclability of major components across the lifecycle of facilities.</td>
<td></td>
</tr>
<tr>
<td><strong>HEALTH AND WELLBEING</strong></td>
<td>Design buildings and public realm spaces which promote the wellbeing of the occupants and visitors.</td>
<td>Internal environment is comfortable, naturally ventilated and has daylight. Provide a high quality external environment including public art and which respects neighbours. Provide an environment supporting occupants’ healthy lifestyles.</td>
</tr>
<tr>
<td><strong>COLLABORATION AND INCLUSION</strong></td>
<td>Ensure the masterplan development and delivery is focused around collaboration between relevant parties to deliver outcomes greater than those arising in isolation. Create accessible spaces which meet the diverse needs of the users.</td>
<td>Collaboration between the site and visitors or neighbours. Provide collaboration opportunities for site users through shared services and co-location. Design for inclusion for all specialist needs.</td>
</tr>
<tr>
<td><strong>EDUCATION AND KNOWLEDGE TRANSFER</strong></td>
<td>Use academic experience when developing the proposals, making links with research programmes where appropriate. Ensure lessons learnt from early phases are used to inform further work. Develop an engagement strategy incorporating sustainability.</td>
<td>Incorporate innovative practices on site, engaging with University academic expertise. Continuous learning through site monitoring. KPIs, and analysis. Engage with site users through multiple media and initiatives.</td>
</tr>
<tr>
<td><strong>EMPLOYMENT OPPORTUNITIES</strong></td>
<td>Contribute to and benefit the local economy and provide opportunities to improve skills and deliver long term employment (service sector and construction sector). Engage with local organisations to support training programmes.</td>
<td>Target increased permanent/volunteer positions over time. Create or increase opportunities with local training programmes. Explore setting a 20% target for local labour for main contractor on all projects with a £10 million value or greater.</td>
</tr>
<tr>
<td><strong>BIODIVERSITY AND ECOLOGY</strong></td>
<td>Ensure the local ecology and urban biodiversity will be protected and improved through appropriate design, specification and long-term management. Encourage site users and others to enjoy and support the biodiversity.</td>
<td>Protect and maintain all existing flora and fauna. Improve biodiversity on site by targeting a large increase in species and coverage in an urban context. Design in appropriate features to enhance biodiversity.</td>
</tr>
<tr>
<td>** POLLUTION AND LOCAL ENVIRONMENT**</td>
<td>Minimise the impact of pollution on the local environment during construction and operation and ensure any incidents are swiftly and suitably managed and lessons are learnt.</td>
<td>Identify and mitigate all major current and potential sources of pollution during design. Ensure contractors have procedures to mitigate pollution. Adopt operational procedures to mitigate and report incidents.</td>
</tr>
<tr>
<td><strong>CULTURE, HERITAGE AND THE CITY</strong></td>
<td>Embrace the culture and heritage of the site: retain and improve buildings of significant value and the setting of the archaeology, celebrate the site's scientific heritage, enhance and promote the site's museum attractions, and improve connections with the City.</td>
<td>Preserve and enhance heritage assets ensuring space is appropriate for use. Celebrate scientific heritage by rejuvenating redundant spaces. Improve permeability to the site and museum access.</td>
</tr>
<tr>
<td><strong>TRANSPORT AND MOBILITY</strong></td>
<td>Create and accessible, pedestrian and cycle friendly site, with excellent connectivity to surrounding areas. Develop a site wide travel plan to improve travel options for occupants, and reduce CO₂ emissions.</td>
<td>Reduce emissions from commuting by 20% from 2012 levels. Improved provision of pedestrian and cyclist facilities. Minimise the impact of construction transport. Engage site users to reduce business travel by 10% by 2020.</td>
</tr>
</tbody>
</table>
3.5. SUSTAINABILITY

3.5.1. OVERVIEW

The masterplan has taken a holistic and site-wide approach to sustainability, addressing the environmental, social, and economic aspects of creating a sustainable development. The core aims of the masterplan to improve the use of buildings and assets, and provide an improved environment for occupants and visitors helps achieve some of the high level sustainability principles.

Sustainability has been placed at the heart of the redevelopment of the New Museums Site to ensure that buildings are highly efficient, constructed from sustainable materials, and have a low impact on residents and neighbours. Site infrastructure will be rationalised providing sustainable solutions for today and flexibility for tomorrow. Buildings and open spaces will serve a multitude of functions, reflecting the latest thinking in sustainability and acting as a showcase for sustainable development for the University.

3.5.2. SUSTAINABILITY FRAMEWORK

A comprehensive bespoke Sustainability Framework has been created to guide the project through from the initial masterplanning stages, through the design and construction stages, to the operation phase.

The Framework has been created taking the best features from existing rating schemes such as BREEAM Communities, BREEAM New Buildings, and CEEQUAL, as well as being responsive to local and national policies, such as the NPPF, the Cambridge Local Plan 2006, the Cambridge draft Local Plan 2014, the Cambridge Sustainable Development Supplementary Planning Guide, and the University of Cambridge’s policies.

The Framework has been used to guide the masterplanning process and will be used on all refurbishment, new build, and landscape projects on the site. It will be used to demonstrate sustainability of redeveloped and refurbished buildings and infrastructure for planning applications instead of BREEAM, in accordance with the allowance for bespoke sustainability framework assessment methods in the Cambridge City Council Draft Local Plan 2014. This should allow a more optimal design to be achieved, with an overarching framework for the entire site, and it can be used as the model for future University sites.

The approach encourages all issues to be targeted, and the optimal sustainable outcome for the site to be achieved, promoting a holistic design approach rather than tick-box approach. The application of the Framework will be guided by a dedicated sustainability consultant for all future New Museums Site projects. The consultant, in conjunction with the University, will support the design process, and then monitor the implementation through construction to post construction, resulting in a final sustainability assessment against the Framework.

An overview of the Framework is shown on the left. Sustainability is defined as twelve key principles which are grouped into four categories. Each principle then consists of a number of topics which are specific and assigned to the appropriate team member at the relevant project stage. This provides both a guide and an audit trail of the measures required to achieve a sustainable development for the New Museums Site.

Overleaf, a graphic shows a key action undertaken under each of the twelve principles.
Better connectivity with the city & access to heritage assets. Some public realm areas intended to welcome visitors rather than just academics & students.

Adoption of passive design principles at a site & building level to improve the internal & external environments.

Energy centre housing CHP to supply heating, hot water and electricity. PV panels combined with green roofs.

Green roofs on new buildings & existing buildings where possible to encourage biodiversity to thrive in a previously predominantly hard landscaped site.

Better integration between departments supported by improved access into and within the site.

New and remodelled buildings better enable the site occupants to deliver innovation and research.

Minimisation of construction waste. Coherent strategy and better planned facilities for operational waste separation & collection.

New infrastructure will reduce the risks of ground & water pollution. External noise pollution risk addressed through services design.

Selection of sustainable construction materials, which can be reused at end of life and are sustainably sourced.

Rationalisation of parking on site; disabled drivers & car club only. Much improved number & location of cycle stores.

Soft landscaping is part of the SUDS approach to water management.

Opportunities for apprenticeships, training and education.
3.6. HEALTHY ENVIRONMENTS

An important aspect of urban design is to ensure that the environments created are suitable for the occupants, and allow for good levels of health and wellbeing. The masterplan considers key measures to allow for this.

3.6.1. DAYLIGHTING

High levels of internal natural lighting will be achieved through the opening up of the site, allowing greater access to daylight within existing buildings. Glazing sizes and positions and floor plans in new buildings will ensure the opportunities for using natural light are maximised. Adequate levels of daylight can increase productivity, increase the health and wellbeing of occupants, and reduce lighting energy demands.

3.6.2. NATURAL VENTILATION

By focusing on the openings and plan depth of the buildings, natural ventilation and cross ventilation are possible to help regulate the temperature of the internal spaces, to allow adequate ventilation, and to deliver good indoor air quality. Employing techniques such as stack ventilation will reduce the need for mechanical ventilation and/or cooling.

3.6.3. THERMAL COMFORT

Thermal comfort is achieved through having suitable ventilation, shading and glare control on openings, and occupant control to adjust comfort levels. All new buildings will be designed to accommodate future warmer climate conditions whilst not relying on the installation of air conditioning. By designing the spaces appropriately, a passive design strategy can be used for most spaces.

3.6.4. NOISE

Noise levels on-site will be improved through the rationalisation of external plant, and the removal of unnecessary vehicle traffic as far as possible. The impact of new plant will be carefully considered and building designs developed to mitigate external sources of noise. Acoustically attenuated natural ventilation openings will be used to limit the need for comfort cooling.

3.6.5. AIR QUALITY

The rationalisation and location of boiler plant and exhaust flues combined with removal of vehicles will help reduce external air pollution, improving the quality of external and internal spaces.

3.6.6. EXTERNAL SPACES

The site will provide accessible and attractive external spaces with good access to sunlight, providing space for occupants to meet, socialise, relax, and move through. The landscaping design and planting schemes provide a comfortable environment. Lighting design is expected to extend the usability and amplify the experience of the external spaces and the elevations and features of the buildings that surround them.
OPPORTUNITY FOR ECOLOGICAL ENHANCEMENT

Water resource - semi-permanent/roof run off supply
PV panels
Aspirational brown roofs - subject to structural survey further review
Tree planting, using native species where suitable
Linear water features
Planting within open space
Refuge pile, consisting of logs

LEGEND

- Green roof
- Brown roof; no structural upgrade required to existing buildings
- Suitable location for climbing plants
- Suitable location for irrigated green wall
- Invertebrate hotel
- Bat tubes
- Brick nest box
- Starling boxes
- Peregrine falcon box
- Open fronted brick bird box
- Swift boxes
- Water resource - permanent/piped water supply
- Water resource - semi-permanent/roof run off supply
- Suitable location for irrigated green wall
- Tree planting, using native species where suitable
- Linear water features
- Planting within open space
- Refuge pile, consisting of logs

No dimensions are to be scaled from this drawing.
All dimensions are to be checked on site.
Area measurements for indicative purposes only.

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3.7. BIODIVERSITY

Given the site is currently of very low ecological value, there are many opportunities to enhance its biodiversity value.

The biodiversity strategy and ecology proposals are based on two factors, the urban character of the site and its context, and the site’s location within Cambridgeshire.

Opportunities for the provision of ecological enhancement in conjunction with the public art strategy should be explored.

In order to maximise the biodiversity of the NMS, the proposals include a range of habitat types:

3.7.1. GRASSLAND HABITATS

Wildflower meadows on neutral and calcareous soils have suffered significant decline across the UK (The Wildlife Trust (undated)) and, due to the rich biodiversity that calcareous grassland meadows support, the habitat is listed as a priority habitat under the Natural Environment and Rural Communities Act (NERC Act 2006).

Calcareous grasslands are relatively numerous in Cambridgeshire, and it was therefore considered important to represent this habitat type within the masterplan. A calcareous grassland green roof has been included in the proposals for the Arup building and to complement this, calcareous and neutral grassland green roofs form part of the masterplan proposals. PV panels are proposed on some green roofs, following the experimental approach taken with the Arup Building, as they are not deemed incompatible.

In addition proposed brown roofs support brown field type habitats for invertebrates, a habitat type that is in decline.

3.7.2. WATER RESOURCES

Water is essential as a drinking source for wildlife, and for supporting habitat for insects, which will in turn provide food for birds and bats. The masterplan features both permanent water features, planted up with native aquatic species, and shallow, semi-permanent water features. These resources are proposed both at ground level and on roofs, creating a layered habitat. The proposed water resources on the roofs will be of limited depth to reduce loading impact.

3.7.3. GREEN WALLS

Green walls comprising climbing plants have been proposed on north and east facing walls in the centre of the site. Flowering climbing plants can provide an important nectar source for invertebrates and cover and night roost sites for birds.

An irrigated green wall is proposed on the eastern elevation of the Cockcroft replacement building. This elevation is overlooked from both the café, and the Cambridge Conservation Initiative (CCI) common room in the Arup Building. A green wall would enliven this elevation and relate closely to the environmental agenda of the CCI and the Department of Zoology adjacent.

3.7.4. BIRD AND BAT HABITAT

Various bird and bat boxes have been proposed for selected areas. The selection of boxes has been based on birds and bats that live in urban areas and which are likely to be attracted to the site once it has been redeveloped. The bat tubes are suitable for crevice dwelling bat species such as the common pipistrelle, which is most likely to use the site.

3.7.5. ECOLOGICAL TARGETS:

The masterplan has the potential to support ecological enhancements to the following capacities:

<table>
<thead>
<tr>
<th>Green/ Brown Roofs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcerous grassland - green roof</td>
<td>1600m²</td>
</tr>
<tr>
<td>Brown field habitat - brown roof</td>
<td>830m²</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2430m²</strong></td>
</tr>
<tr>
<td>Water Resources</td>
<td></td>
</tr>
<tr>
<td>Permanent on roof</td>
<td>2 no</td>
</tr>
<tr>
<td>Semi-permanent on roof</td>
<td>2 no</td>
</tr>
<tr>
<td><strong>Ground level</strong></td>
<td><strong>25m²</strong></td>
</tr>
<tr>
<td><strong>Green Walls</strong></td>
<td></td>
</tr>
<tr>
<td>Climbing plants</td>
<td>32 linear m</td>
</tr>
<tr>
<td>Irrigated green wall</td>
<td>14 linear m</td>
</tr>
<tr>
<td><strong>Bird and Bat habitat</strong></td>
<td></td>
</tr>
<tr>
<td>Bird boxes</td>
<td>31 no</td>
</tr>
<tr>
<td>Bat tubes</td>
<td>6 no</td>
</tr>
<tr>
<td>Insect houses/ bug hotels/ habitat walls</td>
<td>30 no</td>
</tr>
</tbody>
</table>

Refer to the appendix for further detail on the ecology proposals.

---

3.8. PUBLIC ART

The Public Art Strategy responds to Cambridge City Council’s Local Plan, which encourages provision for public art through planning mechanisms at a cost equivalent of 1% of the construction budget of the development project concerned. It is informed by Cambridge City Council’s Public Art Supplementary Planning Document (Adopted January 2010) and meets their strategic objectives for Public Art: Community, Place, Artists and Art.

The masterplan proposes that the redevelopment of the NMS is carried out in 5 construction phases, each of which would constitute a development project in these terms with separate detailed planning applications. Rather than bring forward a series of independent public art projects as a part of these planning applications however, it is proposed that the public art is delivered holistically and in accordance with an overarching approach so that the various projects are linked both conceptually and physically with the place itself and with the wider public realm of the city context.

This strategy has been discussed with the Local Planning Authority and has the support of the Public Art Officer (refer to the Appendix).

A number of themes derived from the history of the place and the plans for its intellectual future are proposed as the basis for the projects as follows:

1) Research and Discovery
2) Light and Observation
3) Calibration and Measurement
4) Legacy and Conservation

It is anticipated that art arising out of consideration of these themes will be delivered in a variety of ways including:

- Commissions that will be sited in relation to key thresholds and the main public spaces of First Court and Bene’t Street Yard/Third Court where there is an opportunity for the art to create physical and conceptual linkages to the city and be accessible to the wider public
- Research and documentation projects undertaken during the course of development that might engage with the process of change and interpret the transformation of the site
- A series of events taking place after the completion of crucial elements of the work using the site and its new public areas as a setting
- A photography project to record the site and its changing condition was commissioned in the spring of 2014 as a first part of this strategy. The possibility of extending this to cover further change on the site should be considered.

Commissioned artists will be encouraged to engage with the ‘raw material’ of the site, including the historic and new buildings, below ground archaeology, the museum and library collections and the site’s history, as well as with the academic community working there.
3.9. UTILITIES & PRIMARY INFRASTRUCTURE

A purpose built Service Corridor will be formed at basement level which will create a spine through the site for primary infrastructure and the site wide heating network to run. This will provide good maintenance access and flexibility for future upgrades.

The corridor will be able to accommodate a number of utilities including the gas main, site wide heating pipes, electrical cables and IT/telecommunication services where appropriate.

The masterplan proposals comprise:

- New incoming Low Pressure Gas Main is to come from Pembroke Street with a Utility Gas Meter located in the new 1907 Building, near the site boundary. This will serve boilers and CHP plant in the Energy Centre. This replaces the various smaller gas supplies around the site.
- Existing High Voltage Electrical Cables are recommended for replacement. Substation No. 3 shall be partly reduced in size to open up space outside. Low Voltage electrical distribution equipment will be replaced within this Substation.
- The Mains Water Service Pipes will be retained where possible with some diversion work required and provision of new Fire Hydrants.
- The proposed basement ‘Services Corridor’ would have the capacity to run the existing Granta Backbone Network (GBN), providing better maintenance access and flexibility for future upgrades.
- Likewise the ‘Services Corridor’ may also accommodate the Site IT Network along with other communications cables such as BT, providing better maintenance access and flexibility for future upgrades.
3.10. ENERGY CENTRE AND DISTRICT HEATING NETWORK

A new Energy Centre is proposed, which will enable the various existing boiler plantrooms across the site to be decommissioned and will result in a more rationalised heating strategy for the site.

The Energy Centre will accommodate Combined Heat and Power (CHP) plant with back-up boilers. The CHP engine will generate electricity. The waste heat inherent to this process is then recovered and used in heating systems. This is a highly efficient and low carbon energy solution which is estimated to provide up to 60% of the site heating demand and reduce annual carbon emissions by 500 tonnes (based on long term future carbon factors of grid supplied electricity and fossil fuel).

This Energy Centre will be located in the basement and ground floor at the Northern end of the Austin Building with circa 320sqm of space. This is the optimum location to phase the renewal of the site’s energy provision in a single location. The Energy Centre will accommodate CHP plant, thermal stores and back-up boilers, which will also meet the peak heating demand. Thermal storage will enable a reserve of heat to be built up in periods of low demand which can be used in periods of high demand, thus maximising the use and benefits of the CHP plant. Due to the height of the CHP and thermal stores, these will be located in a double height space.

Initial thermal energy assessments suggest a 400kWe CHP will be optimum to meet the average site heating demand combined with a total of 4MW boilers to meet the peak heating demand. The Energy Centre allows for design flexibility, resilience and potential linkage for further adjacent buildings.

The construction of the Energy Centre and heating infrastructure will be phased. A boiler plant room will be formed initially at the north of the Austin Building basement to serve the North Range of buildings. This boiler plant will be adopted as part of the Energy Centre in the future Site Core development. The full Energy Centre, including CHP and thermal stores will be created within the Site Core development. Further peak boilers will be added in the future 1907 Building and Old Metallurgy developments.

A district heating network (DHN) will distribute heat across the site with the pipeworks via existing basements, a purpose-built ‘service corridor’ at basement level or buried in the ground. The DHN provides the opportunity and flexibility to export heat beyond New Museums Site to nearby buildings to further increase the economic and low carbon benefits of the CHP.
3.11. WATER RESOURCES

The water resources strategy for the site is to reduce water demand through water efficient design such as low flow taps, use of rain water and grey water and informed occupant behaviour.

The strategy will be delivered in a series of phases and key interventions including:

- Collecting rainfall on some of the buildings roofs with local storage and treatment systems for each Development Area
- Rainwater to be filtered and treated to a non-potable water quality suitable for toilet flushing and landscape irrigation
- Non-potable water to be pumped to nearby buildings where the balance of rainwater yield and building toilet water demand allows
- Rainwater harvesting systems to be backed up by mains water supply for periods of low rainfall
3.12. SURFACE WATER DRAINAGE

The surface water drainage strategy for the New Museums Site is to use the principle of Sustainable Drainage Systems (SuDS) to attenuate flows and reduce the surface water discharge to the public sewers surrounding the site in accordance with local policy and good practice.

The strategy will be delivered in a series of phases and key interventions including:

- A reduction in the current surface water discharge from site will be achieved by providing hydraulic flow control devices on the outfall pipes prior to discharge into the public sewers.
- Storage for additional flows up to the 1 in 100 year return period with a 30% allowance for future climate change, will be provided within below ground, geo-cellular, modular storage crates.
- New drains and the diversion of existing drains will be required to divert flows into the storage crates.
- The increase in soft landscaping, including the use of green roofs, will aid in further reducing the runoff from site.
- Where there is limited opportunity to provide attenuation of flow, surface water drainage arrangements for some areas of the site will remain as existing.
3.13. FOUL WATER DRAINAGE

The foul water drainage strategy for the New Museums Site is to reuse the existing foul and combined network wherever possible. The strategy of removing surface water discharge from the combined network will reduce the burden on the public foul sewerage and wastewater treatment works as well as creating capacity within the site drainage system for development.

The strategy will be delivered in a series of phases and key interventions include:

- Maximise re-use of existing foul and combined drains for foul water throughout each phase of development, subject to capacity and structural condition
- Diversion of foul drains required to facilitate basement structures and surface water tanks
- New connection to public sewer in Pembroke Street may be required due to historic drainage issues
- Pumping will likely be required from basement areas as they are lower than the site outfall levels
- An increase in foul water discharge is expected from the completed NMS buildings; however the removal of surface water from the foul network is anticipated to contribute to an overall reduction in discharge to the existing foul sewerage network around the site. The alteration of the foul water discharge regime will need to be agreed with Anglian Water
SECTION D-D (EAST – WEST) – ACCESS THROUGH THE ARUP BUILDING

LEGEND

- Surface level cycle parking spaces
- Car parking spaces
- Disabled car parking spaces
- Delivery spaces
- Number of cycle parking spaces above ground
- Number of cycle parking spaces below ground
- Pedestrian/ cycle access
- Vehicle access
- All modes except servicing vehicles
3.14. MOVEMENT

3.14.1. PEDESTRIAN MOVEMENT

Pedestrians can access the site via the existing entrances on Free School Lane, Pembroke Street, via the Heycock Wing, and Parson’s Court. In addition, and as discussed in earlier sections of this report, three new pedestrian entrances are proposed:

- Access via the Whipple Museum to connect the southern section of Free School Lane with the student core of the NMS. This access is vital for the wider pedestrian connections to the site from the west connecting Trumpington Street via Botolph Lane.
- Access via the opening in the Old Cavendish East Wing providing a vital connection with the city centre to the north.
- Access via the ground floor of the 1907 Building acting as the main ‘front door’ to the site.

3.14.2. CYCLE MOVEMENT AND PARKING

There are presently 453 cycle parking spaces on the NMS. The Atkins Movement Survey (March 2013) observed approximately 800 cycles parked on the NMS during peak term time.

The masterplan proposes a total of approximately 1320 cycle parking spaces, including those that are provided as part of the Arup Building.

376 no Sheffield stands/ 752 no spaces are proposed at surface level primarily for short term usage.

Circa 566 no spaces, in a combination of Sheffield stands and high density systems, are provided within existing basements. These spaces are primarily for staff and students who are required to be present on the site for longer periods of time.

The number of cycle parking spaces proposed within the masterplan is a dramatic increase on the pre-existing provision. As the site is extremely constrained and has affiliation with various other University institutions, this level of cycle parking is considered appropriate.

<table>
<thead>
<tr>
<th>Cycle Parking Spaces</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Above ground</td>
<td>752</td>
</tr>
<tr>
<td>Below ground</td>
<td>566</td>
</tr>
<tr>
<td>Total</td>
<td>1318</td>
</tr>
</tbody>
</table>

3.14.3. VEHICLE MOVEMENT AND PARKING

Limited vehicle parking will be provided as part of the NMS proposals, reflecting the University Strategy for sustainable travel.

Ten vehicle parking spaces are proposed: five for disabled users; three for electric cars (with charge points); and two for delivery spaces. Of the total ten spaces, eight are proposed to be accessed via Pembroke Street and two are proposed to be accessed via Bene’t Street. Standard parking spaces are designed to standard 2.5m x 5m for a medium sized vehicle and disabled spaces are to be 3.7m x 6.2m.

The proposals for the NMS include widening of the footway adjacent to the Pembroke Street Arch (refer to the appendix for details). This will help enhance the visibility for the exiting vehicles and also ensure better public realm at the entrance. The carriageway is proposed to be reduced to 5.5m to include one way vehicle movement and a contra-flow cycle lane. Pembroke Street would be designated as a no stopping area, as a vehicle stopped on Pembroke Street (with reduced width) could potentially lead to delays to traffic on the wider network.

Further discussions regarding the transformation of Pembroke Street and Downing Street into more pedestrian and cyclist focussed places that might link the NMS with the Downing Site should be promoted.
3.15. SERVICING

3.15.1. WASTE COLLECTION

16 Euro bins are proposed in two locations – within the ground floor of the 1907 Building (6 no. behind the retained eastern elevation within a designed store) and along the western elevation of the Arup Building (10 no. within 2 designed stores).

Waste collection vehicles will access the site via the Pembroke Street Arch and will be restricted to the First Court. The design of the court is such that the movement of the waste collection vehicle is restricted to the eastern side of the court, with turning space in front of the Cockcroft replacement building.

Underground storage for bins has been explored as part of the masterplan options work and discounted due to the size restriction imposed by the existing vehicle entrance into the site.

3.15.2. DELIVERIES

Two delivery spaces have been designated within the First Court. The rest of the site will be serviced via the Facilities Management (FM) base in the basement of the Arup Building which will distribute deliveries around the site.

3.15.3. EMERGENCY VEHICLES

Emergency vehicles will enter the site via the Pembroke Street Arch and Bene't Street Yard. Tracking has been undertaken to ensure that emergency vehicles can move around the site, refer to the appendix for vehicle tracking information.

Fire hydrants are generally present within and around the site. They will be maintained or re-provided as the site is re-developed. All fire hydrants shall be accessible by emergency vehicles.
SECTION 4.0

Development Areas

The following section describes in detail the content of the six Development Areas.

The Development Area boundaries are flexible, and have been illustrated diagrammatically to show the general extents of work within each. The interface between Development Areas must allow for overlap, as temporary works may be required within one Development Area to facilitate works in another for example. The Development Area boundaries will be reviewed as and when each becomes an individual project.
The plan on the left illustrates the six Development Areas on the site.

- **Development Area 1:**
  The 1907 Building and First Court

- **Development Area 2:**
  The Old Metallurgy Building & part of the ground floor of the Heycock Wing

- **Development Area 3:**
  The Whipple Museum Entrance

- **Development Areas 4 & 5:**
  The North Range of Buildings and Third Court

- **Development Area 6:**
  The Site Core and Second Court
New 1907 Building behind retained façade

Retained façade of the Balfour Building with new building behind

New Balfour/Cockcroft Building with glazed ground floor to allow for views into and through the building

First Court with seating and cycle and car parking; landscape layout reflecting the architecture of the 1907 Building

Opened archways to provide new pedestrian and cycle entrances into the site

Link space between First and Second Court

Retained Pembroke Street Arch providing access for vehicles

Bin storage along the Arup Building

Rooftop extension with green roof and photovoltaics, set back from the street elevation

New entrance steps to the Museum of Zoology and the Arup Podium
4.1. DEVELOPMENT AREA 1: THE 1907 BUILDING AND FIRST COURT

Development Area 1 will function as the principle entrance into the site from Pembroke Street with works to the pavement in Pembroke Street, a new building behind the retained façade of the 1907 Building including new entrances to the site on ground floor, First Court and associated linking spaces as appropriate.

4.1.1. BUILDING: 1907 BUILDING

- Retention of the 1907 Building façade, including the Pembroke Street Arch, to retain and conserve the character and appearance of the Conservation Area and Pembroke Street/Downing Street streetscape
- New openings through the retained façade at ground level to increase access
- New five storey building to the rear of the retained façade including the open ground floor access level, basement and roof level accommodation set back from street frontage; floor levels/ storeys to be designed/ constructed so that floors do not conflict with the retained façade window openings
- New lift/ circulation core to provide vertical circulation to the Old Metallurgy Building and to link it to the 1907 Building with DDA compliant access to both buildings

4.1.2. OPEN SPACE: FIRST COURT

- To enhance the setting of the Old Metallurgy Building, the southern end of the Arup Building and Museum of Zoology, and the Zoology Building
- Design of paving, seating, lighting and planting to reflect the function of the Court as an arrival and orientation space, to be arranged to correspond to the 1907 Building openings in a linear arrangement leading visitors into and through the space
- Arrangement of landscape elements to allow for an anticipated high level of movement through the space
- Minimum of 5 no semi-mature feature trees with a 2m (minimum) clear stem to structure the space and provide seasonal interest
- Bin store located in open ground floor of the 1907 Building (to accommodate 6 no Euro Bins), behind retained eastern facade; located close to the site entrance for ease of collection, and well-designed for purpose
- 7 car parking spaces; 3 spaces for disabled drivers/ passengers, 3 spaces for University electric powered cars with recharging point, and 1 space for temporary use for deliveries. Located along the perimeter of the space to minimise conflict between vehicle access and pedestrian use of the space
- 170 cycle spaces provided by 85 surface-level cycle parking stands located as an integral part of the landscape layout providing easily-accessible short and longer-stay spaces, the majority of which will be located on the open ground floor of the new 1907 Building

- Public realm improvements to Pembroke Street to facilitate new entrances through the 1907 Building; localised north-side pavement widening and paving surface level adjustments
- Landscape design to retain and respond to four key vistas:
  - West tower of the Arup Building viewed from the Pembroke Street Arch
  - Whipple Museum entrance between the Phoenix Building and Old Physical Chemistry Building
  - Second Court viewed through the predominantly glazed ground floor of the Cockroft replacement building from the First Court
  - Museum of Zoology foyer viewed from within the First Court
Structuring the Site
- Extent of retained building
- Extent of new building, enclosing and addressing the new courtyard
- Extent of new basement
- Extent of retained facade to preserve character and appearance of Conservation Area
- Creation of new openings through facade, allowing for better access and increased public interaction with buildings within the site
- Building entrances

Approach to Design
- New trees
- Widened pavement on Pembroke Street to create more space for pedestrian movement, resulting in improved visibility and enhanced safety
- Linear landscape layout responding to 1907 Building
- Steps to semi-basement level of Old Metallurgy

Masterplan Infrastructure
- Pedestrian access point into the site
- Vehicle access for refuse collection, private, maintenance and emergency vehicles
- Access core with lift and stairs
- External lift providing DDA compliant access to Old Metallurgy Building and new 1907 Building
- Porter’s lodge
- New ramps from Pembroke Street
- Bin storage for six Euro bins with screen
- Diversion of services into a service corridor
- Provision of parking spaces (3 for disabled users, 1 deliveries, 3 zip-cars)
- Surface level cycle parking spaces
- Surface water attenuation tank below ground with connection to public sewer on Pembroke Street
4.1.3. DEMOLITION
- Demolition of the Shell and 1907 Building, retaining the southern and eastern elevations of the 1907 Building
- Demolition of Goldsmiths’ Laboratory
- Reconfiguration of the 1907 and Shell Building basements

4.1.4. ECOLOGICAL INTERVENTIONS
- Calcareous grassland green roof
- Insect hotel (x 2) and refuge piles (x 4) comprising bricks and logs on the green roof
- Water features at ground level which support native aquatic plants
- Planting of native flowering plants (or non-native plants with a known wildlife benefit e.g. providing a nectar source)
- Open fronted brick bird box (x 2), brick nest box (x 3), starling box (x 2), swift box (x 2)
- Bat tube (x 2)

4.1.5. SERVICES & UTILITIES
- Gas meter to be accommodated near site entrance so that utility-owned gas services are kept at the boundary. This would allow the University to have ownership of the site gas services after the meter
- Replacement and re-organisation of incoming site services from the Pembroke site entrance
- Increase the heating infrastructure capacity in the Energy Centre and extend the site heating network
- Surface water attenuation tank buried below ground in First Court, with new surface water drainage connection to existing public surface water sewer in Pembroke Street, and accepting diversion of surface water drainage from Development Area 6 (Site Core)
- PV Panels to cover 50% of the roof area
Rooftop extension, re-clad with brown roof

Remodelled Old Metallurgy Building with new mezzanine floors

Removal of redundant plant and services and restoration of building elevations

Refurbished ground floor of Heycock Wing

New glazed lift for DDA compliant access

Lane to the west of the Old Metallurgy Building to be re-designed with high quality paving, tree planting and cycle stands

First Court provides a setting for the remodelled and refurbished Building

Refurbished ground floor of Heycock Wing

Removal of redundant plant and services and restoration of building elevations

Rooftop extension, re-clad with brown roof

New glazed lift for DDA compliant access
4.2. DEVELOPMENT AREA 2: THE OLD METALLURGY BUILDING & PART OF THE GROUND FLOOR OF THE HEYCOCK WING

Development Area 2 comprises the Old Metallurgy Building, adapted to retain its main internal structure and restore the building elevations, with remodelling to improve circulation and efficiency of use of internal space.

4.2.1. BUILDING: OLD METALLURGY BUILDING

- Insertion of two new mezzanine floors, set back from the exterior walls and window openings, to enable exterior views of the building to visually retain the original building floor and window relationship, and allow better natural lighting of the building
- New DDA compliant access arrangement at interface between the 1907 Building and Old Metallurgy Building; internal stairs and exterior lift to allow for access to both buildings; differences in building floor levels accommodated internally
- Alterations to existing rooftop extension, including re-cladding and the addition of a brown roof if structurally viable

4.2.2. BUILDING: HEYCOCK WING

- Refurbishment to suit new functional requirements including removal of redundant plant from the exterior

4.2.3. OPEN SPACE

- Landscape treatment to the lane to the west of the building with high quality paving and reorganisation of steps and ramps relating to entrances to simplify and enhance the space
- 34 cycle parking spaces provided by 17 surface level cycle parking stands located as an integral part of the landscape layout providing easily accessible short and longer-stay spaces
4.2.4. DEMOLITION

- Removal of two non-original mezzanine floors

4.2.5. ECOLOGICAL INTERVENTIONS

- Planting appropriate semi-mature feature trees with a 2m minimum clear stem (native where possible), to provide structure and seasonal interest
- Potential for brown roof with semi-permanent water resource, insect hotel (x 2) and refuge piles (x 4) comprising bricks and logs

4.2.6. SERVICES & UTILITIES

- Removal of the boiler equipment retained at basement level timed in accordance with the wider energy strategy
- Increase heating infrastructure plant and extend the site wide energy network
- Divert roof drainage on east and north faces into the attenuation storage tank under First Court
New DDA compliant entrance to Whipple Museum on Free School Lane

Remodelling of ground floor of the Phoenix Building with openings into the site core and the entrance foyer

Potential for brown roof with insect hotel and refuge piles

Potential for green wall of climbing plants to rear of Phoenix Building

Glazed atrium/entrance foyer provides access from both Free School Lane and the site core

Improved space to the rear of the Whipple Museum
4.3. DEVELOPMENT AREA 3: THE WHIPPLE MUSEUM ENTRANCE

Development Area 3 comprises a new public amenity and entrance foyer to the Whipple Museum to improve access and functionality.

4.3.1. BUILDING: NEW ENTRANCE FOR THE WHIPPLE MUSEUM

- New glazed foyer entrance space; architectural design that clearly identifies the Whipple Museum entrance when viewed from Free School Lane and from First Court
- DDA compliant access from Free School Lane accommodating level difference between Free School Lane and the site core
- Reconfiguration of internal staircase (subject to discussion with English Heritage)

4.3.2. BUILDING: REMODELLING OF THE GROUND FLOOR OF THE PHOENIX BUILDING

- To open up the Whipple Museum to the interior of the site and improve the quality of the ‘lane’ running around the Mond Building between the Whipple Museum and Third Court
Structuring the Site
- Building entrances
- Extent of new glazed atrium

Approach to Design
- New tree planting
- Remodelling of openings to allow for more prominent setting
- Extent of remodelled ground floor space for café exhibitions

Masterplan Infrastructure
- Pedestrian access point
4.3.3. DEMOLITION
- Demolition of the existing building parts that link the Old Physical Chemistry Building with the Phoenix Building to accommodate new entrance space

4.3.4. ECOLOGICAL INTERVENTIONS
- Potential for a brown roof to the back of the Phoenix Building with insect hotel (x 2) and refuge piles (x 4) comprising bricks and logs
- Potential for climbing plants to the northern and eastern elevations of the Phoenix Building (native and non-native species with a known wildlife benefit e.g. providing a nectar source)

4.3.5. SERVICES & UTILITIES
- Increase the heating infrastructure capacity in the energy centre and extend the site wide energy network
- Replacement and re-organisation of site services
- Divert roof drainage on the east face of the Phoenix Building into the attenuation storage tank under First Court
Art School renovated and remodelled

Ground floor of Old Cavendish East Wing remodelled

View to Mond drum opened up

View to the West Tower from the entrance on Free School Lane

Third Court creates an entrance space and setting for the Arts School, Old Cavendish Laboratory and the Mond Building

Proposed pedestrian and cycle entrance through the Old Cavendish East Wing

Light to Lecture Theatre A maintained

Green/ brown and accessible roofs with pv panels

New SSC Building in place of Examinations Hall

Ground floor of Old Cavendish Rayleigh Wing remodelled

Improvments to Bene't Street Yard

New SSC Building steps forward to create a relationship to the retained and remodelled Austin Building

Improvements to Bene't Street Yard

Light to Lecture Theatre A maintained

Green/ brown and accessible roofs with pv panels

Third Court creates an entrance space and setting for the Arts School, Old Cavendish Laboratory and the Mond Building

Proposed pedestrian and cycle entrance through the Old Cavendish East Wing

New SSC Building in place of Examinations Hall

Ground floor of Old Cavendish Rayleigh Wing remodelled

Improvments to Bene't Street Yard

New SSC Building steps forward to create a relationship to the retained and remodelled Austin Building

View to Mond drum opened up

View to the West Tower from the entrance on Free School Lane
4.4. DEVELOPMENT AREAS 4 & 5: THE NORTH RANGE OF BUILDINGS AND THIRD COURT

Development Areas 4 and 5 form the northern and north western perimeter of the site. This area will accommodate the Student Services Centre and Exams Halls and form a new entrance way in to the site.

4.4.1. BUILDINGS: THE OLD CAVENDISH EAST AND RAYLEIGH WINGS

- Construction of a new site entrance through the ground floor of the Old Cavendish East Wing; provides access from Bene't St into the site core, the extent and shape of the entrance follows the dimensions and arrangement/ repetition of building façade features. Location to be determined to optimise vista from Bene't St Yard to the Mond Building entrance rotunda as a focal point
- Renovation and remodelling of the ground floor to support conservation of the building and to accommodate new uses

4.4.2. BUILDING: THE ARTS SCHOOL

- Renovation and remodelling to support conservation of the building and to accommodate new uses
- Basement to be cleared back to structural walls to accommodate secure bicycle parking for circa 400 cycle parking spaces
- Improvements to existing basement access ramp along north edge of building to facilitate bicycle access to basement
- Renovations to Lecture Theatre A conserve the original features and architecture but to also provide contemporary lecture facilities; access from Third Court retained to allow for the use independently of the Arts School Building main entrance/ circulation areas

4.4.3. BUILDING: NEW BUILDING IN PLACE OF THE EXAMINATIONS HALL BUILDING

- Construction of a new building 4 to 5 storeys in height with a total accommodation provision in the order of 4,500sqm GIA
- Building height stepped back to integrate massing into context, mitigate city centre views, address right to light issues with neighbouring buildings, with flat roofs for green/ brown/ accessible roofs
- Important frontage with main building entrance onto the Second Court
- Building pulled back from Parson's Court to improve qualities of the passage entrance
4.4.4. OPEN SPACE: THIRD COURT

- Creation of an entrance/arrival courtyard with a level paved area at the centre of the space, set to 10.4m AOD
- Areas of seating, lighting, planting and bicycle parking in a formal arrangement around the edges of the court
- Entrances into surrounding buildings clearly identified by paving, level changes and areas of planting
- Level access between the Mond Building, the Austin Building and the Arts School Lecture Theatre A
- 46 cycle parking spaces provided by 23 surface level cycle parking stands located as an integral part of the landscape layout providing easily-accessible short and longer-stay spaces
- 4 no semi-mature feature trees with a 2m (minimum) clear stem. Location of tree planting to retain vista from Free School Lane entrance to the Arup Building West Tower in Second Court
- DDA compliant accesses between spaces and into buildings
- Vehicle access excluded

Landscape design to retain and respond to three key vistas:

- Arup Building West Tower viewed from the Free School Lane entrance
- Doorway entrance leading into the Arts School lecture theatre corridor viewed from the glazed street between the Mond Building and the Austin Building
- A view of the Mond Building entrance rotunda from the new entrance from Bene’t Street Yard through the East Wing
4.4.5. OPEN SPACE: BENET ST YARD

- New landscape treatment to provide an enhanced setting to the Arts School and Old Cavendish East and Rayleigh Wings
- Simple formal landscape layout with tree planting and cycle parking aligned to the main route leading from the Bene’t St threshold to the new Old Cavendish East Wing entrance
- 6 no semi-mature trees to the western side of the entrance space, and 1 semi-mature feature tree to the Arts School Entrance. Trees to have 2m minimum clear stem, with an upright form. Trees to provide structure and seasonal interest
- The levels of the courtyard raised to meet the Arts School building entrance
- Arts School and Old Cavendish East Wing entrance form focal points
- 64 cycle parking spaces provided by 32 surface level cycle parking stands located as an integral part of the landscape layout providing easily-accessible short and longer-stay spaces
- Landscape layout to retain vista through the new entrance to the Mond entrance
- Two disabled parking spaces located close to Bene’t Street
- Restricted vehicle access

4.4.6. OPEN SPACE: ENTRANCE FROM PARSON’S COURT

- A simple and formal landscape treatment to include new paving and lighting to enhance quality of the space and usability, and positively contribute to the Conservation Area
- Space to be uncluttered with a minimum amount of furniture to facilitate convenient and safe pedestrian and cycle access into the site
- Gated entrance to allowed for control of access
- 24 cycle parking spaces provided by 12 surface level cycle parking stands located as an integral part of the landscape layout providing easily-accessible short and longer-stay spaces
4.4.7. DEMOLITION
- Demolition of Mond Building Annex and northern end of Austin Building
- Demolition of Exams Halls building
- Demolition of Rolls Royce Laboratory and removal of cycle storage sheds (see Development Area 6)

4.4.8. ECOLOGICAL INTERVENTIONS
- Planting appropriate trees (native where suitable)
- Calcareous grassland green roof with permanent water resource e.g. a linear pond which fills up from the drainage from the upper level of the roof. The water resource should be planted with native aquatic plants
- Brown roof
- Invertebrate hotel (x 2) and refuge piles (x 4) comprising bricks and logs on the green roof
- Open fronted brick bird box (x 3), brick nest box (x 3), starling box (x 2), swift box (x 2)
- Bat tube (x 2)

4.4.9. SERVICES & UTILITIES
- A new boiler plant room will be formed at the north of the Austin basement to serve this Development Area. This will be adopted as part of the Energy Centre during the site core development
- Removal of boilers from the Arts School and Exams Hall basement plant room
- New boiler within the basement of the Austin Building and heating pump stations which will be adopted as part of the site wide energy strategy
- Replacement and re-organisation of site services
- Surface water attenuation tank buried below Third Court, with roof drainage diverted from western side of Mond Building, eastern side of Cavendish Museum building and sections of the Arts School, with surface water drainage connection to existing public surface water sewer in Bene’t Street. The new building to replace the Examination Hall will have a temporary surface water drainage connection to existing site drainage west of Arup Building
- PV Panels to cover 50% of roof area
Terraced space mediates between Arup podium and Second Court and provides informal seating areas.

Accessible roofs provide views over the Cambridge skyline.

'Floating' stair between Arup podium and Second Court.

Potential for irrigated green wall to eastern elevation of Cockcroft replacement building.

View to drum of Mond Building from Bene't Street.

Proposed 'glazed street' between Mond and Austin Buildings.

View between cafe on the Arup podium and the Whipple Museum.

Green/brown and accessible roofs with pv panels to site core buildings.

Original Balfour facades retained.
4.5. DEVELOPMENT AREA 6: THE SITE CORE AND SECOND COURT

Development Area 6 forms the core of the site and comprises a mix of retained, remodelled and new buildings. A glazed three-storey linear circulation space (glazed street) is to link the buildings providing internal access as well as a ‘lane’ through the middle of the site for University use.

The site core provides shared University facilities via a main foyer giving access to the glazed street. The foyer is to be visible fronting onto First Court and Second Court.

4.5.1. BUILDINGS: AUSTIN/ BALFOUR/ COCKCROFT REPLACEMENT BUILDING

- Remodelling of the retained three floors and basement of the Austin Building with construction of two replacement rooftop storeys stepped back from the Austin Building line; green and brown rooftops with accessible roof terrace areas; building will be linked to the Balfour/ Cockcroft replacement building via a glazed circulation space; access from the northern and eastern entrances of the glazed street
- Retention of the original Balfour façades
- New five-storey building (including two floors at roof level) positioned behind the retained façade of the Balfour Building and continuing as another entirely new building following the approximate footprint of the demolished Cockcroft Building; where feasible ground floor to be glazed; green and brown rooftops with accessible roof terrace areas; linked to the retained and remodelled Austin Building; access into the buildings through two entrances on the southern elevation and one in the northern elevation via the atrium between this building and the remodelled Austin Building
- Glazed atrium as part of the glazed street located between the Mond Building, Austin Building and new Balfour/ Cockcroft Building; five storeys in height with bridge links between the Austin and new Balfour/ Cockcroft Buildings
- The basements underneath the Austin and Mond Annex will be retained and remodelled to accommodate shared academic facilities as well as an energy centre for the site and bicycle parking
- New basement accommodation extending the existing Austin Basement; located below the Second Court accessed via the new foyer/ glazed street
- Provision of 142 cycle parking spaces in the basement of the Austin Building; access via steps in the Third Court
- The finish floor level of the site core buildings to be 10.10m AOD

4.5.2. BUILDING: MOND BUILDING

- Potential for a brown roof subject to loading/structurally capacity

AERIAL VIEW OF THE SITE CORE LOOKING SOUTH-EAST

VIEW OF THE SITE CORE LOOKING NORTH-WEST
4.5.3. OPEN SPACE: SECOND COURT

- Formal arrangement of landscape treatment with seating, lighting, bicycle parking and planting, arranged in such way that groups of people can easily move through the space to access surrounding University uses.
- A series of steps between the Arup podium level and the Second Court to create a terraced environment with informal seating in this sunny part of the site.
- 232 cycle parking spaces/116 cycle parking stands.
- Level of 10m AOD across the space to relate to the ground floor level of the Austin Building; the edges of the space to step down to existing ground level of the Arup Building.
- Bin stores located along the western elevation of the Arup Building reflecting the shape of the building; located close to the First Court for ease of collection, and well-designed for purpose in this visually prominent area (10 no Euro Bins).
- Thresholds to the First and Second Courts to be designed to allow for the space to be closed off as required; potential for gates to be designed as part of the public art strategy.
- Pedestrian access only; physical objects to be installed between the First and Second Court to stop vehicles entering the space (with the exception of emergency vehicles).

Landscape design to retain and respond to three key vistas:

- West tower of the Arup Building viewed from the southern entrance into the space between the Cockcroft replacement building and the Arup Building.
- Second Court to the First Court viewed through the ground floor of the new Cockcroft replacement building, which will be predominantly glazed.
- Third Court and the Free School Lane entrance.

4.5.4. OPEN SPACE – OTHER

- Lane to west of Mond Building – 20 no cycle spaces/10 no cycle stands; high quality paving.
- Space to south of Balfour/Cockcroft replacement building – 22 no cycle spaces/11 no cycle stands; high quality paving; gates between the Balfour and Old Metallurgy Buildings.
- Court in front of the Whipple Museum.
4.5.5. DEMOLITION

- Demolition of the Balfour Building, retaining the original façades, plus demolition of the bridge link to the Phoenix Building
- Demolition of the Cockcroft Building
- Removal of top two floors of the Austin Building, leaving the lower three storeys above ground and the basement
- Demolition of northern end of Austin Building
- Demolition of transformer station at southern end of Mond Building, to create additional open space in front of the new Whipple entrance (subject to discussions with English Heritage). Extent of demolition subject to size of required sub-station but to align with main southern façade of Mond Building if possible (see appendix for further information)

4.5.6. ECOLOGICAL INTERVENTIONS

- Planting appropriate trees (native where suitable)
- Calcareous grassland green roof with permanent water resource e.g. a linear pond which fills up from the drainage from the upper level of the roof
- Brown roof with semi-permanent water resource
- Invertebrate hotel (x 2) and refuge piles (x 4) comprising bricks and logs on the green and brown roofs
- Irrigated green wall to eastern end of Cockcroft replacement building
- Green wall comprising climbing plants (native and non-native species with a known wildlife benefit e.g. providing a nectar source) to northern and eastern elevation of remodelled Austin Building, and northern elevation of Cockcroft replacement building
- Open fronted brick bird box (x 3), brick nest box (x 3), starling box (x 2), swift box (x 3), Peregrine falcon box (x 1)
- Bat tube (x 2)
4.5.7. SERVICES & UTILITIES: SITE WIDE ENERGY CENTRE

- New service corridor within outer wall of the new basement to accommodate the majority of central site utilities allowing access and maintenance
- Replacement of electrical equipment associated with the substation within southern end of Mond Building (refer to appendix - M&E Infrastructure Report)
- Replacement and re-organisation of site services
- Conversion of the North Range boiler plantroom in the Austin Building to create an Energy Centre that will ultimately provide heat and electricity to the whole of the NMS
- New Energy Centre will accommodate Combined Heat and Power (CHP), a low carbon energy solution generating electricity and heat. It will also include thermal storage to improve efficiency of the system, and associated equipment for connection to the heat and electricity networks
- New flues for the Energy Centre to be integrated with the Austin Building modifications
- New gas supply and gas meter to the Energy Centre from Pembroke Street
- New surface water attenuation tank under Second Court (under the terrace), and new collection to serve south side of the new building to replace the Examination Hall and sections of the Site Core buildings
- PV Panels to cover 50% of roof area